Learning from excellence

An analysis of positive deviants among organic mixed farms in The Netherlands and NRW (DE)

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Period: 01-10-2013 – 29-07-2014

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PREFACE

This study is part of the larger project "Learning from excellence" within the chair-group Farming System Ecology initiated by. Ir. G.J.M. Oomen and Dr. Ir. W.A.H. Rossing. De Adelhart van Toorop (2013) pioneered on this project with a master thesis study entitled: *Analysis of positive deviants among organic dairy farmers in The Netherlands*. This study will build on this research with a focus on organic mixed farms.

Gratia Meijers was really curious about the faces behind the organic farms. She was interested in the views these farmers had on societal issues and the difficulties they experienced in managing their farm. Through this thesis she was inspired by the stories of the farmers and was amazed by the passion these farmers revealed for their work. She would like to thank the farmers for the hospitality and all the friend, family and supervisors who patiently listened to all the stories of farmers she so enthusiastically needed to tell and of course for all the support during the struggles of the writing process. Furthermore, Clara Beck, mijn scriptiemaatje, ik vond het bijzonder dit met jou te mogen doen, dankjewel.

Clara Beck found the research topic especially interesting as she had observed the difficulties that farmers are having in coping with recent developments and the political environment in the EU and hoped for success-stories that would encourage other farmers. She found the visits with the farms very inspiring and especially enjoyed seeing how content farmers were with the choices they made. She would like to thank Stefan Belt, for never ending love and support, Katharina Beck for great feedback; Maria and Martin Beck for being a shoulder to cry on and last but not least, Gratia Meijers voor een leuke tijd die ik zeker niet ga vergeten. Dankjewel, dat je mij op deze mooie zomerdag hebt gevraagd, mee te doen.

SUMMARY

This thesis addresses the challenges faced by agriculture today. While continuous population and consumption growth make efficient food production more needed for the coming 40 years (Godfrey *et al.*, 2010), environmental problems such as soil loss, decreased soil fertility and increasing water demand complicate this. To find a farming system that addresses these obstacles in a sustainable way, the research project "Learning from excellence", by Dr. Ir. W.A.H. Rossing and Ir. G.J.M. Oomen searches for answers in the population of successful organic farms, following the principles of positive deviance (Sternin & Choo, 2000)

De Adelhart van Toorop & Gosselink (2013) pioneered on this project with a master thesis study entitled: *Analysis of positive deviants among organic dairy farmers in The Netherlands*. With this thesis Gratia Meijers and Clara Beck complement the former through a focus on positive deviants among organic mixed farms. The research question "What can we learn from positive deviants among organic mixed farms?" with the three sub questions "What is regarded as an excellent farm by these positive deviants?", "How do these positive deviants perform as we analyze their key Figures?" and "What do they regard as success factors?" are answered.

The positive deviance approach is defined by Sternin and Choo (2000) as:

> "*the observation that in most settings a few at risk individuals follow uncommon, beneficial practices and consequently experience better outcomes than their neighbors who share similar risks.*"

Especially because it focuses on the applicability of found results, this approach is valuable to society. It offers solutions to challenges that are already present and successful. The positive deviance approach is divided in four steps (Bradley *et al.* 2009):

1. Identify positive deviants
2. Study positive deviants and generate hypotheses
3. Test hypotheses
4. Work with key stakeholders to bring solutions to work

This study focuses on the first two steps as we want to see what can be learnt from different groups of farmers before actually testing and applying generated hypotheses.

To identify positive deviants, experts are asked to provide five farms that were frontrunners in regard to their farming system, economics or other categories that they could provide. The resulting 14 farms, of which 4 are situated in NRW (Germany) and 10 in the Netherlands are visited and asked about the data of their farms and the vision of the farmer himself. After qualitative analysis of the vision of the farmer, and taking into account the excellence categories of the experts, the following characteristics of excellent farms are found:

- production-orientation
- long-term health of soil, plants and animals

- economic feasibility
- positive on-farm atmosphere
- continuous development
- open attitude towards society

Furthermore, the following success factors of the visited farms are extracted from the interviews:

- having an observing attitude
- creating room for development
- cooperating with external parties/networking
- cooperating with internal parties
- having an entrepreneurial attitude
- pursuing a vision

We furthermore analyzed actual performance of the positive deviants and paralleled it to their definition of excellence and inquired insights on their success factors. As a result we formed hypotheses to be tested on larger statistical scale for solutions and that possibly can be disseminated to improve performance of peer organic farms and help the organic sector.

The following hypotheses were produced:

1. We hypothesize that energy generation is associated with successful farms.
2. We hypothesize that the allocation of pasture to permanent grazing areas or natural areas heightens on-farm productivity, as other farm space can be used for more productive crops.
3. We hypothesize that a production orientation and a holistic perspective are not necessarily mutually exclusive in perception and performance as observed productivity diverged to a large extent.
4. We hypothesize that nitrogen surpluses of positive deviants are lower than positive deviants aim to close nutrient cycles.
5. We hypothesize that horned cattle is associated with successful farms.
6. We hypothesize that on-farm nutrient cycles in the form of reduced import and application of own manures has beneficial impacts on resilience the farming system it might be in terms of health or economics.
7. We hypothesize that a positive organic matter balance adds to soil fertility and health as most positive deviants showed a positive balance of organic matter.
8. We hypothesize that soil conservation techniques as reduced tillage and GPS lead to highly efficient nutrient uptake of plants but a negative soil organic matter balance.
9. We hypothesize that management of organic matter is spread out over more years which makes it possible to incidentally have a low or negative organic matter balance while sustaining a high organic matter percentage in the soil.
10. We hypothesize that economic feasibility is strengthened through market independence through on-farm nutrient cycles and the creation of an own product and market.

11. We hypothesize that multi-functionality contributes to the resilience of the farm by, on the one hand, a diversified income and on the other hand to resilience of the farm in a way of an increased bargaining power at local institutions.

12. We hypothesize that difficulties in multi-functionality can be overcome by employing expertise and formulating clear objectives of the role of the added function within the farm.

13. We hypothesize that entrepreneurship skills of a farmer are success factors for a successful farm.

14. We hypothesize that carefully handling insights of science and attaching value to own observations and experiences in making decisions contributes to success of the farm.

15. We hypothesize that cooperation with external parties adds to success of the farm.

16. We hypothesize that a motivation which is both idealistically and pragmatically contributes to a successful, farming business

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INTRODUCTION

Today's agriculture is subjected to severe challenges. Continuous population and consumption growth will induce an increasing demand of food for at least another 40 years (Godfrey *et al.*, 2010). Food security is commonly conceptualized as resting on three pillars: availability, access and utilization (Barret *et al.*, 2010). Gomiero *et al.* (2011) state that food production needs to be increased by 70 to 100 percent to meet the demand in 2050. However, the ability of achieving food security is hampered by, among others, soil loss, reduced soil fertility and increasing water demand. Additional negative environmental impacts of current agricultural practices involve environmental pollution by agrochemicals, reactive nitrogen mobilization, decline in biodiversity and emissions of greenhouse gasses (Pelletier, & Tyedmers, 2010; Gomiero *et al*, 2011).

There is a need for a farming method that fits the above sketched context. This farming method should have a dual purpose of meeting the rising demand for food while minimizing negative environmental impact; this is also described as ecological intensification. Ecological intensification entails the environmentally friendly placement of anthropogenic inputs and/or enhancement of crop productivity, by including regulating and supporting ecosystem services management in agricultural practices (Bommarco *et al*, 2013).

Organic farming is in line with ecological intensification and is a farming method which deserves full exploration in its limits and potentials as it can form the solution to the challenges faced by agriculture today. Organic agriculture is defined by the IFOAM as "a *production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects*" (IFOAM, 2014). The latter definition stresses, in line with ecological intensification, the importance of processes and ecosystem functions. Gomiero *et al.* (2011) evaluated a variety of production methods in relation to sustainability and argued that organic agriculture is a valuable option to work for a more sustainable agriculture and deserves wide experimentation to fully explore and understand its potentials and limitations.

In relation to the first purpose of ecological intensification; guaranteeing food security, organic farming is regarded by some as having the potential to meet food security objectives. Seufert *et al.* (2012) found that organic yields are highly contextual, depending on system, site, and crop. Organic yields were found to be lower than conventional yields in the range of 5% up to 34% depending on crop type. Best organic practices were found to be 13% lower in yield. Badgley *et al.* (2007) found an average yield ratio of organic in comparison to conventional of slightly <1.0 for studies in the developed world. Furthermore, Badgley *et al.* (2007) concluded that organic agriculture has the potential to contribute quite substantially to the global food supply.

In relation to the second purpose of ecological intensification; minimizing negative influences on the environment, organic agriculture is shown to have a better performance on several environmental issues compared to conventional agriculture. Organic farming systems show higher organic matter and nitrogen contents in soil, enhanced soil fertility, lower fossil energy inputs,

higher biodiversity, conservation of soil moisture and water resources (Pimentel et al, 2005; Mäder *et al.*, 2002). Mäder *et al.* (2002) also found that at a crop reduction of 20% there was an input of fertilizer and energy reduction of 34-53%, suggesting higher resource efficiencies. A comparison of life cycle analysis of organic dairy farming and conventional dairy farming showed that eutrophication/t milk/ha of farmland is lower for organic farming systems due to lower fertilizer application rates whereas the impact on global warming potential was found higher for organic farming systems (De Boer, 2003).

Though, based on the presented studies, organic agriculture is regarded as a suitable farming method in addressing environmental issues and food security, numbers of organic farms are still not even close to numbers of conventional farms in our research area of The Netherlands and Germany (NRW). In the Netherlands 2.04% of the total utilized agricultural area (UAA) is certified organic (CBS, 2013). In Germany a slightly higher percentage, 5.8%, of UAA is certified organic (StatLine, 2012). Also when viewed over time, the share of organic agriculture does not show a steep incline (Figure 1). In Germany steady growth is visible though in the Netherlands percentage lingers slightly above 2%.
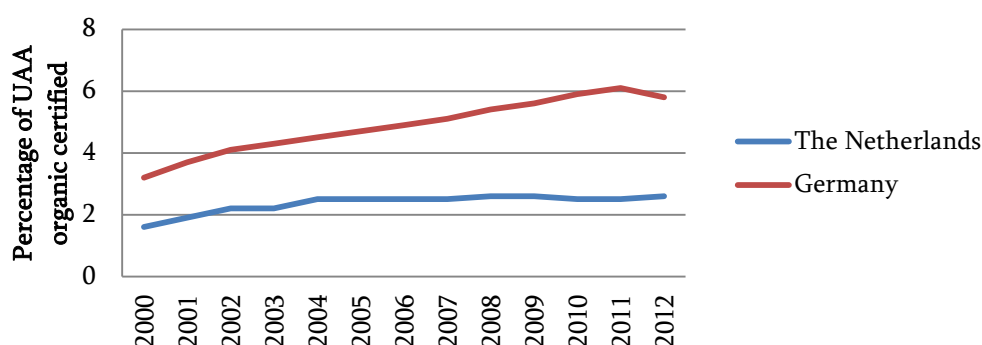
FIGURE: GROWTH OF THE ORGANIC PRODUCTION IN GERMANY AND THE NETHERLANDS, SOURCE EUSTAT (2014).

Question

The presented statistics raise the question why the organic farming method has such a small share and does not show a sharper increase. Answers to this question can be sought in a broad variety of domains, among others institutional context, physical context, consumer behavior, and market conditions, which make answering the question challenging. To circumvent this complexity we decided to approach this question from the opposite angle. Instead of investigating what factors constrain the growth of the share of organic production we chose to analyze a pool of case-study farms that have succeeded in these contexts to manage an organic farm so we can identify characteristics and success factors of these farms. The approach that we applied, the positive deviance approach, developed by the married couple Sternin, is based on a focus on already existing solutions instead of a strong focus on the problem Sternin, J., & Choo, R. (2000).

The aim here is not to analyze organic farms in general; we want, as postulated in our project title, to learn from excellence. Hence within the group of organic farms we want to focus on the most

successful, 'excellent', or in other words positively deviating case-study farms as these farms yield the most interesting hypotheses about characteristics and success factors.

In addition, we have chosen to study mixed farms to complement our predecessors De Adelhart van Toorop & Gosselink (2013) who investigated dairy farms. Mixed farms are farms in which both arable and livestock production take place. Another reason to choose mixed farms for our study pool is the large diversity these farms cover. This diversity in the case-study pool strengthens our understanding of success factors and characteristics (Flyvbjerg, 2006).

This alternative positive deviance approach also implies a change of the research question from "Why has the organic farming method production such a small share and does not show a more sharp increase?" to "What can we learn from positive deviants among organic mixed farms?" Additionally, three sub questions can be formulated: "What is regarded as an excellent farm by these positive deviants?", "What do they regard as success factors?" and "How do these positive deviants perform as we analyze their key Figures?"

Outline

In our theoretical framework we elaborate on the positive deviance method of Sternin, J., & Choo, R. (2000) and provide a theoretical background on the steps of the positive deviance method, prepared by Bradley *et al.* (2009). We explain how we identified positive deviants and we present a theoretical background of the analysis. We subsequently frame our sub questions and elaborate on findings of De Adelhart van Toorop & Gosselink (2013) and other relevant literature.

In the chapter Material and Methods, we describe more concretely how we executed the steps of Bradley *et al.* (2009). We present our case-study pool of 10 Dutch and 4 German farms. Then, we elaborate on how we conducted our analysis with our collected data which consisted of interview statements and key farm Figures. These Figures were used as input for the model FarmDESIGN (Groot *et al.*, 2012) which evaluated nutrient cycles and organic matter balances of all our case study farms.

Our results are subdivided into three components; characteristics of an excellent farm defined by positive deviants, evaluation of farm performance, and success factors of positive deviants. More detailed data about the positive deviant farms is available in the individual farm profiles that have been created and are available on demand.

In the discussion we relate our findings to the existing literature about perceptions of excellent farming and discuss differences and similarities. We raise thoughts about methodological shortcomings and we will make suggestions for further research. The report ends with a set of conclusions and implications.

RESEARCH QUESTIONS

"What can we learn from positive deviants among organic mixed farms?"

1. How is an excellent farm defined by positive deviants?
2. What are the actual farm performances of positive deviants?
3. What factors are said to have contributed to the success of positive deviants?

THEORETICAL FRAMEWORK

First we will elaborate on the positive deviance method of Sternin, J., & Choo, R. (2000) and subsequently explain the steps described by Bradley *et al.* (2009). Secondly, we frame our sub questions and elaborate on findings of De Adelhart van Toorop & Gosselink (2013) and on more existing literature.

The positive deviance approach

The positive deviance approach is established on the observation that in every social group there are certain people or institutions that handle the same situations in a more efficient and successful way. When these people, or in our case farmers, are identified, their strategies and views can be analyzed. Outcomes and solutions that are embedded in their context can be disseminated and used by peers, other farms, to learn from their positive experiences and achieve similar results. Thus positive deviant farms have characteristics of excellence but are not necessarily excellent.

The term "Positive Deviance" has its origin in a book entitled "Positive Deviance in Nutrition" written by Marian Zeitlin in the 1990s. In the early 1990's, Jerry Sternin, a visiting scholar at Tufts University, and his wife, Monique, experimented with Zeitlin's ideas. The Sternins helped to institutionalize this approach as a social change approach by demonstrating its successful application. Moreover they set up a platform called the positive deviance initiative that aims among others to document and share positive deviance projects worldwide, and build partnerships ("Positive Deviance Initiative," 2013).

This methodology is applied in research areas of health care (Bradley *et al.*, 2009), international (agricultural) development (S Biggs, 2008; Ochieng, 2007; Pant, 2009), HIV programs (Marsh, Schroeder, Dearden, Sternin, & Sternin, 2004), child nutrition (Sternin & Choo, 2000; Zeitlin *et al.*, 1990), sports (Hughes, Coakley, Yiannakis, & Melnick, 2001), and organizational performance (Cameron, Dutton, & Quinn, 2003; Walls, 2013).

Sternin and Choo (2000) define positive deviance as

> *the observation that in most settings a few at risk individuals follow uncommon, beneficial practices and consequently experience better outcomes than their neighbors who share similar risks.*

One strength of the postive deviance approach is the applicability of found results. It focuses on solutions already present in the community instead of analyzing and identifying problems and external inputs necessary to meet needs or solve problems ("Positive Deviance Initiative," 2013). Successful strategies are already available in the pool of the reference group which make them most likely fit for potential dissemination in the institutional context, whereas in *de novo* designed solutions institutional barriers are often being overlooked (Bradley *et al.*, 2009). The strengths described above make this positive deviance method very suited for our research question.

Moreover, the postive deviance approach not only examines what processes are present in practices of postive deviants but also includes the context in which they are implemented (Bradley, *et al.*, 2009). The importance of the institutional context is stressed by other authors Hall, Rasheed Sulaiman, Clark, and Yoganand (2003). It is argued that assessment research often does not result in a significant difference because impact assessments lack the institutional context and influence of this context on the research process. Bradley *et al.* (2009) also endorse this and add that due to negligence of the complexity of organizational context important barriers for implementation of solutions are overlooked.

Variation within the case study pool is a tool for the understanding of implications of the context. Maximum variation within the case-study pool, as proposed by Flyvbjerg (2006), will provide additional information about the significance of various contexts for case processes and outcomes.

Diversity of farming systems is considered as an asset as it provides a wide range of responses that likely can help face uncertain futures (Van der Ploeg *et al.*, 2009). A high level of diversity within our case study pool thus could also lead to the discovery of more, diverse, solutions already present in the community. Diversity in our case-study pool is thus of great importance.

Steps in the positive deviance approach

Bradley *et al.* (2009) define four steps (Figure 2) that structure the positive deviance approach. The first step entails the identification of positive deviants, hence individuals that perform better than their peers. In the second step, the identified individuals or organizations are analyzed in depth to generate hypotheses. Thirdly, the generated hypotheses are tested on a representative sample of individuals or organizations to ensure statistically valid outcomes. The fourth step involves implementation by working in partnerships of stakeholders, potential adopters for dissemination of the newly found solutions.

Step 1
- Identify "positive deviants", i.e., organisations that consistently demonstrate exceptionallyerformance in an area of interest

Step 2
- Study organizations in-depth using qualitative methods to generate hypotheses about practices that allow organizations to achieve top performance

Step 3
- Test hypotheses statistically in larger, representative samples of organizations.

Step 4
- Work in partnership with key stakeholders, including potential adopters, to disseminate the evidence about newly characterized best practices.
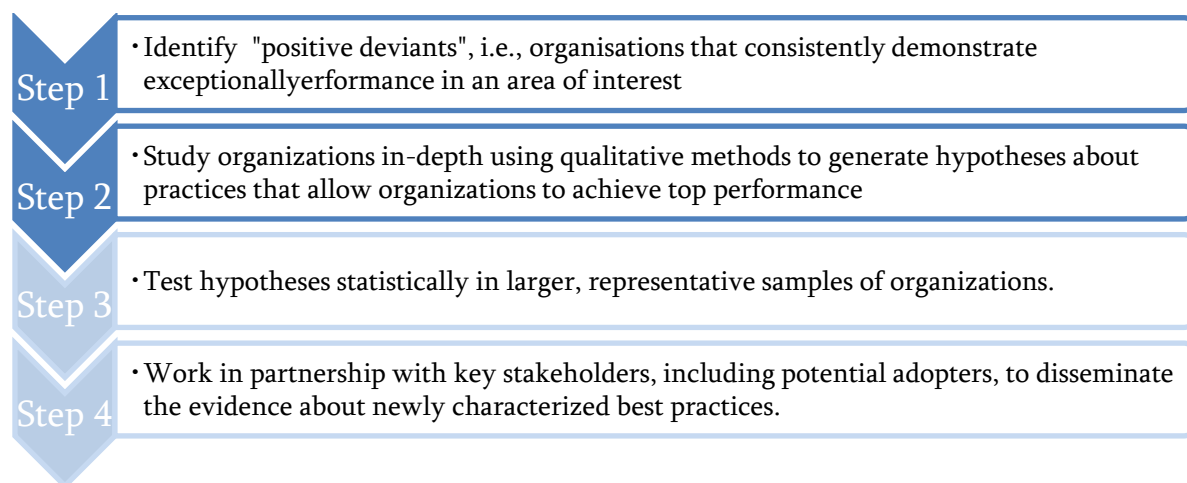
FIGURE 2: STEPS OF THE POSITIVE DEVIANCE APPROACH (BRADLEY, 2009)

We limited this research to the first two steps of the defined method because of time-constraints of this research project. However, in the discussion we will provide hypotheses that are relevant for conducting steps 3 and 4.

To apply the positive deviance approach some requirements need to be met (Bradley *et al.*, 2009). First, accessible performance measures of the organization need to be available. Without any performance measures it would be difficult to determine and subsequently analyze positive deviants. Secondly, variation in organizational performance and outcome needs to be present. Thirdly, positive deviants must be willing to share 'secrets' of success openly in spite of maybe losing competitive advantages (Bradley *et al.*, 2009).

Step 1: How to Identify of Positive Deviants?

"Identify positive deviants, i.e., organizations that consistently demonstrate exceptional performances in an area of interest"

How can we identify positive deviants? Bradley *et al.* (2009) describe positive deviants as *"organizations that consistently demonstrate exceptionally high performances in the area of interest".* Pant (2009) defines positive deviants as: *"those individuals who accept social goals and values despite having no or limited access to structural means to achieve those goals, or simply denying the existing structural means for a good reason".* The latter is based on Merton's (1957) typology of deviance which is depicted in Figure 8.

Identification of deviance can be conducted in different ways. According to Spreitzer & Sonenshein (2004), sociological literature offers four major perspectives on deviance: statistical, supra-conformity, reactive and normative. Statistical deviance is based on the principle that quantifiable outcome variables are located in the right hand of a normal distribution. Supra-conformity is based on the fact that systems or individuals are regarded deviant when they are excessively confirmative to institutional norms. Reactive deviance is centered on the opinions of an audience and is mostly linked to negative behavior. The normative approach is defined by Spreitzer & Sonenshein (2003) *"as intentional behavior that departs from the norms of a referent group in honorable ways".* They regard the normative approach as most suited for positive deviance studies.

From our perspective the abovementioned normative approach to deviance is most applicable, as farms are multi-facetted and hence more than one outcome variable can be included. Using the normative approach the problem of weighing these indicators is overcome because it is implicitly done by norms of an audience. Outcome variables are both quantitative (e.g. operating profit, milk production) and qualitative (e.g. animal welfare). Though the normative approach is our main focus, statistical deviance can be assessed on quantitative outcome variables on which benchmarks are available.

"Who is the reference group?" is a following question to be answered. In line with Biggs (2008) and Flyvbjerg (2006), we selected experts as a reference group. It is assumed that these experts select farms assessing the whole farm with all its aspects using their own set of implicit indicators. We regard experts as individuals that have awareness of the differences between farms and have a vision on what they consider to be a positive deviant farm. We aimed to use experts from different perspectives to cover a wide variety of positive deviant farms.

Step 2: How to analyze Excellence?

"*Study organizations in-depth using qualitative methods to generate hypotheses about practices that allow organizations to achieve top performance*"

It is challenging to analyze 'excellence' in relation to farm functioning. Excellence is difficult to define as it is not clear what variables to investigate. We thus first analyzed what is defined as 'excellence'. We selected the group of positive deviants as the ones to define excellence. The reason for this was that as a result the farmers' definitions of excellence can be used to better interpret and maybe even explain farm performances as conviction and farm performances are related (Schoon & Grotenhuis, 1999).

Next to defining excellence, we also analyzed the actual farm performance of the positive deviant farms. Actual farm performance was assessed in terms of land allocation, productivity, nutrient flows and balances, farm multi-functionality and ownership of the land. Though much more variables could have been investigated we limited ourselves due to time constraints. Hence the actual farm performance of for instance economic figures, biodiversity, and soil health were not assessed.

Analysis of the context, as argued by Bradley *et al.* (2009) and mentioned in the former section, is an important aspect for understanding the significance of various contexts for case processes and outcomes. Context analysis is on the one hand analyzed through the inclusion of a varied case-study pool. On the other hand we regarded it useful to present major developments in the context that explain variation between farm strategies. We therefore elaborate on the historical development of Common Agricultural Policy (CAP) and developments in terms of multi-functionality.

Next to analyzing the definition of excellence of our positive deviants, calculating their actual farm performances and making overview of the context we hope to learn from these farms. Hence we also want to gain more insight in what factors contributed to success of our positive deviants. These success factors are crucial in dissemination of newly defined practices which entails step 4 of the positive deviance method (outside the scope of this study).

Thus, as our study objective entails "learning from excellence" we structured the analysis of our case-study farms from three different angles. First, we analyzed what farmers define as an excellent farm; second, we analyze actual farm performances of our positive deviants and third, we analyzed what factors contributed to the success of our positive deviants.

Analysis of the context of the positive deviants

The goal of performing an analysis of the context is to obtain additional information about the significance of various contexts for case processes and outcomes. As contexts of farms can be extremely variable this is regarded as an important criterion for our case study sample. Including maximum variation was said to be a suited tool for this purpose (Flyvbjerg, 2006). Though we expect to cover a lot of diversity within the group of positive deviants of organic mixed farms we

also see an additional value in presenting major context developments in diversity of farm management.

In this section we elaborate on major trends in diversity in farm strategies to increase understandings of the current diversity. We start with a concise description of the Common Agricultural Policy (CAP) and link it to observed trends.

The historical development of the CAP shows three important drivers: Productivity, Competitiveness and Sustainability (Figure 3). In the following we will provide a short overview of this development.
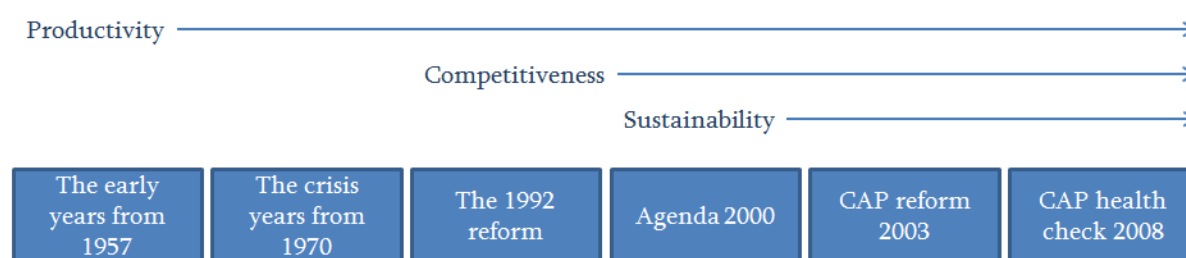
FIGURE 3: HISTORICAL DEVELOPMENT OF THE CAP (EUROPEAN COMMISSION, 2014)

The early years of the CAP are characterized by a focus on productivity. After the Second World War, western European countries were damaged, which resulted in an emerging need in assuring food security as agriculture was crippled and food supplies were not guaranteed.

In the 1970s, attention went to structural adjustments of the European farms since the CAP was successful in assuring food security but caused almost permanent surpluses of the major farm commodities. The Mansholt Plan (1969) encouraged nearly five million farmers to quit farming, what formed an incentive to redistribute land and increase the size of still remaining family farms in order to make them viable and guarantee an average annual income comparable to standards in the region. This plan was rejected though the three directives, modernization of agricultural holdings, abandonment of farming and training of farmers were accepted. In 1979 there was a penalty set for serious over-production in the dairy sector and quotas were introduced in 1984.

In 1992 a reform, also known as the MacSharry reform, initiated the shift from product support through prices to producer support through income support. Aim of this reform was to improve the competitiveness of agriculture, stabilize markets, diversify production and protect the environment. As a result, direct payments were introduced which entailed a basic income support decoupled from production. This gave farmers the freedom to produce according to market demands, whilst guaranteeing a more stable farm income, independently of what and how much was produced.

Agenda 2000, which was initiated in 1995 and completed in 1999, divided the CAP into two pillars (see Figure 4). The first pillar entails the abovementioned direct payments, market interventions and coupled subsidies. The second pillar is based on three axes, focusing on the

improvement of the competitiveness of agriculture, the improvement of the environment and the countryside and at last the improvement of the quality of life in rural areas and the encouragement of diversification of the rural economy.
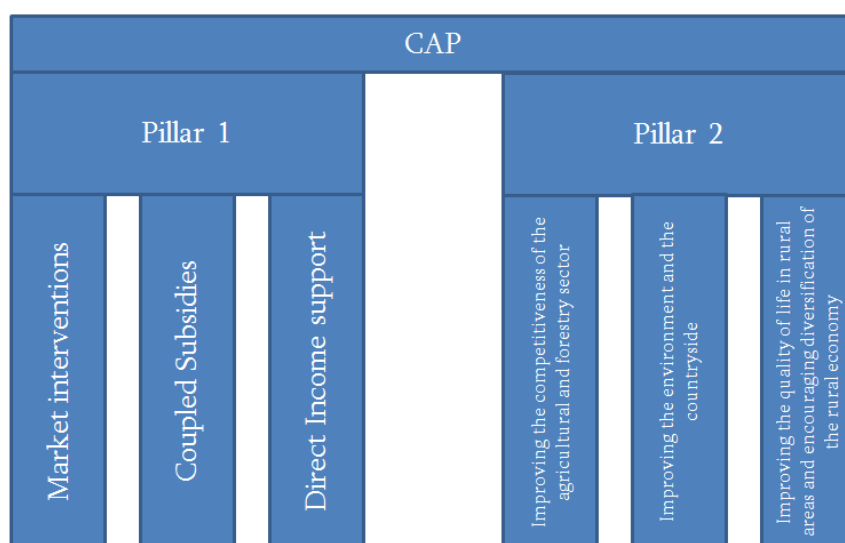

FIGURE 4: THE TWO PILLARS OF THE CAP

After Agenda 2000, the focus on a more sustainable agriculture grew stronger. The reform of 2003 introduced cross-compliance. Cross-compliance entails that farmers who infringe EU law on environmental, public and animal health are punished through reduced EU support. Assessment of the implementation of the 2003 reforms lead to a necessity to modernize, simplify and streamline the policy in order to remove restrictions and enable farmers to better respond to signals from the market and to face challenges as climate change, water or bio-energy, which was called the 2008 health check. Commissioner for agriculture, Cioloş launched a public debate on the Common Agricultural Policy's future in April 2010. Objectives, principles and contributions to the 'Europe 2020' strategy, Europe's ten year growth-strategy, to inform the preparatory work for the decision-making process were discussed. After two years of negotiation an agreement was reached in June 2013. The formal adoption of the reform by the European Parliament and the Council has taken place in the beginning of the year.

Van der Ploeg (2000) states that heterogeneity in farm type and structure is a persistent feature of European farming though homogenization of farm structures – envisioned by modernization policies of the CAP - would be expected. This heterogeneity is described as different farming styles (Van der Ploeg, 1994). On the basis of scale and intensity a typology was developed (Figure 5) (Van der Ploeg,1992).
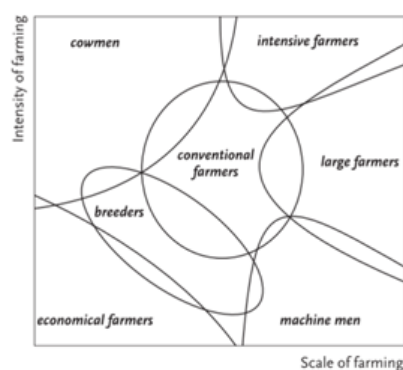
Apart from scale and intensity, farms are also diversifying in terms of their farming activities. Van der Ploeg (2000) states that policy attempts to construct sustainable rural livelihood invoked a shift away from agriculture's traditional core activities towards diversification through 'new' on farm activities such as tourism, care or on-farm processing.

Seuneke *et al.* (2013) disclose that the broadening of farm activities is also the result of urging environmental, social, and economic pressures. New income-generating (non-farming) business activities could reduce financial risks. Statistics of the Netherlands show a slight increase in number and growth of businesses with broadening of farming activities (Figure 6). Total numbers of farms in the Netherlands amounts 67,481 farming business in 2013. To form an idea how many farms are multi-functional we provide an example; 11 percent of the farms had an additional function in the form of Nature/landscape management in 2013 (StatLine, 2013). Furthermore, of all multi-functional farms 62% generated only 10 percent of its revenue with its broadening function, 8 percent between 10-50 percent of its revenue and 11 percent more than 50 percent of its revenue (StatLine, 2013).

FIGURE 6: OVERVIEW OF MULTI-FUNCTIONALITY IN THE NETHERLANDS (2010-2013)(STATLINE, 2013)

Knowledge Gaps

Now that we have elaborated on the theoretical background of the methodology we elaborate on existing knowledge gaps. As was stated before, our analysis is structured our on three pillars:

1. How is an excellent farm defined by positive deviants?
2. What are the actual farm performances of positive deviants?
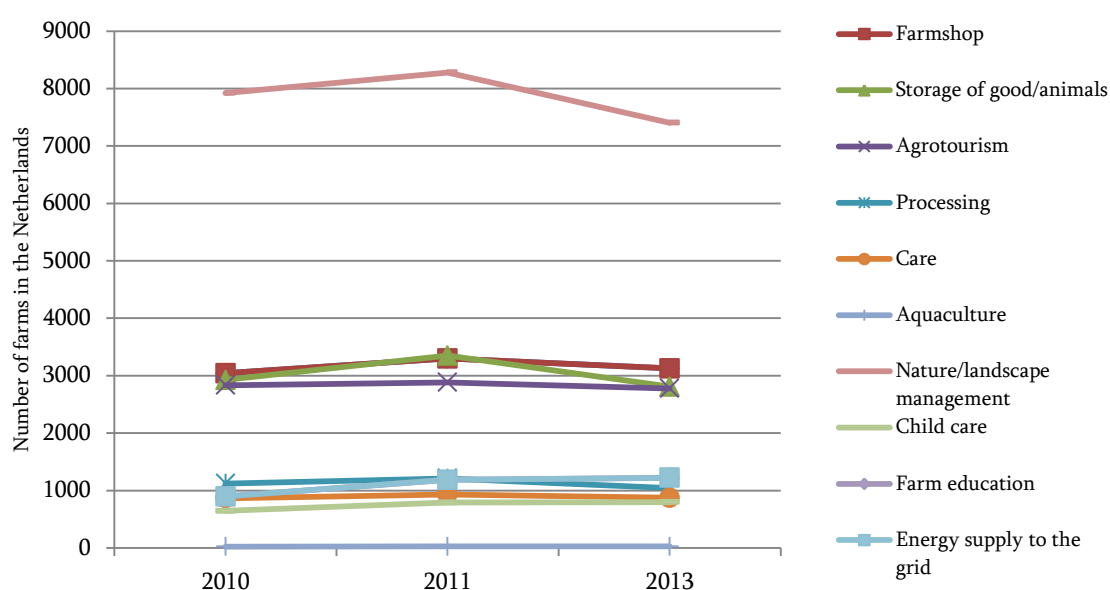3. What factors are said to have contributed to the success of positive deviants?

In the following we will discuss what is found by our predecessor in the project "Learning from Excellence", De Adelhart van Toorop & Gosselink (2013), and discuss relevant existing literature and argue how our analysis contributes.

How is excellent agriculture defined by positive deviants?

As a pioneer in the project "Learning from Excellence", De Adelhart van Toorop & Gosselink (2013) found the following criteria of excellent farming practices in a literature review (Table 1). Additional criteria mentioned by a pool of farmers and their associated ranking based on farmers opinions can also be seen.

TABLE 1: CRITERIA OF EXCELLENT FARMING (DE ADELHART VAN TOOROP & GOSSELINK (2013)

Predefined criteria from literature	Times mention of the (54)	Mentioned criteria by the farmers	Times mentioned
Enhance soil quality management	26	Social function/contact with citizen	2
Minimize the use of antibiotics	25	Animal welfare	2
Farm income	24	Representative appearance	1
Maximize pasture	19	Relations with surroundings	1
Climate friendly farming	15	Broadening (of functions)	1
Closed nutrient cycles	13	Living environment of animals	1
Innovative attitude	10	Food quality	1
Landscape management	9	Solar energy	1
Energy use	9	Biodiversity	1
Producing feed crops	4	Work enjoyment	1
Production (litres/ cow/year)	2	Leisure time	1
Attending study groups	2	Vision	1

Dunlap (1992) found three dimensions in relation to farmers' views on sustainable agriculture. A distinction was made between an ecological dimension, a socioeconomic dimension and an ethical

dimension. Farmers regarded the socioeconomic dimension as most important followed by ethical and ecological dimension. When these criteria are linked to the criteria for excellence of De Adelhart van Toorop & Gosselink (2013) we find similar dimensions whereas the factors "innovative attitude" and "attending study groups" are difficult to place.

Furthermore, the socio-economic criterion "farm income" was mentioned 25 times whereas the criterion "enhance soil quality management" was mentioned 26 times. This would indicate that positive deviant farmers would have an almost equal emphasis on socio-economic as ecological criteria.

Howley *et al.* (2014) state that in comparison to the general public, who tends to take social, recreational, environmental as well as economic benefits into consideration in a holistic fashion, farmers demonstrate a more productivist attitude. Howley *et al.* (2014) compared attitudes towards the most important environmental issues for society to the most important functions for Irish Agriculture. It was found that farmers have a different attitude towards societal issues compared to the function of agriculture. In their attitude towards the function of agriculture economical functions were regarded more important. When these outcomes are related to the criteria of De Adelhart van Toorop & Gosselink (2013) we indeed see "farm income" as one of the major criteria, but the criterion "production" (liters/cow/year) is only mentioned 2 times. In addition, societal issues such as "climate friendly farming" were mentioned 15 times. This would suggest that positive deviant farmers give similar importance towards the functioning of agriculture and societal issues.

Gorton *et al.* (2008) analyzed farmers' attitudes towards agricultural production, diversification, policy support and behavioral intentions in five member states of the EU. In opposition to the diversification theories as a means to economic viability by Seuneke *et al.* (2005) it was concluded that the strategy of diversification and development of multiple income sources creates difficulties for most farmers. Furthermore, the majority of famers rejected the notion that they could be competitive without policy supports though most of the farmers were in favor of more flexibility of policy instruments. When we relate these findings to De Adelhart van Toorop & Gosselink (2013) it is remarkable that "broadening of functions" is mentioned as a criterion for excellence. This results in the question to what extent broadening of farming function is done for economic reasons or for idealistic reasons.

Our analysis adds to the former in that we complement the "criteria of excellence" listed by De Adelhart van Toorop (2013) by insights of positive deviants mixed organic farms to form a more complete view on excellence. In addition we will analyze the attitudes of our positive deviant organic mixed case-studies to farm functioning and societal issues to assess whether our positive deviants have a different attitude than other farmers. In the end we also examine to what extent broadening of function is seen as a component of an excellent farm by our positive deviants or it is seen as a means to economic gain as suggested by Seuneke *et al.* (2005) to keep the farm thriving.

What are the actual farm performances of our positive deviants?

De Adelhart van Toorop & Gosselink (2013) assessed farm performances of nine positive deviants among organic dairy farms. In relation to environmental issues they found that their selected positive deviant farms had a higher impact on global warming compared to benchmarks of organic systems. Also N-surpluses appeared to be much higher for their group of organic dairy positive deviants than values from literature. N surpluses were on average 111 kg/ha while organic benchmarks amounted slightly lower at 104 kg/ha. Land use appeared to be higher for the positive deviants whereas energy use was lower due to a reduced amount of purchased feed. However, eutrophication and acidification values were lower for the group of positive deviants in comparison to organic benchmarks.

Moreover, in relation to management the positive deviants of De Adelhart van Toorop & Gosselink (2013) appeared to use fewer antibiotics than average organic farms. Five out of nine farms used very little antibiotics and two positive deviants almost approached zero. Some of these farmers used herbal remedies that acted as a natural antibiotic. Six of the nine positive deviants managed a nature area in addition to their own farm land. Nature areas also function as a source for roughage and provide opportunities for grazing. Only three of the nine farms held dehorned cows. Reasoning behind this was that it was more natural and some farmers even argued that it contributed to the health of the herd. Furthermore, only four of the farms imported a mixture of concentrates. Importation of concentration has a high impact on off-farm land and energy use. At last also on-farm processing was observed by five out of nine farms and was said to contribute to profits.

We aim to complement these findings by examining to what extent the above mentioned performances are also observed in our case-study pool of positive deviants of organic mixed farms and elaborate on the underlying reasoning of the farmers. As already five out of nine of the positive deviant dairy farms of De Adelhart van Toorop & Gosselink (2013) were not importing animal feed we regard on-farm nutrient flows as an important component of our analysis for our case-study pool of positive deviants among organic mixed farms.

What factors contributed to the success of positive deviants?

Drivers of success identified in the analysis of De Adelhart van Toorop & Gosselink (2013) of nine positive deviant organic dairy farms resulted in nine success factors that are presented in Table 2.

TABLE 2: SUCCESS FACTORS OF NINE POSITIVE DEVIANT ORGANIC FARMS (DE ADELHART VAN TOOROP & GOSSELINK 2013)

| Succes factors |
| --- |
| Realistic expectation from the cows, does not over ask. Strong animals, good breed. |
| Lucky with division of parcels, good soil. Good dairy farmers |
| Through added value via excellent cheese reasonable income/profit |

Keep it simple, no difficult machinery or theories
Everybody can walk their own path. Divers entity, a bit of everything and therefore dynamic. Soil organic matter is the most important.
View from wholeness, system approach, long-term vision
The farm is not so special, does not deviate so much from others. Strong combination with nature conservation
It might be something non-measurable. The good expectations and positivism
Eager to learn, innovative attitude

De Lauwere (2005) concluded that characteristics such as self-criticism, leadership, creativity, perseverance and initiative affected entrepreneurship positively whereas love of ease and passivity affected entrepreneurship negatively. When we relate that to the findings of de De Adelhart van Toorop & Gosselink (2013), we find substantial overlap. Leadership for instance and "everybody can walk their own path", as well as "view from wholeness", are intertwined. De Lauwere defined success factors more abstractly whereas some of the success factors of De Adelhart van Toorop & Gosselink (2013) are more concrete than others.

De Lauwere (2005) categorized Dutch farmers in five types; social, traditional, prudent, new growers and indecisive farmers. Based on future expectations and family income it was concluded that "social famers" and "new growers" were more successful than the other farmers. De Adelhart van Toorop & Gosselink (2013) also postulated a typology of strategic orientation based on scale and intensity of the farming system (Figure 7). Here also entrepreneurial attitude, fine-tuner, intuitive, steady, integrated farmer was defined to describe the farmers of the positive deviants among organic dairy farms.
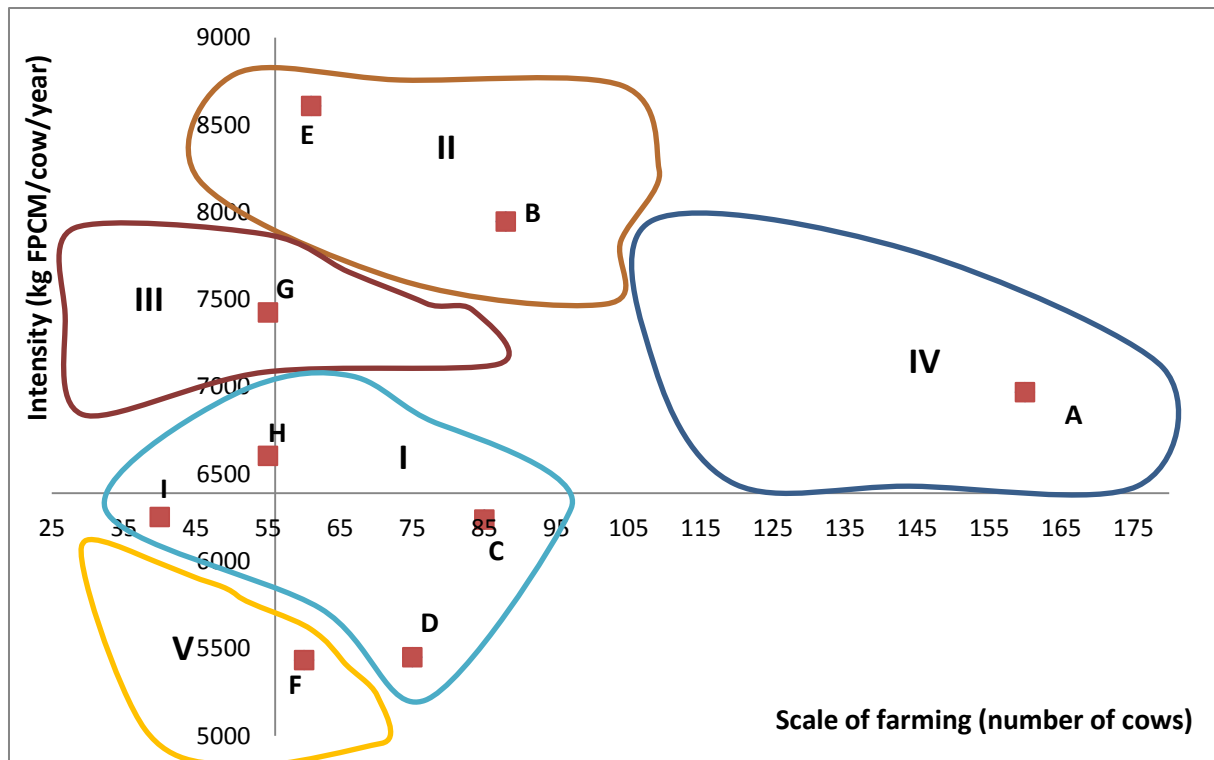
FIGURE 7: TYPOLOGY OF DE ADELHART VAN TOOROP & GOSSELINK (2013) BASED ON SCALE AND INTENSITY; I FINE TUNERS, II INTUITIVE DAIRY FARMERS, III STEADY FARMERS, IV ENTREPRENEURIAL FARMERS AND V INTEGRATED FARMERS

Through our analysis of positive deviants among organic mixed farms we complement the list of success factors of De Adelhart van Toorop & Gosselink (2013) and come up with an overall overview of success factors to present the factors that according to our positive deviants farms result in success. In addition to the available strategic typologies of de Lauwere and De Adelhart van Toorop & Gosselink (2013), we hope to distill separate success factors that have contributed to the success of our mixed organic case study farms.

MATERIAL AND METHODS

STEP 1 Identification of deviants

Normative selection of Agricultural Experts

Selection of experts was done differently in The Netherlands and NRW. In Germany, the chairwoman of Demeter NRW was contacted and provided a list of farms that she saw as frontrunners. For each farm, factors were provided that led to the choice. Of the provided farms, 4 fitted the requirement of being a mixed farm. Together with the Dutch farms, the resulting case study pool consisted of 14 case studies (Appendix IV).

In the Netherlands farms were selected by experts through the use of an online form. An expert was defined as anybody with a link to agriculture by being employed in sectors such as consultancy, science, politics, or farming itself. An additional side effect of consulting different experts was that experts from different sectors would have diverse views on good agriculture which guaranteed a mixed portfolio of mixed organic farms. These experts (see list in appendix II) were contacted via email with a clear description of our research and their role in it and a link to the online form.

In the online form, the experts were asked to list not more than three farms which they regarded as positive deviants in the pool of mixed organic farms. Furthermore, the link between farmer and expert needed to be specified as well as a comment on their choice. In addition we asked the experts to list five criteria which they regarded crucial for an 'excellent' farm and to score their nominated farms on the listed criteria on a Likert scale. The given criteria provided more insight in what the experts saw as important and to what extent they regarded the farm as deviant (for outcomes of the form, see appendix V).

Selected positive deviant Farms

In total 14 farms were nominated by 8 experts through the online form. Only 10 Dutch farms were included. Farm NL10 was mentioned twice by two different experts. Two farms were excluded as they were not a mixed farm and one farm that was nominated was not certified organic.

STEP 2 ANALYIS

"Study organizations in-depth using qualitative methods to generate hypotheses about practices that allow organizations to achieve top performance"

This section describes the analysis of all the obtained data from the interview, the collected data and model results. We will start by data collection, processing of the qualitative data and subsequently processing of the quantitative data into the model FarmDESIGN.

Data collection

The 14 positive deviant farms where approached via email about the possibility of visiting their farms for a two hour interview. By email and telephone farms were contacted and dates were set

for an interview. Three days before the interview, the farmers were sent an interview outline, so that they would be able to prepare especially for the data collection part (See appendix VI for an Interview illustration).

The interview itself was divided into two parts; a quantitative and a qualitative part. The first section dealt with the collection of data about soil, plants, animals, manure and management. Most of these Figures were used for input of the FarmDESIGN model. The second part went deeper into the perceptions and vision of the farmer on agriculture. The questions were aimed at receiving answers to the research questions and to clarify the context of the farm. This part revolved around three main questions:

1) What do you see as an excellent farm?
2) What are specific problems that you have encountered and how did you solve them?
3) What is your success-factor?

During the interview, the farmers were encouraged to speak their mind freely to keep a familiar, pleasant atmosphere.

The interview resulted in varied data about the farm, in the form of soil analyses, crop rotations and herd management tables. Some farmers could provide more information than others. Next to the provided tables, the interview was also taped and typed out so that statements especially from the second part of the interview could be extracted. These revolved around ideas about ideal farming, problems in the agricultural sector and success-factors.

Qualitative analysis
The interviews were typed out and central statements were extracted from each interview and subsequently clustered around certain subjects. These subjects were subsequently accommodated under the six summarizing characteristics of an excellent farm or six success factors.

Quantitative Analysis
We used the model FarmDESIGN to analyze farm performance in terms of nutrient cycles and organic matter. This model was initially developed to overcome limitations of traditional farm performance analysis by coupling a biological and an economical farm model to evaluate and explore the productive, economic and environmental performance of farms (Groot *et al.*, 2011). We only used the model to gain an insight in nutrient cycles, feed, and organic matter balances and left out economical modeling, as farmers did not freely share economic information or did not have an exact overview.

Input of the model comprised data about soil, crops, rotation, animals, manure, and feed. This data was obtained during the interview with the farmer. When figures were not available or missing, these where supplemented and approximated by data compilations available at the university. Output of the model consists of overviews of nutrient cycles of Nitrogen, Carbon, Potassium and Phosphate. Furthermore, a feed balance and organic matter balance are calculated.

To have an insight into the actual productivity of the different farms, a calculation of the produced calories/ha was performed. The production units from FarmDESIGN were taken and multiplied with the amount of calories/kg. Hence, the total production of crops for human consumption and animal products were translated into a total calorie production of the farm. Afterwards, this number was divided by the size of the farm to receive a calorie production/ha, that could be compared.

To see what influence farm size has on productivity, a control size and the actual farm size were used. To control for farm size, use of nature area and imported feed, instead of using the actual farm size, the size of the crop fields plus the livestock units were used as hectares. Hence, a farm that would have 50 dairy cows, 200ha of pasture and 10ha of wheat for human consumption would have the following two calculations for farm size:

Corrected size:

50 dairy cows = 50 livestock units = 50ha

10ha wheat

Results in 60ha corrected farm size

Actual size:

200ha pasture

10ha wheat

Results in 210ha actual size

The multi-functionality of the farms was scored on the 5 sections on-farm store, care, involvement of consumers, education and energy production. For each farm it was calculated how many aspects of multi-functionality they met. This led to a multi-functionality index that could rank between 0 and 5.

The livestock units of the positive deviants were calculated with the help of the list provided by the EU (EUROSTAT, 2014).

Quantitative analysis was also performed using MS Excel, to visualize usage of soil, ownership and the distribution of views and statements

RESULTS

As described in our theoretical framework our analysis was structured along three questions:

1. How is excellent agriculture defined by our positive deviants?
2. What are the actual farm performances of our positive deviants?
3. What factors contributed to the success of our positive deviants?

In the following we will present outcomes of our analysis in a similar sequence. The first and third questions are answered by the use of categorization of the statements of our positive deviants. The second question is based on quantitative figures provided by the positive deviants. More background information on the positive deviants' farm profiles can be assessed and found in the farm profiles that are available on demand.

Characteristics of an excellent farm

In Figure 8, the characteristics of excellent farms can be seen in relation to how many farmers clearly mentioned them during the interviews. In the following we discuss the characteristics one by one, present key statements and elaborate on underlying reasons explained by the farmers.
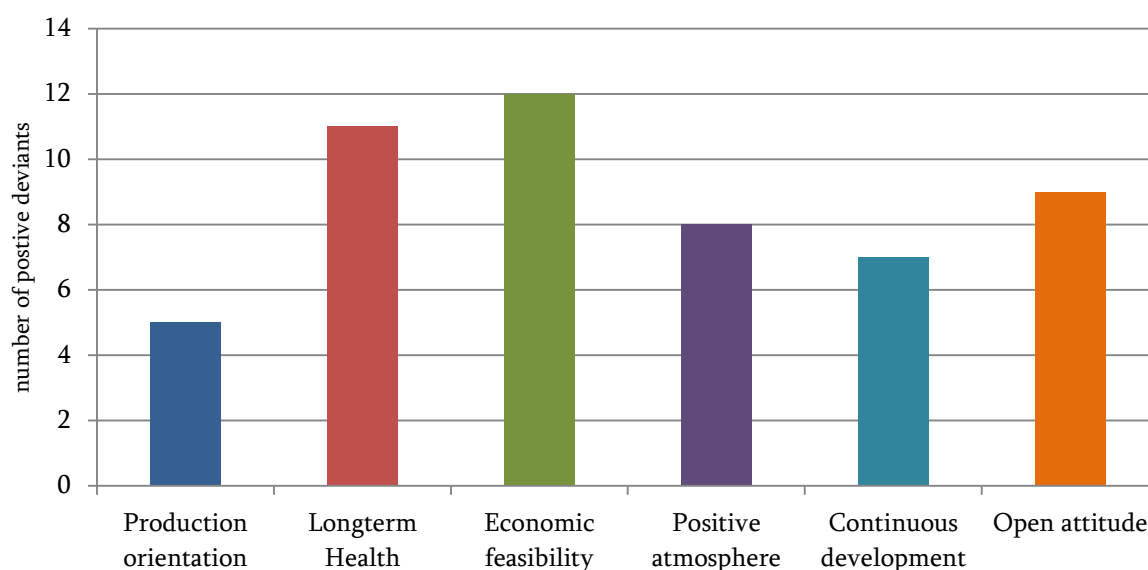
FIGURE 8: NUMBER OF POSITIVE DEVIANTS THAT MENTIONED THE EXTRACTED CHARACTERISTICS OF AN EXCELLENT FARM

Production-orientation

Strong underpinning statements of this characteristic are presented in Table 3. In the following we elaborate on specific reasoning behind the characteristic "production orientation".

According to NL1 the main goal of agriculture is food production. In relation to the world food problem, NL1 states that intensive agriculture and efficiency is needed. He claims to be very fanatic in producing as much food as possible for society. If a population of 9 billion people needs to be fed, as little grass as possible and more crops that are suitable for human consumption should be cultivated.

NL 7 is production oriented though his care branch is financially very attractive said the farmer. NL 7 does not want the care branch to overrule the food production branch, out of principle. He states that he does not want to be known as a care farm but as a production farm. NL7 mentioned that a lot of care clients would like to take care of horses but that this does not fit with the aim of producing food. He said the market trusts the farm in producing food therefore the farm should focus on food production. Furthermore he states it would be alluring to replace milk production with meat production as you do not have to get up early. This can make you lazy.

TABEL 3: STATEMENTS OF POSITIVE DEVIANTS ABOUT A PRODUCTION ORIENTATION

FarmID	Statement
NL 1	"I am really an advocate of intensive agriculture, but that means something completely different than feeding grains to pigs that you could also bake bread from." *(sic)*
NL6	"Pretty intensive with cauliflowers." *(sic)*
NL7	"We really want to be a care farm, but it shouldn't be dominant, it should still be an agricultural business." *(sic)*
NL8	"Not on small scale." *(sic)*
NL9	"The farm is not a care-farm, we are a production business." *(sic)*

Long-term health of soil, plants and animals

Strong underpinning statements of this characteristic are presented in Table 4. In the following we elaborate on the reasoning of positive deviants behind the characteristic 'long-term health of soil, plants and animals'.

NL1 says that a high production or production in the long-term is not possible if the agricultural system is not ecologically sound. Ecology should therefore have priority.

NL 6 states that the mission of agriculture is to make and keep the soil fertile for coming generations. The farmer has been working on improving the soil, as soil quality was not that high when they started farming there. He observed that currently the soil has improved after they stopped ploughing in 2004 to preserve the stratification of the soil. Maintenance of the soil stratification makes the soil more resilient through the preservation of all the fungi and bacteria. As a result a reduction in pests and diseases was observed. In 2010 they also stopped with spading the soil. Furthermore, a fixed wheel track system is applied using precision GPS. All this is done to avoid soil compaction and enhance soil biodiversity.

NL8 claims that a balance of the soil should have priority. This means that a farmer should not be seduced by the production of too many cash crops as cash crops decrease the health of the soil. Crops like Lucerne, which are good for soil fertility, are important to keep in the rotation. Keeping such crops reduces weed problems and results in higher product quality. NL 9 endorses this and uses non-profitable crops as cereals in his rotation to improve soil quality. DE2 also states that it is

an exciting observation that, if you treat your soil well it can develop well even if you only have an organic rotation.

Diversity is stressed by the farmer of DE4. He says the soil needs to have as many plants and animals as possible because diversity goes hand in hand with stability. NL10 emphasizes this as well by saying diversity is needed to build a healthy resistance in the soil. Furthermore, NL7 states that biodiversity might be the most important of all.

NL7 and NL3 mentioned that all the external inputs of the farms make the farm more prone to pests and diseases. NL3 states that a closed cycle or "grondgebondenheid", producing feed on your own farm, is an important basis for a healthy farming system. NL5 also endorses this and states that a mixed autonomic system creates a farm identity which results in an authentic quality of the farm product. NL6 says that having a closed breeding system has an added benefit because animal welfare is increased, as there is less animal transportation needed.

According to NL1 a closed on-farm nutrient cycle is not possible. This is only feasible in small-scale house gardens but not for farms that aim to produce food for society. He says that the fact that a farm produces food for society implies an open system. To close the on-farm nutrient cycle, nutrients need to be returned from society. In this line of thought, compost is used as a societal input to close the nutrient cycle. The farmer of DE3 mentions a similar thought: "imagine there might be more encompassing nutrient-cycles where human wastes get re-used".

Within the interviewed farms only NL1 kept dehorned cows. He however stated that he preferred horned cattle but still needed to Figure out how to adjust management and stable size.

Animal welfare is an important aspect to NL3. At his farm, the piglets are allowed to drink from their mother for 42-45 days. On day 30 the milk production of the mother sow will decrease and the piglets will start eating solid food. On day 45 almost every piglet eats solid food. In contrast, in conventional pig farming piglets only spend 18-22 days with their mother. When pigs are removed from their mother at that age and have to eat alternative feed this can result in intestinal problems. NL3 also states that pigs should not be used as a "pincushion", meaning they should not be vaccinated as much as is common. Vaccination on this farm is not done for 15 to 20 years.

NL3 has its own sow breeding program and states that as a result there is a reduced impact of diseases. Also, manure from the piglet stables is introduced into the sow stable, to activate the immune system of the mother sow before milk production so she is able to provide disease defense through the milk she provides her piglets. For the castration of the boars, a gas anesthetic is used, as it leaves fewer residues in the meat or sewage water than a fluid anesthetic would.

NL10 is trying to increase animal welfare through a recently introduced milk system called "duurmelken". It involves extending the period the mother goats are milked by delaying the moment of re-insemination. This reduces the number of newly born goats. "Duurmelken" requires adjustments to the stable as for instance the lambing goats need to be fed differently than the goats that are being milked. Benefits of "duurmelken" are the beneficial effects on health of the goats, the reduction in workload and results in about the same amount of milk.

TABLE 4: STATEMENTS OF POSITIVE DEVIANTS ABOUT LONG-TERM HEALTH

FarmID	Statement
DE 1	"Our principle is that the animals can live on this farm as welfare oriented and especially species-oriented as possible." *(sic)*
DE 3	"Produce in a way that puts the least strain on the environment." *(sic)*
NL 1	"If your agricultural system is not coherent, it will run dead at some point and I am truly convinced of that." *(sic)*
NL 2	"With a healthy soil you can expect healthy plants and healthy livestock" *(sic)*
NL 3	"Very nice because the pigs think it's fantastic and there is also a mudbath in the pasture" *(sic)*
NL 5	"So, a responsibility, humans as stewards of the connection of mineral, plant and animal kingdom" *(sic)*
NL 6	"Stopped with ploughing, fitted the tractors to a 3,2 fixed path" *(sic)*
NL 7	"With bio-dynamic you fit the environment to the cow and then you can't take away the horns" *(sic)*
NL 8	"Important for the balance is the soil as a basis and what you want to work with, as long as you keep that in focus, it will always pay off" *(sic)*
NL 9	"To give the cow the possibility to convert roughage, low quality into high quality food, I think it's weird that cows in the Netherlands aren't given the chance to ruminate anymore" *(sic)*
NL 10	"With the "duurmelken" system, the goats are more healthy and calm" *(sic)*

Economic feasibility

Strong underpinning statements of this characteristic are presented in Table 5. In the following we elaborate on reasoning of positive deviants behind the characteristic 'economic feasibility'.

The farmer of NL1 poses visiting students the question "What is the goal of farming?" Students often reply "earning an income". This is in line with what he learned during his education. However, he says that the goal "earning an income" is quite different from "producing food". He says that it is undeniable that a farmer needs to earn an income, otherwise the farm would not be viable to subsist but the primary goal of agriculture should be producing food. The farmer of NL1 describes the economy as a web of agreements between people that can be rearranged. For example he says that the fact that his cheese is sold for about 8 Euros per kg and his potatoes for 40 or 50 cents per kg is an agreement between people about the value of these products. Thus, since these agreements between people about the economic value of products are flexible and adjustable, economics should not be the focus of agriculture, but ecology. He says that as a result you have to create your own market because you can create a market but you cannot create ecology.

When the farmer of NL10 started farming he had the aim to make the farm mixed but most of all economically sound. A farm that also was able to cope with economic storms. He furthermore also says that other departments of the farm should not depend on one another.

NL6 says that the task of a farm business is to increase and maintain soil fertility. A farm should therefore be economically feasible because otherwise the maintenance of soil or increase of soil quality becomes impossible.

NL6 says organic agriculture has three problems, sales, sales and sales. It is difficult to sell your product and get a good price. A way to deal with this is to build many contacts and use them when needed in the season. Moreover, by adding extra quality a farm can differentiate itself and stand out. In 2013 he started with sealing cauliflowers to distinguish his product from the competition. He and his father always focus on quality. In the starting years of being organic there were two categories of cauliflowers 'first class' and 'second class'. They stopped with the second class because this class hampered the success of the first class. NL9 has a herd that calves in autumn, so they can earn the higher milk prices in winter.

NL5 stresses that the farm individuality which arises in an autonomic mixed system ensures an authentic farm product. In the same line of anthroposophic thinking NL7 says that in such a system shelf life is increased in crops as lettuce as well as taste of, for instance, strawberries. NL 9 endorses this and therefore regrets that all his milk is sold to a large dairy factory and the farm individuality disappears in the batch and is not recognized. There are however plans to start an on-farm Dairy.

NL7 says that often "authentic" aspects cannot be measured though there is more and more scientific evidence that milk of horned cattle has beneficial characteristics as for example higher levels of omega fatty acids.

The farmer of NL3 states that inputs of external parties should be minimized. He adds that the industry is constantly trying to increase sales to farms and thus trying to make farmers even more economically dependent. The farmer of NL4 hopes to find citizens as investors. He says this capital can make farmers more powerful in the food chain.

Being independent in terms of machinery enables the farmer to do certain tasks at the right time. By owning his own machines, a farmer earns independency. This is stressed by NL3 and NL6. With optimized timing comes increased quantity and quality of products.

TABLE 5: STATEMENTS OF POSITIVE DEVIANTS ABOUT ECONOMIC FEASIBILITY

FarmID	Statement
DE 1	"But economics, that causes sleepless nights." *(sic)*
DE 2	"In a situation where prices are bad, through producing and selling good quality, I can find people who are willing to pay good prices." *(sic)*

DE 3	"Then I wrote down, process and refine, adding value." *(sic)*
NL 1	"You can make economics, not ecology." *(sic)*
NL 2	"It's produced here, the people want to buy it here." *(sic)*
NL 3	"The marketing of the vegetables, you keep having to work on it." *(sic)*
NL 4	"You need to develop a market, so you need to have a negotiable product." *(sic)*
NL 6	"Organic agriculture has three problems; sales, sales, sales." *(sic)*
NL 7	"The fact that we will produce our own concentrates makes us stronger." *(sic)*
NL 8	"What is better than selling your own product?" *(sic)*
NL 9	"We should not depend on the external market." *(sic)*
NL 10	"Never lose sight of the financial side." *(sic)*

Positive on-farm atmosphere

Strong underpinning statements of this characteristic are presented in Table 6. In the following we elaborate on specific reasoning of a positive on-farm atmosphere.

NL1 states that the success of the farm is owed to the people that are on the farm. Each day they drink coffee together. He says he does not know when you can call it success but he says that when people feel at home on his farm, that is success to him. People come from everywhere and nowhere. NL1 thinks it is important that there is space for people to start something independently and realize their own visions ("hun ei kwijt kunnen"). Some people stay and some people come and go if it does not work out. The only prerequisite is that they have to be motivated. NL10 states something similar and says that the good performance of the farm is due to everybody's commitment. The on-farm atmosphere is very important to DE2 and he highly values his good relationship with his wife that strengthens the farm. Also the farmer of DE4 argues that the most important premise is that people are happy. "You need to put emotion into your farm and engage yourself relatively unconditionally. If you give nothing, you get nothing back."

NL1 furthermore states that because there are a lot of people working on the farm there is also a lot of flexibility. On the one hand people have the flexibility to go on holiday; on the other hand people are also flexible in doing overtime to fill in for others. He himself is therefore in the position to go on holiday for 6 weeks a year. This flexibility is also mentioned by NL10.

NL10, however also experienced some difficulties with partnerships. He states that after working in several partner constructions he once experienced a difficult collaboration. He witnessed that the atmosphere on the farm changed in such a negative way that he even did not want to invite friends and there was no space for personal development. For 6 years he tried to make the best of it, but eventually the cooperation fell apart. He said he learned a lot from this experience and says that it should be prevented that people get alienated from each other due to the focus on their

own tasks. Still, he stresses that partnerships on the farm are very important and he enjoys working with the many different people currently involved in the farm.

TABLE 6: STATEMENTS OF POSITIVE DEVIANTS ABOUT POSITIVE ON-FARM ATMOSPHERE

FarmID	Statement
DE 2	"An important factor for us is our relationship, our marriage and all the other people here take part in that and in that way we have a good functioning social structure here on the farm." *(sic)*
DE 3	"Socially coherent is the most important thing. Where the people are a team." *(sic)*
DE 4	"A main prerequisite is that people are happy." *(sic)*
NL 1	"We can all have lunch together and everyone has their place in the group and this is possible through the people that are here." *(sic)*
NL 7	"You recognize a biodynamic farm from, when you walk through it, you get a feeling as if you put on a warm jacket." *(sic)*
NL 8	"The atmosphere adds a lot." *(sic)*
NL 9	"The character of the farm already radiates so much, it has a healing effect on everyone." *(sic)*
NL 10	"You should not grow apart" *(sic)*

Continuous development

Strong underpinning statements of this characteristic are presented in Table 7. In the following we elaborate on the reasoning of positive deviants behind the characteristic 'continuous development'.

During the interview, NL4 mentions the innovation adoption scheme. He sees himself as an innovator and seeks to reach the early adopters, so they can communicate the ideas to the early majority and so on. NL4 is constantly transforming his farm, with "Passie, visie en lef" (passion, vision, courage). His next on-farm plan is to build sleeping accommodations for members of the care department as well as a place for spiritual reflection. He furthermore finds the concept of permaculture interesting and also leaves space for this on his courtyard. In addition he tries to involve citizens in agriculture through a new funding mechanism. NL4 will be a "proef-boerderij" (taste-farm) where consumers can literally get a taste of farm life.

NL7 says that he likes that his business offers a lot of opportunities and there is space for innovation. An idea of NL7 is to offer a research internship which optional plans ideas. He would like to investigate the mineral balance of different sorts of trees. As they are allowed to use wood from the surrounding forest he would like to know what kind of minerals are coming into the system to find a balance in the input and output of minerals. He says an intern could investigate it and would be offered a job to implement it. NL7 is also growing rapeseed to add a "flowering quality" to the system to reduce pests and to explore options of for instance fueling their own machinery.

NL9 says that if someone wants to take on the opportunity to manage the dairy processing, there is space on the farm. The same is also mentioned by NL1 and NL10. All three farmers say that if someone is motivated, taking responsibility and considered competent is given an opportunity to realize an idea. Ideas these farms have are processing of waste vegetables or for instance processing of dairy.

NL1 states that these initiatives could become permanent. In 1992 a former intern started the delivery service. This started on a small scale but currently contributes to half of the total revenue. This intern did an internship in 1989 and came back and wanted to work. He was given the possibility to work on the farm, if he developed his own business idea. The intern came up with a distribution plan for a delivery service and is now not only earning money on markets, but also delivers cheese products to supermarkets.

TABLE 7: STATEMENTS OF POSITIVE DEVIANTS ABOUT CONTINUOUS DEVELOPMENT

FarmID	Statement
DE 3	"We need a method that goes with nature and not against nature." *(sic)*
DE 4	"What stayed is the idea that agriculture can work in a sustainable way." *(sic)*
NL 1	"The future is theirs, I bring in some plans." *(sic)*
NL 3	"We participated in an experience about omitting castration because I am against castration." *(sic)*
NL 4	"This is my research and development and the farmers come and watch." *(sic)*
NL 6	"We are completely up to date, so there are no specific future plans." *(sic)*
NL 7	"Place of innovation." *(sic)*

Open attitude towards society

Strong underpinning statements of this characteristic are presented in Table 8. In the following we elaborate on the reasoning of the positive deviants behind the characteristic "open attitude towards society".

Some farms had the objective to profile themselves as an example farm. This was the case for NL10, NL5 and NL8.

NL5 and NL8 had the objective to contribute to the future of farming. NL8 liked the idea of contributing to the future of farming in the Netherlands. Therefore they deliberately chose for farming in the surroundings of a city that is fast-growing. The citizens are mostly oriented towards Amsterdam while on the other side of the city the big agricultural polder ("de grote landbouwpolder") is situated. With the method of a city farm they aimed to make the connection between these two worlds. NL5 on the other hand wanted to shape organic agriculture and play a part in changes as he was alarmed by environmental issues. He realizes his responsibility as a part of the system and wants to do what he can in the setting he is in. His conviction is that if you can do something that is good you should try it.

NL 8 stresses that the societal function of their farm made the farm more stable. She adds that it is important to approach the city not with the question "How can we benefit?" or "What are possible win-win situations?", but "What can we offer to the city?" The openness to society on NL8 manifests itself through a range of options among others organizing a market, facilitating cultural events, hosting excursions and organizing a harvest festival. NL8 also claims that the cows play a very important role in the farm. The cows are important for contact of the farm with citizen as animals are easier to connect to than arable crops. NL8 demonstrates that public support results in an increased bargaining position with local governments. NL8 benefitted from the sympathy of the city when city development plans were presented to convert one of their arable fields into a hockey field the public came into action. The bargaining position goes hand in hand with more security and hence resilience and persistence of the farm.

It is important to NL3 that he is visible and heard because he says "Unknown makes unloved" ('onbekend maakt onbemind'). NL3 for instance uses Twitter as a platform where he retweets articles and tweets about subjects that are important to him. He says that having and/or starting a dialogue is important as it can feed ongoing discussions and perhaps cause a have an effect on public opinion about organic agriculture.

Visibility to society is regarded as very important to the partners of NL7. The farmers like being on the market in Enschede. A few years ago the partners of NL7 decided that they wanted to become more visible to society. Physically they made the farm more visible through the removal of trees and other obstacles that deprived the visibility of the farm and they visited a range of markets to present their products. Moreover they held a group session on the farm in which they sent out a signal to the spiritual world that they wanted to become more visible to society. Since these actions they experienced an increasing number of people that come in contact with NL7.

A lot of farms are open for cooperation with nature organizations such as Natuurmonumenten, Staatsbosbeheer. NL4 commits himself to supporting farmers that want to start the same sort of farm with an increased level of multi-functionality. His keywords are "Regional", "Organic" and "Fair".

Right from the beginning, the farmers of NL10 had the objective to make the farm ready for transfer to the next generation. NL10 declares that a lot of farmers have the idea that ownership of the land is a good thing. They consider themselves rich but as long as you are not selling that land the value of the soil is not accessible. The reality to NL10 is that a big farm can only be sold to very rich people and often such a farm is too expensive for your own children. To NL10, ownership of the land makes a farm business intransferable.

DE1 used an alternative financing system. Through crowd-funding, citizens are able to take part in the farm directly. They invest their money in the farm and get interest either in form of money or in the form of naturals. DE1 likes this form of investment, as it is relatively informal and involves the citizens directly in food production. Once a year, all investors get invited on the farm and get the chance to collect their interests in the form of eggs, milk and chicken. This is why DE1 likes poultry production, as it is a fast way to grow high quality interest for his investors. NL4 has

a similar idea as DE1 to connect citizens more to the farming process. Moreover, this system empowers farmers in the food chain as they will have more steering ability due to increased capital.

Traditionally farms are family businesses. However NL7, NL9 and NL10 have different structures. These farms are led by cooperating entrepreneurs. NL9 states that this makes certain continuity possible on farm. He furthermore says that a farm business needs the refreshment of new people.

NL10 came in touch with biodynamic farming and since he already liked to cooperate with people he in particular liked the social aspect of biodynamic farming. He says we are entering a period in which the social aspect becomes more and more important. We are in a transition from a period in which businesses are led by a few authorities toward a period in which people will be steering businesses from a communal perspective. NL10 is organized also in such a system in which more entrepreneurs are managing though they have their own expertise. NL7 is organized in a similar way. This farm has three partners with different fields of expertise.

NL 9 is organized as a holding with the on-farm bakery as an independent actor and agriculture, horses, and care as three parts of the holding. The original farmer developed this idea together with his colleagues, to ease the transition from a family farm to a farm structure that is fit for the future.

TABLE 8: STATEMENTS OF POSITIVE DEVIANTS ABOUT AN OPEN ATTITUDE TO SOCIETY

FarmID	Statement
DE 1	"Because we do this and we need to communicate that, I think that distinguishes us." *(sic)*
DE 2	"Honesty is of course an important point." *(sic)*
NL 2	"We get 5000 visitors each year, of which 200 schools" *(sic)*
NL 3	"Once you are converted, there are more people on the farm" *(sic)*
NL 4	"How can you reintroduce life, the connection of producer and consumer, fair share, take away the anonymity and return the regionality." *(sic)*
NL 6	"Ask for a lot of advice, get the opinion of many people, that is central, you never know it on your own." *(sic)*
NL 7	"We want to become more visible, come in contact with the outside world." *(sic)*
NL 8	"Make contact with the city." *(sic)*
NL 9	"Citizens are the key to success." *(sic)*

Performance of positive deviant organic mixed farms

The positive deviant farms were quantitatively evaluated on land allocation, nutrient flows, productivity, multi-functionality and landownership. In the following, results are presented correspondingly.

Land allocation

When viewing the different uses of farm soil (Figure 9), it becomes apparent that the farms differ highly in the allocation of land use. The category nature involves land that is made available by Natuurmonumenten, Staatsbosbeheer or other nature organizations. These areas are used for extensive cattle grazing. Nine out of the fourteen farms use these nature areas and eleven out of the fourteen farms produce feed crops. It is notable, that while most farms have very small yards that are only used as space for stables and machinery, farm NL4 has a big yard were horticulture is also performed.
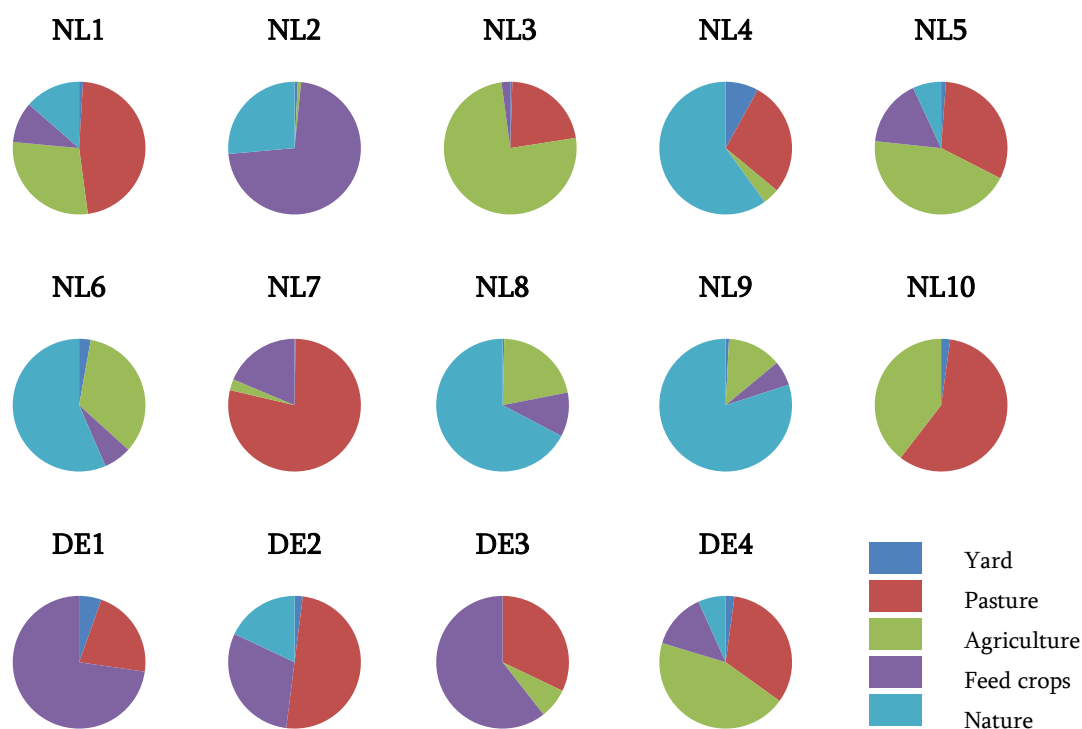
FIGURE 91: LAND ALLOCATION ON FARM OF POSITIVE DEVIANTS

NL3 uses more than half of its space for arable farming whereas NL7 and NL10 have more than 50% of the area under pasture. DE1, DE3 and NL2 concentrate on feed production. Note that farms NL2, NL6, NL8 and NL9 use only nature area for grazing and have grass-clover and other feed crops in the rotation.

Productivity

Productivity is evaluated through intensity measure of life-units (LU) per hectare (Figure 10) and on the other hand number of calories produced per hectare (Figure 11). As described in our methodology we present two types of production levels; one corrected and one uncorrected. In

our materials and methods section we provide clear description how these corrected and uncorrected production levels are calculated.

It is interesting to see, that in the version that is corrected for farm size and import of crops, farms NL5, NL8, NL10, and DE3 are most productive, whereas, when looking at actual farm size with nature area and correction for inputs, farms NL1, NL3, NL10, and DE3 are most productive (Figure 11). On farm NL5 there is an ongoing change of structure which explains an unusually low value for LU per hectares. NL3 has the biggest difference in production efficiency. Here, many pigs are housed and the import of feed highly exceeds the import of other farms. NL9 with the lowest production also states that they have an extensive farming system. In the graph below (Figure 10), the different livestock numbers per hectare are depicted. As can be seen there are substantial differences between the farms. NL3, a pig farm, is the outlier with almost 2.5 livestock units per hectare (LU). It is interesting to see, how farms with a high LU perform better in the not corrected version of the production graph (NL1, NL3, NL10). The opposite can be said for farms NL5, NL8, and DE3, that all have a low LU.
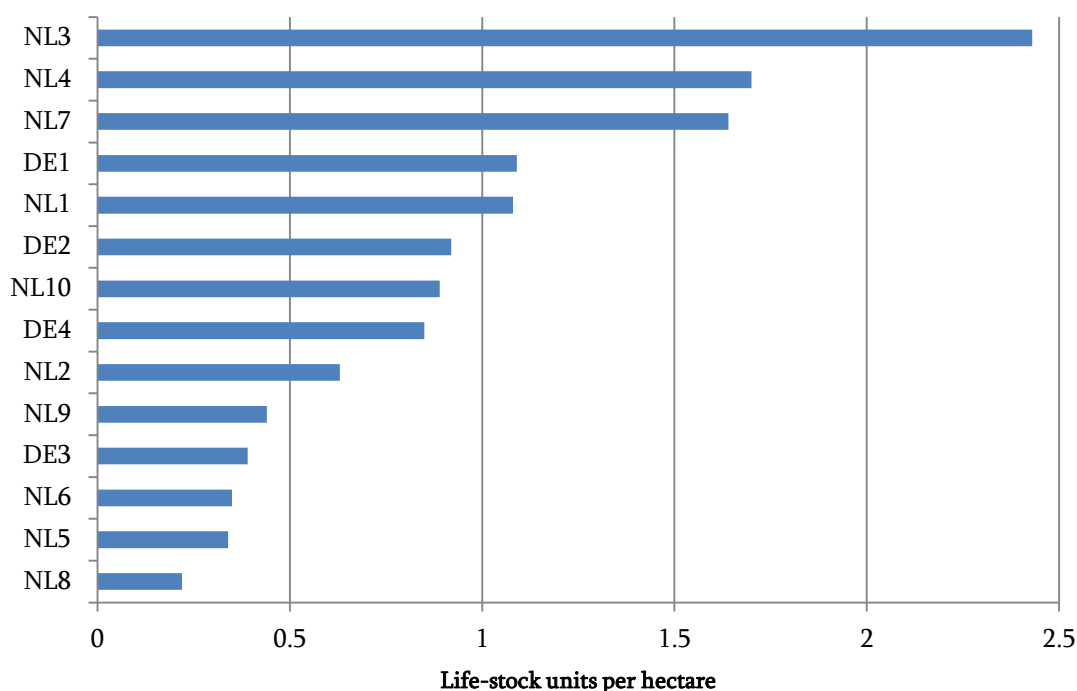
FIGURE 10: CALCULATED PRODUCTIVITY OF POSITIVE DEVIANTS EXPRESSED IN LIFE-STOCK UNITS PER HECTARE.
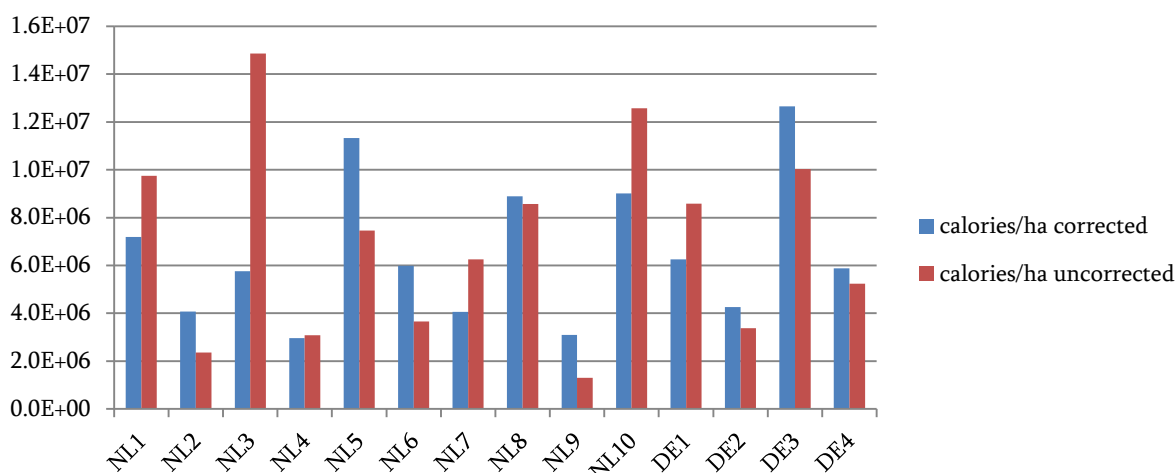
FIGURE 11: CALCULATED PRODUCTIVITY OF POSITIVE DEVIANTS EXPRESSED IN CALORIES PER HECTARE CORRECTED= UNCORRECTED

Nutrient flows

The key figures amount of inputs (Figure 13) and the nutrient balances (Figure 12) are calculated by the FarmDESIGN model and can be used to asses to what extent nutrient cycles are closed and dependent on external inputs. Figure 12 provides an overview of nutrient balances.

As can be seen all farms except for NL8 score positively for their nitrogen balance of which five positive deviants even above 130 kg/ha. Six positive deviants have a negative balance for Potassium with a negative outlier of -68 kg/ha and nine positive deviants have a negative Phosphate balance. The nutrient balances of NL8 are negative for each nutrient, which is noteworthy. However, this farm makes high use of nature areas for cattle grazing, so the manure from the stable period is differently distributed in reality than portrayed by the FarmDESIGN model outcomes. In reality manure is only applied to the arable fields, not to the nature area. In these nature areas only pasture manure is used. The FarmDESIGN model distributes manure evenly on all fields. Hence the model calculates a manure application on nature areas which is higher than in reality and a lower application for the arable field. The arable fields hence do not necessarily have a negative nutrient balance. On a system level however a negative balance does exist for NL8.

Results of the calculation of the organic matter balance by the model FarmDESIGN (Figure 14) show that eleven out of all the fourteen positive deviants show a positive organic matter balance. NL6, NL7 and NL8 show a negative balance of which NL6 even shows an extremely negative balance of over -3000 kg/ha. A possible explanation for the latter can be a combination of default settings of the model FarmDESIGN and the alternative reduced ploughing techniques and GPS techniques which is applied by NL6. In the discussion we elaborate on this.

Averages of organic matter value percentages provided by the farmers are presented in Table 9. The average value of organic matter for all positive deviants equals 3.3 percent. NL8 and NL7 are positive outliers which is counterintuitive on the basis of the calculated negative organic matter

balances. Furthermore, though NL6 has a slightly lower organic matter percentage of 2.85 this is also unexpectedly high on the basis of a negative organic matter balance of -3000 kg/ha.
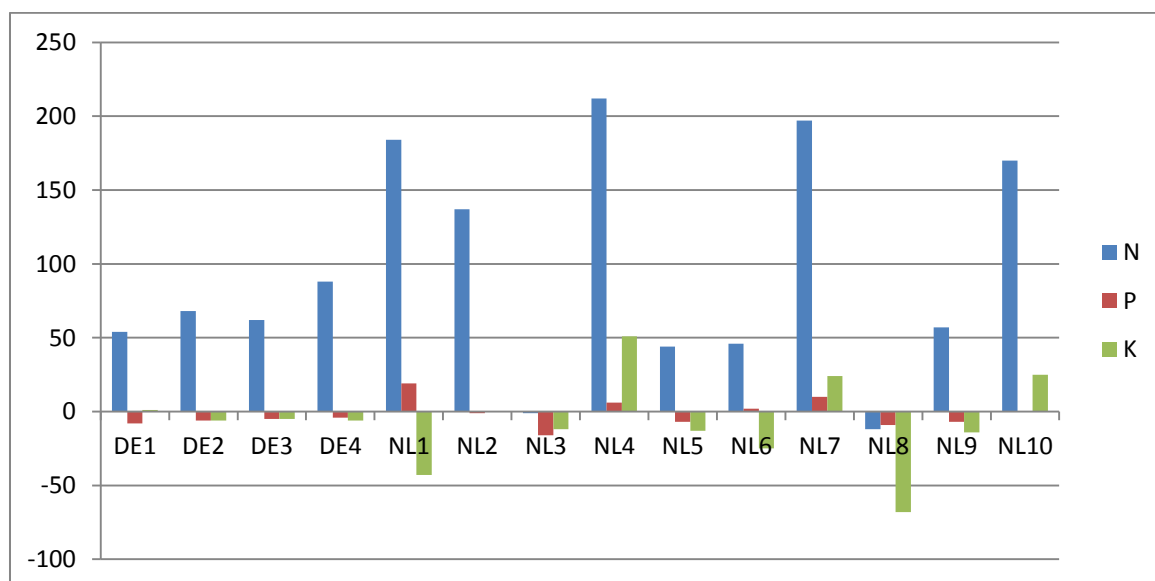
FIGURE 2: MODELED NUTRIENT BALANCES FOR NPK PER HECTARE OF THE POSITIVE DEVIANT FARMS.
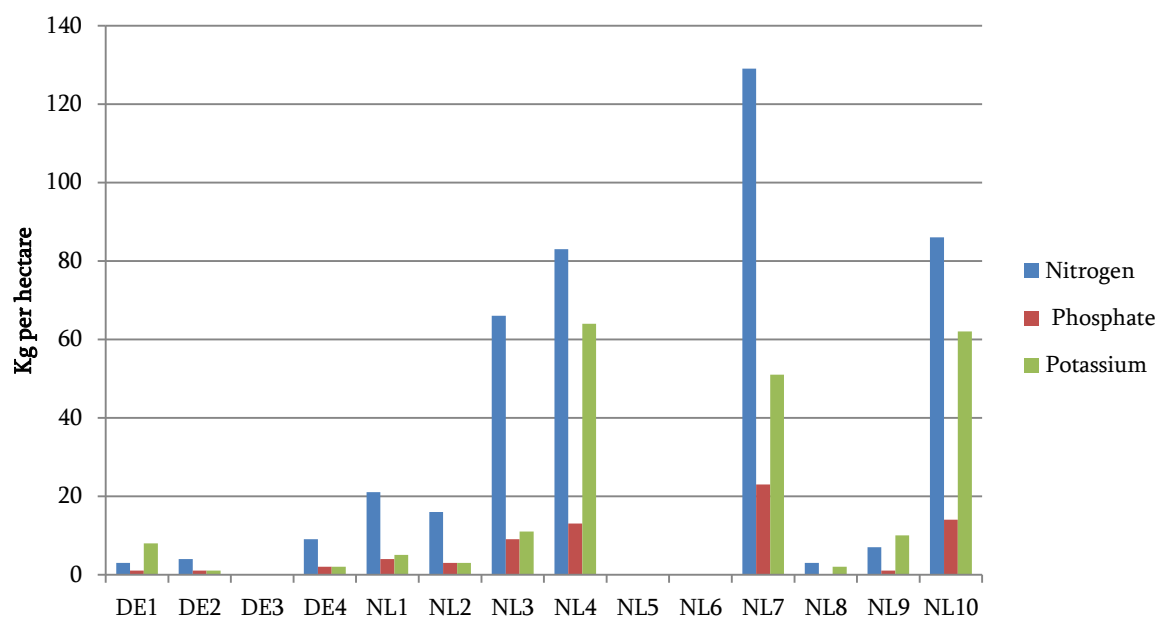
FIGURE 3: NUTRIENT IMPORTS KG/HA OF POSITIVE DEVIANTS
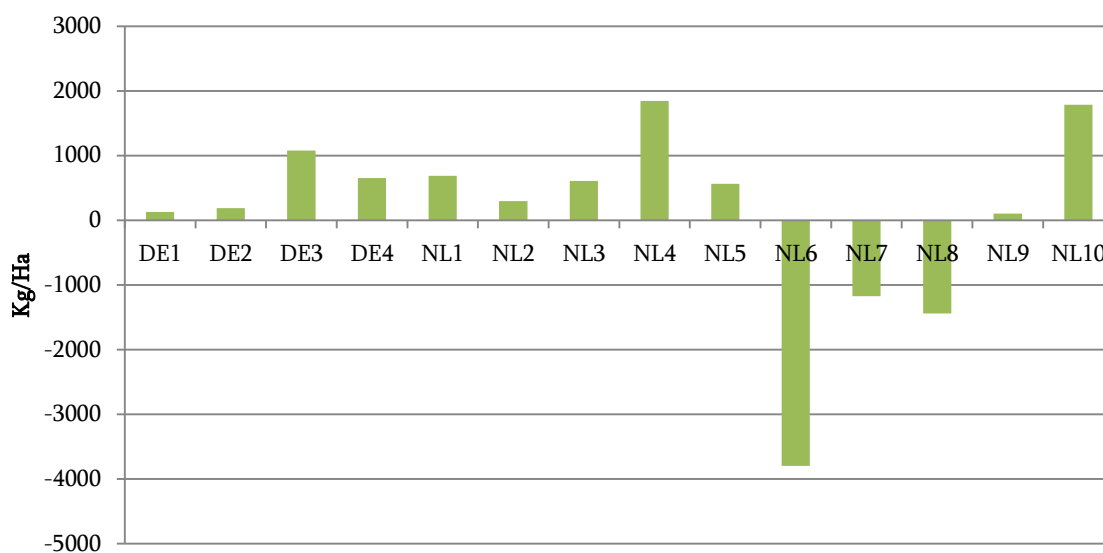
FIGURE 44: MODELED ORGANIC MATTER BALANCES OF THE POSITIVE DEVIANT FARMS

TABLE 9 : ORGANIC MATTER PERCENTAGES OF POSITIVE DEVIANTS

Farm ID	Organic matter in %
DE1	3
DE2	3.5
DE3	2
DE4	2.6
Nl1	2.9
NL2	2.6
NL3	not available
NL4	not available
NL5	3
NL6	2.85
NL7	6.18
NL8	5.25
NL9	3.4
NL10	not available
Average of the Positive deviants	3.39

Multi-functionality

Multi-functionality was observed to occur in five different forms; on-farm store, care, involvement of consumers, education and energy (Figure 15). Involvement of consumers could be in different forms through cultural events, open days or crowd-funding. Energy generation took place in the form of solar energy or wind energy, 7 out of 14 farms generated energy in some form. NL7 was even found to be climate neutral when they cooperated in the project 'Boer en Klimaat'.

In Figure 16, it becomes apparent that especially NL2 has a very high score of multi-functionality and includes all five broadenings functions in its farming system.
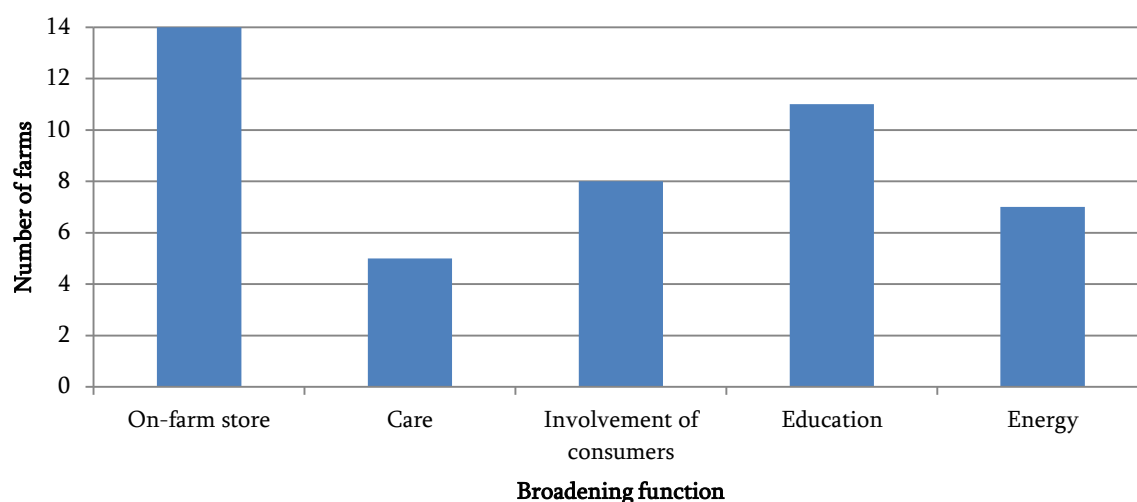
FIGURE 15: MULTI-FUNCTIONALITY OF POSITIVE DEVIANTS
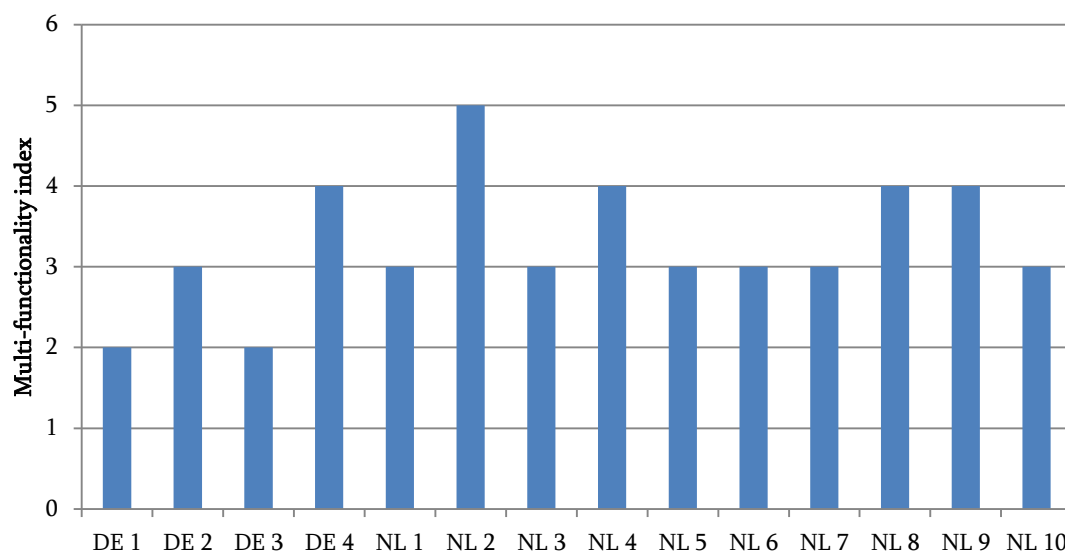
FIGURE 16 : MULTIFUNCTIONALITY INDEX OF POSTIVE DEVIANTS

Land ownership

When viewing the different ownership settings (Figure 17) of the farms, we see that five (NL2, NL5, NL10, DE1, and DE3) out of fourteen farms rent all their land. Four farms (NL6, NL8, NL9,

and DE 2) also rent all their production land, but have an additional agreement with a nature organization for additional land on which they graze their cattle. As these nature areas need to be extensively managed rent is relatively low. Other farmers (NL1, NL3, NL4, and DE4) rent and own parts of their land. Only farmer NL7 owns all his land.
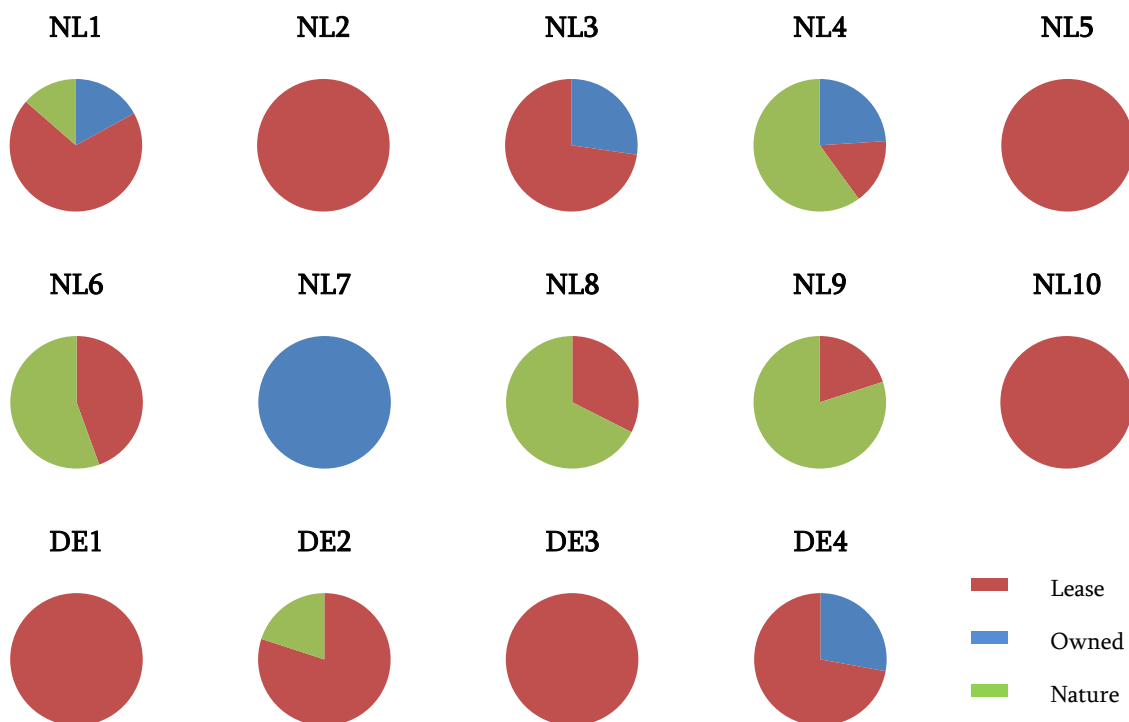
FIGURE 17: OWNERSHIP OF THE POSITIVE DEVIANT FARMS

Success factors of the positive deviants

Below success-factors are listed that were extracted from the interviews with the farmers. Success factors are factors or behaviors that farmers stated had a positive influence on their farm's performance.

In Figure 18 the six different success-factors are presented in relation to how many farmers clearly mentioned them during the interview. It becomes apparent, that entrepreneurial attitude and vision are mentioned by all farmers, while room for development is only mentioned by four farmers.
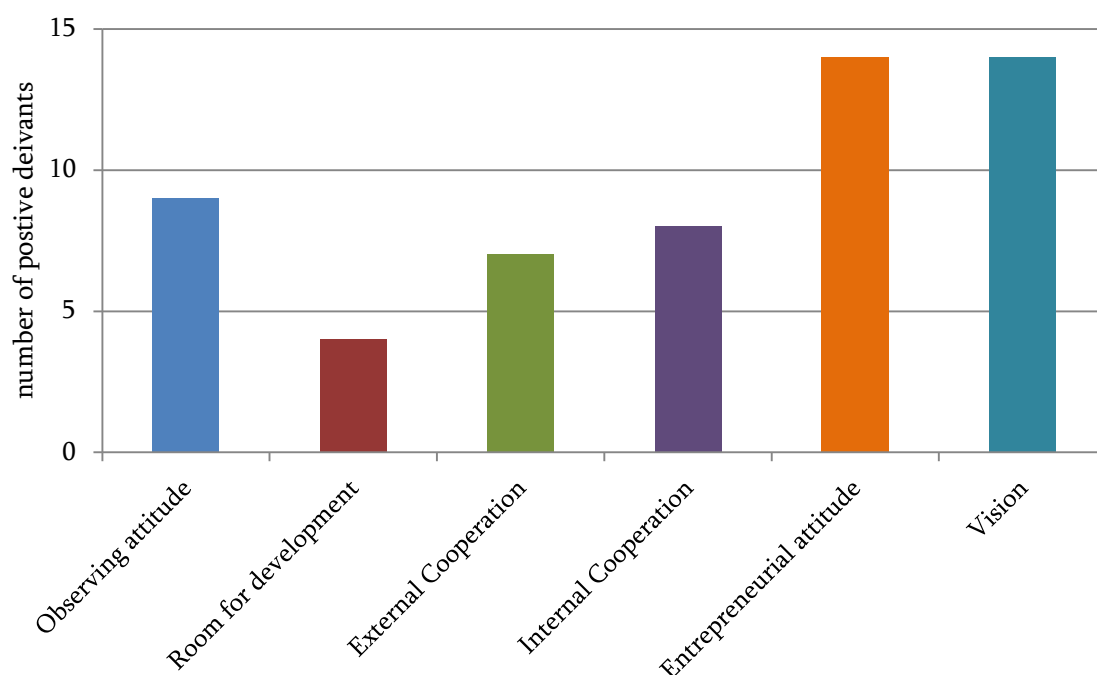
FIGURE 58: NUMBER OF POSITIVE DEVIANTS THAT MENTIONED THE EXTRACTED SUCCESS FACTORS

Having an observing attitude

Strong underpinning statements of this success factor are presented in Table 10. In the following we elaborate on the reasoning of the positive deviants behind the factor 'an observing attitude'.

Many farmers mentioned observation as a key aspect towards an excellent farming system. An observing attitude is a conscious approach to animals, plants and relationships on the farm. NL7 defines observing as "Attention and care, taking care of things and getting this done and having an eye for it". This approach is also seen in contrast to a dependency on research institutes, science and measurements. NL9 warns that it is important to not "blindly handle the farm according to key Figures".

The observing attitude appeared to be a common factor among the farmers. Especially amongst the bio-dynamic farmers, the perception of a farm is one of the central focus points. "The world is a living organism. That's the way a bio-dynamic farmer looks at it" (NL5).

Farmers find it important to be aware of processes that are occurring on their farms because "as a farmer you shape life" (DE4). DE2 says: "Mass-animal-production, to me, is, when you cannot see or address the individual animal" (DE2). Hence, the animal needs to be able to express its individuality, but it is also important to address the herd as a whole to ensure it is in balance with the herd manager. "You should approach the cow as a child, or the herd. We address the herd spirit" (NL7).

NL10 tells us how he visits fields that experience problems or diseases because he feels that the plants react positively to his presence. "Everything that lives, also reacts to my attitude as a farmer", he explains. A farmer that is attentive to the signs that plants, animals and the soil send him, can react more targeted and can better see what it is that they need.

The attention and observation however do not only include the production units, but also the employees and the general environment of the farm. As such, DE2 mentions that one of the success-factors on his farm is, that his "wife has a good eye for social processes" and addresses potential problems before they become problematic. Through experience, farmers state that they can learn to notice and react to motions on the farm. This experience is especially gained by working on farms and getting to know new systems. NL2, for example states: "we have been to some big mixed farms in Germany as well". By visiting other farms, going abroad or just consciously witnessing happenings on the own farm, farmers develop senses that give them the advantage of being able to observe their farm in a better way.

Another point that many of the farmers make is to not depend on science too much. Many farmers state that they would not have the successful farming system they have now, had they listened to advisers and scientists. NL6 for example states: „Advice from DLV, I never let them see our fertilizing plan, I have my own plan and I think this goes well and I will only get confused if someone else looks at it." This is because many advisers say that his way of farming will deplete the soil, as he uses too little manure, but he experiences the opposite. He is supported by the view of the farmer of NL5: "I see conventional agriculture as pretty over the top in its scientific and its materialistically scientific approach and pursuit." DE1, however, points out: "You should do that in any case, let other people, who are critical as well, look over your plans. Not to knock over all of it, but to re-inspect your plans and yourself".

TABLE 10: STATEMENTS OF POSITIVE DEVIANTS ABOUT AN OBSERVING ATTITUDE

FarmID	Statement
NL2	„My attitude how I stand in a farm is perceiving and seeing" *(sic)*

NL5	"And animals and plants are approached completely physical, as if it were dead material not connected with life" *(sic)*
	"All sorts of observations, use your feeling to taste quality" *(sic)*
	"You can also have contact with the world in another way than through numbers and dissection" *(sic)*
NL6	„You can't write this down, you slowly grow into it, it's pure experience"*(sic)*
	"A bit of timing, a bit of feeling, a bit of weather forecast, what is in the air?" *(sic)*
NL7	"Through these kinds of observations you get a lot sharper and you begin to so many more differences" *(sic)*
NL 8	"It's a feeling, you need to develop a very good sense for it" *(sic)*
NL9	„How can we really measure quality?" *(sic)*
NL10	„It's too bad if you shut yourself off from very subtle observations just because you don't believe in it. " *(sic)*
DE1	"Difference between welfare-oriented (m2, Lux-numbers) and species-oriented" *(sic)*
DE2	"The time spent with administrative work is time that lacks a good job later on. Because the documentation is something that is not only useful, in my eyes." *(sic)*
	"Because bio-dynamic has some things where you don't really see a material impact." *(sic)*

Creating room for development

Strong underpinning statements of this success factor are presented in Table 11. In the following we elaborate on the reasoning of the positive deviants behind the factor 'creating room for development'.

By creating room for development, employees on the farm get the chance to live out their potential and their ideas and further develop themselves.

In the foregoing section, it was mentioned that experience is an important factor to be able to observe and be an attentive farm manager. Farms should offer space for farmers to learn, but also to develop and try out new ideas. NL10 states that it is important for his farm "that people can grow here". To NL7 it is important "to give space to modernization". As on the farm NL1, where a former intern developed his own branch of cheese products, this can also offer possibilities of enhancing the farm in a positive way.

TABLE 11: STATEMENTS OF POSITIVE DEVIANTS ABOUT CREATING ROOM FOR DEVELOPMENT

FarmID	Statement
NL1	"Something was added every time and slowly, in the course of the years and it developed, especially because of the people that were here and took the initiative, to what it is now." *(sic)*
NL7	"To give space to renewals" *(sic)*
NL9	"Stepping stone for people" *(sic)*
NL10	"That people can develop here" *(sic)*

Cooperating with external parties/networking

Strong underpinning statements of this success factor are presented in Table 12. In the following we elaborate on the reasoning of the positive deviants behind the factor 'cooperating with external parties/networking'.

To many farmers the connection to external parties and networking in general is an important part of their work. NL9 states: "partnerships; you can't do it on your own anymore". Following the motto 'together we are stronger', farmers see networks as a chance of building resilience. Networks can exist in different forms.

As seen on the NL4, where the farmer says: "I founded several agriculture-nature cooperatives (agrarische natuurverenigingen)", the connection between farmers in different groups concerning different farming strategies, gave them the possibility to push through political decisions. NL7 is connected to other farms that resist using earmarks on their livestock.

The involvement with the authorities can yield many benefits, as lower rent costs on nature and woodland areas that can be used for extensive grassland or cereal cultivation. For the city farms like NL8 and NL2 the city plays a central role in the management of the farm. NL8 says: "Almere is the perfect place". NL2, on the other hand had to fulfil special guidelines and plans that were set by the city. "So the cultural and historical influence are also determinative for the way we manage this farm and what happens on his farm", he explains.

A good connection to the retailers or processors is central to good marketing. Especially farmers that do not want to or can sell their products directly, depend on good prices paid by the retailers. The excellent farmers focus on the quality of their product, to ensure a reliable income source. ("We have always distinguished ourselves in quality, nothing leaves this farm that I have doubts about", NL6; "In a situation where prices are bad, through producing and selling good quality, I can find people who are willing to pay good prices", NL2) Being the main producer of organic pumpkins for Albert Heijn, NL5 has the advantage of dominating this market in the Netherlands, which gives him the security to be able to experiment on other parts of his farm.

Consumer connection is important to the farmers. They are conscious of the power that consumers have and many see that consumers are not informed about the food they buy. This is a fact that alarms many farmers and they search for different ways to solve this problem. All of the farms have an open door policy; guests are generally welcomed, especially on farms with an on-farm shop. Even more involvement is offered to consumers on NL4 and DE1, where consumers can invest directly into the farm and reap interest in the form of products from the farm. DE1 participates in one of these crowd-funding systems and states: "The nice thing about it is, it's relatively informal."

TABLE 12: STATEMENTS OF POSITIVE DEVIANTS ABOUT COOPERATING WITH EXTERNAL PARTIES/NETWORKING

FarmID	Statement
NL2	"I have a lot of collaboration from the municipality, but also a lot of counteraction" *(sic)*
NL4	"A strong appeal to the citizen, don't stay at a distance, but participate again, I want to turn them into farmers again, a bit." *(sic)*
NL6	"Get a lot of advice, go to many people for help, you never know it alone" *(sic)*
NL7	"As a bio-dynamic farmer we try to make a connection between the world and the cosmos and the piece in between, that is for you, the farmer, to find." *(sic)*
NL8	"There is a lot of collegiality in organic agriculture" *(sic)*
NL9	"Partnerships; you can't do it on your own anymore". *(sic)*
DE1	"Because we do this and we need to communicate that, I think that distinguishes us." *(sic)*

Cooperating with internal parties

Strong underpinning statements of this success factor are presented in Table 12. In the following we elaborate on the reasoning of the positive deviants behind the factor 'cooperating with external parties/networking'.

The care of connections on the farm is just as important as networking. Farmers state that it is important to be aware of ones and the employees' strengths and limitations and to build a managing system that serves these the best. ("A business community makes I possible to have continuity in a farm", NL9; "We enter a period where farms will not be managed by one authority Figure", NL10; "But if it goes the way it goes now and the people feel at home, that is success to me", NL1) This way, everyone on the farm feels appreciated for their abilities and everyone can work in the most effective way. Should the balancing of these capacities not work at some point or another or should problems occur, farmers state that these problems need to be addressed as quickly as possible. Many farmers have had good experiences with meeting in a group of managers, if more than one person has the responsibilities on the farm. The farmers on NL7 have one appointed day in the week, where they meet and discuss their plans, to make sure no misconceptions can occur.

TABLE 13: STATEMENTS OF POSITIVE DEVIANTS ABOUT COOPERATING WITH INTERNAL PARTIES

FarmID	Statement
NL1	"I am happiest with the people that are here now and how you are drinking coffee together with everyone" *(sic)*
NL6	"But because it is a family farm, you have all the knowledge in one place" *(sic)*
NL7	"Everyone has their own field of expertise, the other people can say something about it, but it stays his field." *(sic)*

NL9	"You come get something and you come bring something" *(sic)*
NL10	"You should not grow apart" *(sic)*
DE2	"An important factor for us is our relationship, our marriage and all the other people here take part in that and in that way we have a good functioning social structure here on the farm." *(sic)*
DE3	"Social coherence is the most important thing. Where the people are a team."
DE4	"A main prerequisite is that people are happy." *(sic)*

Having an entrepreneurial attitude

Strong underpinning statements of this success factor are presented in Table 14. In the following we elaborate on the reasoning of the positive deviants behind the factor 'having an entrepreneurial attitude'.

The entrepreneurial attitude of a farmer is an important success-factor according to the interviewed farmers. It describes the way a farmer addresses his farming system and approaches decisions that need to be made.

Some farmers say that they would make other decisions if they could start again, but that it was just this sort of naive ideology that made it possible for them to create a farm that goes beyond the usual. The farmers enjoy the freedom they have and feel the thrill of taking risks. This is also seen as an important entrepreneurial skill by the farmers. Daring to take risks, but also knowing when to stop.

TABLE 14: STATEMENTS OF POSITIVE DEVIANTS ABOUT HAVING AN ENTREPRENEURIAL ATTITUDE

FarmID	Statement
NL 1	"Someone that wants to independently go all-in for his" *(sic)*
NL 2	"It is fascinating, when you see how everything connects" *(sic)*
NL 3	"You need to have a vision of in 20 years, in 5 years" *(sic)*
NL 4	"I cannot write, I have to get things moving and then the smart people will come by themselves and write it down." *(sic)*
NL 5	"I was naïve and I was inexperienced and that leads to you starting something up"*(sic)*
NL 6	"Dare to take the right risk at the right moment" *(sic)*
NL 7	"We are looking for a way to get as close as possible to our ideals" *(sic)*
NL 8	"Combine dreams with a sense of reality, hands-on and don't be distracted door all the unsustainable sideways." *(sic)*
NL 9	"Heart, head and doing, they all need to be on one line" *(sic)*

NL 10	"The anthroposophical ideology is important from a big freedom" *(sic)*
DE 1	"Inclination, passion, fate" *(sic)*
DE 2	"Agriculture works in a way that, depending on the circumstances, you can do things completely different and still they are right" *(sic)*
DE 3	"Unpredictability is an appeal. It is not tough it is an appeal." *(sic)*
DE 4	"Organic agriculture was something so new, that it was exciting." *(sic)*

Pursuing a vision

Strong underpinning statements of this success factor are presented in Table 15. In the following we elaborate on the reasoning of the positive deviants behind the factor 'pursuing a vision'.

It is important to the farmers to have a plan, a vision of how their farm should be, in mind. DE1 has a detailed plan of his farm, that he can rely on and gives him security. Also NL8 states that in the beginning of the farm, they had an idea of how it would look. Now that they are some years further, the idea has been fitted to the present day, but is coming closer to its realization. NL4 is constantly working on realizing his visions of the ideal farm. He states that he likes to think about new plans and see them put into action. Hence, while it is important to have a vision or an ideal of a farm, the actual pursuit is even more important.

TABLE 15: STATEMENTS OF POSITIVE DEVIANTS ABOUT PURSUING A VISION

FarmID	Statement
NL 1	"For example that we feed tapioca to pigs here from far away and make expensive pork from it, that doesn't work with fairness in the world" *(sic)*
NL 2	"You used to think you should go with the current, everything bigger, so the standard farm has a chance to survive, but he (Jan Douwe van der Ploeg) saw that there were farms surviving, that went a different course" *(sic)*
NL 3	"They say that not vaccinating is dangerous for your farm and others, but for me it is the other way around and it's the industry that is in danger" *(sic)*
NL 4	"My basic principle is passion, vision and courage" *(sic)*
NL 5	"I was worried about the future of the earth, about sustainability" *(sic)*
NL 6	"He (his father) said, let's go the organic way because that's a way where they use less pesticides and I like that" *(sic)*
NL 7	"Organic is leaving things out, you leave out artificial fertilizers, you stop usin pesticides en bio-dynamic lets you think about the things you can add." *(sic)*
NL 8	"The power of having an idea, then think about it very well, not only dream about it, but really

	think about it that is the basis of success, I think" *(sic)*
NL 9	"You see a lot of care farms begin quite amateuristic and we said from the beginning, we want craftsmanship" *(sic)*
NL 10	"Everything we do has consequences and we have the ability to take a stand in i tand take responsibility" *(sic)*
DE 1	"To develop a sense of self-confidence and to say, no, I won't do as I was told and I'm going another way, against resistance and that surely distinguishes us." *(sic)*
DE 2	"It's important that, if I have a task, I do it right." *(sic)*
DE 3	"And then it's important, I always get advice and listen to what the adviser says, then I know, what I will not do." *(sic)*
DE 4	"I always had the idea of proving the sceptics wrong." *(sic)*

DISCUSSION

In the beginning of this thesis we raised the question "What can be learned from positive deviants in terms of 'excellent' farming?" and structured our analysis into the following three questions:

    a.   What is defined by positive deviants to be excellent farming?

    b.   What are the farm performances of positive deviants?

    c.   What factors contribute according to positive deviants to excellent farming?

In the following we will answer these questions based on our results and interpret them in relation to existing literature presented in the theoretical framework. Subsequently we discuss the methodological strengths and weaknesses of our approach and close with recommendation for further research.

Interpretation of the results

As stated in our description of the analysis in our theoretical framework we stated that defining excellence was helpful. The definitions of excellence of farmers may result in better understanding of their farm performances as perceptions and farm management are concerned (Schoon & Grotenhuis, 1999). In the following, where applicable, we carefully parallel the characteristics on excellence with observed performance of our positive deviant farms and at last elaborate on their success factors.

What can we learn from positive deviants?

On the basis of statements of the farmers in the interviews we found the following characteristics to define excellent agriculture:

- production orientation
- long-term health of soil, plants and animals
- economic feasibility
- positive on-farm atmosphere
- continuous development
- open attitude towards society

NL8 postulated that excellence manifests itself differently in different settings. When we look at the above listed characteristics we see that there is room for interpretation, or in other words, there are multiple ways these characteristics can be expressed in practice.

When we relate our findings about the perception of excellent farms to the results of De Adelhart van Toorop & Gosselink (2013) we find much overlap. All their listed criteria (Table 1) can be classified under our six defined characteristics though "leisure time" and "work enjoyment" are slightly more difficult to categorize. We interpreted these criteria in relation to people working on the farm and thus recognized it as "positive internal atmosphere". Another criterion for excellence listed by De Adelhart van Toorop & Gosselink (2013) was "energy". Though we did not find

pronounced statements of our positive deviant farmers related to energy we found that seven out of fourteen farms generated energy through solar panels or wind energy.

Hypothesis:

We conclude that on-farm energy generation is apparently a prominent characteristic within our pool; we thus hypothesize that energy generation is associated with successful farms. Though farmers did not elaborate on the reasoning behind energy production we theorize that energy generation either contributes economically through subsidies and market independence or contributes to the second characteristic 'long-term health of the planet' as it reduces the farm's impact on climate change or both.

In accordance with Gorton (2008) we found a productivist attitude in some of our positive deviants. Five of the fourteen farmers clearly stated to have a production orientation. This productivist view emerged for example because they did not want to be called a care or petting farm. One farmer substantiated this view in relation to the societal challenge of achieving world food security. Producing food for society was said to be the primary objective for most farms though it was not concretely expressed in amount of outputs. When we look at the evaluation of the farming systems; we have two measures of productivity, livestock units and calorie production per hectare; we see a broad diversity of production levels. Livestock units ranged between 0.25(NL8) and 2.5(NL3) livestock units per hectare. Calories ranged between 1.30 million calories per hectare (NL9) and 14.85 million calories per hectare (NL3). Here it can be seen that farm NL3 imported a lot of food and seems more productive than other farms in the non-corrected farm size. Looking at the corrected farm size, farm DE3 with 12,000,000 calories per hectare performs better than farm NL3 concerning productivity.

Hypothesis:

We observed that the discrepancies of calories per hectare between the corrected and the uncorrected farm size can be explained with use of nature areas for grazing or the high use of imported feed. We thus hypothesize that the allocation of pasture to permanent grazing areas or natural areas heightens on-farm productivity, as other farm space can be used for more productive crops.

Howly *et al.* (2014) stated that the general public in contrast to farmers evaluated agriculture from a more holistic view whereas farmers approached agriculture with a much more productivist perspective. Farms NL1, NL8 and NL10 had a strong production orientation but a balanced system was priority as these famers linked their actions to its societal impact. Statements about societal impact were made by almost all farmers. These statements were clustered in the second characteristic of excellent farming, "long-term health". This involved long-term health of cows, soil, plants, biodiversity and closed nutrient cycles. Though not all societal impacts were assessed, we assessed on-farm nutrient flows. Calculation of actual nutrient balances of potassium, phosphate, nitrogen and soil organic matter showed ranges between -68 kg/ha and 51 kg/ha per

hectare, -16 kg/ha and 19 kg/ha, and -12 kg/ha and 212 kg/ha, -3000 kg/ha and 1500 kg/ha respectively. De Adelhart van Toorop & Gosselink (2013) found N surpluses of on average 111 kg/ha while organic benchmarks amounted slightly lower at 104 kg/ha. Nine of our fifteen positive deviant farms performed below the organic benchmark for Nitrogen surpluses.

Hypothesis:

Farmers had a production orientation and also mentioned societal issues such as animal welfare, closed nutrient cycles and health as important. We thus hypothesize that a production orientation and a holistic perspective are not necessarily mutually exclusive in perception and performance as observed productivity diverged to a large extent.

Hypothesis:

We see that our positive deviant farmers regard a closed nutrient cycle as an objective. Hence we hypothesize that nitrogen surpluses of positive deviants are lower as positive deviants aim to close nutrient cycles.

The few statements that were made about dehorning of cattle entailed that the only reason for not dehorning was animal integrity. We thus did not find statements on beneficial health effects of horns which were observed by De Adelhart van Toorop & Gosselink (2013). De Adelhart van Toorop & Gosselink (2013) already found that only three of the nine of the farms held dehorned cows. We can thus support this as only one of our fifteen positive deviant farms had dehorned cattle. This one farmer (NL1) moreover, endorsed the impact on the animal integrity but was searching for an adequate management system that fitted horned cattle.

Hypothesis:

We conclude that horned cattle are a prominent characteristic within our pool; we thus hypothesize that horned cattle is associated with successful farms. Though farmers did not elaborate on the reasoning behind additional benefits of horned cattle we theorize that it contributes to the characteristic 'long-term health' in terms of animal health.

De Adelhart van Toorop & Gosselink (2013) found the reduced antibiotic usage as the binding factor of the positive deviant dairy farms. However, our analysis did not yield many statements about antibiotics. Antibiotics were only mentioned by NL3. This farmer said that he did not use antibiotics anymore because of a negative impact on health of the environment, the animal and product quality. A plausible reason for the fact that statements were less predominant in our case study analysis is that we analyzed mixed farms. Farmers of mixed farms may have put more focus on the whole functioning of the farm and less on specific cattle related subjects such as use of antibiotics. Use of antibiotics was not assessed for our positive deviants.

Statements clustering around characteristic two; "long-term health of soil, plants and animals" about animal welfare, soil health, closed cycles, biodiversity were in congruence, however conflicting perceptions were observed to what extent and for what reasons on-farm flows were

ideal. The farmer of NL1 stated that a closed on-farm nutrient cycle is not possible as farm products go into society and for this reason nutrients need to return from society to the farm for instance in the form of compost. Other farms, in particular NL5 and NL7 reasoned that internal on-farm nutrient flows are beneficial in terms of economic but also in terms of beneficial health aspects. It was said to contribute to soil, plant, and animal health, authenticity, and quality of farm product. Many of the farmers hence regarded the mixed farm as more ideal than a specialized farm. When we look at the amount of inputs we see that in our positive deviant pool indeed only NL1 and NL6 imported external inputs in the form of compost and manure. Eleven out of the fifteen farms produced a proportion of their own feed crops. This is in line in with findings of De Adelhart van Toorop & Gosselink (2013) who found that only four out of nine farms imported concentrates.

Hypothesis:

We hypothesize that on-farm nutrient cycles in the form of reduced import and application of own manures has beneficial impacts on the resilience of the farming system in terms of health or economics.

Evaluation of the organic matter balance by the model FarmDESIGN showed that eleven out the fifteen positive deviants had a positive organic matter balance with NL4 as an extreme positive outlier. However, NL7, NL8 and in particular NL6 showed negative organic matter balances which would suggest an ongoing decline of the organic matter content in their fields. A possible explanation for their negative soil organic matter balances can be found in light of their nutrient balances. NL8 and NL6 for instance had a nutrient balance close to zero. A nutrient balance close to zero indicates that there is no accumulation of nutrients in the form of organic matter in the soil.

Hypothesis:

As most positive deviants showed a positive balance of organic matter we hypothesize that a positive organic matter balance adds to soil fertility and health.

The organic matter balance of NL6 is so low that possibly additional factors influence the negative balance of organic matter for this farm. NL6 stated to apply reduced tillage and GPS techniques. These soil conservation techniques might preserve and stimulate the soil organisms among which arbuscular mycorrhiza fungi, which contribute to an increased efficient nutrient distribution to the plants and make high nutrient uptake possible (Adesemoye, 2008). As a result of this high nutrient efficiency FarmDESIGN calculates a low nutrient accumulation in the soil in the form of organic matter which can explain the negative balance. However, this effect can only take place in other crops than the farm's main crop, cauliflower, as it is a member of the family of Brassicacae, a plant family that does not form symbioses with arbuscular mycorrhiza fungi. In addition it is noteworthy that the real values of the organic matter balance might be more positive than calculated by the FarmDESIGNmodel as the reduced tillage management of NL6 that reduces the

rate of decomposition is not incorporated. Hence, FarmDESIGN might calculate with a default value for decomposition that is higher than the actual decomposition on farm NL6. Since the no-ploughing system is rather unique, more research is needed to answer this question.

Hypothesis:

Soil conservation techniques as reduced tillage and GPS lead to highly efficient nutrient uptake of plants but a negative soil organic matter balance.

Organic matter was stated to add to the health and balance of the soil (NL2). Values obtained from former soil assessment showed that our positive deviants together had an average soil organic matter percentage of 3.3 with a minimum of 2 percent and a maximum of 6.18 percent. In a report of Alterra by Smit et al. (2007) it was stated that experts of DLV (agricultural consultancy agency) mentioned optimal values for organic matter percentages to range between 3-5 percent depending on soil type. For sandy soils 3 percent was stated to be optimal though on a clay soil 2-2.5 percent already was regarded sufficient. We thus conclude that our positive deviants perform within the target ranges postulated by these DLV experts and even positively deviate as a large number of farms were located on clay soil and met the target value.

When we link the model outcomes of the organic matter balances, discussed above, to the measured values we have difficulties to interpret the percentage of the farm with the negative balances as the measured organic matter percentages of these farms are not remarkably low in comparison to their peer positive deviants which would be expected on the basis of an ongoing decline. For instance the organic matter percentage of NL8 even was highest and amounted 5.25 percent. A possible explanation for this discrepancy would be an effect over years. As NL8 is already farming for 18 years on most of her field, this organic matter percentage of 5.25 must have been built up in previous years. This might also have occurred on farms NL6 and NL7.

Hypothesis:

Management of organic matter is spread out over more years which makes it possible to incidentally have a low or negative organic matter balance while sustaining a high organic matter percentage in the soil.

The third characteristic of excellence about economic feasibility was strongly associated with market independence and the creation of an own product and market. Though farm income was regarded as an important criterion (Table 1) only one positive deviant dairy farm of De Adelhart van Toorop & Gosselink (2013) stated that he saw it as a challenge for the future to increase his earning by adding value through processing. This reasoning was very prominent in our group of positive deviants. Reasons for the absence in their analysis can be that organic dairy farms did not all process their own milk but sold it to large customers and hence do not put time in marketing their own product which makes it a less prominent factor to them. During the evaluation of our positive deviants it was observed that all farmers had a farm shop in which they sold their own

products. Furthermore, it was also mentioned that having a closed on-farm nutrient cycles adds the authenticity and quality of the production which strengthens the sale of the own product.

Hypothesis:

Economic feasibility is strengthened through market independence through on-farm nutrient cycles and the creation of an own product and market.

Gorton *et al.* (2008) observed that some findings about diversification of multiple income sources still create difficulties for a substantial proportion of European farmers whereas our farmers linked it to the open attitude to society and economic feasibility and providing opportunities to people working on the farm. NL7 also said that the care branch itself functions as a stable economic buffer. The latter is also argued by Seuneke *et al.* (2013) who concluded that farmers review their farming activities due to environmental, social and economic pressures. NL8 and NL2, both urban farms, also argued that due to their multi-functionality their bargaining power at local government was strengthened as citizens stood up for them. Analysis of the actual multi-functionality in our group of positive deviants showed that our positive deviants fulfilled at least two and a maximum of 5 different functions in addition to the production of food.

Hypothesis:

Multi-functionality contributes to the resilience of the farm through, on the one hand, a diversified income and on the other hand resilience of the farm in a way of an increased bargaining power at local institutions.

One of the reasons Gorton *et al.* (2008) observe the abovementioned difficulties is the lack of appropriate skills. When we relate this to statements of NL10, who started a care branch a few years ago, he also endorsed the difficulty of that. However the farmers of NL10 had a clear goal in mind from the start. They wanted to provide professional care which was economically independent from the rest of the farm. Some care expertise was already present at NL10 and another partner started an education in relation to care. Similar approaches were observed by other positive deviants; NL1 for instance facilitated broadening of functions to intrinsically motivated people who wanted to add another function to the farm.

Hypothesis:

We hypothesize that difficulties in multi-functionality can be overcome by employing expertise and formulating clear objectives of the role of the added function within the farm.

Other important emergent characteristics for excellence were the positive internal environment, continuous development and open attitude which we clustered in different excellence characteristics. These characteristics as well as the abovementioned have to large extent similarities with lectures of Rudolf Steiner (Steiner, 1924) and the thereon based method of agriculture "biodynamic farming". Demeter is the most prominent certifier of biodynamic farms.

On their website Demeter frames biodynamic farming as a path of development with following guidelines:

- farm character
- mixed farm
- fertilization and composting
- nature development
- Development of farmer and farm in the form of personal development, social, economic and political.

In statements of our positive deviant farmers farm character was mentioned in relation to creating your own market and on-farm nutrient cycles. Also a mixed farm was said to be ideal (NL2, NL3, NL5, NL7, NL8, NL9, NL10). Nature and biodiversity were also mentioned to be part of health. This was also observed in the land allocation of farms in which it appeared that nine out of the fifteen farms had allocated land for extensive cattle grazing and nature purposes. The last guideline revolved around developments in different domains; social, economic, and political. This was also observed in the statements of our positive deviants. We clustered these statements in the following excellence characteristics: positive internal environment, continuous development and open attitude. Five out of the fourteen positive deviant farms were certified biodynamic; however, also the organic farmers (NL5, NL4) appeared to endorse the abovementioned guidelines to a great extent.

Success factors of positive deviants

Positive deviants were asked to come up with success factors which they regarded important for their own success. Through clustering of statements we found the following success factors:

- having an observing attitude
- creating room for development
- cooperating with external parties/networking
- cooperating with internal parties
- having an entrepreneurial attitude
- pursuing a vision

The listed personality traits; self-criticism, leadership, initiative, creativity and perseverance, described by De Lauwere (2005) that were argued to affect entrepreneurship positively are also covered by our identified success factors. Our factor "creating room for development" links to creativity and initiative. Self-criticism on the one hand links to cooperating with internal parties as some of our positive deviant farmers had stated that it is very important to know one's strengths and limitations in order to introduce a partnership that is complementary to these. On the other hand, self-criticism links to the factor "having an entrepreneurial attitude" as the farmer of NL5 had stated that and entrepreneurial attitude also entails recognizing failure and knowing when to stop. Leadership was described by De Lauwere (2005) as an attitude to manage people, convincing people and also as a personal quality to be someone other people could lean on. This factor can be

categorized under our success factor "cooperating with internal parties". Our positive deviants stressed the importance of cooperation internally between partners and workers on the farm to sustain a good atmosphere on the farm. Perseverance was defined by De Lauwere (2005) as an attitude of daring to take risks, stay calm in panic situations. Perseverance can be related to "pursuing a vision" and "having an entrepreneurial attitude". Keywords of the vision of NL4 were "Mission, Passion, and Courage". Implicitly these words cover a certain perseverance to hold on to a vision and keep trying to realize it. NL4 and NL8 both described the pitfall of having lots of ideas but lacking courage to take risks and convert them into action.

Hypothesis:

We observed that positive deviants strongly endorsed the entrepreneurial skills self-criticism, leadership, initiative, creativity, and perseverance, identified by De Lauwere (2005) as success factors. Hence we hypothesize that entrepreneurship skills of a farmer are success factors for a farm.

When compared to the identified success factors of De Adelhart van Toorop & Gosselink (2013) (Table 2) we can categorize almost all their success factors under our defined success factors. Furthermore one of the success factors of De Adelhart van Toorop & Gosselink (2013) was predominantly present in the statement of our positive deviant farmers. "*It might be something non-measurable, the good expectations and positivism*". The first part of that factor "*it might be something non-measurable*" was strongly endorsed by our farmers and was linked to a critical attitude towards science. NL5 says that many farmers are still impressed by scientific research which is plausible as artificial fertilizers before have resulted in higher yields. However, this has resulted in blind dependency on science of farmers. NL5 stated that science attempts to dissemble everything into small components while the system as a whole is not understood yet. He says a sense for observing the system should be developed. NL8 endorsed this and said that a farmer needs to develop a "vingerspitzgevoel", a sense for understanding the system to be able to see what the system needs. Furthermore, NL6 even stated to sometimes get confused by science as it sometimes contradicts his experiences and said it is good to trust your own observations and experiences.

Hypothesis:

We thus conclude that our positive deviants attach high value to their own observations and experiences. We therefore hypothesize that carefully handling insights of science and attaching value to own observations and experiences in making decisions contributes to success of the farm.

One of the positive deviant farmers of De Adelhart van Toorop & Gosselink (2013) mentioned 'luck 'as a success factor while this is not explicitly one of our success factors. One of our farmers, NL5, also mentioned 'luck'. This was the luck of concluding an agreement with a large buyer which gave this farm a great business opportunity. We regarded this under cooperating with external parties/networking as the farmer also could have chosen not to cooperate. NL2 also

mentioned 'luck' in receiving the opportunity of the municipality to start an urban farm. Also this was regarded as 'cooperating with external parties'.

Hypothesis:

We conclude that positive deviants seize opportunities to cooperate with external parties when such a possibility arises. We thus hypothesize that cooperation with external parties adds to success of the farm.

Schoon & Grotenhuis (1999) discriminated between idealistically motivated and pragmatically motivated farmers. On the basis of the statements we found clustering around the factor 'pursuing a vision' we regarded our positive deviants as idealistically motivated. All of our farmers had a vision on management based on their own conviction or were idealistically motivated. However, NL6, NL7, NL8, NL9 and NL10 in addition to being idealistically motivated also showed to be very pragmatic. The farmer of NL10 for instance had a strong vision about how value of the land should be transferred to the next generation. Regulation however imposed his ideal. As a pragmatic solution to this he drafted an agreement with cooperating farmers in line with his vision to realize the transfer still according to his ideals. DE3 even explicitly mentioned that farmers should not blindly follow policy schemes but should rely on their own vision. He even stated if he gets advice he listens to what the adviser has to say to know what he will not do, as everyone else will also be doing this. Though he thus favors an idealistic motivation there is also a pragmatic component to his motivation as he adjusts his decisions in some way to policy/advisors though it is in doing the opposite. The combination of motivation also appears from the statements of NL4 and NL8. They experience difficulties with local governments to realize their new plans which are based on their ideals. These farmers say to be far ahead of their time and local governments are thus not 'ready' for their plans. Their pragmatic attitude subsequently appears form the fact that they (NL4, NL8, and NL9) already carefully plan how to anticipate regulations to still realize their ideals.

Hypothesis:

We observed within our pool that positive deviants are idealistically motivated though they are also attaching high value to the continuation of their business and pragmatically anticipate regulations. A motivation which is both idealistic and pragmatic contributes to a successful farming business

Discussion of the methodology and its implications

On the basis of our analysis we are not able to attribute cause and effect between the excellence characteristics, actual farm performance and the success factors though we explored and hypothesized about possible links. In this analysis it was hence also not possible to assess the multi-finality of actions in relation to the identified success factors. One action or success factor that had a certain outcome for a farmer in his/her situation does not necessarily have to have the same result in another situation with another farmer. It is even more likely that there are several outcomes to one action (Hoholm, 2010).

Another limitation of the study was that we approached the experts by email including a short description of our research project and our research focus on mixed farms. In this way we might have steered the approached experts to think along lines of organic production and multi-functionality instead of a broader look at their more fundamental perception 'excellence' in relation to agriculture. To check for this we also inquired background information about the basis of selection of the expert. We found no hard evidence that experts were steered by our description.

Analyzed statements involved personal statements of interviewed farmers. This may have led to the overlooking of important factors or an over-estimation of factors that do not have as strong an influence as perceived by the farmer on farm performance. By analyzing multiple case-studies in line with high variation we aimed to reduce this limitation.

The model FarmDESIGN strengthened our analysis though it did have some limitations and drawbacks. FarmDESIGN was a strong tool to visualize, interpret and compare on-farm nutrient cycles. However, entering high quality input data into FarmDESIGN is challenging as numbers were not available, up-to-date or unknown. As a consequence, estimates or default values were used. In addition, the model FarmDESIGN is supported by a repository of default values that did not include pigs, goats, chicken or other livestock apart from dairy cattle. Finally, subtle differences in techniques in tillage, as for instance was the case for NL6, are difficult to model and hence difficult to evaluate by model results. Moreover, gathering all the necessary input data is time intensive and took a lot of preparation time of the farmer as well as substantial time during the interview. As a consequence outcomes of FarmDESIGN need to be interpreted in light of these shortcomings.

The positive deviance approach, a research method that aims to combine qualitative and quantitative research in subsequent steps, forms a strong tool in science. Opposed to a strictly statistical analysis, a case study research approach leaves room for great detail and contextual aspects (Bradley *et al.,* 2009). The strength of case-study research is the generation of hypotheses, but they are limited in providing evidence for correlations. Thus a combination of first exploration for hypotheses through case-study research followed by statistical analysis of correlation is complementary and hence a strong tool in science. This case-study forms the first part of such an analysis. This study should hence be complemented with statistical research as also described by step 3 in the positive deviance method (Bradley *et al.,* 2009).

Generalization of our findings is linked to the diversity present in our case-study pool. Our case-study pool entailed 10 of the 198 mixed organic farms in The Netherlands and 4 of the 3734 mixed farms in Germany. We aimed to be exhaustive on characteristics relevant for excellence farm performance in organic mixed farms and success factors. In other words, we assume that the inclusion of an additional mixed organic farm would not result in different views of characteristics of excellence and additional success factors.

Further research questions

Step 3 and step 4 of the positive deviance method described by Bradley *et al.* (2009) were not part of the scope of this thesis. However, these steps are relevant for further research. In the following we will describe how further research following these defined steps can be conducted in our opinion.

STEP 3 Bradley *et al.* (2009): "Test hypotheses statistically in larger, representative samples of organizations."

In addition to the proposed characteristics and success factors, in this thesis we generated more detailed hypotheses which could be tested in larger representative samples of farms.

The following hypotheses could be tested on larger scale:

1. We hypothesize that energy generation is associated with successful farms.
2. We hypothesize that the allocation of pasture to permanent grazing areas or natural areas heightens on-farm productivity, as other farm space can be used for more productive crops.
3. We hypothesize that a production orientation and a holistic perspective are not necessarily mutually exclusive in perception and performance as observed productivity diverged to a large extent.
4. We hypothesize that nitrogen surpluses of positive deviants are lower as positive deviants aim to close nutrient cycles.
5. We hypothesize that horned cattle is associated with successful farms.
6. We hypothesize that on-farm nutrient cycles in the form of reduced import and application of own manures has beneficial impacts on the resilience of the farming system in terms of health or economics.
7. We hypothesize that a positive organic matter balance adds to soil fertility and health as most positive deviants showed a positive balance of organic matter.
8. We hypothesize that soil conservation techniques as reduced tillage and GPS lead to highly efficient nutrient uptake of plants but a negative soil organic matter balance.
9. We hypothesize that management of organic matter is spread out over more years which makes it possible to incidentally have a low or negative organic matter balance while sustaining a high organic matter percentage in the soil.
10. We hypothesize that economic feasibility is strengthened through market independence through on-farm nutrient cycles and the creation of an own product and market.
11. We hypothesize that multi-functionality contributes to the resilience of the farm by, on the one hand, a diversified income and on the other hand to resilience of the farm in a way of an increased bargaining power at local institutions.
12. We hypothesize that difficulties in multi-functionality can be overcome by employing expertise and formulating clear objectives of the role of the added function within the farm.
13. We hypothesize that entrepreneurial skills of a farmer are success-factors for a farm.

14. We hypothesize that carefully handling insights of science and attaching value to own observations and experiences in making decisions contributes to success of the farm.
15. We hypothesize that cooperation with external parties adds to success of the farm.
16. We hypothesize that a motivation which is both idealistic and pragmatic contributes to a successful, farming business.

STEP 4 Bradley *et al.* (2009): Work in partnership with key stakeholders, including potential adopters, to disseminate the evidence about newly characterized best practices.

After a statistical analysis, research application of the newly characterized solutions or 'best practices' can be realized by identifying and cooperating with important stakeholders and potential adopters to enhance 'excellence' in agriculture. Stakeholders of agriculture can be diverse as it could involve policymakers on differing scales, farmers, research institutes and city planners, consumers and citizens.

CONCLUSION

This thesis entailed a further exploration of the phenomenon "excellent farms" through the analysis of organic mixed positive deviants as part of the project "Learning from Excellence" of the Chairgroup Farming System Ecology. Six characteristics of excellent farm performances were identified based on interviews with farmers that were identified as positively deviant by agricultural professionals. The positive deviants defined an excellent farm as a farm that was production-oriented, promoted long-term health of soil, plants and animals, was economically feasible, had an open attitude towards society, had a positive internal atmosphere, and facilitated continuous development. Success factors of the positive deviants entailed; having an observing attitude, creating room for development, cooperating with external parties/networking, cooperating with internal parties, having an entrepreneurial attitude, and pursuing a vision.

Our objective was to learn from excellence. We learned what is defined by positive deviants as an excellent farm. We furthermore analyzed actual performance of the positive deviants and paralleled it to their definition of excellence and inquired insights on their success factors. As a result we formed hypotheses to be tested on a larger statistical scale for solutions that can possibly be disseminated to improve performance of peer organic farms and help the organic sector.

The following hypotheses were formulated:

1. We hypothesize that energy generation is associated with successful farms.
2. We hypothesize that the allocation of pasture to permanent grazing areas or natural areas heightens on-farm productivity, as other farm space can be used for more productive crops.
3. We hypothesize that a production orientation and a holistic perspective are not necessarily mutually exclusive in perception and performance as observed productivity diverged to a large extent.
4. We hypothesize that nitrogen surpluses of positive deviants are lower as positive deviants aim to close nutrient cycles.
5. We hypothesize that horned cattle is associated with successful farms.
6. We hypothesize that on-farm nutrient cycles in the form of reduced import and application of own manures has beneficial impacts on the resilience of the farming system in terms of health or economics.
7. We hypothesize that a positive organic matter balance adds to soil fertility and health as most positive deviants showed a positive balance of organic matter.
8. We hypothesize that soil conservation techniques as reduced tillage and GPS lead to highly efficient nutrient uptake of plants but a negative soil organic matter balance.
9. We hypothesize that management of organic matter is spread out over more years which makes it possible to incidentally have a low or negative organic matter balance while sustaining a high organic matter percentage in the soil.

10. We hypothesize that economic feasibility is strengthened through market independence through on-farm nutrient cycles and the creation of an own product and market.
11. We hypothesize that multi-functionality contributes to the resilience of the farm by, on the one hand, a diversified income and on the other hand to resilience of the farm in a way of an increased bargaining power at local institutions.
12. We hypothesize that difficulties in multi-functionality can be overcome by employing expertise and formulating clear objectives of the role of the added function within the farm.
13. We hypothesize that entrepreneurial skills of a farmer are success-factors for a farm.
14. We hypothesize that carefully handling insights of science and attaching value to own observations and experiences in making decisions contributes to success of the farm.
15. We hypothesize that cooperation with external parties adds to success of the farm.
16. We hypothesize that a motivation which is both idealistic and pragmatic contributes to a successful, farming business.

Implications of our research entail a more clear description of an excellent farm and its associated characteristics. The additional value of a more tangible definition of an excellent farm is that it might help other farms on their way to excellence. Success factors as well as the reasoning of the positive deviants provide tools and ideas for the organic farming sector and peer farms to attain more success. Our results are also relevant for policymakers seeing that policy in compliance with ideas of these farmers will be the most effective as farmers appear strongly idealistically motivated. Increased understanding of the positive deviants thus contributes to more purposeful policies that are valued by farmers and will boost the organic farming sector.

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APPENDICES

Appendix I: Pillars of CAP

Pillar I

Policy	Objectives	Main Instruments	2009 Expenditure
Market Interventions	Raise and stabilise market prices	Intervention buying; export subsidies	3,410
Coupled Subsidies	Increase production of selected goods	Production premia; area payments	4,846
Direct Income Support	Reward farmers' historic support entitlements	Single Farm Payment; Single Area Payment	31,295

Pillar II

Policy	Objectives	Main Instruments	2009 Expenditure
Axis 1	Improving the competitiveness of the agricultural and forestry sector	Modernization of agricultural holdings; adding value to agricultural and forestry products; infrastructure	2,626
Axis 2	Improving the environment and the countryside	Agri-environmental payments; payments to farmers in areas with handicaps	4,741
Axis 3	Improving the quality of life in rural areas and encouraging diversification of the rural economy	Village renewal and developments; basic services for the economy and rural population; business creation and development	364

Appendix II: List of contacted Experts

	Expert	Organisation
1	Kees van Veluw	Louis Bolk
2	Jos van Hamont	DLV
3	Christoffel den Herder	DLV
4	Bertus Buizer	Buizer Advies
5	Henk Renting	RUAF Foundation
6	Derk van Balen	PPO
7	Henny van Rij	Ministerie van economische Zaken
8	Piet van Ijzendoorn	BD
9	John Hilhorst	NAJK
10	Ute Rönnebeck	Demeter
11	Jan Douwe van der Ploeg	WUR
12	Bram Bos	WUR
13	Arthur Wiltink	Director Wakker Dier
14	Bas Eickhout	Groenlinks Dossierhouder landbouw
15	Sjoera Dikkers	PvdA woordvoerder landbouw
16	Gerben-Jan Gerbrandy	D66
17	Gerda Verbrug	Minister of landbouw, FAO
18	Louise Fresco	WUR, FAO, SER, UvA
19	Jan Willem van der Schans	LEI, Erasmus
20	Michiel Korthals	WUR
21	Kors den Hartog,	Kringloopboeren
22	Boerenverstand	Consultancy office
23	Dr. ing. G. (Gertjan) Fonk	Innovatie netwerk
24	Dr.ir. J.G. (Jan) de Wilt	Innovatie netwerk
25	Kees van Zelderen	Voorzitter Biohuis
26	Bionext	Chain organization for organic agriculture
27	LTO	
28	Bert van Ruitenbeek	Directeur Demeter
29	Bestuur van Skal	

30	Imke de Boer	APS
31	Herman Snijders	EZ

Appendix III: Expert Questionnaire

Link to the Questionnaire: Enquête Landbouwexperts "Learning from excellence"

WAGENINGEN UR
For quality of life

Beste mevrouw/meneer,

Als onderdeel van het project *"Learning from excellence"* van de leerstoel Farming System Ecology onder supervisie van dr. ir. W.A.H. Rossing en dr. ir. J.C.J. Groot onderzoeken wij, Clara Beck en Gratia Meijers, voor ons afstudeeronderzoek positieve uitschieters binnen de biologische landbouw. Hiermee bedoelen we boerenbedrijven die zich op een positieve manier onderscheiden van gelijksoortige bedrijven. Meer specifiek richten we ons op gemengde biologische bedrijven, waar plantaardige en dierlijke productie wordt gecombineerd.

Gezien uw kennis van dit vakgebied zouden wij graag gebruik willen maken van uw expertise. Onze vraag aan u is tweeledig. Enerzijds willen wij u vragen gemengde bedrijven te noemen die door u momenteel gezien worden als koploper of positieve uitschieter binnen de biologische landbouw in Nederland. Anderzijds willen we u vragen om vijf criteria op te stellen waar een 'excellent' agrarisch bedrijf volgens u aan zou moeten voldoen. Tevens vragen we u de genoemde bedrijven te scoren op deze gestelde criteria. Ook als u geen bedrijven kent, zijn wij nog steeds geïnteresseerd in de criteria die volgens u belangrijk zijn.

Het invullen van het formulier duurt naar schatting maximaal **7** minuten. Gezien de grote waarde voor ons onderzoek zijn wij u zeer dankbaar voor uw medewerking.

Met vriendelijke groet,

Clara Beck & Gratia Meijers
Studenten Master Organic Agriculture

Uw naam (optioneel; de uitslagen van deze enquête worden anoniem behandeld)

Tot welke sector rekent u zich? (meerdere opties zijn mogelijk)*

☐ Beleid
☐ Wetenschap
☐ Voorlichting
☐ Ondernemer
☐ Anders, namelijk

BEDRIJVEN

Welke Nederlandse **biologisch gecertificeerde gemengde** bedrijven ziet u als **koploper of als positieve uitschieter** die als voorbeeld zou kunnen dienen binnen de sector? U kunt meerdere bedrijven (max. 3) noemen. Heeft u geen duidelijk bedrijf in gedachten dan kunt u dit onderdeel overslaan en doorgaan naar het onderdeel 'criteria'.

Naam van Bedrijf A

Uw connectie met het bedrijf

Wat maakt dit bedrijf bijzonder in uw ogen?

Naam van het Bedrijf B

Uw connectie met het bedrijf

Wat maakt dit bedrijf bijzonder in uw ogen?

Naam van het Bedrijf C

Uw connectie met het bedrijf

Wat maakt dit bedrijf bijzonder in uw ogen?

CRITERIA

Wat een goed, excellent, agrarisch bedrijf is, is in ieders ogen net weer wat anders. Graag zouden wij van u willen weten wat u als de **5 belangrijkste criteria** ziet **waaraan een "excellent" agrarisch bedrijf zou moeten voldoen.**

Vervolgens willen wij ook graag weten hoe naar uw inzicht de bovengenoemde bedrijven (A,B,C) scoren op deze criteria. Mocht u minder dan 3 bedrijven hebben genoemd dan is er de optie 'N.v.t.'.

Criterium 1 *

Hoe scoort **Bedrijf** A op bovenstaand criterium 1? *

Hoe scoort **Bedrijf** B op bovenstaand criterium 1? *

Hoe scoort **Bedrijf** C op bovenstaand criterium 1? *

Criterium 2 *

Hoe scoort **Bedrijf** A op bovenstaand criterium 2? *

Hoe scoort **Bedrijf** B op bovenstaand criterium 2? *

Hoe scoort **Bedrijf** C op bovenstaand criterium 2? *

Criterium 3 *

Hoe scoort **Bedrijf** A op bovenstaand criterium 3? * [dropdown ▼]

Hoe scoort **Bedrijf** B op bovenstaand criterium 3? * [dropdown ▼]

Hoe scoort **Bedrijf** C op bovenstaand criterium 3? * [dropdown ▼]

Criterium 4 * [?]

[text field]

Hoe scoort **Bedrijf** A op bovenstaand criterium 4? * [dropdown ▼]

Hoe scoort **Bedrijf** B op bovenstaand criterium 4? * [dropdown ▼]

Hoe scoort **Bedrijf** C op bovenstaand criterium 4? * [dropdown ▼]

Criterium 5 * [?]

[text field]

Hoe scoort **Bedrijf** A op bovenstaand criterium 5? * [dropdown ▼]

Hoe scoort **Bedrijf** B op bovenstaand criterium 5? * [dropdown ▼]

Hoe scoort **Bedrijf** C op bovenstaand criterium 5? * [dropdown ▼]

Tot slot, heeft u nog opmerkingen?

[text area]

Hartelijk dank voor uw medewerking!

[Verzenden]

Appendix IV: Selected Positive Deviant Farms

ID	Farm	Interview Partner	Homepage
NL1	Eko de Eerste	Gerrit Marsman	http://www.eko-de-eerste.nl/
NL2	Genneperhoeve	Age Opdam	http://www.vaneigenerf.nl/onzeboeren/profiel.php?profile=34
NL3	Overesch	Jan Overesch	http://www.overesch.nl/
NL4	Eemlandhoeve	Jan Huijgen	http://www.eemlandhoeve.nl/
NL5	De Terp	Jeroen Robbers	http://www.cvdeterp.nl/
NL6	Bakker Bio	Jan Willem Bakker	http://www.bakkerbio.nl/
NL7	Naoberhoeve	Gerlof Pronk	http://naoberhoeve.nl/
NL8	De Kemphaan	Tineke van der Berg	http://www.kemphaan.nl/
NL9	Zonnehoeve	Teka Kappers	http://www.zonnehoeve.net/
NL10	Gerbrandastate	Asse Aukes	http://www.gerbrandastate.nl/
DE1	Hellweghof	Gregor Scholz	http://hellweghof.de/
DE2	Hof Vorberg	Ulfert Bewig-Glashoff	http://www.hofvorberg.de/
DE3	Gut Körtlinghausen	Gyso von Bonin	http://www.koertlinghausen.de/
DE4	Büsch Naturkost	Johannes Büsch	http://www.buesch-naturkost.de/

	Soil	Size	Animals	Croprotation	LU/ha
DE1 – Hellweghof	Löss	55ha	C,B,H,P,S,Br	1:7	1.09
DE2 – Hof Vorberg	Grauplastosol	50ha	C,B,H,P,S,Br	1:4;1:5	0.92
DE3 – Gut Körtlinghausen	Slate	218ha	C,P,S	1:7	0.39
DE4 – Büsch Naturkost	Sand	51ha	Cm,B,H	1:7	0.85
NL1 – Eko De Eerste	Marine clay	73ha	C,H	1:8	1.08
NL2 – Genneperhoeve	Sand/peat	125ha	C,H,P	1:3	0.63
NL3 – Overesch	Sand	110	Cm,P,S,Br	1:7	2.43
NL4 – Eemlandhoeve	Clay peat	25ha	Cm	Horticulture	1.70
NL5 – De Terp	Fluvial soil	90ha	Cm,B	1:3	0.34
NL6 – Bakker Bio	Clay	80ha/100ha	Cm,B	1:5	0.35
NL7 – Naoberhoeve	Sand	37ha	C,H,P,S	1:4	1.64
NL8 – De Kemphaan	Clay, Silt, Sand	160ha/500ha	Cm, B	1:8	0.22

NL9 – Zonnehoeve	Clay	50ha/200ha	C,Cm	1:2	0.44
NL10 – Gerbrandastate	Clay loam	35ha	G	1:5	0.89

C=milking cow; Cm=meat cow; B=Bull; H=laying hens; Hm=meat chicken; P=fattening pigs; S:sows; Br=Boar; S=Sheep; G=Goats

Appendix V Outcome expert questionnaire

	Criterium 1	Criterium 2	Criterium 3	Criterium 4	Criterium 5
	Sufficiently financially and economically profitable	Good relationship agriculture - ecology	Agrobiodiversity	Socialisation of agriculture	Community support
NL 1	3	4	4	5	4
	Mixed farm needs to be able to provide for itself (feed, straw, manure)	Farm needs to function well economically (noticeable)	Farm has to be groundbreaking in one way or the other	Farm needs to be organized clearly within (allocation of tasks, responsibilities)	High production (in comparison to other organic farms on comparable soil)
NL 2	4	4	4	5	4
	Integrity through working method, attitude, business model, representing reliability	Innovative	Pro-active; if something goes wrong, report it directly, take action to limit the extent of the problem	Conscious of production chain	Atmosphere of the farm, education and attitude of employees, vision on organic, etc.
NL 3	4	4	5	4	3
	Good treatment of animals and plants (no chemistry)	Contact with consumers	Local products, networks	Diversity	Consumer friendly
NL 4	4	5	5	5	4
	Sufficiently financially and economically profitable	Good relationship agriculture - ecology	Agrobiodiversity	Socialisation of agriculture	Community support
NL 5	5	4	2	3	3
	Sustainable soil management	Appealing example for farms in the area	Creating possibilities for others	Sustainable in the broad sense (take care of CO_2 emission)	Willingness to share knowledge and experience
NL 6	4	5	3	5	5
	Sufficiently financially and economically profitable	Good relationship agriculture - ecology	Agrobiodiversity	Socialisation of agriculture	Community support
NL 7	3	4	4	4	4
	Integrity through working method, attitude, business	Innovative	Pro-active; if something goes wrong, report it	Conscious of production chain	Atmosphere of the farm, education and attitude of

	model, representing reliability		directly, take action to limit the extent of the problem		employees, vision on organic, etc.
NL 8	5	5	5	5	4
	Integrity through working method, attitude, business model, representing reliability	Innovative	Pro-active; if something goes wrong, report it directly, take action to limit the extent of the problem	Conscious of production chain	Atmosphere of the farm, education and attitude of employees, vision on organic, etc.
NL 9	5	4	5	5	5
	Sustainable soil management	Appealing example for farms in the area	Creating possibilities for others	Sustainable in the broad sense (take care of CO_2 emission)	Willingness to share knowledge and experience
NL 10	4	3	5	3	4
	Integrity through working method, attitude, business model, representing reliability	Innovative	Pro-active; if something goes wrong, report it directly, take action to limit the extent of the problem	Conscious of production chain	Atmosphere of the farm, education and attitude of employees, vision on organic, etc.
NL 10	4	4	5	4	4

	Comment
NL 1	"It is the first organic farm in the Noordoostpolder and besides being mixed and having a farm shop, the farm is also a good example of the socialisation of a farm. It is possibly also a good example of community support"
NL 2	"More or less the same as farm A (NL8). Though more embedded in the cultural history of the region and less future-oriented"
NL 3	"The integration of arable and livestock farming and nature"
NL 4	"Diversity, drive, good care of animals, local network for products"
NL 5	"Moder mixed organic farm with 100% livestock feed production on own farm. Closed farm, international charisma"
NL 6	"Show that a combination of technics (GPS, fixed paths) and non-ploughing soil management lead to a better soil structure which makes the cultivation of intensive crops (cauliflower) possible"

NL 7	"The combination of mixed farm and care farm and the innovative character of both of those parts make this farm special. Socialization and community support form important factors."
NL 8	"Open towards 'the city', a lot of room for initiatives of others, productive, strict towards themselves concerning inputs (autonomous farm), everything under control, easy-going, on good soil"
NL 9	"The large scale. The integration of livestock, arable, nature care horses, bakery and web store. Livestock in service of arable farm. Soil fertility is the most important capital."
NL 10	"Notwithstanding difficult times, concept of mixed farm and stick to biodynamic principles and creating work and widening. Very driven."
NL 10	"Small, remote, care-unit, special cultivation and an eye for the spiritual dimension of life."

Appendix VI: Interview illustration

Allereerst hartelijk dank voor uw medewerking. Om u alvast een idee te geven van wat wij willen onderzoeken zullen wij u kort even toelichten hoe wij dit voor ons zien. Daarnaast vindt u onderstaand alvast een overzicht van vragen die wij u willen stellen. Het interview zal uit twee onderdelen bestaan.

Het eerste onderdeel zal voornamelijk over concrete bedrijfsinformatie gaan als type bodem, aantal dieren etc. Wij hopen dit onderdeel binnen 30-45 minuten af te ronden. Het tweede onderdeel zal naar schatting ongeveer 60 minuten duren en dieper ingaan op uw visie op landbouw en bedrijfsvoering. Daarnaast zouden wij ook natuurlijk graag een kijkje willen nemen op de boerderij.

De antwoorden op de vragen uit onderdeel 1 gebruiken wij als input voor het model 'FarmDesign'. Wij gebruiken dit model om nutrientenstromen in kaart te brengen en deze te vergelijken met andere bedrijven. Wij kunnen u ook laten zien hoe dit model werkt. Gezien de omvang van de hoeveelheid van informatie zullen wij ons in ieder geval voorbereiden door uw website goed te bekijken. Mocht u echter verdere digitale documenten of gegevens hebben waarvan u denkt dat deze relevant voor ons kunnen zijn dan zien wij deze graag van te voren tegemoet. Hierdoor kan de duur van onderdeel 1 ingeperkt worden.

Het tweede onderdeel bestaat uit meer subjectieve, exploratieve, vragen waarin wij zullen vragen naar o.a. uw visie op landbouw, problemen waar u in uw bedrijfsvoering tegenaanloopt en zullen wij proberen uw 'succesfactor' concreter in beeld te krijgen.

Mocht u van te voren nog andere vragen hebben kunt u emailen naar gratia.meijers@wur.nl / clara.beck@wur.nl of kunt u ons telefonisch bereiken op 06-24377912.

Met vriendelijke groet,

Clara Beck & Gratia Meijers

ONDERDEEL 1	(ongeveer 30 min)

BODEM

Wat voor type bodem heeft u?

Hoe diep is de bodem?

Hoeveelheid organische stof?

Wat is de pH van de bodem?

Heeft u andere gedetailleerde gegevens over de bodem?
(bijv. Kalium/fosfaat/calcium/waterhuishouding e.d.)

GEWASSEN

Hoe groot zijn de velden en hoeveel velden zijn er?

Hoe ziet het bouwplan eruit?

Opvolgende gewassen (meerdere gewassen achter elkaar?)

Ploegt u residuen onder?

Wat voor rotatie hanteert u?

Wat zijn de opbrengsten per gewas?

Welke gewassen verkoopt u? Tegen welke prijs?

Aan welke partners worden de producten verkocht?

DIEREN

Welke dieren (en specifiek welke rassen) worden gehouden op het bedrijf?

Wat is de samenstelling van de kudde m.b.t. geslacht en leeftijd?

Wat voert u de dieren?

Hoelang blijven de dieren op de boerderij? (wat is de replacementrate?)

Hoeveel melk/eieren/vlees produceren deze dieren?

Wat voor type stal hebben de dieren?

Hoeveel dagen per jaar en hoeveel uur staan de dieren buiten?

Hoeveel stro wordt er gebruikt?

MEST

Hoeveel van welk type mest wordt er op uw bedrijf geproduceerd?

Hoe bewaart u de mest?

Verkoopt u mest of koopt u mest in?

Zijn er andere fertilizers die worden ingekocht?
(bijv. Kali vinasse)

MANAGEMENT

Hoeveel uur is nodig voor het houden van de dieren?

Hoeveel uur is nodig voor het produceren van de gewassen?

Wat zijn de kosten per hectare?

Wat zijn de grootste kostenposten?

Ontvangt u subsidie?

Huurt u mankracht in?

Huurt u machines of heeft u zelf machines?

ONDERDEEL 2	**(ongeveer 1 uur)**

Wat is uw visie op landbouw?

Wat ziet u als een succesvol agrarisch bedrijf?

Wat is de historie van uw bedrijf?

Zijn er specifieke problemen waar u tegenaan bent gelopen/waar u nu mee te maken heeft en hoe lost u deze op?

Wat ziet u als uw succesfactor?