

## Article

# Appreciating Multiple Realities in the Transformation towards a Sustainable Dairy Sector: An Explorative Study from the Inside-Out Perspective

Liz Engelberts <sup>1</sup>, Arjan van Rheede <sup>2</sup> , Henk Kievit <sup>1</sup>  and André Nijhof <sup>1,\*</sup>

<sup>1</sup> General Management, Nyenrode Business Universiteit, 3621 BG Breukelen, The Netherlands; Liz7198@hotmail.com (L.E.); h.kievit@nyenrode.nl (H.K.)

<sup>2</sup> Research Centre, Hotelschool The Hague, 2587 AH The Hague, The Netherlands; a.v.rheede@hotelschool.nl or avanrheede@my.nyenrode.nl

\* Correspondence: a.nijhof@nyenrode.nl



**Citation:** Engelberts, L.; van Rheede, A.; Kievit, H.; Nijhof, A. Appreciating Multiple Realities in the Transformation towards a Sustainable Dairy Sector: An Explorative Study from the Inside-Out Perspective. *Agronomy* **2021**, *11*, 2116. <https://doi.org/10.3390/agronomy11112116>

Academic Editors: Marta Monjardino, Geoff Kuehne, Khondoker Abdul Mottaleb and Magdalena Sobocińska

Received: 8 July 2021

Accepted: 17 October 2021

Published: 22 October 2021

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Abstract:** The dairy sector is in a systemic lock-in due to reinforcing cycles. This qualitative study, based on 13 in-depth interviews with frontrunning dairy farmers and additional observations, challenges this impression by looking at the sustainable business model innovation from the inside-out perspective of the sustainability-driven niche. The theoretical foundation rests in market transformation, looking at the co-evolution of sustainable business models, regime, system barriers and niche players. The objective is to gain a better understanding on the practices of frontrunner dairy farmers that innovate and overcome system barriers in the transformation from the current regime. The data is collected in 2020 and the analysis is based on template analysis. This study clustered the practices in five groups: an extra margin on milk, perceived support for product diversification, partnerships with specialists, increased transparency, and use of modern technology. Additionally, the appreciation by the farmers of multiple realities and their entrepreneurial competencies helped the dairy farmers to re-establish a closer connection between farmer and consumer, and a better connection between farmer and the production environment, resulting in more biodiverse and landscape-inclusive dairy farming. These insights will help policy makers better cater to the beliefs and values of dairy farmers.

**Keywords:** frontrunners; dairy farming; insiders' perspective; system barriers; practices

## 1. Introduction

Dairy farming is an essential part of the Dutch economy. Sixty percent of the agricultural land in the Netherlands is used for dairy farming [1]. The number of dairy farms is approximately 17,000 in the Netherlands [1,2], and the number of cows used for Dutch dairy farming has decreased over the years, currently amounting at 1,590,000 (CBS, 2020 [3]). The average size of a dairy farm, however, increased from 42 cows in 1990, to 60 cows in 2008, to 97 cows in 2016 [1,4]. In 2018, 1.6% of Dutch milk was produced organically [1]. In the Netherlands, most of the dairy processing and marketing companies are cooperatives [2]. This means the businesses are owned by the dairy farmers themselves. The cooperatives have had a joint market share of over 80% since 1950, which implies that cooperatives are long-lasting associations [5]. Nevertheless, there were only five dairy cooperatives left in 2015. According to the governmental advisor Strootman [6] in the number of insects has been halved and the number of farmland birds decreased by 70 percent. This calls for sustainable practices and for a transfer to 'landscape-inclusive' agriculture, in which the current contract between farmers and society has to be revised and overhauled [6]. In fact, the Dutch minister of Agriculture, Nature and Food Quality, earmarked in 2020 a transition fund of 175 million euros to help farmers with financial support in the switch to overcome different obstacles towards a low-nitrogen and more sustainable agriculture.



Sustainability of dairy farming has many aspects. Indicators for measuring sustainability in Dutch dairy farming are related to economic sustainability (profitability), internal social sustainability (working conditions), external social sustainability (foodsafety, animal welfare and health, landscape quality and use of undisputed products), and ecological sustainability (eutrophication, groundwater pollution, dehydration of soils, acidification and biodiversity, grouped under different forms of sustainability) [7]. The current crisis in dairy farming (and other forms of agriculture) is rooted in a disconnect between farmer and consumer [8–11], and a disconnect between farmer and land management/ecology [12,13].

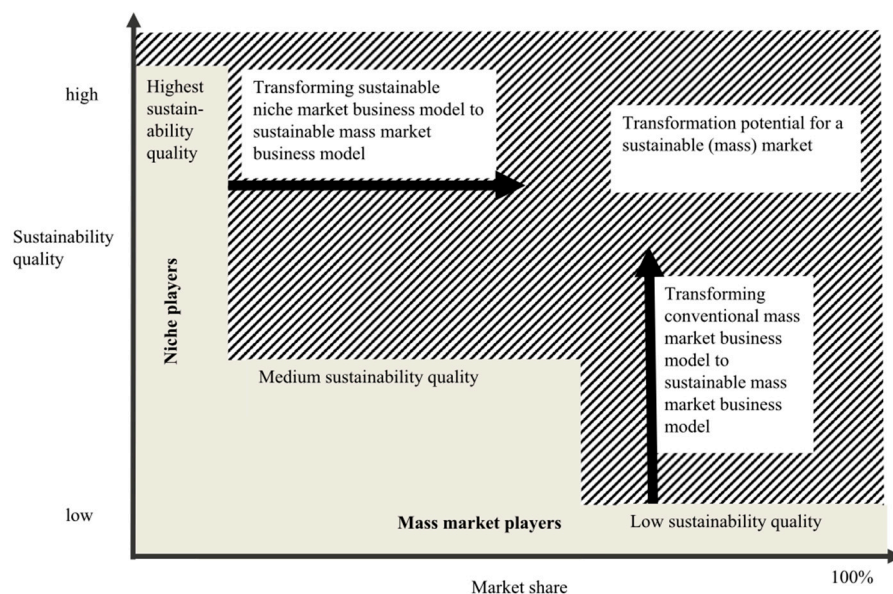
Frontrunner groups of Dutch dairy farmers have shown an increase in sustainable intensification, with both environmental and social sustainability advantages compared to the Dutch average [14]. This makes the farmers more involved in, and more ambitious to improve, social structures. However, Hoes et al. [2] argue that sector-wide adjustments are crucial for making Dutch agriculture more sustainable. In order to achieve such a transition, innovation initiatives are essential [2]. These initiatives can be classified as ‘interventions’ or practices in processes of system change, whereby these practices can steer a transition [15,16]. Many such practices can be found in the technological domain. According to Guerrini [17], smart farming, as an example of practice, will solve the problem of feeding the world. Examples of technological innovations in the dairy industry include the use of drones, rotating cow brushes (for blood circulation), collar technology and 3D printing [18]. An entirely different upcoming phenomenon in the dairy industry is plant-based milk. The sales of almond milk experienced an increase of 250% between 2011 and 2016, while dairy milk sales decreased by 7% in 2015 (Pellman Rowland, 2018). Another recent innovation in the dairy industry is the one of cellular milk production. It is currently possible to produce milk without cows, using gene sequencing and 3D printing in a process of fermentation [19].

These developments result in systemic pressure for the traditional production of dairy milk. This study will mainly focus on farmers that ‘stepped up’ from conventional dairy milk farming towards being frontrunners. They managed to transform their business models into more environmentally friendly ones via sustainable practices. The ‘co-evolution of business models for sustainability’ consists of sustainable entrepreneurs who act as market co-creators who influence each other’s evolution with their businesses [20]. The co-evolutionary interplay of stakeholders builds on the dynamics between sustainable niche players and conventional incumbents.

A frontrunner is defined as a dairy farmer who performs other activities than the average (traditional) dairy farmer in the direction of sustainable biodiversity and landscape-inclusive dairy farming. Therefore, the frontrunning dairy farmers can be compared to the niche players, and traditional dairy farmers to the traditional incumbents in the theoretical model of Schaltegger et al. [20] (see Figure 1). Some frontrunners are developing new circular business models, acting as innovative, and sometimes even social, entrepreneurs [21]. Besides, frontrunner farmers can be classified as more environmentally sustainable than the national average, according to Weber [14]. A frontrunner’s aim is to comply with the strict regulation of environmental laws while being entrepreneurial, socially accepted and economically strong [14]). Therefore, these frontrunning farmers will in this study be depicted as a ‘niche’ looking from the multi-level perspective (MLP) [20,22]. This MLP pictures three hierarchical levels: the socio-technical landscape, the niches and the regimes, and the interrelationships between them. Transitions are deep-rooted, long-term, complicated, and multidimensional changes of systems [23,24]. In fact, “transitions are defined as shifts from one regime to another and they result from the interaction between processes at niche–regime–landscape levels” [25] (p. 1696) argue that investigating scaling of agricultural innovations requires a systemic analysis that includes complex realities beyond simple approaches to knowledge transfer or trying out what works [24]. A regime change is necessary towards sustainably biodiverse and landscape-inclusive dairy farming. Therefore, the main research question for this study is: what practices of dairy farmers



have the potential to overcome system barriers in the sustainable market transformation of the dairy sector?



**Figure 1.** How sustainable entrepreneurship influences the sustainability transformation potential [20].

## 2. Theory

Transition management, the dairy market, and sustainability are widely discussed concepts in academic literature, and although these concepts are clearly evident in both conceptual and empirical works, there are limitations. These limitations encompass (i) the role of the co-evolution of business models for sustainability in relation to the sustainable transformation; (ii) the mediating role of practices for a more inclusive and circular agriculture in this relationship; and (iii) the differences in sustainable transitioning between frontrunners and traditional farmers. According to Schaltegger et al. [20] sustainable market transformation research is extremely important, because sustainable development calls for mass-markets to sustainably transform. The extensive effects of sustainability frontrunners on the dairy market might be diminished, either because the pioneers remain local and in their niche-market, or because they cannot develop or thrive and as a result are driven out or taken over by competitors [20]. Furthermore, practices of how established dairy farmers pursue innovation in sustainable development is relatively understudied in sustainability transitions research, in comparison with system innovation processes [4,26]. Morrissey et al. [27] add to this that further examination is required to research innovation, stakeholder interactions and different dimensions in agri-food systems. However, agri-food systems is still an extensive umbrella term, whereas this study is focused on dairy farming. In fact, El Bilali [25,28] stated that most papers that focus on the MLP within agriculture focus on crop production, while dairy farming remains underserved. This study will engage in the complicated system of dairy farming, and therefore will be valuable for managing the complexity in dairy farming. Moreover, it helps function as an instrument for controlling complexity in other dynamic and convoluted systems.

The managerial relevance is linked to the practical relevance of this research. Many attempts have been made by policymakers to intervene in the current dairy system, like the subsidy schemes, the milk quota, and the phosphate rights. However, policy makers still struggle to bridge the discrepancies between the government and the agricultural sector, and thus also the dairy farmers. The focus from policy makers, therefore, should make a shift from policy interventions to the perspective of the (support) dairy farmer practices [29].



### *Co-Evolution of Business Models for Sustainability*

The theoretical perspective for this study is embedded in sustainable market transformation [30]. In order to understand the co-evolution of business models for sustainability encompasses, it is important to understand the definition of a business model for sustainability. “A business model for sustainability helps describing, analyzing, managing and communicating (i) a company’s sustainable value proposition to its customers and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social and economic capital beyond its organizational boundaries” [20] (p. 268). The co-evolution of business models for sustainability arose from the interplay between sustainability-driven niche players, such as sustainable pioneers, and conventional incumbents, such as mass-market players or big traditional companies [31]. Long et al. [32] illustrated those collaborations and partnerships with external actors, such as the government or suppliers, being essential in improving the success of a transition towards a business model for sustainability in the Dutch food and beverage market.

The concept of co-evolution can be used as a theoretical framework to analyse the function of business model innovation by entrepreneurs who care for sustainability. Likewise, sustainable entrepreneurs can be individuals and companies, but above all, are market co-creators and transformers which use their core business as a force for environmental and social progress [24,31]. The entrepreneurs do not solely rely on their pioneering strategies and actions, but also on the circumstances of the wider business environment. Therefore, the analysis should not only focus on single case studies, but also how they interact with all appropriate stakeholders in the industry.

The wider business environment is included in this study with the focus on system barriers transforming the current regime. The actions of sustainable entrepreneurs are influenced by the current system barriers, but also have the potential to change them and therefore contribute to system change. The current system barriers in dairy production are heavily influenced by the fact that most agricultural and food products are commodities, which are undifferentiated [33]. Therefore, farmers struggle with increasing prices for their products, and everywhere in the world farmers are complaining about their low income, from Latin America to the Netherlands [34]. The cynical conclusion is that, to some extent, actors in the dairy market compete on externalizing the costs of environmental degradation, poor working conditions and poverty, while customers, governments, supermarkets and other involved actors, profit from the current situation. For example, the dominant behavior of consumers in commodity industries is to pursue the lowest price possible. This leads to overexploitation of (dairy) farmers and sometimes pushes them into poverty, which makes it unattractive for the younger generation to take over farms [30]. This threatens the future of the agricultural food sector.

It is important to respond to the continuous dynamics in regime development [22]. For example, niche-markets gain power if they can link with different regimes. As an illustration, biomass is used to generate electricity, but it also closes the waste cycle, so it serves both the agricultural regime and the electricity regime [22]. There is, however, an inclination to emphasize technology improvements instead of institutional change. Due to the steep learning curve of a niche innovation, it can improve its efficiency quicker than settled technologies in the dominant regime [22]. That is why the co-evolution of business models for sustainability is all about the co-evolutionary dynamics between traditional incumbents and niche actors [20]. It results from the facts depicted in Figure 1, which shows that sustainable niche actors begin from very different starting points than conventional mass-market players when they attempt to interact with sustainability transformations of markets [20]. Thereby, it is important to not solely focus on the ‘small versus big dichotomy’, but also on specific business model aspects, such as replicability or scalability [20].

The sustainable transitions in the agri-food sector indicate the shift towards sustainable agriculture and food systems due to the started transformation processes [28]. Sustainability transitions are “long-term, multi-dimensional and fundamental transformation processes



through which established socio-technical systems shift to more sustainable modes of production and consumption” [35] (p. 956). They are co-evolutionary processes, as it involves adjustments in several socio-technical dimensions [25]. The characteristic of a sustainability transition is a radical conversion towards a society with sustainability at its core, which forms the consequence of constant obstacles confronting modern society [36]. Furthermore, transitions are executed by a set of stakeholders, might take decades to unravel, are open-ended, ambiguous, and are highly disputed [25]. Together with public policy, these features form the following significant subjects within the sustainable market transformation debate: (i) multi-dimensionality and co-evolution, (ii) multi-actor process, (iii) stability and change, (iv) long-term process, (v) open-endedness and uncertainty, and (vi) values, contestation, and disagreement [25].

Schaltegger et al. [25] show in their research how sustainable mass-markets receive a transformational potential (Figure 1). It pictures the crucial direction of business model innovation. Market innovation that supports sustainable development does not happen naturally and has to be created by entrepreneurial leaders who put it at the center of their business models. The dimensions market share and sustainability quality in Figure 1 mark the sales of environmentally and socially superior products in the mass-market, which at the same time tackle problems which lack sustainability. It shows that small market players (column on the left in Figure 1) often sell high sustainability products only in small-scale niches, while mass-market players (rectangles at the bottom) often lack sustainability quality. However, a sustainability transformation of an economy can solely be achieved if the entire society or market is converted into a more sustainable one [20]. This will require a sustainability improvement of a large share of the market and the upscaling of sustainable niche players.

The disruption of conventional production methods happens due to sustainable entrepreneurs who use more sustainable products and services [20]. From this viewpoint, sustainable entrepreneurship is “a sustainability mission-driven process of solving environmental and social problems of unsustainability by means of the exploration and exploitation of market opportunities created with innovative business models.” [20] (p. 268).

### 3. Materials and Methods

This qualitative research focusses on frontrunning dairy farmers in the Netherlands. This is a non-probability sample, in which 13 participants were selected through purposive sampling [37], combined with snowball sampling via people in our own network, based on our strict definition. All the participants occupied practices other than traditional dairy farmers, focused on sustainability. At least three of the following practices should be part of their business model: use of modern technology, the use of solar panels or wind turbines, the integration of circularity, the production of organic milk, the amount of time the cattle grazed outdoors, the elimination of unsustainable pesticide use, or the amount of other sustainable or social side activities.

In the selection process for the sample, first an initial set of potential participants was collected. Their website was checked and discussed with a group of experts to be sure that participants would be modern, sustainable and progressive in order to be classified as a frontrunner. However, these conditions still offer a broad range of dairy farmers. Additional criteria were added, such as the amount of cows the dairy farmer should at least have; what kind of ideas the dairy farmer has on sustainability; or what kind of interventions the farmer has already implemented on his farm. Furthermore, the dairy farmers should at least have 30 cows, reside in the Netherlands, and keeping dairy cattle should be (one of) their primary occupation(s), i.e., not a hobby. This resulted in a predefined sample selection set of 16 frontrunner dairy farms, of which 13 wanted to participate (see Table 1).



**Table 1.** Characteristics of the selected case studies.

Participant	Primary Income	Number of Cows	Netherlands	Organic	Urban Farm	Care for Sustainability	How?
A	Yes	45	Yes	No	Yes	Yes	Fence with natural posts, sowing herbs on the field edges, building the farm with sustainable material, good isolation, choice for the efficient Jersey cow, processing own milk.
B	Yes	55	Yes	No	No	Yes	Building a new shed with more space, more ventilation and less nitrogen and ammonia emissions, processing own milk, outdoor grazing.
C	Yes	200	Yes	Yes	No	Yes	Organic dairy farmer, outdoor grazing, no use of artificial or disputed fertilizers, also integrating social sustainability in his business model by setting up an elderly- and day care at his farm.
D	Yes	105	Yes	No	No	Yes	Participating in Friesland Campina's Planet Proof label, using cow brushes, field edge management, 5 hectares of land sown with clover to reduce nitrogen emissions.
E	Yes	350	Yes	No	No	Yes	Milking robots with energy-efficient regulators, focus on circularity with regard to manure, shed floor that separates thin and thick manure, processing own milk.
F	Yes	32	Yes	No	Yes	Yes	Solar energy, focus on circularity by collecting waste residual flows from the community, collecting rain water and cleaning it into drinking water for the cows and cleaning the manure with a manure robot to sell it to customers.
G	Yes	60	Yes	No	No	Yes	Wind energy, solar energy, using minimal fertilizer, field edge management, outdoor grazing.
H	Yes	100	Yes	Yes	No	Yes	Organic dairy farmer, outdoor grazing, cautious with veterinary medicines, no artificial fertilizers or pesticides, processing own milk.
I	Yes	90	Yes	Yes	No	Yes	Organic dairy farmer, no use of antibiotics, use of herbs, cows keep their horns, calves stay with their mother for three weeks, no pesticides, no ploughing, 100% grass fed, processing own milk.
J	Yes	100	Yes	No	No	Yes	Solar energy, field edge management, processing own milk, regional sales.
K	Yes	100	Yes	No	No	Yes	Using heat recovery and heat exchangers, outdoor grazing, bird management.
L	Yes	700 *	Yes	No	No	Yes	Processing own milk, wants to become CO <sub>2</sub> neutral within a couple of years, keeping Jersey cows which produce 20% fatter milk and thus results in 20% less packaging, 20% less transport, 20% less labour than regular.
M	Yes	85	Yes	No	No	Yes	Solar energy, LED lighting, heat recovery, new 'Maatlat' sustainable shed, mixing clover through the grass to sow which reduces nitrogen emissions, minimal use of pesticides.

\* divided over two farms.

### 3.1. Data Collection

Primary data was collected by conducting in-depth interviews with the farmers. Each interview was recorded and took around 50 min on average; the language used in the interviews was Dutch. The qualitative research method focusses on the individual beliefs and experiences of the dairy farmers who were interviewed. The semi-structured interviews contained 26 nearly only open-ended questions, matching the theoretical concepts



of the research question. Only one interviewee requested to remain anonymous. The operationalisation of the key concepts is in line with the concept descriptions in the theoretical section. The inductive character of this study made us decide to sometimes use more easily comprehensible wording. For example, by changing ‘barriers’ to ‘obstacles’. Additional primary data is collected by observations from the tours around the farms and from the interviews themselves. Secondary data is gathered in the form of documents and videos about frontrunning dairy farmers, both from interviewed farmers and from frontrunning dairy farmers who were not available for an interview. In this way, we use triangulation of data sources to improve the traceability and transparency of this study [38]. As qualitative research is more interpretive, the results can be influenced by the researcher through their participation and perception. Therefore, interpretivism is a crucial part of this inductive research. The theoretical contribution, traceability and transparency are important measures for this qualitative research. Qualitative research can add a new dimension to interventional research, according to Pathak et al. [39]. Validity in qualitative research actually means ‘appropriateness’ of the data and processes, according to Leung (2015). This means that the respondents have to be verified, proper documentation is necessary, and that the data used in this research is traceable and transparent. Triangulation improves the validity of research [40].

### 3.2. Data Preparation and Analysis

The recordings of the interviews were transcribed, after which thematic analysis was conducted. The full interview is transcribed in a way that each word is transcribed, but not in a verbatim manner in which every sound is typed out. For those interested, the authors of this study can be contacted to view all the transcripts. All transcripts were imported in ATLAS.ti version 8.4.24 and coded based on an initial template and a final template. Secondary data about the dairy farms were also analysed and prepared.

The data from the individual interviews were analysed with the technique of template analysis, an iterative process between theory building and data collection analysis. According to King [41], “template analysis is a style of thematic analysis that balances a relatively high degree of structure in the process of analysing textual data with the flexibility to adapt it to the needs of a particular study” (p. 426).

The data analysed for this study consists of expert interviews, observations, and document analysis. Quotes from the expert interviews are analysed and categorised under different codes, which means all codes are based on the analysed interviews. First, the initial template was developed through the analysis of the first three interviews of interview participants A, B and C. The initial template was adjusted continuously, until the theory building was saturated. The results of the analysis are presented in the next section.

## 4. Results

This research is about understanding the reality as it is experienced by frontrunning dairy farmers in the Netherlands. Farmers chose different paths towards more sustainability, which means there is not solely one system perspective, but more system perspectives did emerge. Therefore, a main result is that different dairy farmers take different paths about the practices they take, and that some farmers perceive the system they are in differently than other farmers. To understand the connections between the practices enacted by the dairy farmers and how these practices changed the experienced system barriers, we did cluster the cases in five different approaches to develop sustainable business models. The five different clusters consist of: (i) obtain extra margin on the milk products; (ii) positive view on policy and feeling supported by policy; (iii) forming partnerships with specialists; (iv) increasing transparency; and (v) using modern technology.

The five clusters are linked to different practices. It is important to note that there are connections between the clusters and therefore case studies can be part of more than one cluster. For example, obtaining an extra margin can be done through creating an experience on the farm or through showing the public the developments in sustainability on the farm.



Subsequently, the first and fourth cluster, about extra margin and transparency are both relevant for this example. How the case studies are part of the five clusters is shown in Table 2.

**Table 2.** Clusters, practices and potential to overcome system barriers.

	Dairy Farm	Practices	Potential to Overcome System Barriers
Cluster 1—Obtain extra margin on the milk products	A, B, F, I and M	Efficient use of inputs for farming or create different distribution channels, often in combination with diversification	Increasing income, resulting in lower need for debts
Cluster 2—Political support for diversification practices	C, G and K	Diversification results in feeling supported by other policy areas and the possibility to create visions on a sustainable future	Spreading risks, focus on action (not protest) and therefore positioning farming as part of the solution instead of part of the problem
Cluster 3—Forming partnerships with specialists	B, G, K and M	Cooperate with cross-sector actors; for example, to improve biodiversity and soil	Alternative ways to create budget for investments
Cluster 4—Increasing transparency	A, B, D, I, J and L	Direct via visits to the farm or indirect via true price	Close the gap between city and countryside, resulting in more chance of succession
Cluster 5—Using modern technology	A, H, K and E	In-house processing of milk and alternative distribution chains	Impacts scaling, but due to combination with diversification it results in increased income for farmers

We noted that it is possible that different interviewed farmers contrasted each other, because of individual differences, for example, in which region they were dairy farming. It became evident that choosing which business model or how to diversify a business model depends on the farmer's own perspective, for example, regarding scaling up or down, and to the physical surroundings of the farmer. Although in some constructs variation was shown, more often, the frontrunning dairy farmers confirmed each other's quotes, agreed with each other, or only had minor disagreements, for example, with regard to their view on policy, increasing transparency or improving the image and legitimacy of the dairy sector.

Next, each of these clusters is described in more detail.

#### 4.1. Cluster 1: Obtain Extra Margin on the Milk Products

The first cluster focuses on practices enacted by dairy farmers that result in extra margin on the milk products. An example of this is Friesland Campina's Planet Proof label, which generates more income for farmers (2 cents more per litre) if they adhere to certain conditions within the domains of animal welfare, greenhouse gases or outdoor grazing. Participant M relates to this, as he stated:

*You have to market the product better. Friesland Campina is probably doing the best they can, but mistakes are also made there. ( . . . ) But they just need to market it better. However, we depend on the big players. Albert Heijn and those things. ( . . . ) And they actually put my cooperative under pressure. Because you can deliver milk, but only at a fixed price, otherwise they go to the competitor.*

Increasing profitability is not only about lowering costs; for instance, one interviewee who is consciously increasing his cost price, is participant A, who built a city farm right outside a northern city in the Netherlands. He stated:

*We are going to process our dairy ourselves and that will of course cost a bit more than 33 cents per litre. But by being aware of the fuels we use and by opening the company to the public, we can also offer added value and we can also ask for a higher milk price.*



This in-house processing of milk is something more farmers see as a way to increase their profitability. As stated above, participant M explained that he felt that the margins never really increased much. However, this cluster of farmers getting an extra margin on milk products, as the milk price is somewhat locked, can be illustrated by this quote from a participant:

*And when you are in the supermarket, you still grab the weekly offer. And then you really look at your wallet. But when you are out on a terrace, it does not really matter whether you have to pay 8.95 or 16 euros. That makes it so difficult. Because when people are out, they are enjoying themselves and having free time and they don't mind spending money. But in buying the basic things that is still not done enough.*

Furthermore, participant J established a cheese factory on his farm and processes all his milk himself. Additionally, since this year, he also owns beef cattle, which, together with the cheese, he sells in his farm shop. In the future he would like to also sell potatoes or eggs in his own store as well, contributing to an ultimate form of multi-functional farming. Another example is given by participant B, who illustrated that by processing and selling its own milk, it was possible to “control our own margins”, which resulted in him earning one euro per litre of milk, which is far more than the prevailing milk price of around 35 cents. Another form of diversification is presented by participant E, who wants to sell his dairy products to businesses in the future, thus becoming B2B.

An even more extreme example is given by participant I, who stated that his milk price is six-fold that of a conventional farmer by using an alternative cow breed, the Jersey cow, producing his own organic cheese from the milk, and selling it solely to catering and specialty stores. He stated “we have to disappoint buyers”, as their demand is too big for their supply (participant I). The interventions participant I undertook all began by changing to the Jersey cow breed, which gives fatter milk. Additionally, he feeds his cows with 100% grass, tries to be self-sufficient by intervening as little as possible in nature, and tries to be extremely transparent. He also stated that he wanted to show other farmers how he works, e.g., how he grows his grains without ploughing or needing irrigation in the driest periods:

*“When we experienced the worst drought here, we sold our irrigation.” (participant I)*

Besides, he uses the cow as a mirror in which he thoroughly measures every change in a cow and what the consequence of that change is. For example, he became organic, changed the way he fed his animals, and stopped giving antibiotics or any sort of medicines to the cows, only herbs. The result of the change in diet for the Jersey cows was a change in their manure.

Becoming organic is one way of making the business model of a dairy farmer more sustainable and nature-inclusive. Participant C became an organic dairy farmer some years ago. Not using pesticides and fertilizers was a big step for him, as he experienced a far lesser harvest. He wanted to be ahead of regulations and policy and made the switch. He did also establish an elderly-care and a day-care on his farm, which forms an interesting combination. Participant C argued the following about the collaboration between his stakeholders:

*“Care for people and animals go hand in hand. ( . . . ) People are distracted from the animals and the children have distraction from the animals. Before corona happened, the children sometimes went to the elderly. Of course [the elderly] think it is fantastic to see the children run and play. It's a very good combination.”*

This combination shows how participant C is pioneering in the field of combining different stakeholders on his farm, generating more value for all of them together than if they were separate entities. One could see the development of synergies in this business model, with this combination of different diversifications to help overcome the barriers mentioned. As stated, many farmers experienced negativity, insecurity, and were inhibited from investing in their business as they found the Dutch policy unreliable. However,



participant C had a positive note: “It was very easy to explain it to the municipality with the permit applications for elderly care. They understood it too. Everyone understands the combination of humans and animals”.

These diversifications of a farmer’s business model are ranging from a day-care to an art gallery, and from a tea-house to a cheese factory. This shows that many frontrunning dairy farmers in the Netherlands are pursuing multi-functional agriculture. That diversification also brings its own barriers, which is not a surprise. Diversifying the business model fits in with the general understanding of a farm. According to participant G: “The beauty of the farm is that it is very diverse”. Besides, he stated that multi-functional dairy farming, diversification, urban farming and all the other alternatives from traditional dairy farming brings a lot of diversity to the sector. It became clear that practices helped with scaling up a business and with overcoming certain barriers. It is like participant D described:

*If you put more value into your company and product, you can also scale up more easily. The bank also looks at whether you are working towards the future. So then you may be able to get an interest discount again.*

Offering more sustainable products results in a higher margin for the farmer; this higher margin is solving certain barriers. This shows the link between the barriers and the practices, which can also be seen in Table 2. A large part of the practices could be arranged under diversification of the business model and multi-functional farming.

One of the biggest barriers for conventional dairy farmers is reducing the economic sustainability of dairy farms, by receiving low margins while having a lot of equity, i.e., being financially burdened. Therefore, income of conventional dairy farmers is relatively low, while they have large debts. Accordingly, ‘profitability’ and ‘efficiency’ are codes being part of the ‘economic sustainability’ sub-theme within the ‘overall sustainability in the dairy sector’ overarching theme, and the ‘sustainable value proposition’ sub-theme within the ‘business model for sustainability’ overarching theme. This makes sense, as profitability and efficiency can increase the economic sustainability of a business and improve the sustainable value proposition.

#### 4.2. Cluster 2: Political Support for Diversification Practices

Nearly every interviewed farmer sees the Dutch policy as the biggest threat to their businesses in the future. It remains an unreliable, untrustworthy, and short-term focused factor in the perspective of the farmers, which, according to participant M, results in a lot of insecurity and fear. This inhibits farmers making investments to scale up or improve their businesses, which eventually results in bankruptcies and mental health problems (participant M). Participant F stated that she is terribly disappointed in the policy of the Dutch government and thinks that they should support innovative initiatives which offer opportunities in the future, instead of inhibiting them from happening. Farmers rarely mentioned Dutch policy in a positive context and do not perceive it as supportive.

However, a small cluster (of participants C, G, K and M) was more positive about policy. Participant G said that the practices he undertook (own water source, solar panels, balanced feeding ration, focus on animal welfare, fertilizing with less artificial fertilizer) were all stimulated by the government, the municipality and the neighborhood. Both participant C and M also felt positivity and support when they met with the municipality to discuss their plans for diversifying their business model. Participant K added how much policy has helped by comparing the current dairy farms to the farms of twenty years ago, and he thinks that the current policy continues to change but some actors magnify the contradictions between policymakers and farmers.

On the contrary, participant M mentioned that

*“There is so little structure that you cannot say a meaningful word about it.”*

That explains why the code ‘negative view on policy (makers)’ came forward so often. Participant G said:



*“I cannot handle the regulations at all. Because you have a permit for this and a year later it has to be 100% different again. And you have already made the investment. That is unjust.”*

He refers to the construction of his new cow shed floor that would last for ten years but, due to new legislation, had to be replaced after two years. This shows that the legislation is unreliable, that a common ‘dot on the horizon’ is missing, and that farmers cannot trust the policy to make a budget for the future of their farm. This prevents farmers from investing in their business and from scaling up.

So, what needs changing regarding policy on dairy farming in the Netherlands? It is possible for farmers to protest against policies from the Dutch government. This is something a farmer can do themselves, without having to wait on another stakeholder; ‘protests’ is a code that is arranged under the social domain of practices. Participant D said that more tranquility is necessary, as the policy changes too often for farmers to invest or anticipate it. Clarity and a common goal, “a dot on the horizon” are the key words in this debate, as participants E, B, H and K all mentioned this ‘dot’.

Participant L also thinks an unambiguous policy should be formed, which is fixed for the upcoming 10 years and in which farmers can achieve a higher income through various options. Participant K stated: “that producing a good piece of food is still a legitimate reason for existence, a very beautiful one. I just think that we should consider together what kind of food we want to produce”. According to him, the Dutch climate and soil in the Netherlands are very suitable for cows, which forms a legitimacy to produce food and to export this.

*“We produce here a lot of infant nutrition, medicinal food, which really requires top quality dairy, in which the Netherlands is technologically ahead in the world.”* (participant K)

#### 4.3. Cluster 3: Forming Partnerships with Specialists

Dairy farmers form partnerships with stakeholders and put-up long-term goals to enhance their business model, while at the same time increasing the sustainability on their farm. There is not a strict path that can be followed to form the best partnerships or to create the best long-term goals. Participant G illustrates this with the collaboration he has with a beer brewery from his area, buying the brewer’s grains to feed his cows. Waste flows are collected resulting in a more circular way of doing business. Participant G mentioned the possibility to work together with an arable farmer, which was mentioned by a couple of other interviewed dairy farmers as well, which can be seen as a cluster. Participant B illustrated why such a partnership is a valuable objective:

*“Yes, especially arable farmers. They understand cultivation and protein-rich crops, so they also have the machines for that, we do not have those either. So such a collaboration with an arable farmer is super.”*

Furthermore, he would like to form a partnership within sales channels and in the future to set up an agricultural school (long-term goal). Similarly, participant K explained that partnerships with specialists will help the farmer to become more circular, as “it is becoming so complex that you can no longer do it alone. And the one who accepts that most easily, is the best off” (participant K). He states that farmers should receive one-on-one coaching, guidance or advice within a company-specific situation.

In fact, the cluster of farmers, in favour of partnerships with specialists, mentioned this as their biggest opportunity for the future and wanted to incorporate such a partnership in their long-term goals (participants B, G, K and M). For example, participant M stated that partnerships with other branches within the agricultural sector (e.g., arable or pig farming) would enhance value creation, but that regulations often inhibit these partnerships from being formed. He added: “working together can become the strength of our industry”, showing the belief in partnerships with several stakeholders as the long-term goal of the business.



The interviewed dairy farmers for this research are open for change and transparent about their businesses. Multiple interviewed dairy farmers stated they would regularly give guided tours and introductions to the farms, which helped them improving their farm's image. Frontrunners in the dairy sector seem to have appreciated that their customers pay a surcharge for more sustainable and environmentally friendly products (participant D). Participant C illustrated that he sells his organic milk to a cheese-maker nearby, which makes him regionally focused and allows him to get a surcharge for his milk. Participant F agrees with this view, as she found that the supermarkets have too much power, which results in too much competition among dairy farmers and low margins. She stated that it was too difficult to sell her product in supermarkets and began searching for alternative sales channels.

#### 4.4. Cluster 4: Increasing Transparency

Another cluster of practices focuses on raising awareness and increasing transparency. Participant D argued that this can best be realized via publicity, information and Dutch television programs such as 'Onze boerderij'. According to him, that works better than protesting. However, the protests are a consequence of unreliable policy by the government, so the goal of the protests is a different one than improving the image of the dairy sector. Improving the image of the agricultural sector must really happen, according to participants, as "[the Dutch dairy sector] performs incomparably to all other countries in the world". To relate the improvement of the image and legitimacy to a more local level, participant E declared that:

*"You have to manage that you are wanted in your area. Namely, you must be wanted instead of unwanted. You have a lot of influence on that yourself, by taking your environment into account. But also by being transparent in your communication when you have plans and involving your neighbourhood. And if necessary, adjust your plans."*

Participant A is already trying to get rid of this stigma in society by transparently showing the milking robots on his urban farm to a broad public. He consciously chose an automated milking system over a more traditional one, because although it is cost-increasing, he now has an attraction on his farm, which works all day long.

Another way of having a positive influence on your environment and neighbours is to sow sunflowers on the field edges, like participant D did, noticing that people in the neighbourhood found this "very beautiful", and it generated a "positive feeling". Transparency positively influences the stakeholders of a dairy farm, which is illustrated by participant J:

*"People around us have always responded positively. But that is also because we open up and expose everything."*

One way in which participant B tried to learn about more transparency, but also about other sectors, is by hiring an intern from a different part of the world each year.

Furthermore, true pricing, in which environmental costs are also included in the costs of a product, is mentioned by participants F and H. On the one hand, participant F thinks that if the public would know the true price of alternative milk products, such as soy milk, they would not buy it anymore.

Participant H thinks it is possible to generate changes with regard to incentives for sustainable developments, in which the social and environmental impact is discounted in the milk price. In this scenario, he describes that the best dairy farmer, e.g., whose cows are grazing outside the most, gets a higher price. As consumers get more aware and environmentally conscious, he estimated future growth for regional and transparent products. However, to realise an impact, this practice has to be accomplished on a nationwide level with support from the government. Participant I works on raising awareness and increasing transparency by a nature-inclusive manner. He called this an "efficient natural system" producing his own Jersey cheese.



#### 4.5. Cluster 5: Using Modern Technology

Regarding modern technology in the Dutch dairy sector, participant H showed the orbiter, positioned at his farm, which can produce milk through a selection of 160 data parameters. In this way, he can categorize the milk he wants to produce in terms of the hours a cow has walked outside, the amount of protein in the milk, or, for example, semi-skimmed milk. This process is fully automated and if a cow does not meet the conditions of the parameter, it does not get milked. Additionally, he could produce protein rich milk for athletes, specialized cappuccino milk, or relatively sweet milk. Technology infused farms like the one from participant H preludes the fourth cluster of farmers that make use of modern technology to decrease certain system barriers and develop their farm. This cluster consists of participants A, H, K and E.

Participant K thinks technology improves the efficiency in the business. As a long-term goal, he would like to use more data points, as the data becomes cheaper and more precise. In using sensors or satellites to get to know more about his soil, it makes the circular agricultural practices more efficient. Participant E positively agrees: “Technology is not a dirty word to me. That’s how it is seen. Technology and scaling-up are seen as animal-unfriendly by society. I think we should get rid of that.” Participant D opposes this modern technology vision, as he does not use automated milking robots, and stated: “Automation is great, but you also have a lot of fixed costs”. So, on the one hand automated milking systems are perceived as a means to get more free time and to relieve the dairy farmers, but it can also be seen as bearing a lot of fixed costs.

Technology, precision farming, digitalization and making use of more data can certainly help the dairy sector to increase sustainability and circular agriculture. Participant E states:

*“Now, I think that regarding the development of livestock farming, that also applies to pig farming and poultry, big data comes into play. As a result of automation, containing a lot of sensors, a lot of data is released. [Through this development] we can realize a lot of sustainability in agriculture over the next 10–20 years. We should focus more on that, technology to become more sustainable in the production of food, than to go back to the old days.”*

### 5. Discussion and Conclusions

The core of this research focused on the transition from traditional (dairy) farming to a more sustainable form by focusing on the enacted solutions and practices from the perspective of the pioneering dairy farmers, and aims to identify the system barriers within this dairy sector.

The problem with the current industrial and global agricultural production system has alienated the farmers from direct contact with their customers and their natural production environment.

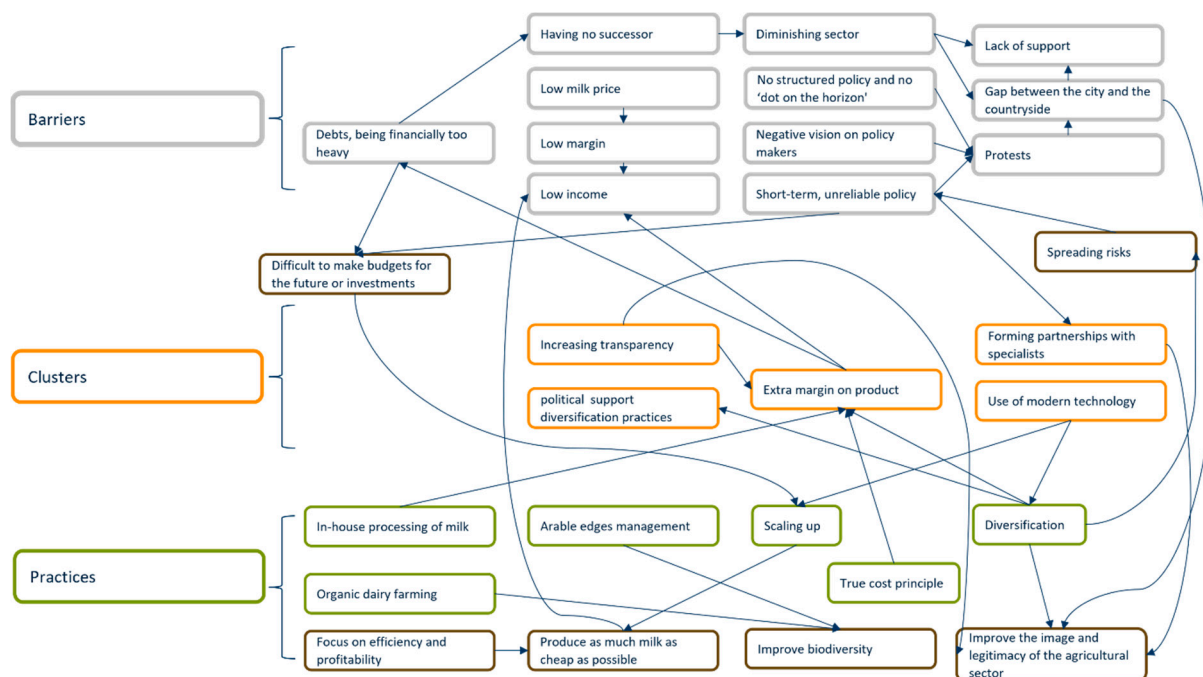
The large global milk cooperatives have served the customers on behalf of the farmers, imposing all kinds of regulations on the dairy farmers, including how to produce their milk. Government policy, sector policies and the global, industrialized scaling-up of this agricultural production system has also alienated farmers from their natural production environment.

This research into pioneering frontrunners of dairy farmers is breaking down barriers to regain that direct customer needs perspective and insight into the biodiversity- and landscape-inclusive production environment. In the five clusters, we see them developing new business models, such as short chain initiatives, multi-business activities, diversification initiatives, and ensuring a nature-friendly production environment in their milk production.

These clusters are formed by farmers perceiving certain practices as the best way to increase sustainability, develop their farm and overcome system barriers (see Figure 2). It can be concluded that practices have a mediating role in establishing a more inclusive and circular agriculture, which closes one of the knowledge gaps mentioned in the introduction.



This study also narrowed the knowledge gap of innovative practices of frontrunner dairy farmers in sustainability transitions research [2].



**Figure 2.** Visualization of the results where the barriers (grey), clusters (orange) and practices (green) are categorized.

Most of the system barriers addressed by the frontrunners can be recognized in the finding of previous studies as described before. These barriers might result in dairy farmers feeling insecure, anxious and could refrain them from investing in their business. These outcomes confirm the view of Verberne [42], who expressed that a long-term policy vision is lacking, especially within the Dutch agricultural sector, as the governance does not give a lot of guidance. Similarly, this study found that a common sustainable dairy sector goal, a ‘dot on the horizon’, was missing, which helped farmers focus their investments and work for the future. The unreliability of the policy refers to the short-term perspective of the regime in which Dutch dairy farmers operate. As policies change often, it makes the regime very complex, changes difficult to predict, and makes it even more difficult to make affordable investments. Regimes rarely experience transitions and can be regarded as stable, reinforcing and path-dependent with lock-in and stability characteristics [24,27]. Moreover, the regimes will seek to counter niches [23], which is why frontrunning dairy farmers might feel opposition. However, the negative view that most farmers had on policy (makers) contrasts with the Dutch minister’s plan (referred to introduction of allocating 175 million euros to help farmers transitioning to more sustainable, and nitrogen-conserving agricultural practices) [6]. None of the interviewed farmers for this research mentioned this. Then again, this study found that the gap between the city and the countryside is still relatively wide and far from bridged.

From the results, it can be argued that everyone is stuck in the regime system that he or she perceives. Different farmers perceive policy- and market barriers in different ways. This means that there are multiple realities. This can be illustrated when looking at cluster 2, farmers who have a positive view on policy and who feel supported by policy, versus most of the farmers who perceive the policy as unfair, counteracting, unreliable and untrustworthy. Another example is given by a dairy farmer creating practices that are not only about efficiency, but more about self-sufficiency and almost no impact on nature.

A cluster of dairy farmers incorporated sustainable practices in their business model to make it possible to earn an extra margin on their products. The nature-inclusive way



can be seen as a niche-innovation that could eventually affect the regime, if supported by a network of actors, and thereafter the landscape [43].

Regarding sustainable market transformations, it is also important to focus on the replicability and scalability of specific business model aspects [20]. This study found that in order to do this, the revenue model has to be improved. For example, see the result of cluster 1, with farmers that gained extra margin on their milk (products). The problem of focusing on efficiency, economic growth and export within the Dutch dairy sector is that environmental degradation is not accounted for [27]. This could potentially be solved by 'true pricing', as this study found that Dutch frontrunning dairy farmers are very efficient regarding the milk production, but they do not yet include other values or look at the true price of environmental degradation. Incentives in which the social and environmental impact is included in the milk price are possible. Simons and Nijhof [30] also explained the importance of true pricing within the agricultural sector. As consumers get more aware and environmentally conscious, a growth in regional and transparent products can be foreseen. These sustainability concerns in the regime can play an important role in the creation of niches [33]. Farmers within cluster 4 responded well to this trend of customers becoming more environmentally aware, as they already focus on transparency within their business by allowing everyone to visit their farm.

Both cluster 4 (transparency) and 5 (modern technology) can go hand in hand, as this study showed that having automated milking machines can act as an attraction for people to the farm and showing them the farm operations. Furthermore, technology can increase the efficiency of a farm, and increase sustainability. To develop a more sustainable dairy farm, certain practices are taken to improve or alter the business model of farmers, in which scaling up does not necessarily mean that it is unsustainable. According to Schaltegger et al. [20], a sustainability transformation of an economy can solely be achieved if the entire society or market is converted into a more sustainable one, which will require a sustainability improvement of a large share of the market and the upscaling of sustainable niche players. Small market players often sell high sustainability products in small-scale niches, as shown in Figure 1, while mass-market players often lack sustainability quality [20]. In general, this study found that technology and scaling-up in the dairy sector are seen as animal-unfriendly by society. Subsequently, the results showed that scaling up can help in overcoming certain system barriers, such as being too financially heavy (too many debts and equity versus a low income). Scaling up often means an upgrade in technological aspects, which translates itself in automatized milking systems. This relieves farmers of labor and makes it possible for them to focus on other (sustainable) activities.

A surprising result is that many practices taken by dairy farmers can be traced back to the entrepreneurial competences of dairy farmers, even more than were found in the technological domain. These practices often relate to multi-functional agriculture and diversifying the business model of farmers. Bergevoet [44] stated that entrepreneurial competencies have a positive impact on the size of a farm. The results clearly indicated that entrepreneurial competencies not only have a positive impact on the size of the farm, but also on the composition of the business model. This increases innovation in the business model through undertaking circular practices.

Many of the interviewed dairy farmers would be interested in forming a partnership, e.g., with an arable farmer (cluster 3). Subsequently, Long et al. [32] illustrated that collaborations and partnerships with the external actors of a farm, such as the government or suppliers, is essential in improving the success of a transition towards a business model for sustainability in the Dutch food market. This study found that the interviewed dairy farmers form partnerships to enhance their business, increasing sustainability at the same time. The cluster of farmers that wish to form partnerships in the long-term see opportunities, especially with arable farmers, as they are specialized in cultivation and certain machines, with sales channels and even an agricultural school. This adds to the study of Gorissen et al. [45], who showed that forming multi-actor partnerships is one of the instruments to speed up sustainability transitions in urban food systems. According



to Simons [34], different parties will be required to collaborate, and short-term interests should be overcome. Collectively working together towards a common goal and aiming for more connectedness between stakeholders will result in more ‘connectability’ within the system [34]. This can increase the true pricing of commodity products.

This study displayed that farmers will have to work a lot more with specialists in the future. Partnerships should be formed especially if a farmer wants to become more circular, so there should be more stakeholder interaction. Mirrossey et al. (2014) argued that examination is required to research innovation, stakeholder interactions and different dimensions in agri-food systems. This research gap addressed by Morrissey et al. [27] can be partially closed, as stakeholder interactions and innovation within business models were researched by this study.

El Bilali [25] argued that the agricultural food system requires a legitimate sustainability transition to accomplish food security and reduce the negative impacts on the environment. According to Safarzyńska et al. [15], practices can steer a transition, such as grass roots initiatives increasing sustainability in the dairy sector. Grassroots initiatives are diverse, innovative, practical, collective and collaborative movements which solve challenges that mainstream institutions have not yet solved [43]. One example of such an initiative is offered by participant C, an organic dairy farmer who combined the stakeholders within his business model, so there would be more value generated for all of them. This synergistic effect is established by the elderly- and day-care he runs on his dairy farm, which forms an interesting combination. Schaltegger et al. [20] evaluates this, as they state that market innovation that supports sustainable development has to be created by entrepreneurial leaders who put it at the centre of their business models. With this diversified business model, it was easier for participant C to negotiate with the municipality and get a permit for the elderly care. Therefore, this niche development supported him in overcoming certain barriers related to policy, such as not perceiving the government as counteracting or the long waiting times for municipal affairs. Of course, practices like these are difficult to implement on a large scale, just like Verberne [42] predicted; she stated that these movements operate well on a small scale, but struggle to implement structural and transformational change on a broad scale. Similarly, as was stated in Chapter 2, organic dairy farming is a consumer-driven sector, which is exactly the reason why there are so few organic dairy farmers on a national scale [46]. In this study, it was noted that many dairy farmers still earn a low income and that changing one’s business model costs money, which has to come from the market. The organic dairy farmers that were interviewed confirmed that although the yield of an organic farmer is lower than of a traditional farmer, it is more profitable in the long-term, due to higher margins, less resource inputs, and better water retention of the soil [46].

The image and legitimacy of the dairy sector can be gradually improved via practices like arable edge management or creating more transparency. For example, Verberne [42] stated that the promotion of organic certifications and labelling will increase the legitimacy of the organic sector. However, the interviewees for this study mostly focused on increasing transparency and raising awareness through inviting customers and critics to their farms, showing them how the dairy industry works and opening the dialogue with them. As a consequence, transparency positively influences the stakeholders of a dairy farm, which is confirmed by the results which state that opening up and exposing the farm has a positive effect on society. This can support closing the gap between the farmer and consumer, and also showcase the role farmers can have in protecting the landscape and biodiversity.

The sample size could have influenced the outcome of this study. A limitation of this study is that only frontrunning dairy farmers were interviewed. Although a careful selection process was put in place, a bigger or more diverse sample could have brought forward different or additional system barriers or practices and might have given the opportunity to showcase the transferability of the findings of this study to the majority of traditional dairy farmers in the Netherlands.



An opportunity for future research is to find out about the transferability of these practices towards the mass players—conventional dairy farmers. More research on the consumer perspective is needed to better understand the motivation and willingness to pay fair prices and the interest in short chain initiatives.

The inside-out perspective of frontrunning Dutch dairy farmers can support policy makers to cater to the beliefs and values of dairy farmers. Hence, this study could support public authorities who work on development policies (most likely in the agricultural sector) and assist them in creating strategic actions and interventions in the decision-making process; especially since this study presents a future perspective for a sector needing to transform into biodiversity- and landscape-inclusive dairy farming.

**Author Contributions:** Conceptualization, A.N.; Writing—original draft, L.E.; Writing—review and editing, A.v.R. and H.K. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data that support the findings of this study are available from the corresponding author, A.N., upon reasonable request.

**Acknowledgments:** We acknowledge the editors and reviewers for their helpful advice to improve the manuscript.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Van der Peet, G.; Leenstra, F.; Vermeij, I.; Bondt, N.; Puister, L.; van Os, J. *Feiten en Cijfers over de Nederlandse Veehouderijsectoren 2018* (No. 1134); Wageningen Livestock Research: Wageningen, The Netherlands, 2018. Available online: <https://library.wur.nl/WebQuery/wurpubs/reports/544595> (accessed on 6 January 2021).
2. Hoes, A.C.; Beers, P.J.; Van Mierlo, B. Communicating tensions among incumbents about system innovation in the Dutch dairy sector. *Environ. Innov. Soc. Transit.* **2016**, *21*, 113–122. [CrossRef]
3. CBS. Rundveestapel. CBS Statline. 2020. Available online: <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/80274ned/table?ts=1593510134801> (accessed on 6 January 2021).
4. Van Someren, T.C.R.; Nijhof, A.H.J.; Triple, P. *Business Development in the Dutch Agro-Food Sector: 9 Cases of Strategic Innovation*; Van Gorcum: Assen, The Netherlands, 2010. Available online: <https://www.duurzaam-ondernemen.nl/boek/triple-p-business-development-dutch-agro-food-sector/> (accessed on 6 January 2021).
5. Bijman, J. Exploring the sustainability of the cooperative model in dairy: The case of The Netherlands. *Sustainability* **2018**, *10*, 2498. [CrossRef]
6. Boonen, J. Rijksadviseur Pleit voor Landschapsinclusieve Landbouw. Nieuwe Oogst. 2020. Available online: <https://www.nieuweoogst.nl/nieuws/2020/09/29/rijksadviseur-pleit-voor-landschapsinclusieve-landbouw> (accessed on 6 January 2021).
7. Van Calker, K.J.; Berentsen, P.B.; Giesen, G.W.; Huirne, R.B. Identifying and ranking attributes that determine sustainability in Dutch dairy farming. *Agric. Hum. Values* **2005**, *22*, 53–63. [CrossRef]
8. Bellotti, B. Food literacy: Reconnecting the city with the country. *Agric. Sci.* **2010**, *22*, 29–34.
9. Gibson, K.E.; Lamm, A.J.; Lamm, K.W.; Warner, L.A. Communicating with Diverse Audiences about Sustainable Farming: Does Rural Matter? *J. Agric. Educ.* **2020**, *61*, 156–174.
10. Holmes, A.P. *Exploring the Potential Disconnect in Agriculture between Industry Bodies and Farmers in Their Sustainability Strategies and Priorities*; University of Canterbury: Canterbury, UK, 2019.
11. Lyson, T. *Civic Agriculture: Reconnecting Farm, Food, and Community*. *Civic Agriculture: Reconnecting Farm, Food, and Community*; University Press of New England: London, UK, 2004.
12. Deuffic, P.; Candau, J. Farming and Landscape Management: How French Farmers are Coping with the Ecologization of Their Activities. *J. Agric. Environ. Ethics* **2006**, *19*, 563–585. [CrossRef]
13. Termeer, C.J.; Feindt, P.H.; Karpouzoglou, T.; Poppe, K.J.; Hofstede, G.J.; Kramer, K.; Meuwissen, M.P.M. Institutions and the resilience of biobased production systems: The historical case of livestock intensification in the Netherlands. *Ecol. Soc.* **2019**, *24*, 15. [CrossRef]
14. Weber, A. Assessment of the Level of Sustainable Intensification of Dutch Front-Runner Dairy and Arable Farms Compared to the National Average. 2019. Available online: <https://edepot.wur.nl/476460> (accessed on 6 January 2021).
15. Safarzyńska, K.; Frenken, K.; Van Den Bergh, J.C. Evolutionary theorizing and modeling of sustainability transitions. *Res. Policy* **2012**, *41*, 1011–1024. [CrossRef]



16. Monjardino, M.; Hochman, Z.; Horan, H. Yield potential determines Australian wheat growers' capacity to close yield gaps while mitigating economic risk. *Agron. Sustain.* **2019**, *39*, 49. [CrossRef]
17. Guerrini, F. Do Cows Dream of Robot Milkers? The Unintended Consequences of Smart Farming. 2019. Available online: <https://www.forbes.com/sites/federicoguerrini/2019/01/02/do-cows-dream-of-robot-milkers-the-unintended-consequences-of-smart-farming/#1c21bd969a8a> (accessed on 6 January 2021).
18. Arnold, A. How Smart Tech and the Digital Age Is Benefiting the Dairy Industry. 2019. Available online: <https://www.forbes.com/sites/andrewarnold/2019/01/02/how-smart-tech-and-the-digital-age-is-benefiting-the-dairy-industry/#6e2cb17662f7> (accessed on 6 January 2021).
19. Pellman Rowland, M. This Futuristic Startup Could Disrupt the Dairy Industry. 2018. Available online: <https://www.forbes.com/sites/michaelpellmanrowland/2018/02/27/perfectday-disrupts-dairy/#696d7b325f61> (accessed on 6 January 2021).
20. Schaltegger, S.; Lüdeke-Freund, F.; Hansen, E.G. Business models for sustainability: A co-evolutionary analysis of sustainable entrepreneurship, innovation, and transformation. *Organ. Environ.* **2016**, *29*, 264–289. [CrossRef]
21. Vrolijk, H.; Reijers, J.; Dijkshoorn-Dekker, M. *Towards Sustainable and Circular Farming in the Netherlands: Lessons from the Socio-Economic Perspective*; Wageningen Economic Research: Wageningen, The Netherlands, 2020. Available online: <https://library.wur.nl/WebQuery/wurpubs/571111> (accessed on 6 January 2021).
22. Hofman, P. Embedding radical innovations in society. In Proceedings of the 11th Greening of Industry Network Conference, GIN 2003: Innovating for Sustainability, San Francisco, CA, USA, 12–15 October 2003. Available online: <https://research.utwente.nl/en/publications/embedding-radical-innovations-in-society> (accessed on 6 January 2021).
23. Geels, F.W. *Understanding the Dynamics of Technological Transitions: A Co-Evolutionary and Socio-Technical Analysis*; Twente University Press: Enschede, The Netherlands, 2002; p. 426. Available online: <https://www.osti.gov/etdeweb/biblio/20330346> (accessed on 6 January 2021).
24. Wigboldus, S.; Laurens Klerkx, L.; Leeuwis, C.; Schut, M.; Muilerman, S.; Jochemsen, H. Systemic perspectives on scaling agricultural innovations: A review. *Agron. Sustain.* **2016**, *36*, 46. [CrossRef]
25. El Bilali, H. Transition heuristic frameworks in research on agro-food sustainability transitions. *Environ. Dev. Sustain.* **2020**, *22*, 1693–1728. [CrossRef]
26. Van Rheede, A.; Lim, A. Understanding Corporate Responsibility in the Hospitality Industry: A View Based on the Strategy-as-Practices. In *Sustainable Hospitality Management*; Ruël, H., Lombarts, A., Eds.; Emerald Publishing Limited: Bingley, UK, 2020; Volume 24, pp. 137–144.
27. Morrissey, J.E.; Miroso, M.; Abbott, M. Identifying transition capacity for agri-food regimes: Application of the multi-level perspective for strategic mapping. *J. Environ. Policy Plan.* **2014**, *16*, 281–301. [CrossRef]
28. El Bilali, H. The multi-level perspective in research on sustainability transitions in agriculture and food systems: A systematic review. *Agriculture* **2019**, *9*, 74. [CrossRef]
29. Monjardino, M.; López-Ridaura, S.; Van Loon, J.; Mottaleb, K.A.; Kruseman, G.; Zepeda, A.; Hernández, E.O.; Burgueño, J.; Singh, R.G.; Govaerts, B.; et al. Disaggregating the Value of Conservation Agriculture to Inform Smallholder Transition to Sustainable Farming: A Mexican Case Study. *Agriculture* **2021**, *11*, 1214. [CrossRef]
30. Simons, L.; Nijhof, A. *Changing the Game: Sustainable Market Transformation Strategies to Understand and Tackle the Big and Complex Sustainability Challenges of Our Generation*; Routledge: London, UK, 2020.
31. Schaltegger, S.; Wagner, M. Sustainable entrepreneurship and sustainability innovation: Categories and interactions. *Bus. Strategy Environ.* **2011**, *20*, 222–237. [CrossRef]
32. Long, T.B.; Looijen, A.; Blok, V. Critical success factors for the transition to business models for sustainability in the food and beverage industry in the Netherlands. *J. Clean. Prod.* **2018**, *175*, 82–95. [CrossRef]
33. Ingram, J. Framing niche-regime linkage as adaptation: An analysis of learning and innovation networks for sustainable agriculture across Europe. *J. Rural Stud.* **2015**, *40*, 59–75. [CrossRef]
34. Simons, L. *Changing the Food Game: Market Transformation Strategies for Sustainable Agriculture*; Routledge: London, UK, 2017.
35. Markard, J.; Raven, R.; Truffer, B. Sustainability transitions: An emerging field of research and its prospects. *Res. Policy* **2012**, *41*, 955–967. [CrossRef]
36. Grin, J.; Rotmans, J.; Schot, J.; Geels, F.W.; Loorbach, D. *Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change*; Routledge: New York, NY, USA, 2010.
37. Acharya, A.S.; Prakash, A.; Saxena, P.; Nigam, A. Sampling: Why and how of it. *Indian J. Med. Spec.* **2013**, *4*, 330–333. [CrossRef]
38. O'Donoghue, T.; Punch, K. (Eds.) *Qualitative Educational Research in Action: Doing and Reflecting*; Routledge: London, UK, 2003. [CrossRef]
39. Pathak, V.; Jena, B.; Kalra, S. Qualitative research. *Perspect. Clin. Res.* **2013**, *4*, 192. [CrossRef] [PubMed]
40. Leung, L. Validity, reliability, and generalizability in qualitative research. *J. Fam. Med. Prim. Care* **2015**, *4*, 324. [CrossRef] [PubMed]
41. King, N. Doing template analysis. In *Qualitative Organizational Research: Core Methods and Current Challenges*; Cassell, C., Symon, G., Eds.; Sage: London, UK, 2012; pp. 426–450.
42. Verberne, E.K.C. Transitioning the Dutch Agricultural System through Niche Development-A Case Study of the Organic Dairy Sector. Master's Thesis, Nyenrode Business Universiteit, Breukelen, The Netherlands, 2020.



43. Gernert, M.; El Bilali, H.; Strassner, C. Grassroots initiatives as sustainability transition pioneers implications and lessons for urban food systems. *Urban Sci.* **2018**, *2*, 23. [[CrossRef](#)]
44. Bergevoet, R.H.M. Entrepreneurship of Dutch Dairy Farmers. 2005. Available online: <https://library.wur.nl/WebQuery/wurpubs/fulltext/42000> (accessed on 6 January 2021).
45. Gorissen, L.; Spira, F.; Meynaerts, E.; Valkering, P.; Frantzeskaki, N. Moving towards systemic change? Investigating acceleration dynamics of urban sustainability transitions in the Belgian City of Genk. *J. Clean. Prod.* **2018**, *173*, 171–185. [[CrossRef](#)]
46. Seufert, V.; Ramankutty, N.; Mayerhofer, T. What is this thing called organic?—How organic farming is codified in regulations. *Food Policy* **2017**, *68*, 10–20. [[CrossRef](#)]