The Social Effects of Nature-Inclusive Agriculture Farmers on Their Neighbors' Attitude Towards Nature-Inclusive Agriculture

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Summary

Biodiversity in the Netherlands is decreasing rapidly and its primary driver is agriculture (Kleijn et al., 2020). In an attempt to slow this trend, the Dutch government published a vision for Nature Inclusive Agriculture(NIA) as the future of farming (Ministerie van Economische Zaken, 2014). However, the uptake of NIA remains low (Vermunt et al., 2022). As a result, it is relevant to understand what factors improve its uptake among Dutch farmers. Literature indicates that social factors are important for the uptake of new practices among farmers. The influence of social norms in the wider agricultural network on individual farmers has been well-studied (E.g.:Case, 1992; Kuhfuss et al., 2016; H. Liu & Ruebeck, 2020; X. Liu et al., 2014; Munasib & Jordan, 2011). However, there is an academic lacuna concerning how early adopters influence the attitudes towards NIA among their local social network. This has led to the research question: *How do early adopters of NIA influence the attitude towards NIA practices among their neighboring farmers?* This was divided into three sub-questions focused on understanding the NIA farmers' influence on legitimacy, knowledge diffusion, and adoption interest among their neighboring farmers. Legitimacy and knowledge are important components in understanding the farmers' attitudes towards NIA. Furthermore, both are prerequisites for increasing the adoption of NIA.

Due do the lack of previous research, the theoretical framework was built using a range of theoretical concepts. This included concepts such as 'good farming' and communities of practice for the sub-question about legitimacy. The bounded normative influence(BNI) framework and boundary spanners for understanding knowledge diffusion, and characteristics important for adoption. The research aimed to empirically verify the theoretical framework. The research followed a case study design, focusing on farmers that received long-term land leases from Staatsbosbeheer(SBB) in exchange for turning their farm nature-inclusive. Data was collected through interviews.

The results suggested that the NIA farmer's influence is limited in their local environment. This is due to the limited personal acceptance of NIA by neighbors. Furthermore, knowledge diffusion from NIA farmers to neighbors was found to be surface-level. This is because the NIA farmers and conventional neighbors learn in different social networks. Lastly, barriers such as lack of additional land or compensation limited adoption interest among neighbors. However, though the results point to a limited impact of NIA farmers on their neighbors' attitudes towards NIA, the results also point to the influence of NIA farmers on adoption in their wider network. Overall, the theory proved useful for the legitimacy-related research question. The BNI framework used for understanding knowledge diffusion was modified to include a wider set of circumstances. Lastly, the data was unable to provide significant insight into the theory used for adoption interest. However, the research was able to produce policy recommendations for the Dutch government to enhance NIA uptake.

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The Social Effects of Nature-Inclusive Agriculture Farmers on Their Neighbors' Attitude Towards NIA

1. Introduction

1.1. Background

Biodiversity on agricultural land is continuing to decline across Europe (European Commission, 2016). The same is true in the Netherlands. Dutch agriculture is extremely intensive and has very high production levels. This has led to the continued demise of natural habitats and biodiversity across the Netherlands (Kleijn et al., 2020). In an attempt to slow down this trend, or even reverse it, the concept of nature-inclusive agriculture (NIA) was introduced by the Dutch Ministry of Economic Affairs. NIA was announced as a strategy for future agriculture in a document on the National Nature Vision in 2014 (Ministerie van Economische Zaken, 2014). NIA is seen as a way to counteract the agro-biodiversity loss and its connected ecosystem services, as well as a holistic method to make farming more sustainable. The vision is based on three pillars, namely: (1) using functional biodiversity, (2) minimizing environmental pressures of the farm, and (3) caring for nature (Vermunt et al., 2022). To operationalize these pillars there are many measures farmers can implement. These include actions to (1) protect, enhance, and use the ecosystem services provided by water and soil, (2) try to close the nutrient cycles, (3) reduce detrimental emissions to the air, water, and soil, and (4) protect and construct landscape features (Vermunt et al., 2022).

Nonetheless, though the concept has been around for several years, NIA uptake amongst Dutch farmers remains low, only around 10% of Dutch farmers are estimated to be nature-inclusive (Vermunt et al., 2022). A recent study shows that multiple barriers are preventing a widespread uptake of NIA (Vermunt et al., 2022). One of those barriers is that NIA lacks legitimacy in the wider agricultural network in the Netherlands (Vermunt et al., 2022). As a result, NIA is believed not to be fully congruent with current farmer norms and socially acceptable farming practices (Westerink et al., 2021). It is well-established in research that social norms and neighbors influence a farmer's choice when the uptake of new technology or farming practices is concerned (E.g.: Case, 1992; Kuhfuss et al., 2016; H. Liu & Ruebeck, 2020; X. Liu et al., 2014; Munasib & Jordan, 2011; Nakano et al., 2018; Rust et al., 2020; Villamayor-Tomas et al., 2019; Wollni & Andersson, 2014). This is further proof that legitimacy and local social influences matter when the uptake of new farming practices is concerned. However, current research only studies the effects of the social network on whether or not an individual farmer decides to adopt an innovation. What is not yet studied is the reverse, how a single adopter influences their local social network. As a result, this study would like to focus on how NIA farmers influence the attitude towards NIA among their neighbors. This attitude change is believed to

be mitigated through legitimacy increase and knowledge diffusion, which are both necessary factors to increase adoption interest among the neighbors.

1.2. Research Questions

As a result, this study will attempt to start to fill this large research gap of how early adopters influence their neighbors in the farming sector. More specifically, this research aimed to understand what the social influence of NIA farmers is on their neighboring colleagues' attitudes towards NIA. This has led to the following research question: *How do early adopters of NIA influence the attitude towards NIA practices among their neighboring farmers?* In order to break down the research question into more manageable parts, the research aims to answer three sub-questions.

1. How do the interactions between early adopters of NIA and their neighboring farmers influence the legitimacy of NIA practices in their neighborhood?
2. How do the interactions between early adopters of NIA and their neighboring farmers influence knowledge about NIA practices in its neighborhood?
3. How do the interactions between early adopters of NIA and their neighboring farmers influence interest in the adoption of NIA practices in its neighborhood?

Both legitimacy and knowledge about NIA are seen as prerequisites for potential adoption (Rogers, 2003). Furthermore, the three sub-questions will help to understand how the early NIA adopters influence their neighbors' attitudes toward NIA.

To answer the proposed questions, this study will focus on a case study of a Dutch NIA experiment that is currently taking place. The project is funded by the Ministry of Agriculture, Nature, and Food (LVN), implemented by the State Forest Service (SBB), and monitored by Wageningen University & Research (WUR) (Staatsbosbeheer, 2021). Farmers in the project can lease more SBB land long-term if they are willing to become more nature-inclusive (Staatsbosbeheer, 2021). Focusing on this case allows access to NIA farmers for data collection. Data was collected through semi-structured interviews with both the farmers and their neighboring farmers.

1.3. Academic and Social Relevance

Previous research has established that neighboring farmers might influence each other's adoption choices. This idea has been studied through quantitative studies focusing on clustered appearances of knowledge-intensive technology uptake among farmers (H. Liu & Ruebeck, 2020; X. Liu et al., 2014; Villamayor-Tomas et al., 2019; Wollni & Andersson, 2014). These studies have found that for example, the uptake of organic farming is positively correlated with an increased presence of other organic farms in the neighborhood (X. Liu et al., 2014). However, though this indicates that the neighborhood influences the adoption choices of the individual farmer, it is unknown how an individual adopter influences the neighborhood. This is a research lacuna that this study aims to contribute to.

Furthermore, research has found that neighborhood effects seem to exist for organic farmers, where positive correlations have been found between agricultural decisions that neighbors make (Wollni & Andersson, 2014), but no such research has been conducted for NIA. The restricted fertilizer use and a ban on pesticide use that are part of the organic certification are also important for NIA, but NIA is more comprehensive with an aim to close the loop of farming inputs and outputs, and by including landscape elements at the farm. As a result, the decision to become NIA involves additional factors. As such, it is unknown whether the same neighborhood effects still apply to NIA. This is an additional research gap that this study aims to contribute too. Furthermore, due to the lack of studies in the proposed field, no comprehensive theoretical framework exists. Therefore, this study proposes a theoretical framework built form many concepts in the literature and aims to verify the proposed concepts against empirical data.

Aside from being academically interesting, the proposed research question is also policy-relevant. The Dutch government supports several NIA experimentation initiatives, with the underlying idea that ultimately NIA will spread and become more widely adopted. Furthermore, the government envisions regional collaboration to make NIA more effective in closing the mineral loop and protecting agro-biodiversity (Ministerie van LNV, 2018). This makes it interesting to understand how NIA might spread locally due to the presence of early adopters. As a result, it is important to research whether these NIA experiments have the potential to further spread knowledge, acceptance, and adoption of NIA. In essence, this means that it would be useful to understand the potential externality of "convincing" one farmer to adopt alternative farming practices and how this influences neighboring farmers (Case, 1992). With this in mind, the research provides policy recommendations to the Dutch government to support the wider adoption of NIA among Dutch farmers.

In the following sections, the theoretical framework will be presented first. In chapter 3, the methodology is outlined. Chapter 4 presents the findings and places them in the context of the theoretical framework. Chapter 6 consists of the discussion and the conclusion. Lastly, chapter 7 discusses the potential avenues Dutch policymakers can take to further aid the spread of NIA.

2. Theoretical Framework

The theoretical framework below is based on a myriad of theoretical concepts selected from the literature that are believed to have relevance to the research questions. It must be noted that the impact of NIA farmers on their neighbors' attitudes toward NIA has not yet been studied. As a result, the theoretical framework is not yet grounded in empirical data that is specific to this research. Therefore, this study aims to establish whether these concepts are indeed useful to answer the research questions. Additionally, if necessary, to broaden or adjust certain theoretical concepts to better understand how NIA farmers influence their neighbors' conception of the legitimacy of NIA, their knowledge of NIA, and their willingness to adopt NIA on their farm.

This chapter consists of four parts. The first section will discuss concepts related to legitimacy. The second section discusses how knowledge can spread between farmers and farmer groups, answering sub-question two. The reason legitimacy is discussed before knowledge is because it is important to understand that detailed knowledge will only spread between farmers if the information source is deemed legitimate. It remains important to recognize that increased legitimacy and knowledge diffusion form an iterative process and one can never happen without the other. However, this theoretical framework deems legitimacy as a prerequisite for knowledge diffusion. In the third section, the theoretical framework discusses what characteristics of the NIA farmer could be important in changing their neighbors' willingness to adopt NIA. This section will therefore sketch the theoretical concepts deemed relevant to answer the third sub-question. Lastly, the theory is summarized and a more general framework is described in which all concepts come together.

2.1. Legitimacy: Social Norms in the Farming Profession

2.1.1. Defining and Obtaining Legitimacy

Sub-question one is focused on understanding how the interactions between the NIA farmers and their neighbors influence the perception of the legitimacy of NIA in said neighborhood. Therefore, this section focusses on theoretical concepts concerning legitimacy. Legitimacy has been defined in many different ways throughout the literature (Suddaby et al., 2016). For this research, legitimacy is framed through the perception perspective. In this perspective, legitimacy is not seen as a characteristic or a process, but as a perception of an evaluator which leads to a judgment that determines legitimacy (Suddaby et al., 2016). The judgment of the norm or behavior needs to pass a "legitimacy threshold" to be deemed legitimate (Suddaby et al., 2016). The perception that leads to a judgment of legitimacy is built up of two components (1) propriety and (2) validity. Propriety is based on personal beliefs about whether the norms or behaviors are appropriate and/or desirable strategies (Johnson et al., 2006). Validity is the social component of perception, which is co-created in social interactions. It is

based on the belief that the norm or behavior is widely accepted by the larger social group (Johnson et al., 2006).

The propriety and validity of a norm or behavior lead to a legitimacy judgment of said norm or behavior. This judgment can happen on three levels, leading to three different types of legitimacy: (1) pragmatic legitimacy, (2) social-group-based legitimacy, and (3) moral legitimacy (Bitektine, 2011). Firstly, pragmatic legitimacy is focused on self-interest-based judgments. Here the evaluator determines legitimacy based on what behavior or norm they believe to be appropriate and in their best interest. This also means the pragmatic legitimacy is mainly propriety-based. Secondly, social-group-based legitimacy consists of a judgment of what is believed to be acceptable in the social group of the evaluator. This type of legitimacy is more validity-based. Thirdly, moral legitimacy is based on the wider societal benefit that the norm or behavior creates and what is believed to be deemed valid by wider society. As a result, this form of legitimacy is also grounded more in validity than in propriety.

2.1.2. Legitimacy in the Farming Context

When applying this understanding of legitimacy to farming practices and how legitimacy is created in the farmer community, the 'good farmer' concept is important to understand. The 'good farmer' concept was mainly popularized by Burton in 2004, and further developed by Burton and colleagues, as well as used by other academics over the years (E.g.: Burton & Paragahawewa, 2011; Burton & Schwarz, 2013; Saunders, 2016; Sutherland & Burton, 2011; Westerink et al., 2021). The 'good farmer' concept deals with both personal and social perceptions of what a 'good farmer' looks like. Part of what it means to be a 'good farmer' is composed of the farmer's self-identity in relation to their beliefs about 'good farmers', thereby forming the link with propriety and pragmatic legitimacy (Johnson et al., 2006; Westerink et al., 2021). Additionally, the concept is used to describe what is accepted as the appropriate practices carried out by a 'good farmer' within the wider farming profession, relating back to the concept of validity and both social-group and moral legitimacy (Johnson et al., 2006; Westerink et al., 2021).

2.1.2.1. Social-Group Legitimacy

The culturally valid norms dictated by 'good farming' are often linked to ideas of cultural and social capital (Burton & Paragahawewa, 2011). The concepts of cultural and social capital used in the 'good farmer' literature are based on Bourdieu's work (Sutherland & Burton, 2011). Cultural capital is defined as those resources that come in the form of knowledge, skills, dispositions, and the possession of culturally relevant objects (Burton & Paragahawewa, 2011). Cultural capital is the manifestation of 'good farming', following the cultural norms is one way for an individual to acquire cultural capital (Westerink et al., 2021). This is because one needs to embody the appropriate knowledge and skills in order to carry out 'good farming' practices. As a result, cultural capital increases through learning.

When a farmer acquires socially desired skills or knowledge, their cultural capital increases. This can lead to increased status and prestige, otherwise known as symbolic capital (Westerink et al., 2021). Once the farmer possesses prestige, they then become recognized as a 'good farmer' and this leads to increased social capital (Burton & Paragahawewa, 2011). Social capital is defined as the resources that can be accessed via social connections. This includes physical objects such as tools and intangible resources such as labor or knowledge that a member of the social group has acquired, thereby also accessing their cultural capital (Burton & Paragahawewa, 2011).

Social-group-based legitimacy is believed to be very important in the farming world. This is because farms tend to be businesses run by relatively few people, they are often reliant on their social network in case of emergency. This makes it important to be considered a 'good farmer' by local peers (Sutherland & Burton, 2011). What is deemed legitimate in a farmer group is created in what is known as communities of practice (CoPs). A CoP is defined as a group of people that share common pursuits or activities and who negotiate a shared identity through common interests and regular interactions (Oreszczyn et al., 2010). The farmer profession is built up of multiple CoPs, where farmers can be a member of more than one group. The collection of farmers CoPs forms a Network of Practice (NoP). In the NoP there are fewer strong bonds between individuals with reduced direct interaction. However, they do still share a set of cultural norms and beliefs of 'good farming' (Morgan, 2011).

The farming CoPs act as arenas for the co-creation and acceptance of valid 'good farming' practices. In other words, this researcher believes CoP membership determines the validity perception of farmer norms and behaviors. It therefore influences social-group-based legitimacy and moral legitimacy judgments heavily. Furthermore, CoP memberships are also believed to influence propriety perceptions, thereby influencing pragmatic legitimacy. This belief stems from the idea that individuals frequently "borrow" legitimacy judgments made by those they have tight social bonds with in order to diminish the costs of searching for information and processing said information (Bitektine, 2011).

However, it must also be noted that an individual's pragmatic legitimacy judgment and their social-groups or moral legitimacy judgment do not have to overlap. The legitimacy-as-perception perspective recognizes a diversity of pragmatic legitimacy judgments, even if the individuals all express similar judgments at the social-group or moral level (Suddaby et al., 2016).

2.1.2.2. Accepted Farmer Norms and Behaviors

Currently, the traditional conception of 'good farming' and what is deemed legitimate in conventional farmer social-groups is closely intertwined with a productivist mindset based on efficiency and high yields (Saunders, 2016). 'Tidy landscapes' are often used as visual indicators of 'good' and efficient farming. As a result, they act as an indicator of a farmer's cultural capital (Westerink et al., 2021). These 'tidy landscapes' include straight lines, no weeds, and dry fields; which are not consistent with

the biodiversity-friendly farming practices required in NIA (Westerink et al., 2021). As a result, for new farming practices, such as NIA, to be sustainable in the long run, they need to become accepted as 'good farming' practices and desired cultural capital (Burton & Paragahawewa, 2011; Westerink et al., 2021).

Nonetheless, farmers are a very diverse group and in reality, there are several different conceptions of social-group legitimacy present in the different CoPs. This is because each CoP creates its own set of valid shared norms, behaviors, and practices. Therefore, they also construct their own 'good farmer' ideal. This means that there is likely a variety in what it means to be a 'good farmer'. Therefore, there is no such thing as the 'good farm' (Riley, 2016). Farmers are likely more diverse. This means that NIA farmers and their neighbors may have different ideas of what a 'good farmer' is. As a result, making it harder for the NIA farmer to be deemed legitimate across the farmer profession in the whole NoP. This could hamper knowledge diffusion and interest in the adoption of NIA. However, it would also open up learning opportunities. If NIA exists as a legitimate 'good farmer' ideal, that means that this ideal could spread. Socially accepted norms of what a 'good farmer' is can shift and change over time (Riley, 2016; Saunders, 2016). Learning is a constant and cooperative process in CoPs (Oreszczyn et al., 2010). This means that new ideas that are being brought in, by NIA farmers for example, can influence the knowledge and norms present in a CoP.

2.2. Knowledge Diffusion

2.2.1. Knowledge Diffusion and Changed Legitimacy: Bounded Normative Influence and Boundary Spanners

Sub-question two is aimed at understanding how NIA farmers can influence the knowledge their neighbors have on NIA. This section, therefore, discusses knowledge diffusion in the farming profession. Knowledge diffusion is placed in the context of legitimacy, as the perceived legitimacy of the source of the information, or the information itself, is necessary for learning to occur. If the source or knowledge is not deemed legitimate, the recipient of said knowledge is less likely to heed the message (Rust et al., 2020).

As mentioned in the previous section, the norms of 'good farming', and therefore what is deemed legitimate in the farming profession as good practice, can change over time. Though that might not seem intuitively odd, research on group conformity and social norms suggests that the ideas of the majority and the social norms should always prevail. Yet social change does happen (Kincaid, 2010). The basic premise would be tradition over change, except for when the change has a very clear and objective advantage compared to the traditional ideas or practices. However, clear and objective advantages are very rare, especially when the change is in its early stages. The question then becomes how and why social change still happens. This is where the concept of bounded normative influence

(BNI) comes into play (Kincaid, 2010). BNI is defined as: “the tendency of social norms to influence behavior within relatively bounded, local subgroups of a social system rather than the system as a whole” (Kincaid, 2010, p.38).

Essentially, BNI is founded on the idea that when individuals have different opinions or show different behaviors from the rest of their social group they have three options. Those that are different from the majority can either (1) change their own opinion/behavior, (2) try to change the opinion/behavior of the majority, or (3) simply retreat from the majority and form their own sub-group. However, option two, changing the opinion/behavior of the majority while being the minority is not easy. As a result, minority individuals often go for option three and retreat leading to the creation of their own sub-group. This means that the NIA farmers would create sub-groups, thereby limiting their interaction with people that do not share their opinions. This would therefore also limit the diffusion of ideas about NIA to the majority, in this case, the conventional neighbors. Within the sub-group, the NIA farmers would form the majority opinion and behaviors. This allows them to sustain their opinion/behavior without major social scrutiny (Kincaid, 2010). According to CoP literature boundaries then arise between the original group and the sub-group. These boundaries can arise when one group shares a history of learning and thereby acquires new competencies. The boundary then comes to exist between this new group and members of the original group that did not acquire the new competencies (Oreszczyn et al., 2010). In essence, it is important to understand the social organization of the NIA farmers to understand whether they reduce or break contact with their neighbors as a result of becoming NIA. If the NIA farmers do indeed retreat, they reduce their contact with the neighbors, thereby reducing their potential to diffuse knowledge about NIA to their neighbors.

Following the BNI framework, early adopters often have to retreat to protect themselves from social rejection. The diffusion of knowledge, and ultimately adoption, then becomes a question of how a minority sub-group influences people outside their sub-group and interact with their near environments. These sub-groups are seen as CoPs in this research as they display similar characteristics in the literature. Essentially, once the CoP has emerged the question becomes whether individuals within the CoP decide to stay retreated within their new social group, or whether they try to spread their ideas (Kincaid, 2010). This spreading of ideas becomes easier once the individual has found social support in the new sub-group. These cross-boundary interactions can then slowly expand the minority group boundaries until they become the numerical majority (Kincaid, 2010).

Just like the BNI concept, CoP and NoP literature also indicates that learning happens at the boundary between different communities or networks (Dolinska & d’Aquino, 2016; Oreszczyn et al., 2010). This learning can happen through indirect or direct social interaction. Indirect social interaction

would be the observation of the experimentation done by another farmer, as it is believed that this is a prominent way through which farmers learn (Maertens & Barrett, 2013; Stone, 2016). Additionally, the visibility of new ideas being put into practice can play a role in how efficiently they spread (Stone, 2016). Learning through direct social interaction happens when the farmers have conversations with one another. One form of direct social learning is believed to be facilitated by boundary spanners (Oreszczyn et al., 2010). In this research, this would be NIA farmers that form a bridge between NIA CoPs and conventional farmers.

2.2.2. Levels of NIA

The Dutch government recognizes four levels of NIA. The levels were originally developed by Erisman and colleagues (2017) and later adopted by the Ministry of LNV. The levels matter because they are an indicator of how much knowledge a farmer has that they can then spread. Level 0 is when the farmer simply follows the laws and has no additional nature-friendly practices at their farm. NIA level 1 generally consists of conventional farmers that are part of a nature-conservation subsidy scheme or a basic private nature-conservation label. Level 2 NIA farmers are actively working towards closing the nutrient cycles at their farms, they usually undertake multiple measures to protect and enhance biodiversity, and they conserve landscape features such as trees or hedges. Level 3 NIA farmers have achieved a fully self-sufficient closed-loop on their farms with no foreign inputs. They have multiple landscape features on their farm and their livestock can show their natural behavior without unnecessary interference (Erisman et al., 2017).

These NIA levels are relevant because they could be used as proxies for the amount of knowledge a NIA farmer has, and consequently how much knowledge they can potentially spread. Higher NIA levels equate to a higher variety or more complex NIA practices at the farm. This might allow the NIA farmer to have developed more knowledge and skills they can share with their neighbors.

2.3. Influences on Adoption

There are several characteristics that the NIA farmer, might have that could be important when influencing adoption. These characteristics are frequently painted as characteristics of boundary spanners. The (1) frequency of interaction, (2) persuasiveness of the source, and (3) trust in the source are seen as important variables when changing the opinions and thereby behaviors of outgroup individuals (Kincaid, 2010). The frequency of interaction is an important variable on its own, but also a necessary condition for persuasiveness. Furthermore, persuasiveness is believed to consist of being able to understand others and changing the story based on that knowledge (Boster et al., 2011). Trust in the source can be linked to the concept of knowledgeability. Knowledgeability is often recognized by the fact that the individuals are sought after for information and advice (Jungnickel, 2018).

Additionally, this is also linked to the perceived reliance on and credibility of the source of information. The farmer who is passing on information must be deemed to be a good source and a 'good farmer' (Oreszczyn et al., 2010). As a result, if the NIA farmers display these characteristics, there is a higher chance they will be spreading NIA.

2.4. Linking the Literature to the Current Research

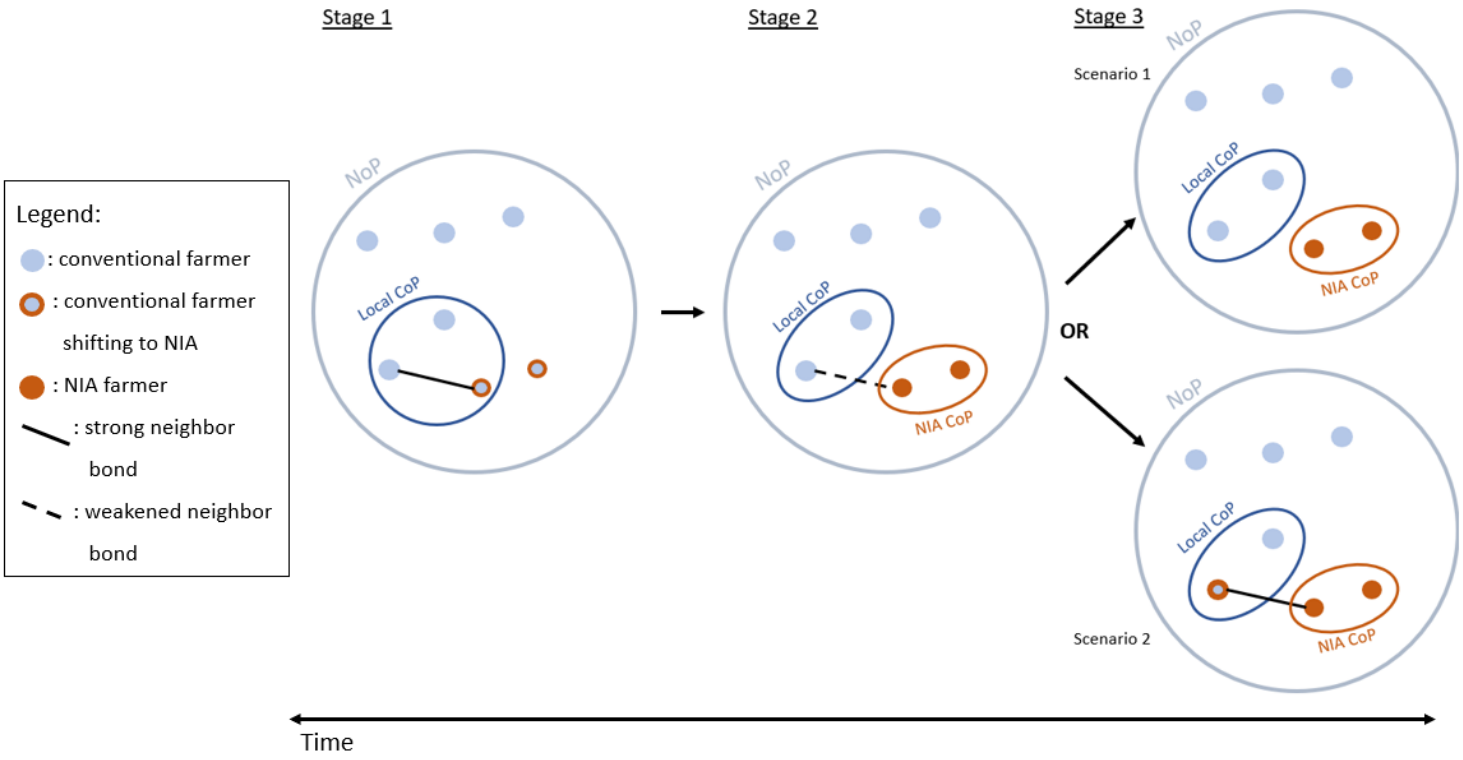

Figure 1. Timeline of NIA CoP formation and the potential for a permanent retreat or boundary spanning

Figure one illustrates how the theoretical concepts could link to each other chronologically, and how they link to the research questions. The figure only depicts the process over time but does not directly depict the underlying processes that lead to the changes. However, the underlying processes are discussed in the text below. The first stage portrays a NoP with a local farmer CoP imbedded in it. In this local CoP, there are conventional farmers and a farmer that is starting to convert to NIA. One of the conventional farmers and a NIA converter are direct neighbors with a strong bond. These strong bonds allow them to influence each other's perceptions of 'good farming', allow them to frequently share knowledge, and enable them to influence adoption decisions. The second stage shows that a NIA CoP has formed and that the converter who used to be part of the local CoP has fully converted to NIA and started retreating into the NIA CoP. This has weakened the previously strong neighbor bond with their conventional neighbor, thereby limiting communication and potential knowledge exchange. This would also limit the neighbor's potential to learn about NIA from their NIA neighbor.

The third stage is split into two different scenarios. The top scenario shows a fully retreated NIA CoP. In this case, all communication with the neighbor has ceased. As a result, no more knowledge

diffuses from the NIA CoP to the neighbor. Furthermore, due to their separation, 'good farmer' conceptions develop more independently and influence each other less, this creates diversity in what is deemed legitimate. The influence that the NIA farmer and neighbor have on one another will never drop down to zero, as farmers also learn indirectly from one another. However, the NIA farmer's influence on their neighbor would likely be significantly reduced. The bottom scenario illustrates a renewed strong neighbor connection between the NIA farmer and the conventional neighbor. With the social support of the NIA CoP, the NIA farmer becomes a boundary spanner and tries to spread knowledge on NIA. As a result, the scenario shows that the conventional neighbor is also considering converting to NIA. This strong neighbor connection not only has the potential to enable knowledge diffusion from the NIA farmer to the neighbor, but it can also impact the social-group legitimacy of NIA in the local CoP. The other members of the local CoP will also become more exposed to NIA and potentially become more accepting.

The two last scenarios described above were also found to occur among early adopters of reduced tillage in England, which is a similarly knowledge-intensive innovation to NIA (Ingram, 2010). Some early adopters of the farming innovation actively distanced themselves from CoPs that had conventional farming ideas. They became protective of their hard-won new knowledge. However, others became boundary spanners and active advocates for reduced tillage. They tried to change the behavior of farmers in their social networks and organized demonstrations on their farms (Ingram, 2010). As a sidenote, these results were not framed within the BNI theory, but the processes described seem remarkably similar. NIA farmers might display behavior similar to the reduced tillage farmers. The NIA farmers could decide to retreat from other farmer CoPs. Or they could also be part of the local farmer CoP or other CoPs, making them boundary spanners.

In conclusion, the theory discussed above consists of a potential mechanism through which NIA farmers could influence the legitimacy of, knowledge about, and adoption of NIA. However, as mentioned previously, NIA farmers' influence on their neighbors remains unstudied and the proposed mechanism is an agglomeration of potentially interesting concepts that could aid this research. The aim is to verify the proposed concepts against empirical data and to better understand whether the theory accurately depicts the reality captured by the data.

3. Methodology

3.1. Operationalization Key Concepts

3.1.1. Legitimacy

For legitimacy to be achieved from the perception perspective, the legitimacy judgment needs to pass a certain "legitimacy threshold". As discussed in the theory there are three levels of judgment resulting in three levels of legitimacy (Bitektine, 2011). These levels are pragmatic legitimacy, social-group legitimacy, and moral legitimacy.

According to the literature, pragmatic legitimacy is achieved when the behavior or norm under advisement is seen as being in the best interest of the evaluator (Bitektine, 2011). In order to operationalize this, pragmatic legitimacy is achieved when the neighbors want to adopt NIA themselves. They do not have to have adopted NIA, as there might be barriers preventing such decisions, but they must believe that adopting NIA would benefit them. This is also linked to the theoretical concept of the 'good farmer' concerning the self.

Social-group legitimacy is mainly contingent on the belief that the behavior or norm under advisement is accepted by the social-group of the evaluator (Bitektine, 2011; Suddaby et al., 2016). If the legitimacy threshold is passed, social-group legitimacy can range from tolerance to encouragement of the norm or behavior (Bitektine, 2011). If the threshold is not passed, social unacceptability can range from avoidance of the behavior (both by not enacting it and avoiding others enacting the behavior), to active discouragement of the behavior, to sanctions on the behavior (Bitektine, 2011). When placed in the context of this research, that means that NIA is deemed legitimate if it is tolerated or even encouraged by the neighbors because they believe that NIA is seen as acceptable by their farming community. NIA is seen as unacceptable when neighbors avoid NIA practices or NIA farmers or when they discourage NIA farmers from continuing as NIA farmers. Sanctioning NIA farmers could also be a sign of no legitimacy, but sanctions would be hard in this case. This part of the legitimacy operationalization links back to the theoretical concepts of a 'good farmer' as they are defined in a CoP and NoP context, and what skills and behaviors are part of the cultural capital in said social group.

Moral legitimacy is based on the idea that the new behavior or norm must benefit society as a whole and that the behavior or norm is widely deemed valid (Bitektine, 2011). Moral legitimacy is measured through statements about societal and governmental acceptance or demands for NIA, these statements can come from both the neighbors and the NIA farmers.

3.1.2. Knowledge Diffusion and Adoption Influence

Knowledge diffusion and adoption influence are more easily operationalized. Knowledge diffusion is measured by the amount and frequency of knowledge about NIA being shared. Furthermore, what topics and in what detail they are discussed are also important. Lastly, here the BNI theory also comes into play for understanding whether NIA farmers and their neighbors are part of the same CoP or not, thereby understanding how this influences knowledge diffusion. For adoption influence the measurement is quite simple: has the neighbor adopted a NIA practice? Or are they more inclined to as a result of their interactions with the NIA farmer? Additionally, the relevant NIA farmer characteristics for influencing adoption are investigated.

3.2. Research Design

The study consists of open qualitative research to verify certain theoretical mechanisms while also allowing the freedom to develop a better-suited theory. This makes qualitative methods most appropriate (Bryman, 2016). The research is built on a case study design with a pilot case. This decision was made because it provides a more in-depth understanding of one particular case of interest. Additionally, it allowed for a more contained research population in which the theory could be verified (Bryman, 2016). In this section, the case will be explained a little further and the choice for this particular case will be justified.

The case that is being studied in this research is a project funded by the Ministry of LNV, implemented by SBB, and monitored by WUR (Staatsbosbeheer, 2021). SBB is a quasi-autonomous non-governmental organization responsible for protecting and managing forests and nature in the Netherlands (Staatsbosbeheer, n.d.). For this experiment, they are making 4000 hectares of land available for long-term leasing to support farmers aiming to use more extensive and nature-inclusive agricultural practices (Staatsbosbeheer, 2021). The lease is set to extend over a period of 12 years and the participating farmers are not compensated monetarily. Currently, 16 farmers are participating (personal communication: Judith Westerink, WUR project leader). Of these 16 farmers, some farmers have long-term experience with nature-friendly farming and/or have been involved in some form of NIA before they joined the project, while others are just starting. This allowed the research to consider temporal elements in the influence of NIA farmers on their neighbors.

Furthermore, this case adds an interesting element, namely the long-term access to SBB land that the participating NIA farmers gain. This is a unique additional factor that could play a role in the data collection. Additional land is an important incentive for the participants and it allows for the extensification that is often necessary for NIA. Since the interviewed neighbors do not have access to additional long-term land leases if they decide to adopt NIA, this could limit the diffusion of NIA. If a case were to be studied where adopters of NIA did not gain additional land, their neighbors might see

shifting to NIA as more attainable for their own farm. This impacts the generalizability of the results, meaning that the uniqueness of the case could limit the wider applicability of the findings.

The reason this case was selected was primarily practical. The direct link between the researcher and the WUR project leader was used to facilitate the first contact made with the NIA farmers. This was intended to attain a higher response rate among the desired population. A second reason this case was selected is that the social relevance of this research is linked to the aim to make policy recommendations to the Dutch government. The NIA farmers in the SBB case are the NIA farmers that the Ministry of LNV sees as example farms that will enhance the diffusion of NIA. As a result, it was believed to be important to test this belief.

3.3. Data Collection

3.3.1. Sampling Strategy

The data collection was split into two different data categories, interviews with the SBB NIA farmers and interviews with their neighbors. The SBB NIA farmer population consists of 16 farmers in total. However, as a result of the time constraints of this research, it was not possible to interview all of them with all of their neighbors. Therefore, the aim was to interview eight farmers with four neighboring farmers each. However, it turned out to be slightly more difficult to reach neighbors than expected. This led to the following acquired data: 8 NIA farmers and 16 neighboring farmers were interviewed. The sample will be further discussed in the section below.

The NIA farmers were approached via email first, this email was sent out by one of the WUR project leaders. The eight farmers were selected in cooperation with one of the project leaders to ensure a diverse sample. The aim was to have a good mix of farmers that have been NIA for an extended period and those that are just starting out. This is important to understand the temporal mechanisms described in the theoretical framework. Furthermore, the idea was to interview farmers that are very outspoken about NIA and those that might be considered more introverted. This selection criterion was based on the factors discussed in the theory (section 2.4) that might be relevant in influencing others to adopt certain practices. This is a form of generic purposeful sampling with the idea that sampling criteria are used which might be relevant to the research (Bryman, 2016). NIA farmers were then contacted via phone until eight farmers agreed to participate.

When the NIA farmers were contacted by phone, they were also asked for four farmer contacts in the neighborhood. Doing this before the interview took place enabled more efficient interview scheduling. The suggested neighboring farmers were also contacted over the phone to make appointments for face-to-face interviews.

3.3.2. Resulting Sample

The 24 participating farmers were all located in Noord-Brabant, Zuid-Holland, and Overijssel. NIA farmers contacted who were located in Utrecht, Drenthe, and Zeeland declined to participate. It is unknown to what extent this influences the representativeness of the sample, but it must be kept in mind that it might indeed have had an influence. Eight NIA farmers were interviewed.

All NIA farmers were asked whether they would be willing to provide the contact details of four neighboring farmers. Who was considered a neighbor was left up to the NIA farmer to decide. This was to allow the NIA farmer slightly more freedom in providing neighbor contact details. Additionally, this ensured that the NIA farmers were comfortable with the neighbors being contacted by the researcher. Furthermore, some NIA farmers indicated that they had little to no direct neighbors, so this from of sampling ensured that there were still enough farmers to interview in the wider neighborhood.

On average, three neighbors were contacted to participate, even though the goal was to contact four neighbors. However, most farmers did not provide contact information for four neighbors, saying that they did not have more neighbors. Ultimately, this led to 16 neighbor interviews. Three NIA farmers had three neighbors who participated. For another three NIA farmers, two neighbors participated. One NIA farmer only gave one neighbor contact, who also participated. For the last NIA farmer, no neighbors were contacted. This was because another study had recently asked several similar questions to this farmer's neighbors. For this NIA farmer, the transcripts from the previous study were acquired and considered as additional data sources.

Of the farmers contacted, seven farmers declined participation. The decision not to participate was contingent on several different reasons. One NIA farmer did not want to seem like a "know-it-all" to his neighbors and another one was currently in a lawsuit over land with a neighbor. Additionally, interestingly, one of the NIA farmers initially only gave the names of the neighbors without their personal phone numbers, meaning that these neighbors were originally contacted through their landlines. Through this method of contact, two did not pick up the phone, even after three repeated attempts, and two declined to participate. One did not hear out my story and simply said they were not interested. The second indicated that the media is mean to farmers and that they had no interest in sharing their stories with anyone as a result. However, once the personal phone numbers of these neighbors were acquired through the NIA farmer, three neighbors did agree to participate, including the two that had originally declined.

Even though the NIA farmers were explicitly asked for contact details of their neighbors, some of the NIA farmers gave contact information for farmers slightly further away. These farther farmers were always farmers that also had higher NIA levels. As a result, three of the interviewed neighbors

were organic farmers, and another two neighbors could be classified as NI farmers. This can already be an indication of the fact that these NIA farmers retreated away from their conventional neighbors, pictured in stage three scenario two in section 2.5 of the theory.

3.3.3. Semi-Structured Interviews and Interview Guide

The data was collected through interviews using interview guides. The interview guides were semi-structured and can be found in appendices I and II. The fact that the interviews were semi-structured allowed the questions to change slightly throughout the interview process. Some new questions were added and certain questions were not always relevant (Bryman, 2016). The additional questions generally consisted of follow-up questions, especially if the interviewee brought up an idea that the researcher thought was relevant to the theory. As a result, the semi-structured nature of the interviews allowed space for new insights and additional topics that the interviewees raised (Bryman, 2016). In this section, the important theoretical concepts included in the interview guides will be discussed. There were two interview guides necessary, one for the NIA farmers and one for their neighbors.

The aim of the interviews with participating NIA farmers was to understand the interactions that the NIA farmers have with their neighbors and how they might have shifted since they adopted NIA. Furthermore, the aim was to understand how these farmers learn and how knowledge about NIA is diffused. Lastly, they were also asked about their perceived influence on their neighbors in terms of legitimacy, knowledge diffusion, and adoption of NIA by their neighbors.

The goal of the interviews with the neighbors was to further investigate four main topics. These topics largely coincide with the three sub-questions formulated in the introduction and with the topics discussed in the theoretical framework. These topics are the nature of their relationship with the NIA farmer, legitimacy and norms of 'good farming', knowledge exchanged with the NIA farmer, and a willingness to adopt NIA. The interview guide was made with these ideas in mind.

The first goal was to explore the nature of the relationship between the neighbor and the NIA farmer. Here, the interviewer aimed to understand under what circumstances the interviewees interact with the NIA neighbor. Some examples could be a shared CoP or a one-on-one relationship, formally or informally, and verbally or non-verbally. The second topic aimed at understanding the neighbors' view on what is means to be a 'good farmer' and how they view the NIA practices undertaken by their NIA neighbor. The questions linked to this topic were aimed to explore the legitimacy of NIA in the eyes of the neighbor. The third topic was knowledge exchange. Here the aim was to understand what knowledge is exchanged actively, and what knowledge is passed on visually. Lastly, the fourth topic tried to understand whether the neighbor had noticed changes in their conceptions of NIA since their neighbor started undertaking NIA practices or joined the experiment.

The table below presents the relationships between the research questions, the theoretical concepts proposed in the theoretical framework, and the interview questions asked.

Research Question	Theoretical Concepts	IQs: NIA farmers	IQs: Neighbors
How does the presence of early adopters of NIA influence the **legitimacy** of NIA practices in their neighborhood?	Cultural capital →'Good farmer' (1) propriety (2) validity	(1) How would you define a good farmer?	(1) What makes you proud as a farmer? -Does nature fit into that? (1) What is your opinion on farms with a broader focus? (1) What do you think about NIA? (2) How would you define a good farmer? (2) How is NIA spoken about in the neighborhood?
	'Tidy' fields (linked to 'good farmer')	Ask for follow-ups when the topic arises	Ask for follow-ups when the topic arises
	Social capital	How do you think non-NIA farmers look at your way of farming?	Take note when equipment sharing is discussed (proxy of trust and operationalization of SC)
	Questions not directly related to a specific theoretical concept		-Has your attitude towards NIA changed since your neighbor adopted NIA?
How does the presence of a NIA farmer influence **knowledge** about NIA practices in its neighborhood?	BNI (1) Change own opinion (2) Change opinion of the majority (3) Retreat	-Did the contact with your neighbors change since you adopted NIA? -What kind of contact do you have with colleagues? (3) With what groups are you closest? Why?	(2) Do you discuss NIA with [NIA farmer]?
	Boundary spanners	-Do you try to share your knowledge on NIA with other farmers? If so, with whom?	Do you discuss NIA with [NIA farmer]?

		-What do you talk about with your neighbors?	
	Indirect (visual) learning		Do you and [NIA farmer] ever visit each other's farm? If so, do you notice any difference at their farm?
	Direct learning	Do you discuss NIA with your neighbors? If so, can you give some examples?	-What do you talk about with [NIA farmer]? -Do you discuss NIA? -Do you notice a difference in how [NIA farmer] runs their farm?
	Questions not directly related to a specific theoretical concept	-From what sources do you learn most about nature-friendly farming? -In what ways do others learn from you?	
How does the presence of a NIA farmer influence **interest in the adoption** of NIA practices in its neighborhood?	Farmer characteristics (1) Frequency of contact (2) Persuasiveness (3) Trust in the source, also linked to social capital (4) Knowledgeability	(1) How often are you in touch with the neighboring farmers? (2) Have you ever convinced a colleague to adopt a NIA practice? (or something else) (4) Do other framers frequently come to you for advice or information?	(1) In what way do you stay in touch with [NIA farmer]? (1) Do you have frequent contact? (2) Is [NIA farmer] good at explaining what they do in terms of NIA? (3) How do you know [NIA farmer]? (3) Would you ask [NIA farmer] for advice?
	Questions not directly related to a specific theoretical concept		-Would you adopt NIA practices? -Why (not)? -Does [NIA farmer] have any influence on this decision?

Table 1. Relationships between the research questions, theoretical concepts, and interview questions

3.4. Data Analysis Method

The collected interview data was first transcribed using transcribe.wreally. The interviews were mostly transcribed verbatim, which means that all the original data was in Dutch. Irrelevant tangents were

not transcribed, their presence was indicated in square brackets with the subject included in case the tangents would turn out relevant.

After the transcription was completed, all interviews were coded using NVivo. The NIA farmers and neighbors were coded in separate projects to facilitate the separation of the data when the analysis took place. However, when similar codes arose in both projects, they were named the same and given the same description.

The coding process was similar to that of Mills et al. (2017). Initially, the data was separated into broad a priori categories based on the research questions and some important theoretical concepts. These initial categories and codes are indicated in the codebook which can be found in appendices III and IV. The second round of coding was inductive and grounded in the data (Mills et al., 2017). The two resulting codebooks can be found in the appendix. Due to the original data being in Dutch, all quotes found in the results section were translated by the researcher.

After coding was completed, all farmers were classified into the levels of NIA explained in the theory chapter. The reason all farmers were given a level is that this gives an overview of which NIA farmers gave contact information of conventional farmers and which NIA farmers gave contact information of other nature-friendly farmers. Though the official levels only use whole integers, the researcher believed that sub-levels might give a better understanding of the interviewee's level of NIA. This was because it felt like some farmers did not quite fit into one category or another. As a result, all farmers were classified as being level 0, 0.5,1, 1.5, 2, 2.5, or 3. An overview of the practices linked to the levels can be found in the table below.

NIA levels	Description of farming practices
Level 0	The farmer does nothing for nature that is not required by law.
Level 0.5	The farmer does nothing to intentionally preserve nature on the farm but owns some forest or has hedgerows that were historically present. The farmer has highly productive land that is not impacted by the landscape elements present.
Level 1	The farmer participates in a private or government-funded basic nature conservation scheme. Examples: - (private) Planet Proof Milk - (public) nest conservation - (public) biodiverse field boarders - etc.

Level 1.5	The farmer participates in more than one scheme and is actively trying to incorporate nature-friendly practices across the farm.
Level 2	The farmer has reached the basic level of nature-inclusivity across the farm. Organic farmers are seen as automatic members of this level due to no fertilizer and no pesticide use.
Level 2.5	The farmer is moving towards closed-loop farming with no fertilizer or pesticide use and has landscape elements present. Achieving all these aspects puts them at level 3. However, the farmers in this group are still lacking in one of the aspects.
Level 3	The farmer has achieved closed-loop farming with no fertilizer or pesticide use and has landscape elements present. Furthermore, if there is livestock, they experience as little interference as possible, allowing them to show their natural behavior.

Table 2. Farming practices linked to NIA levels

4. Results

4.1. Demographic Information

This section gives an overview of the basic characteristics of the farmers in the sample. NIA 1, NIA 3, and NIA 6 have been farming organically for over 20 years, giving them a lot of experience. Though organic farming and NIA farming are not the same, these three farmers were generally seen as nature-friendly farmers by their neighbors from the moment they became organic, rather than from the moment they switched to NIA. NIA 7 and NIA 8 can be seen as farmers who have medium experience due to the more recent adoption of NIA. NIA 2, NIA 4, and NIA 5 are only recently starting out. NIA 4 does have long-term experience and was also an advisor before starting their farm, but they are still classified as a recent adoptee since their focus is mainly taken up by starting up the farm. The specific years the NIA farmers started with NIA and organic can be found in the table below.

An overview of the classification of all interviewees into NIA levels can be found in the table below. The table also provides some information about the type of NIA practices undertaken by the farmers.

NIA1 -Organic for 25 yrs, biodynamic for 15 yrs -Circular agriculture -NIA level 3	**Org1.1** -Organic for 25 yrs -NIA level 2	**Org1.2** -Organic for 7 yrs -NIA level 2	
NIA2 -Orientation NIA for 3 yrs, not really started -Planet Proof milk, biodiverse grassland -NIA level 1	**Con2.1** -SBB land -NIA level 1	**Con2.2** -Planet Proof milk -NIA level 1	**Con2.3** -75ha of SBB land -NIA level 1
NIA3 -Organic for 22 yrs -Hedgerow conservation, mobile milking parlor, biodiverse grassland, etc. -NIA level 2.5	**Con3.1** -Has hedges and small forests, but very intense prod. land -NIA level 0.5	**Con3.2** -NIA level 0	
NIA4 -Father turned farm organic more than 30 yrs ago, started their own org. farm 5 yrs ago -Grazing in nature, diverse livestock breeds -NIA level 2	**Con4.1** -Planet Proof milk -NIA level 1	**Con4.2** -Planet Proof milk -Green-blue service conservation -Nest conservation -NIA level 1	**Org4.1** -Parents turned farm organic more than 30 yrs ago -NIA level 2
NIA5 -Orientation NIA for 4 yrs, start-up phase -Biodiverse grasslands, plans for hedgerows and landscape features -NIA level 1.5	**Con5.1** -Planet Proof milk -NIA level 1	**Con5.2** -Hedgerow conservation - NIA level 1	**Con5.3** -NIA level 0
NIA6 -Father turned farm organic more than 30 yrs ago	**NI6.1** -Historic landscape conservation (hedgerows,		

-Own protein production, avoid outside inputs -NIA level 2	kolks, toad pools, orchard, etc.); limited outside inputs -NIA level 2		
NIA7 -Farmland redesignated to nature 8 yrs ago, organic for 5 yrs -Grazing in nature, BUT import feed concentrates -NIA level 2			
NIA8 -NIA on this location for 2 yrs, but started in a different location in town 17 yrs ago -Herd roams freely in nature with limited interference and no outside inputs -NIA level 3	**Con8.1** -Nature conservation agreements -NIA level 1.5	**NI8.1** -Circular agriculture -NIA level 2	

Table 3. Overview of Interviewees. NIA: Nature Inclusive Agriculture farmer in the SBB project; Org: organic neighbor; Con: conventional neighbor; NI: Nature Inclusive neighbor; NIA level based on (Erisman et al., 2017).

4.2. NIA Farmer Influence on the Legitimacy of NIA in the Neighborhood

Nature-friendly farming practices in general have increased in acceptability and therefore legitimacy over the years, according to both NIA interviewees and their neighbors. Nature-friendly is used as an umbrella term for nature conservation schemes, organic farming, and NIA. This research aimed to find the NIA farmer's influence on legitimacy in the neighborhood. However, the data indicates that the increased acceptance of NIA is mainly driven by external societal and governmental demand and is not necessarily due to the existence of the NIA farmer. Neighbors claim that their opinion on NIA has not changed due to the NIA farmer in their neighborhood, but rather that they see nature as more important in response to a societal trend. As a result, society and governmental demands are increasing the perceived validity of NIA in wider society, thereby increasing the moral legitimacy of NIA. However, in opposition to what the neighbors claim about not being influenced by the NIA farmer, half of the NIA farmers do indicate their neighbors were initially apprehensive of the nature-friendly changes made at their farms, but that they got used to it over time. This leads to the speculation that the NIA farmers' presence sped up the acceptance of NIA in their neighborhood.

When discussing the legitimacy of NIA with neighbors, it is interesting to note that NIA is deemed more acceptable than organic farming by non-organic neighbors. This is especially the case for social-group legitimacy, but also in terms of pragmatic legitimacy in some cases. When asked whether they had a positive opinion of NIA, NI6.1 answered: *"Yes definitely, but making the step to organic is one step too far for me."*. With this, it must be said that many organic farmers seem to think the opposite is true and believe organic farming is more legitimate than NIA. This illuminates different social-group legitimacy judgments between organic and non-organic farmers. The higher acceptance

of NIA among neighbors is mainly due to the neighbors' belief that NIA can be a simple add-on to the farm, without having to change the mindset with which the rest of the farm is run. This belief is supported by the following quote:

> "*Organic is a whole different way of working. I feel like it's a different way of living. […] And NIA I see more as having your conventional business with nature next to it. That is how I see it. And what you do for nature can vary, but it is a type of side business. While organic really means focusing your entire farm on that. That's the way I see the difference, but I don't think I'm too far off."* (Con4.1)

This belief causes both higher social-group legitimacy of NIA among non-organic farmers and lower social-group legitimacy among organic farmers.

However, the same neighbors who deem NIA legitimate also indicate that they are unclear on what NIA is specifically. Eight of the 16 interviewed neighbors explicitly say they only have a broad understanding of what NIA entails. Con5.3 says: *"Yes well, I also don't precisely know what [NIA] is."*. Con4.1 further illustrates that NIA is a confusing term: *"Yeah but what is nature inclusive? Does it include field boarders, or is it really x% of your land that has to have nature, or is it meadow bird conservation, or yeah? It seems very broad. Is it hedgerow protection, or?"*. Additionally, many of the neighbors still associate organic farming with untidiness, lower production, and unhealthy livestock. The concept of 'tidy' fields was heavily present in the data and was discussed in ten of the 16 neighbor interviews. These fields included both crop and grazing fields. This indicates that the skills associated with organic farming have gained low traction in terms of desired cultural capital. That could cause issues as several of the farming practices associated with organic farming are also desired by NIA. As a result, it is reasonable to speculate that once the neighbors understand that NIA is meant to be linked to more biodiverse fields and extensification, this might impact the acceptance of NIA.

On the other hand, the data does indicate that some neighbors see the skills required for nature-friendly farming practices as desirable, indicating a positive propriety perception. A quote illustrates the point: *"I think, in itself, if you manage to farm well organically it is an achievement to still be successful despite the limitations they have."* (Con2.3). This quote discusses organic farming, but the limitations this farmer is discussing include the restrictions on pesticides and artificial fertilizer use, which would also be practices that are relevant for NIA. This quote indicates that the interviewee recognizes the skills needed to work within these limitations as cultural capital. The recognition of skills as cultural capital is an important step toward gaining social-group legitimacy (Burton & Paragahawewa, 2011). However, this is one quote and it remains hard to predict whether NIA is culturally accepted enough to lead to prestige and increased social capital. This data, therefore,

illustrates the same point made by Westerink et al. (2021), that conceptions of cultural capital and what it means to be a 'good farmer' are diverse in the farming world.

In relation to the 'good farmer' concept outlined in the theoretical framework, there are two important things to note. Firstly, 6/16 neighbors explicitly state that they think NIA is good, but not for them. The following quote illustrates this point: *"I tell [NIA farmer]: it makes sense what you are doing, but you're nuts. I wouldn't do it, but that's me."* (Con3.1). So, though neighbors do not yet accept NIA as a definition of a 'good farmer' for themselves (i.e. pragmatic legitimacy), they do seem to believe NIA is part of the general cultural norm for 'good farming' (i.e. social-group legitimacy). This could be an indicator that NIA has been added as a valid definition of 'good farming', thereby broadening its scope.

Secondly, when comparing NIA farmers' beliefs about a 'good farmer' to their neighbors', another interesting distinction arises. Both NIA farmers and neighbors see a decent income and healthy livestock as indicators of 'good farmers'. However, for NIA farmers the other most important indicator for recognizing a 'good farmer' is farming with the future in mind (6/8). NIA is therefore a good fit with their beliefs of how a 'good farmer' should farm. On the other hand, for the neighbors, the other most stated indicators all refer back to the idea of autonomy. The neighbors claim that every farmer has to do it their way (11/16), that they have to be entrepreneurs (5/16), and that they have to have their own vision and execute it (5/16). Additionally, five out of 16 neighbors state that they are proud of the freedom in their profession. This leads to the conclusion that many of the neighbors, especially the conventional ones, value individuality, autonomy, and freedom in deciding how the farm is run. This can allow the space for their own farm goals to be considered 'good farming', while potentially also allowing space for NIA to be accepted as 'good farming'. Additionally, it also illustrates that there is diversity between the norms and behaviors deemed legitimate in different social groups.

In conclusion, NIA seems to be deemed legitimate morally and sometimes also within the social groups of the interviewees. However, neighbors declare it is not the result of interactions with the NIA farmers. Additionally, the moral legitimacy that seems to be widely accepted has not trickled down to pragmatic legitimacy for most farmers. Famers are aware of the societal benefit of NIA and recognize NIA as legitimate at this level, but they mostly do not believe that NIA is the best option for them. This means that pragmatic legitimacy is very low. Furthermore, the skills and knowledge associated with NIA do not seem to have been established fully as valid cultural capital that leads to a higher status in the farmer community. This is because though NIA is often judged as legitimate on the social-group level, it has mostly only reached the stage of tolerable rather than something to be encouraged within the social groups. But following Riley (2016) and Westerink (2021), the concept of 'good farming' seems to be broadening, allowing room for NIA to be accepted and deemed legitimate.

4.3. Knowledge Diffusion as a Result of Interactions with NIA Farmers

4.3.1. Knowledge Diffusion to Neighbors

When discussing knowledge diffusion with neighbors it becomes clear that this diffusion consists of surface-level information. Eight of the 16 interviewed neighbors explicitly say they only have a broad understanding of what NIA entails. Neighbors tend to know what is happening or changing in the neighborhood to a certain extent, but they are rarely aware of the details. Some of the changes made by NIA farmers are noticed visually while others come up in conversation with the NIA farmer. The visual changes noticed tend to consist of biodiverse grassland, different mowing routines, or a change in crops grown (like less corn). The changes that most notably came up in conversation are decreased production and discussions about the production levels achieved on biodiverse grassland or how to manage weeds. When relating how neighbors understand NIA to the previously discussed levels of NIA, most neighbors seem to think that NIA is achieved at level 1 or 1.5, as a simple scheme that acts as an add-on to the farm.

In terms of reactions to visual changes, four NIA farmers report limited reactions from the neighborhood. This is because they believe there have been limited visual changes at the farm since becoming NI. Two of these farmers are long-time organic farmers who say there is little difference from before they were NI (NIA 3 and NIA 6). The other two are recent converters to NIA with limited changes made so far (NIA 2 and NIA 5). The low visibility of NIA at these farms limits these farms' effects on NIA knowledge diffusion in the neighborhood, this is in accordance with literature about the importance of indirect, visual learning (Maertens & Barrett, 2013; Stone, 2016). For the recent converters (NIA 2 and NIA 5), only the neighbors with whom they had active and regular contact know about their conversion to NIA. The neighbors with whom the contact was not as regular were unaware of the NIA farmers' switch to NIA (Con2.2, Con2.3, and Con5.2). For the organic farmers (NIA3 and NIA6) only neighbors with whom they had regular contact were interviewed. As a result, the NIA farmers' claims about the changes made not being noticed by neighbors cannot be cross-referenced with neighbor data.

Independently of visual changes, the changes being made by NIA farmers are also topics of conversation with their neighbors. This is related to the concept of direct learning (Maertens & Barrett, 2013; Stone, 2016). Furthermore, it also points to the fact that the NIA farmers do show some form of boundary spanning. They move outside their nature-related CoPs to discuss certain NIA topics with their neighbors. As mentioned, these topics include production levels achieved on biodiverse grassland, milk production levels, how to manage weeds, and how the SBB land is used and managed. Almost all neighbors say they either discuss nature-related practices with their NIA neighbor. Only one of the 16 neighbors says they do not discuss nature in any way (Con2.3). However, it must be noted

that the discussions tend to happen in passing and are not very detailed. A quote by Con5.2 illustrates the point: "*We stay in touch, like I said, once or twice a month. And we do discuss nature on his farm, but we don't have in-depth conversations about it.".* An additional 5 neighbors indicate that they sometimes talk about nature-friendly practices such as nature conservation schemes, organic farming, or practices associated with NIA. However, they do not explicitly see it as discussing NIA because NIA as a concept does not necessarily come up in the conversations. They talk about practices that the NIA farmer undertakes as a result from being NIA, but the neighbors might not necessarily know that the NIA farmer undertakes said practices as a result of being NIA. For example, the same farmer quoted above (Con5.2), talking about the fact that he sometimes discusses nature with the NIA farmer, also said later in the interview he had never heard of the concept nature-inclusive.

On top of neighbors saying they only discuss nature-friendly farming practices on a surface level with their NIA neighbors, NIA farmers indicate that they believe their neighbors take notice of the information on NIA being shared, but that the neighbors do not intend to do anything with it (3/8). This sentiment is in agreement with what the neighbors said. Additionally, lack of knowledge on NIA was mentioned several times as a barrier to adoption, in 4/16 neighbor interviews and 2/8 NIA farmer interviews. This is in accordance with the literature (Vermunt et al., 2022).

Another interesting factor in knowledge diffusion is a temporal element. The three NIA farmers who are still transitioning NIA or starting out at their farm (NIA2, NIA4, and NIA5) all say that they are still too focused on learning and transitioning their farm to really spend time spreading knowledge to others. Coincidently, these are also the NIA farmers with the lowest NIA levels: level 1, level 2, and level 1.5 respectively. This also indicates that their knowledge and skills might still be low. However, all other NIA farmers have medium to long-term experience with NIA related practices and actively spread their NIA knowledge to interested parties. They often receive visitors at their farms interested to learn. They are also all NIA level 2 or higher. So they likely have more knowledge to share.

4.3.2. How NIA Farmers Learn and the Implications for Knowledge Diffusion of NIA in a Wider Network

In the previous section, knowledge diffusion to neighbors specifically was discussed. Here it becomes apparent that the learning resulting from these interactions is often surface level. When trying to understand how farmers pick up more detailed knowledge it becomes clear that this often happens in study groups, which can be seen as separate CoPs (Oreszczyn et al., 2010). This is both the case for NIA farmers and the interviewed neighbors. However, NIA farmers often have their own nature-related study clubs for discussing NIA practices. It must be noted that though all NIA farmers are part of the NIA study group created by the SBB project, most NIA farmers that are also organic talk more frequently about organic study groups when asked where they discuss nature-friendly farming

practices. These study clubs are not only a place for group learning but also a source of social support for change. This is in accordance with the bounded normative influence framework, which predicted a retreat into a separate subgroup (Kincaid, 2010). This leads to and explains the low-level knowledge diffusion of NIA to the conventional neighbors. Furthermore, though a "retreat" is clear in the sense of learning, the interviewed NIA farmers do not necessarily retreat socially. Three of the NIA interviewees (NIA2, NIA5, and NIA6) remain part of local conventional study groups. However, they do not discuss NIA there. This finding is illustrated by NIA farmer 7:

> *"I always consider the meeting I am attending. I love chatting about nonsense the whole night if that is what the group is like. […] If I am going to a meeting with NIA farmers, I find that super interesting and fun. You know you are all on the same page and can support each other. Look, if I am going to a local meet-up with conventional farmers there are a lot of farmers that have absolutely no interest in organic farming. So there is no reason for me to drone on about it. […] The meetings with people with the same interests and passion for NIA, I really like those, of course! It is always a challenge. […] And mostly a lot of learning from each other, it's a lot of fun."* (NIA7)

As discussed in the previous paragraph, all NIA farmers are part of some nature-related peer group where they learn from one another, this is either a NIA-specific group or an organic farming group. Other important forms of learning about nature-friendly farming occur via the existence of example farms where other farmers have already made the switch to NIA or other forms of nature-friendly farming. This knowledge diffusion can happen via a simple visit, 7/8 of NIA interviewees mention this. Or by interning at an example farm, 5/8 interviewees mention this. The fact that the NIA farmers learned about NIA in these ways might also indicate that other interested farmers in their wider social network can also learn this way. As a result, even though neighbors might not learn about NIA in detail from the NIA farmers, the NIA farmers do play an important role in knowledge diffusion to non-neighboring farmers interested in converting.

4.3.3. Conclusion

In conclusion, the neighbors learn about NIA at a surface level from the NIA farmers. The neighbors tend to believe they have a basic understanding of NIA, but they often indicate they are unclear of the exact definition of NIA. The knowledge that they acquire from their neighboring NIA farmers happens both visually and through conversation. However, the visual aspect of learning is sometimes hampered by the fact that many of the NIA farmers were already organic, thereby making the switch to NIA less noticeable. The conversational aspect of learning is limited because the data indicates that detailed learning more frequently happens within one's CoP. Furthermore, the NIA farmers seem to

have retreated into their own CoPs, thereby limiting the spread of information on NIA to their neighbors who are not part of said CoP.

4.4. NIA Farmer Influence on NIA Adoption

Following previous research (e.g. Vermunt et al., 2022), this research also points to several hard barriers preventing the adoption of NIA. There were over ten different barriers mentioned, both by NIA farmers and their neighbors. A detailed list of all barriers can be found in the codebooks in the appendix, but because this research is not focused on these barriers, they will not be discussed in much detail here. However, what is important to mention is that some of these barriers are perceived by the neighbors as too hard to overcome.

The two most dominant barriers mentioned were the lack of additional compensation for NIA and the fact that land availability is limited. The lack of structural compensation is also mentioned in the literature by Vermunt and colleagues (2022). The additional compensation would be deemed necessary for many reasons. Some of these reasons include the maintenance of landscape features, which both take time and reduces the production of the fields they are in. Another frequently given example is the fact that biodiverse grasslands lead to lower quality feed, reducing milk production for dairy farmers, and again leading to the need for additional compensation. If compensation does not become a reality, more land would be necessary, as NIA requires extensification and closed-loop farming. Achieving this, while maintaining the same production, and therefore the same income, would require farmers to have access to more land. However, due to current high land prices, this frequently is not an option. Both of these barriers cannot be influenced by the NIA farmer and are perceived as large obstacles by the neighbors. As a result, this likely limits the effect that NIA farmers have on the adoption of NIA in the neighborhood. Additionally, neighbors also indicate that they do not feel more inclined to adopt due to NIA farmer presence.

The NIA farmers interviewed also mentioned lack of compensation or additional land most frequently. When asked how they influence adoption among their neighbors, the NIA farmers often say that their neighbors simply do not have enough land to adopt NIA. Here it is important to return to the specific circumstances of the case being studied. The NIA farmers interviewed all received additional long-term land leases from SBB. As a result, the additional land they can lease was frequently the decisive factor for the farmers to switch to NIA. This means that they often see the lack of additional land for their neighbors as being their largest hurdle, even if the neighbors most frequently talk about compensation. Many NIA farmers recognize that additional land allowed them to become NIA and that their neighbors do not have the same opportunity.

The adoption influence theory discussed in chapter 2.4. suggests that (1) frequency of interaction, (2) persuasiveness of the source individual, (3) trust in the source and knowledgeability

are important indicators of a person's influence on the adoption of a technology by someone else. However, the data indicates that these characteristics are not sufficient to convince neighbors to adopt. Firstly, data indicates that the frequency of interaction between the NIA farmer and the neighbor was not a sufficiently important variable on its own. This is because there was a wide variety of interaction frequencies in the sample, yet no neighbors were interested in adopting NIA. Secondly, no conclusions can be drawn on persuasiveness, as it was hard to determine whether the NIA farmers were deemed persuasive from the data. This was because it was hard to ask directly about the NIA farmers' persuasiveness and the questions that were asked surrounding the subject were rarely answered directly. Thirdly, the neighbors' trust in the source was sometimes also hard to determine. Though it must be mentioned that most NIA farmers were frequently visited by other farmers for advice on NIA, indicating that they are seen as credible and knowledgeable sources in a wider social network. One proxy that could be used to determine neighbor trust is equipment sharing and whether they would ask the NIA farmer for advice. Using these proxies, several NIA farmers can be deemed trustworthy according to their neighbors. However, like frequency of contact, trustworthiness is also not a sufficient condition for the adoption of NIA, as yet again, no neighbors were really interested in adoption. This remains the case when trustworthiness was combined with frequent contact.

Though several characteristics for knowledge diffusion are stated above, another valuable characteristic emerges from the data. The enthusiasm with which the NIA farmer talks about NIA was mentioned in two neighbor interviews as being an important quality. Enthusiasm could be another indicator of persuasiveness, on top of being able to explain NIA clearly and compellingly. This idea could be something to add to adoption theory

The paragraphs above discuss the influence of NIA farmers on the adoption of NIA by their neighbors. As the data shows, this influence seems practically non-existent. Only one neighbor (NI6.1) said they started growing their own wheat as a protein source and using the straw as bedding for the cows to increase the circularity of their farm. However, that does not mean that NIA farmers do not influence the adoption of NIA whatsoever. Even though the NIA farmers might not have a large local influence, they are likely important for farmers all over the country that are considering converting to NIA or adopting certain nature-friendly practices. The NIA farmer interviews revealed that adoption does happen in the NIA farmers' wider influence sphere. Three of the eight NIA farmers believe they have had a direct influence on the adoption of an NIA practice by other farmers who came to visit their farms.

In conclusion, the neighbors see the lack of additional compensation or additional land as large barriers to adoption. Due to the fact that the NIA farmers cannot influence these barriers, this limits their impact on adoption interest among neighbors. Furthermore, the theoretically predicted

characteristics that were believed to be important for influencing adoption interest were also found to not be sufficient in convincing neighbors to adopt. This is likely also due to the barriers mentioned. However, though the local adoption influence of the NIA farmers is limited, the data pointed to a potentially larger impact on the NIA farmers' wider social network. This likely happens via farmers interested in adoption visiting their farms.

5. Discussion and Conclusion

5.1. Discussion and Conclusions of the Three Sub-Questions

This sub-chapter is split into three main sections. These sections are in line with the research questions and discuss legitimacy, knowledge diffusion, and adoption influence. Each section starts with a summary of the results, then a discussion of the theory and how the results aligned with said theory. Next, the findings that are not in full congruence with the theory proposed in the theoretical framework are discussed. Lastly, suggestions are given on how the theory might be improved through additions or adjustments. This outline is repeated in all sections.

5.1.1. Legitimacy

Key Results

The results showed an increased social-group and moral legitimacy of NIA according to both the NIA farmers and their neighbors. This is believed to be largely driven by outside forces such as increased social and governmental demands. However, half of the NIA farmers indicate that neighbors were initially apprehensive of their switch made to NIA, but got used to it over time. This could also indicate that though societal changes are important, NIA farmer presence could have sped up the acceptance of NIA in the neighborhood.

The results also showed that the definition of NIA is still quite vague. This means it can be interpreted and operationalized in many ways. This has led to a higher social-group legitimacy of NIA both in general and in comparison with organic farming among non-NIA and non-organic farmers. However, interestingly, this same vagueness resulted in lower social-group legitimacy among organic neighbors.

So, NIA seems to have increased in moral legitimacy and also within certain social groups. This indicates that NIA is becoming part of the broadening definition of 'good farming' and therefore broadening the skills and knowledge that are recognized as cultural capital. However, these statements have to be nuanced with the context in which NIA is believed to be legitimate. Most neighbors see NIA as an add-on to the farm, with limited impact on the current management and production levels achieved. It must be noted that this is not the definition of NIA that the Dutch government had in mind. As a result, the increased acceptance of NIA might not lead to the desired results, should NIA in its current form become more widespread. Additionally, this increased general legitimacy has not led to an increase in pragmatic legitimacy and assimilation of NIA into the self-identity conceptions of 'good farming' for most neighbors.

Discussion

The theory suggested the importance of social capital among farmers and the need to be accepted by neighbors, thereby behaving similarly. However, several interviewees, both NIA farmers and neighbors, mention the low importance of neighbor opinion. This is also linked to the high importance of autonomy and individuality. These findings coincide with the findings by Westerink et al. (2021) who speculate that local social capital is decreasing in importance amongst farmer communities, which leads to lower importance of the opinions of neighboring farmers. This might be because farmers are becoming part of more geographically dispersed networks with different sub-cultures or CoPs, where the sub-culture identity is more important. As a result, the desired knowledge and skills, i.e. cultural capital, have likely also diversified. So the practices that give a farmer a higher status in one group might be different from another group. This trend reduces the impact of neighbors on each other in general and might have influenced the impact NIA farmers can have on their neighbors.

The theory also predicted that the 'good farmer' is still a farmer focused on high levels of productivity with 'tidy' fields. The findings do indeed partly confirm that. Ideas related to this productivism are still frequent in the language used and issues discussed by the neighbors. Additionally, ideas that good land needs to be used for production, or simply talking about wanting to produce a certain number of liters of milk per cow often come up in the conversations. However, the theory did speculate that there is an indication that the 'good farming' ideal might be shifting (Westerink et al., 2021; Stone, 2016). This research adds to the idea that 'good farming' is a very broadly defined concept. The results might even go a step further than the literature and point to the acceptance of NIA within the current 'good farming' definition. As discussed in the results, the neighbors believe in the individuality and freedom of making decisions on one's farm, saying that a 'good farmer' is someone who reaches their own goals. As a result, they state that they do not judge another farmer's concept of what it means to be a 'good farmer'. Furthermore, when asked what these farmers think about NIA, six neighbors state that it is a good way of farming, but that it is not for them. This indicates that the social-group and moral legitimacy of NIA is growing (also supported by other data points), but the personal acceptance of NIA for one's own farm is lagging. This means that pragmatic legitimacy is still low. In other words, NIA seems to be becoming part of the wide range of socially accepted conceptions of 'good farming', but not necessarily part of the neighbors' self-identity. One can speculate that as long as the productivist mindset also continues to be seen as 'good farming', these farmers have no reason to adjust their practices.

5.1.2. Knowledge Diffusion

Key Results

Following the results, the neighbors learn about NIA at a surface level from the NIA farmers. The neighbors often say that they are unclear about what NIA is exactly, but they do indicate they have a general idea. Knowledge diffuses from NIA farmers to the neighbors via visual cues and through conversation. Visually, some neighbors indicate they notice biodiverse grasslands, different mowing routines, less corn being grown, etc. However, the visual aspect of learning is sometimes hampered by the fact that many of the NIA farmers were already organic, thereby making the switch to NIA less noticeable. As a result, indirect learning does not seem sufficient for knowledge diffusion about NIA to neighboring farmers.

The second way in which knowledge diffuses is through conversations. 15 out of 16 neighbors report discussing nature in one way or another with the NIA farmers. Yet, eight out of those 16 interviewees also state they are unclear on the exact definition of NIA. This indicates that knowledge diffusion, though happening, is rather sparse. The conversational aspect of learning is limited because the data indicates that detailed learning more frequently happens within one's CoPs. The NIA farmers seem to have retreated into their own CoPs, thereby limiting the spread of information on NIA to their neighbors who are not part of said CoP.

Discussion

The bounded normative influence (BNI) framework discusses the creation of minority sub-groups through which they retreat from the majority (Kincaid, 2010). This is true in the data in the sense of learning, especially when learning about nature-friendly farming practices is discussed. The NIA farmers interviewed became part of nature-oriented study groups and have increased contact with other nature-focused farmers, in line with Runhaar and Polman (2018) and Westerink et al. (2021). However, data also showed that not all NIA farmers necessarily reduced contact with conventional farmers socially. In the case of continued contact with conventional neighbors, NIA or nature-friendly farming practices are generally only discussed at a superficial level and not with the goal of mutual learning.

Resulting from the existence of farmers who retreat for learning, but do not retreat socially, one could argue that there are different types of retreating from the majority. The first is to simply remove oneself from the conventional farmer groups, which is the case for several NIA farmers in the sample. While the second "retreat" is less drastic and more nuanced than the first. Some NIA farmers just do not discuss the subjects on which they disagree or have different opinions from the conventional farmers with whom they continue to interact. This hypothesis would require future research but could be an expansion of the BNI framework.

5.1.3. Adoption Influence

Key Results

When discussing the adoption of NIA, many barriers were quickly raised in the interviews. Both by NIA farmers and their neighbors. The primary barriers mentioned were land shortage and lack of compensation. Lack of compensation was also a large barrier discussed in previous research (Vermunt et al., 2022). These barriers limited the ability of the neighbors to adopt and were hard to influence as NIA farmer. As a result, this largely limited the impact that NIA farmers had on the diffusion of NIA in their neighborhoods. However, though the local adoption influence of the NIA farmers is limited, the data pointed to a potentially larger impact on the NIA farmers' wider social network. This is because their farms are frequently visited by farmers interested in adoption.

Discussion

The theory predicted three characteristics that were believed to be important for influencing adoption interest. These were: frequency of contact, persuasiveness, and trust in the source. Trust in the source was seen as a combination of credibility and knowledgeability. Persuasiveness turned out to be hard to measure. The frequency of contact and trust in the source were found not to be sufficient in convincing neighbors to adopt. Both when the variables were independently analyzed and when they were combined in one NIA farmer. This is likely also due to the barriers mentioned.

Furthermore, as mentioned in the results, a suggestion for the extension of the theory on the influences on adoption arose. This would be to add the enthusiasm of the NIA farmer as a characteristic that is important in determining whether or not people might want to adopt the practices that the NIA farmer discusses. More enthusiasm is hypothesized to lead to higher adoption rates according to the interviewed neighbors.

5.2. Discussion of the Mechanism for Influence of NIA Farmers on Their Neighbors

Figure 3. Timeline of NIA CoP formation and the potential for a permanent retreat or boundary spanning

At the end of the theory chapter, a mechanism was proposed through which NIA farmers might influence legitimacy, knowledge diffusion, and adoption interest in NIA among their neighbors. The figure above was used as an illustration of said mechanism. All stages and scenarios depicted were found in the data. This will be elaborated on below. However, after analyzing the empirical data, an updated version was needed to nuance scenario 2 and an additional scenario was found in stage 3. Following the data, scenario 2, with strong neighbor contact, only seemed to occur if the neighbor showed interest in nature-friendly farming. The data also indicated that there different types of neighbor bonds, which led to the creation of a new scenario. Scenario 3 shows that though the NIA farmer might retreat into the NIA CoP for learning, they did not necessarily do so socially. Here the social bond remains just as strong, but the neighbors no longer turn to each other for specific farm-related questions. As a result, this bond does not influence pragmatic legitimacy, knowledge diffusion, or adoption interest in NIA for the neighbor. This led to the figure below.

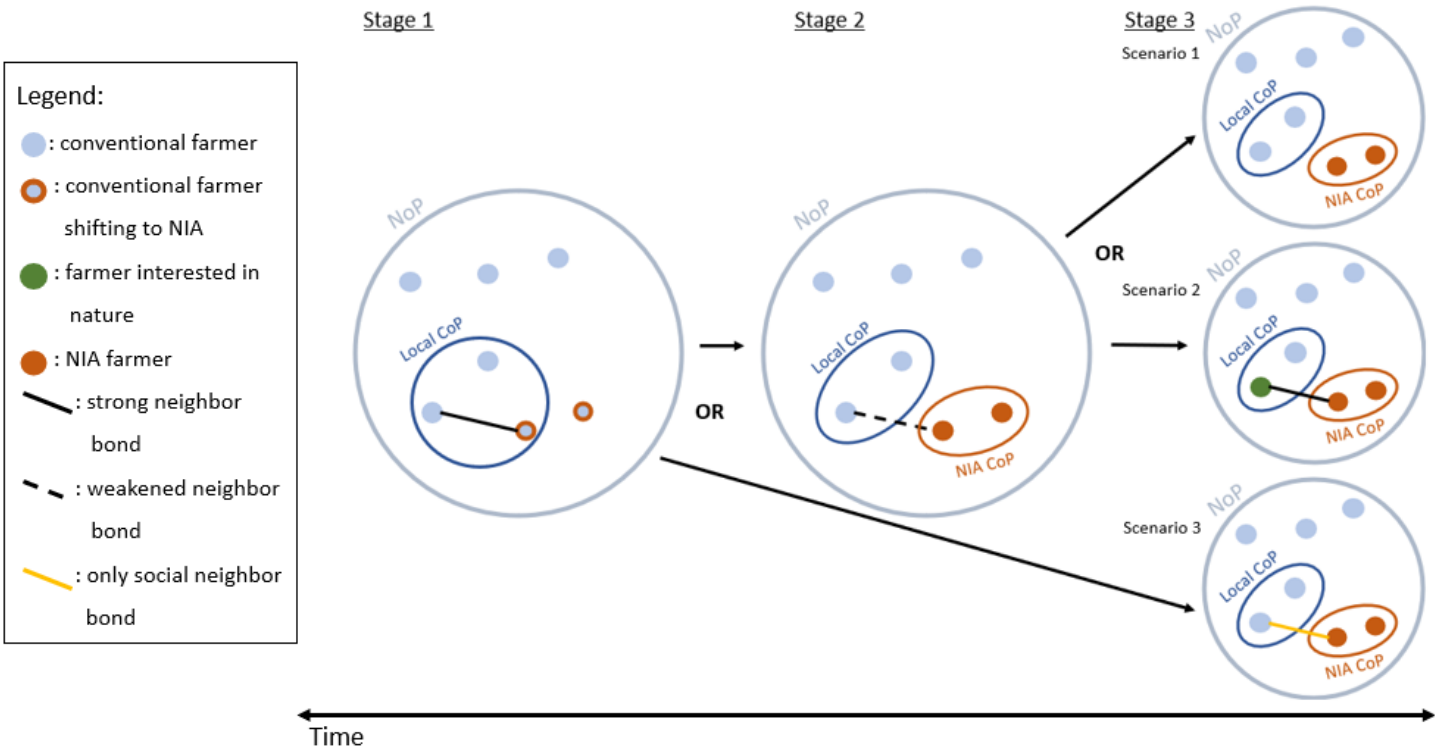

Figure 4. Updated timeline of NIA CoP formation and interaction with neighbors

The new framework was supported by the data collected in this research and an example will be discussed for every stage and scenario. An example of stage 1 was NIA farmer 2, he is still in the very first stages of converting to NIA and is strongly connected to his conventional neighbors. Stage 2 was supported by NIA farmer 2, who is a recent adoptee of NIA. He talked about having stronger connections to other nature-friendly farmers (both NIA and organic) since starting his shift to NIA. Furthermore, he says he is shifting away from contact with conventional neighbors.

Stage 3 scenario 1 is the situation that NIA farmer 1 found himself in. He not only said that he no longer had contact with conventional neighbors, but he also only provided contact information for other organic farmers. NIA1 is a farmer who switched to organic 25 years ago and to biodynamic 15 years ago, he also ranks as NIA level 3. This indicates that he is further along in the switch to NIA than the example farmers for stages 1 and 2.

An example of scenario 2 were NIA farmer 6 and their neighbor NI6.1. NIA6 is also a farmer that has a long history with nature-friendly farming practices as his father converted the farm over 30 years ago. His neighbor talked about being personally interested in nature. He said he frequently discusses NIA with the NIA farmer, learns from the NIA farmer, and even adopted something.

An example of the bond depicted in scenario 3 is NIA farmer 3 and their neighbor Con3.1. Here, the neighbor talks about the fact that they would never do business with the NIA farmer because they have different visions of how a farm should be run. However, they are old friends and still have frequent social contact. NIA farmer 3 is also a farmer that has a long history of nature-friendly farming.

In conclusion, all stages and scenarios are now supported by data. Additionally, there is an indication that the stages do indeed occur chronologically. This is supported by the fact that the example farmer for stage 1 is still in the process of converting to NIA, the example farmer for stage 2 is slightly further along in his conversion, and all example farmers in stage 3 are farmers that have a long history with nature-friendly farming. However, the chronological nature of the stages is a tentative hypothesis. This is because the research conducted did not have a longitudinal design, making it hard to hypothesize about effects that occur over time.

5.3. General Avenues for Future Research

This research illuminates several more general avenues for future research. Two suggestions are discussed below. Firstly, this research found a limited impact of the NIA farmers on their neighbors' attitudes towards NIA. However, the current research methods only allowed for the study of conscious impacts which the neighbors were aware of and could report on. Therefore, what remains unstudied is the unconscious impacts that NIA farmers might have on their neighbors and larger social networks. In social psychology, there exists a concept known as the mere-exposure effect. This is the idea that people develop a preference for certain things by merely being exposed to them frequently, thereby becoming familiar with them (Kahneman, 2011). As a result, if the farmers are exposed to NIA more frequently, for example through the existence of their NIA neighbor, this could benefit their willingness to adopt. As a result, the unconscious social effects of the existence of NIA farmers could be an interesting avenue for future research.

Secondly, future research could focus on the impact of the NIA farmer on their larger network. This research already touched on the fact that there is a reason to believe that the NIA farmer impact is larger in their extended social network compared to their local impact. Here it would be interesting to focus on the impact of NIA farmers on the study groups they are part of, and on the farmers that visit the NIA farm. However, understanding this impact was not the primary focus of this research, so a more in-depth study is called for.

5.4. Limitations

Several limitations need to be kept in mind for this research. The first limitation was the case choice. The case that was chosen for this study represents an rather unique group of NIA farmers. This is because they received a long-term lease of SBB land upon joining the NIA project. As a result, one barrier frequently mentioned, i.e. lack of land, was not an obstacle to the NIA farmers that were interviewed. This could have hampered the 'relatability' of the NIA farmers in the eyes of the neighbors, thereby limiting their belief that they could also adopt NIA practices. As a result, this might have limited the generalizability of the results in that regard. However, the researchers do not believe

that the additional SBB land had a large impact on the legitimacy or knowledge diffusion aspects of the study.

The second set of limitations concern the sample. The sampling limitations that could have affected the data collected for this research are fourfold. Firstly, NIA farmers were asked for contact details of neighbors of their choice. As a result, the neighbor sample consisted of neighbors with whom the NIA farmers at least had some form of contact. This means that the research could not study the effects of indirect learning without any direct contact. Secondly, some NIA farmers explicitly mentioned that they would provide the contact information of neighbors or farmers in their network that are more open-minded. As a result, this might have led to the study of neighbors that were impacted more by the interaction with NIA farmers than the average neighbor. Furthermore, it could also already be an indication of the retreat of NIA farmers described in the BNI framework. Thirdly, one NIA farmer that was contacted declined to participate because they did not want to be perceived as a “know-it-all” by their neighbors. This means that the NIA farmers that might be less keen to talk about NIA with their neighbors might have selected themselves out of the research. Fourthly, another NIA farmer declined to participate due to disputes with the neighbors over additional land they acquired as a result of the SBB project. As a result, the sample does not include a study of more negative neighbor relationships. So these limitations indicate that even though this study found that NIA farmer presence had a limited impact on neighbors, the sampling limitations could indicate that the impact found in this research might still be higher than the average impact in reality. However, the sampling strategy used allows researchers to understand the properties of a social network (Maertens & Barrett, 2013). Here it shows that some NIA farmers seem to have closer contact with other NIA or organic farmers in the area.

Another limitation concerning the data set is the fact that the concepts of organic farming and NIA are very interlinked in this data as most NIA farmers are also organic. This has led to the fact that many of the neighbors' reactions to and ideas about NIA are intertwined with their reactions to and ideas about organic farming. As a result, sometimes it was hard to separate the two in the analysis. Additionally, this could also call into question the representativeness of the data. However, it is unknown what percentage of NIA farmers are also organic in the Netherlands. This means no judgment can be made about whether this high correlation between organic and NIA farming is also present in the larger population of NIA farmers. Therefore, it is hard to know how this affected the representativeness of the sample.

COVID-19 is also a factor that might have affected the results. The SBB project started in 2020. This means that many of the NIA interviewees made the switch to NIA during the COVID-19 pandemic,

meaning they likely had less contact with neighbors while this switch was taking place. This could have had an impact on knowledge diffusion especially.

There are also some aspects of the analysis that limit this research. Open coding with only one researcher analyzing the data means that there was a lot of room for personal interpretation of that researcher. On the other hand, this did ensure a higher level of internal consistency for the coding. Additionally, the fact that this research is an open qualitative study and the first study conducted on the influence of Dutch NIA farmers on their neighbors. This means that more research needs to be done to enhance the robustness of the results. As a result, this study opens up a lot of avenues for future research to continue studying the effects of NIA farmers on their social networks.

5.5. General Conclusion

In conclusion, this research points to a limited impact of NIA farmers on legitimacy, knowledge diffusion, and adoption of NIA at neighboring farms. The overarching research question in this thesis was: *How do early adopters of NIA influence the attitude towards NIA practices among their neighboring farmers?* The simple answer turns out to be that the attitude of the neighbors is not changed drastically as a result of interactions with the NIA farmers. However, the long answer is more nuanced. The NIA farmers are not present in a vacuum, they form part of the larger societal and political demands for a movement toward more sustainable farming practices. This research cannot point towards a direct isolated impact that the NIA farmers have on their neighbors' attitudes towards NIA. But when seen within a larger societal context, the interviewed neighbors do seem to have a more positive attitude towards NIA and often reflect that this is a relatively recent change.

6. Policy Recommendations

6.1. Increasing Legitimacy of NIA

This section will discuss two policy recommendations for Dutch policymakers to improve the legitimacy of NIA amongst farmers in the Netherlands. Firstly, essentially, if the Dutch government wishes for more Dutch farmers to convert to NIA, traditional 'good farming' has to be delegitimized. NIA seems to have become relatively legitimate (in this small sample), but as long as the traditional productivist mindset also remains acceptable, farmers have no reason to switch to NIA. Though it is impossible and not the goal for all farmers to switch to NIA, the aim is for it to become more widely adopted. As a result, the government could consider phasing out harmful farming practices. In literature, this idea is known as deliberate destabilization (van Oers et al., 2021). Deliberate destabilization is aimed at disrupting the existing socio-technical regime to create the space for innovations to establish themselves. This can be done through strict policies like bans, or indirect policies that make the current set of undesirable practices less attractive or feasible (van Oers et al., 2021). However, it is important to be aware of several factors when devising a deliberate destabilization strategy. Firstly, abrupt bans will likely lead to strong resistance and it is not always an option if there is no readily available alternative (van Oers et al., 2021). Strong resistance will be the likely outcome if the government bans certain conventional farming practices such as pesticide use and fertilizer use. The research indicated that farmers are very attached to their freedom. As a result, a softer approach where the government educates both the consumer and the farmer on the effects that harmful farming practices have on nature could stimulate a move toward the rejection of such farming practices.

The results indicated that NIA is gaining social-group and moral legitimacy. However, as discussed, pragmatic legitimacy is lagging. NIA must become re-framed in a way that makes it desirable for a wide range of conventional farmers. NIA needs to be made more concrete so farmers actually understand what it means and how it could benefit their farms. This reframing will likely need to go hand in hand with a type of compensation to enhance the desirability of NIA.

6.2. Improving Knowledge Diffusion on NIA

To improve knowledge diffusion to non-NIA farmers, several suggestions for Dutch policymakers can be made. The first would be to compensate NIA farmers for their time spent diffusing knowledge, this idea was brought up by a NIA farmer (NIA7). The interviewee mentioned that they spend a lot of time voluntarily sharing their knowledge and experiences with farmers interested in converting to NIA. While they enjoy doing it, it would be nice to be compensated for their effort as it takes up a lot of time. Compensation could increase the knowledge diffusion taking place by allowing enthusiastic NIA farmers to free up more time for it.

A second suggestion would be to find a way for NIA farmers to become guest speakers in conventional study clubs. This could be helpful because the results suggested that study groups are important places for learning.

Lastly, the government could work to ensure that the example farms are perceived as comparable and their management as attainable by the conventional farmers. This could be interpreted as similar production levels, size, soil types, etc. Previous research shows that it is easier to learn from circumstances similar to one's own (Oreszczyn et al., 2010). Additionally, three neighbors indicated in the interviews that there was a lack of comparability between their farm and the NIA farms they had been exposed to.

6.3. Enabling Higher Adoption Rates of NIA

It is clear that the hard barriers preventing NIA adoption are important as many neighbors were quick to provide several reasons they could not become NIA. The main hard barriers suggested by this research are a lack of compensation and a lack of additional land. Additionally, it has also been established that they are not the only decisive factor in adopting NIA. However, even the NIA farmers state that they had the right geographic circumstances to switch to NIA and that it is simply not an option for everyone due to a lack of available land or high land prices. However, as discussed in the results, additional land is not always necessary. This is the case if the compensation linked to NIA would go up. Increased compensation could reduce the need for high-intensity farming by allowing farmers to maintain their income with lower production rates. The required money to increase compensation could come from government subsidy schemes or higher prices for NI agricultural products, these higher prices could be paid by the food processing industry, the grocery stores, or the customers. On top of working on reducing the hard barriers linked to NIA, continued effort needs to be made to increase the legitimacy of NIA and to support farmers in gaining knowledge about NIA. If all of these things are achieved, an environment could be created where NIA becomes the preferred method of farming.

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Appendix

Appendix I: Interview Guide NIA Farmers (Dutch)

Telefoongesprek:

Goedemiddag,

Ik ben Emma Windey, een Masterstudent aan de universiteit van Utrecht. Judith Westerink van het SBB project heeft een mailtje gestuurd dat ik ging bellen ivm mijn scriptieonderzoek. Heeft u even tijd?

JA (Indien NEE: Kan ik op een ander moment terug bellen?)

Ik probeer om voor dit onderzoek te achterhalen wat de effecten van NIL boeren zijn op de boeren in hun omgeving. Om dit onderzoek uit te voeren wil ik beide NIL boeren en hun buren graag interviewen. Het interview zal ongeveer een klein uur duren. Ik vroeg me af of u misschien tijd zou hebben voor een gesprek.

JA

Wanneer zou voor u passen?

Alvast bedankt voor u tijd!

Introductie begin interview

Eerst en vooral wil ik u nogmaals bedanken voor u tijd! We hebben al contact gehad, maar ik zal me nog even snel opnieuw voorstellen. Mijn naam is Emma Windey en ik ben momenteel bezig aan mijn scriptie onderzoek voor mijn Master. Het onderzoek gaat over de effecten van NIL boeren op de boeren in hun omgeving. In dit interview wil ik vooral meer te weten komen over u contact met niet NIL boeren.

Voor dat we beginnen wil ik nog eerst even enkele dingen overlopen. Allereerst is het belangrijk dat u weet dat alle data geanonimiseerd word in het uiteindelijk onderzoek. Verder mag u natuurlijk altijd aangeven dat u liever niet antwoord op bepaalde vragen of dat u liever stopt met het interview. Als laatste zou ik u willen vragen of het oké is als het interview opgenomen wordt, dat maakt het makkelijker voor mij om de data te verwerken. De opnames zullen dan ook verwijdert worden van zodra dat is gebeurt. Als u met dit alles eens bent, zou u dan dit formulier even willen ondertekenen? Zijn er nog vragen voor we beginnen?

Interview vragen

Intro & Kennis overdracht

1. Waarom bent u bezig met NIL?
2. Probeert u om kennis over NIL met andere boeren te delen?
    a. Zo ja, hoe?
3. Komen andere boeren vaak om advies of informatie bij u terecht?

Sociaal netwerk buren

4. Hoe is het contact met u collega-boeren in de buurt?
    a. Hoe vaak hebben jullie ongeveer contact?
5. Waar praten jullie zoal over?
    a. Vragen jullie wel eens om advies aan elkaar?
    b. Hebben jullie het soms over NIL?
        i. Zo ja, wat voor dingen bespreken jullie dan?
6. Gaan jullie af en toe bij elkaar kijken om te zien hoe de ander zijn of haar boerderij runt?
7. Is het contact veranderd sinds dat u met NIL begonnen bent?
8. Wat is de mening van uw collega's over u, denkt u?

Andere sociale contacten in de boeren gemeenschap

9. Bij welke gelegenheden heeft u contact met andere collega's?
10. Is het contact veranderd sinds dat u met NIL begonnen bent?
11. Met welke groepen heeft u het beste contact?
12. Hoe komt dat volgens u?
13. Zou u zeggen dat u één hoofdgroep heeft als connecties in de boeren wereld? Of voelt u zich gelijk verbonden met meerdere groepen?
14. Heeft u het gevoel dat u vaak de link bent tussen verschillende mensen in verschillende groepen?
    a. Stelt u vaak nieuwe mensen aan elkaar voor?
        i. Zo ja, onder welke omstandigheden?
15. In welke groepen leert u het meest?
16. In welke groepen leren anderen van u?

Legitimiteit

17. Wat is volgens u een goede boer?
18. Wat vinden niet-NIL boeren van u manier van boeren volgens u?
    a. Verschilt dit afhankelijk van u verschillende sociale groepen?

Adoptie & Overtuigingskracht

19. Heeft u wel eens een collega kunnen overtuigen van NIL of iets anders?
    a. Kunt u een voorbeeld geven?
20. Zijn er mensen in u omgeving die meer natuur-inclusief zijn gaan boeren sinds u begonnen bent?
    a. Zo ja, uit welk netwerk? & Heeft deze persoon bij u om advies gevraagd?

Afronding

21. Zijn er nog dingen die we nog moeten bespreken, wat nog niet voldoende aan de orde is geweest?

Appendix II: Interview Guide Neighbors (Dutch)

Eerste contact en introductie onderzoek

Hallo, ik ben Emma Windey, een Master student aan de Universiteit van Utrecht en doe momenteel onderzoek voor mijn scriptie. Ik heb u telefoonnummer via boer x gekregen. Heeft u even tijd?

ZO JA

Mijn onderzoek gaat over natuur-inclusieve landbouw en sociale netwerken in de boerengemeenschap. Ik probeer boeren te interviewen die in de buurt wonen van een boerenbedrijf met natuur-inclusieve landbouw praktijken om zo te zien hoe deze manieren van werken navolging krijgt. Het interview zal ongeveer een uurtje duren. Zou dat voor u uitkomen?

Voor het interview

Alvast bedankt voor u tijd! Voor dat we beginnen wil ik nog eerst even enkele dingen overlopen. Allereerst is het belangrijk dat u weet dat alle data geanonimiseerd word in het uiteindelijk onderzoek. Verder mag u natuurlijk altijd aangeven dat u liever niet antwoord op bepaalde vragen of dat u liever stopt met het interview. Als laatste zou ik u willen vragen of het oké is als het interview opgenomen wordt, dat maakt het makkelijker voor mij om de data te verwerken. De opnames zullen dan ook verwijdert worden van zodra dat is gebeurt. Als u met dit alles eens bent, zou u dan dit formulier even willen ondertekenen? Zijn er nog vragen voor we beginnen?

Interview vragen

Algemeen

1. Vertel eens wat over u bedrijf?
    a. Boert u al lang?
    b. Hoe bent u begonnen?

Sociale normen

2. Wat maakt u als boer trots op u werk?
    a. Heeft de natuur hier ook een plekje in?
3. Wat is volgens u een goede boer en waaraan zou u hem/haar herkennen?
4. Hoe kijkt u aan tegen een boerderij die met een bredere focus gerund wordt en die niet hoofdzakelijk op hoge productiviteit en gewas/vee opbrengst focust?

Legitimiteit NIL

5. Wat vind u van NIL?
6. Hoe wordt er in de buurt over NIL gesproken?

Connectie met NIL boer en indruk van NIL boer eigenschappen

7. Hoe kent u NIL boer X?
8. Op welke manieren hebben jullie contact?

Kennis uitwisseling

9. Waar praten jullie vooral over?
    a. Vragen jullie soms om advies aan elkaar?
        i. ZO NEE: Zijn er andere boeren/mensen waar u wel advies aan vraagt?
10. Gaan jullie wel eens bij elkaar kijken om te zien hoe de ander zijn/ haar boerderij runt?

Kennis NIL

11. Bespreekt u NIL ooit met boer x?
12. Vindt u dat boer x goed kan uitleggen wat hij/zij doet?
13. Wat valt u vooral op aan hoe boer x anders boert dan u?
    b. Visueel
    c. Uit gespreken
    d. Welke aspecten van zijn/haar bedrijfsvoering spreken u wel of niet aan?

Meningsveranderingen NIL

14. Is u mening over NIL verandert doordat boer x op die manier boert?
15. Zou u zelf op een meer NIL manier gaan boeren?
    e. Waarom wel/niet?
    f. Heeft boer x hier invloed op gehad?
    g. Wat heeft u bij boer x gezien, dat u ook wel zou willen proberen?

Afronden

16. Zijn er nog dingen die we nog moeten bespreken, wat nog niet voldoende aan de orde is geweest?

Appendix III: Codebook NIA Farmers

See separate document.

Appendix IV: Codebook Neighbors

See separate document.