sustainability

MDPI

Article

Blind Spot for Pioneering Farmers? Reflections on Dutch Dairy Sustainability Transition

Anne-Charlotte Hoes * and Lusine Aramyan

Wageningen Economic Research, Wageningen University & Research, Droevendaalsesteeg 4, 6708 PB Wageningen, The Netherlands

* Correspondence: anne-charlotte.hoes@wur.nl; Tel.: +31-317-482636

Abstract: This study explores the questions of how to govern the transition towards sustainable farming in a responsible and inclusive manner by exploring the Dutch dairy case. Sustainability transition is about fundamental social–technical changes to address the grand challenges that society faces today. It includes breaking down and phasing out unsustainable practice as well as scaling up sustainable alternatives. Transition literature argues that governments should implement a mix of transition tasks to give direction, support the new and destabilase the unsustainable. In addition, market-based instruments (MBIs) and policy interventions rewarding sustainable farming stimulate transition. This study illustrates that strong and prolonged pressure of not meeting international environmental agreements triggered the implementation of stronger policy interventions that destabilize the unsustainable. However, less policy attention seems to be given to supporting the "new", such as pioneering alternative farmers who develop sustainable alternatives to mainstream farming. To achieve more responsible and inclusive sustainability transitions, it is important to implement tailor-made policies that support pioneering alternative farmers who are already taking steps in developing sustainable farms which, in addition to food, provide ecological and other benefits to community.

Keywords: transition; governance; dairy; agriculture; market-based instruments; nitrogen

Citation: Hoes, A.-C.; Aramyan, L. Blind Spot for Pioneering Farmers? Reflections on Dutch Dairy Sustainability Transition. *Sustainability* **2022**, *14*, 10959. https://doi.org/10.3390/su141710959

Academic Editor: Michael S. Carolan

Received: 29 June 2022
Accepted: 1 September 2022
Published: 2 September 2022

1. Introduction

Climate change and biodiversity loss are the most pressing sustainability issues humanity currently faces [1]. In the Netherlands, and other regions in Europe, dairy farming plays an important role in both issues [2,3]. Depending on the type, setting and management of dairy farms, it can become part of the climate and/or biodiversity solution, or worsen the situation [4–7]. For example, circular nature-inclusive dairy farming cares for biodiversity and keeps the number of cows in balance with the carrying capacities of the pastures and stores carbon in the form of grass roots, trees, fungi and other soil life [8–11]. Despite the benefits of these types of dairy farming and public and private initiatives that support the sustainable development of Dutch dairy farming, studies indicate that currently less than 10% of Dutch dairy farmers are considered nature inclusive [12]. An explanation for this low number is that many dairy farmers are stuck in a business and income model of producing higher amounts of milk with the support of nutrient input streams, such as animal feed and chemical fertilizer [13]. The European expansion of intensive animal farming systems raise environmental and animal welfare concerns, expressed by researchers, experts and citizens [3,7,14]. In the Netherlands, extensification of dairy farms, and making them nature-inclusive, is part of the current circular agriculture policy vision of Dutch government. However, this is unappealing or unrealistic for many dairy farmers due to a lack of available land, high land prices, depts of prior investments and the additional labor that nature-inclusive dairy farming might require [15–17]. Sustainability transition research questions how to achieve more sustainable production and consumption systems

despite all the dynamics and circumstances that hamper this [2]. Livestock production is one of the sectors that needs to improve its sustainability performance [18–20].

Sustainability transition is a rather new research field that studies and supports innovation efforts of societies to become more sustainable. Many transition studies focus on sustainable alternatives that are being developed [12] such as promising green innovations, usually developed by pioneers, that have the potential to scale and eventually transform the status quo [21,22]. It is argued that far-reaching changes are needed to address the grand challenges such as climate change, loss of biodiversity and resource depletion. Transitions take a long time and are about innovations that transcend disciplinary, divisional and institutional boundaries. It is about replacing and adapting multiple technologies, behaviors, business models, infrastructure, regulations and norms and has an impact on human (social) life [21,22]. Governing transitions involves a plurality of actors, both public and private, and it requires a mix of policy instruments to enable and sometimes force these actors to act differently [23–25]. Putting it more bluntly, transitions are not merely about changing production and consumption practices; they are also about changing the way in which people are influenced and governed by rules, infrastructures, norm, technologies, etc. [26,27] Early sustainability transition research focused mostly on understanding the process, governance, power and politics of transitions. More recently, studies have appeared that investigate the ethical aspects of transitions, mostly in the domain of energy transition in low-income contexts [26,28–30]. Less attention has been given to the topic of governing sustainable farming transitions in a more responsible way. Besides, pioneering alterative farms, who are already making steps towards sustainable transition, seem to be neglected. The aim of this article is to explore the governing of the sustainable farming transition in the Netherlands and to explore whether it is taking place in a responsible and inclusive way. The article studies the case of the Dutch dairy farming sustainability transition.

Background

Approximately 60% of Dutch agricultural land is in use by dairy farms, which is 28% of the entire country (roughly 1.2 million ha) [31]. These farms manage grasslands and less than 20% of land is used to grow additional feed crops such as corn. In 2021, the Netherlands counted approximately 15,000 dairy farms compared to 185,000 in 1960 while keeping the total number of cows at roughly 1.6 million [32]. This means that the size of the remaining dairy farms has grown steadily. The "get-big-or-get-out" trend occurred across Europe in different regions [3]. In addition, the milk production per cow has grown steadily for years [33], with the yields of 9255 kg/animal in 2020 compared to the EU average of 7500 kg/animal [34]. This high production is achieved, among others, by importing nutrients to the farm [35] and improved breeding practices, stables, cow—and grass management. On average, the Dutch dairy herd consumes 20% fresh grass, 35% grass silage, 15% whole maize silage and 30% concentrates (in dry matter) [36]. Due to the high nutrient import and livestock density, the Netherlands has a manure surplus.

In the 1960s, manure regulation was limited, and it was common practice to bring all the livestock manure to farmlands. This resulted in accumulation of phosphate and nitrogen in the Dutch ecosystem. Due to European and Dutch regulations, farmers changed their manure management [37]. Monitoring data show that this significantly improved the water quality from 1992 to 2019 [38]. Although farmers agree that manure policy is important, the complexity of current manure regulations and concerns for soil health and fertility make farmers dissatisfied with the current manure policy [37].

Over the last 35 years, Dutch dairy farmers have been confronted with a pile of restrictions directed to achieving sustainability goals (e.g., improving water quality and lowering nitrogen deposition). For example, in 2016, it was decided to introduce a phosphate quota, thereby putting a cap on the amount of cows kept in the Netherlands. As a result, Dutch dairy processing companies oblige their farmers to monitor annually their nutrient cycle by filling in the assessment tool called "KringloopWijzer" (nutrient cycle assessment) [39]. The

KringloopWijzer was developed "to assess the agronomic and environmental performances of commercial dairy farms" (p. 143, [36]). The tool estimates the nitrogen and phosphate flows and use efficiencies of dairy farms by filling in input and output data from the herd, manure, soil and crop.

In 2019, pressure to speed up the sustainability change of Dutch dairy farming was raised due to a ruling of the Council of State: the Netherlands must reduce the amount of anthropogenic nitrogen it emits. Dairy farming is one of the main sources of nitrogen emission [40]. Numerous farmers' protests took place in the Netherlands, as farmers feel that they are being blamed for the environmental crisis and fear new laws which might threaten the continuation of farming. In 2022, the newly formed Dutch Cabinet gave high priority to solving this nitrogen crises. For example, they installed a new position in the governmental structure for a Minister for Nature and Nitrogen Policy. This new Minister has explained that her strategy includes buyout agreements with farmers [41] which would help in reducing the number of farms and livestock in the Netherlands. In May 2022 (three weeks before submitting this article), the Ministry of Agriculture, Nature and Food Quality published two policy letters that will have a major impact on Dutch farmers. A letter included a map with local Nitrogen goals that showed that in several areas, a more than 70% Nitrogen reduction must be achieved. During the submission of this article, fierce farmers protest took place. These recent developments are not included in this article as they are still ongoing.

In this article, we briefly introduce the sustainability transition literature with a focus on the governance of transitions (Section 3.1 which follows Materials and Methods in Section 2). Next, key policy letters by the previous cabinet of the Ministry of Agriculture (in the remainder of this article, the abbreviation Ministry of Agriculture is used for the Dutch Ministry of Agriculture, Nature and Food Quality) are explored, together with the sustainability approach of the Dutch dairy industry and the viewpoints of the farmers' association (Section 3.2). In addition, the viewpoints of three pioneering alternative dairy farmers, which experiment with radical new more sustainable ways of farming, are included. The alternative pioneering farms are those farmers who are working on radical and incremental farm change to achieve (more) sustainable food production. The further explanation of these types of farms is provided in Section 3. Besides, the debates of the workshop organized between pioneering alternative farmers and policy makers are analyzed (Section 3.3). In the discussion, the empirical case results are related to transition literature (Section 4) and the article ends with a conclusion (Section 5).

2. Materials and Methods

In this study, an explorative qualitative research approach is utilized [42,43] to further explore our understanding of governing the sustainable farming transition in a responsible and inclusive way. An explorative case study was executed to explore the phenomena of the Dutch dairy sustainable transition. The first author of the article was already active in various applied research projects concerning Dutch dairy and sustainability transitions which provided a valuable background information during the scoping stage of the study. For example, during the writing of this article, the first author was involved in policy supportive projects that studied the Dutch dairy case for the Dutch Ministry of Agriculture [44], and a public–private research project for the Dutch dairy sector [45]. Besides, she was involved in a project about circular and nature-inclusive farming in which participating agroecological farmers in addition to food production experiment with providing ecological and social services [46–50].

This study consists of three sequential steps depicted in Figure 1, where three types of data were collected and analyzed and described below.

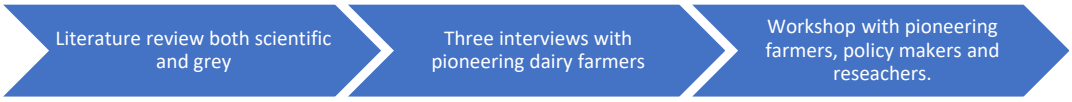

Figure 1. Steps of study and data collection.

The study started with a broad literature review involving both scientific and grey literature. The study of scientific literature comprises analysis of sustainable transition theories including governance and inclusiveness aspects, and analysis of market-based instruments. Since the study is rather practical and involves policy analysis, relevant policy documents, public communication by the Ministry of Agriculture, scientific reports and media articles have been screened and analyzed. It is not the intention of this study to provide a broad literature overview of all related policy documents. The study rather focuses on the most relevant documents with regard to the Dutch dairy sustainability transition. For this, the policy documents from the Ministry of Agriculture during the previous cabinet (2017–2022) have been explored. Furthermore, the public communication by the partnership Sustainable Dairy Chain [45], position papers by the Netherlands Agricultural and Horticultural Association (LTO Nederland) and relevant reports, news and opinions that appeared in (agri-food) media are included.

The analysis of the literature on governing sustainability transitions and the described practical approach by the Dutch Ministry of Agriculture revealed a potential blind spot. Although transition studies put emphasis on 'supporting the new' in order to achieve sustainability ambitions, Dutch agricultural policy seems not to be focused on that. Instead, policy focuses on the traditional farming, while pioneering farms seem to fall out of policy support radar. In the case of the Dutch dairy sector, 'supporting the new' can mean giving research, innovation and policy support also to pioneering alternative dairy farmers that contribute to achieving environmental goals.

To explore this issue further, interviews with three pioneering alternative dairy farmers were analyzed.

Table 1 provides background information on the farms of the interviewees. Semi-structured interviews with open-ended questions were executed to provide interviewees the opportunity to elaborate on their situation, experiences and perspectives. The interviews were conducted online using Teams (due to COVID-19 restrictions) and were recorded and transcribed.

The aim of the interviews was to gain insight in the practice, experiences, ideas, perspective and motives of alternative pioneering farmers. The interviews started with getting a better understanding of what the alternative farms are. Examples of the questions included in the questionnaire are: what is innovative about your farm?, and, how does it contribute to sustainability goals? Besides, questions concerning the key activities, partners, resources and customers were discussed. Next, the topic of (innovation) barriers was addressed. In addition, the interviewees were asked to which extent they experienced innovation support from among others policy. A thematic analysis [51] was executed in the autumn of 2021 to identify what interviewees said about the topic of the innovative character of their farm, the (innovation) barriers they encountered and the policy support they experienced. Although the sample size of interviewed alternative pioneering dairy farmers was quite small, similar innovation barriers and a lack of innovation policy support were identified in another applied research project, in which participating agroecological farmers experimented with alternative farming systems such as community supported agriculture (CSA), agroforestry and regenerative farming. It was decided to organize a workshop between pioneering alternative agro-ecological farmers, policy makers and researchers to discuss these issues further.

Table 1. Summary of the interviewed Dutch dairy farmers.

Farm	Type	Description
A	Biodynamic dairy	80 cows, 40 young stock 6 bulls, 150 chickens, 80 ha and nature-inclusive The farm of interviewee A is a biodynamic dairy farm with an 'Irish dairy farming system'. This means the whole herd gets calves around the 1st of March, and the grass growth is in balance with the feed demand of the cows and no concentrates are fed. The laying hens in the pastures help to spread the manure of the cows. By using strip grazing techniques, the cows can stay in pastures and eat fresh grass longer. Six months a year, the cows can stay outside during the day and night. The stables are used three months a year during the night and three months a year fulltime. The farms also maintain landscape elements such as marshland and bocage (tree/hedgerows).
B	Goat cheese	75 Toggenburg goats, 12 ha, makes and sells natural goat cheeses Interviewee B makes natural goat cheeses using Toggenburg goats. Natural cheesemaking is about using traditional methods and raw ingredients. For the cheesemaking farm, C develops and cultivates its own bacterial cultures and collects rennet from the young suckling goat lambs from the herd (from the stomachs after butchery). The animals are also kept in a natural way in which much attention is paid to a natural diet. Lambs and bucks (i.e., male goats) are kept in the herd of now 75 goats and they can graze outside year-round as there is an open stable.
C	Plant based-dairy	Dutch soy milk The farm of interviewee C produces plant-based milk using soybeans they grow themselves. The ecological footprint is low because they do not use chemical fertilizer or pesticides, and because the processed soybean is consumed by humans directly instead of animals. They produce the soy milk themselves and deliver it to restaurants. This soy milk differs from the products you can buy in the supermarket, due to the lower temperatures used in the processing. This means a tastier product with a shorter shelf life.

In November 2021, the workshop took place with seven pioneering farmers, eleven policy makers (seven policy makers of the Ministry of Agriculture and two civil servants from Netherlands Enterprise Agency) and four researchers. The goal was to address and discuss in sub-groups the following issues that these farmers encounter: (1) limited access to land, (2) lack of research and innovation support from policy, (3) restrictive regulations. The first author of this paper facilitated the conversation that took place on the topic of a lack of research and innovation support from policy. This conversation was recorded and transcribed and a thematic analysis [51] was executed for this article. The workshop took place at a biological nature-inclusive dairy farm and included a lunch with local agro-ecological farm products and a farm tour.

3. Results

3.1. Governing Sustainability Transitions: Insights from Literature

In this section, we argue that for responsible agri-food transitions, it is important to support pioneering farmers and stimulate multiple smaller changes to occur for mainstream farmers and other agri-food stakeholders over time in order to eventually achieve large-scale agri-food change. Additionally, governmental intervention is needed in which a mix of transition tasks is executed, inclusiveness of different types of farmers and other stakeholders is organized and recognition for the potential personal and profit loss, and the innovation and sustainability efforts of farmers and other stakeholders.

3.1.1. Importance of Not Too Risky Step-by-Step Transition Approach in Agriculture

Sustainability transitions scholars argue that in order to address the grand challenges that society faces today, fundamental changes are necessary that go beyond improving current sectors or adopting an innovation [21,26]. Transition includes breaking-down and phasing out unsustainable practice as well as scaling up sustainable alternatives [52]. These alternatives can be developed by pioneers that develop innovative solutions for the status quo. Pioneers are important for transition processes as they dare to experiment and develop radical alternative practices, techniques and businesses. These radical alternatives need to mature in order to eventually successfully compete with existing practices and over

a long period of time change the status quo [22]. In 2019, an inventory was executed of radical innovative circular farms in the Netherlands which resulted in a database with over 250 pioneering farmers that experiment with alternative farms that produce food in a more sustainable way [47].

The difficulty with fundamental change is that it is associated with risks and higher uncertainties of the results. Risks and uncertainties are generally avoided in agri-food contexts, to safeguard the global supply of safe food. In addition, the topic of fair trade and securing incomes for famers is also high on the international agri-food sustainability agenda. In the words of Raworth [53], there is a need to transform current society into one that stays within the ecological carrying capacity while at the same time attending to social needs. These circumstances make the more radical disruptive substitution-perspective of transition less suitable. Geels and Schot [54] propose four pathways of transitions, from which two are more disruptive (i.e., technological substitution and de-alignment and re-alignment) and the other two, the transformation and reconfiguration pathways, are more gradual in changing processes [54].

To avoid taking high risks, it is more likely that governments support agri-food sustainability transitions that involve a step-by-step process of behavioral changes and replacement of parts of the existing agri-food system, which over time may eventually amount to fundamental change: not only to avoid food safety and food shortages risks but also because farming is not structured around 'core' technologies that can be replaced to achieve radical change. Farmers often spread investments and improve their farms using piecemeal engineering. In addition, farms are not powerful multinational organizations with whom governments can negotiate new 'license to produce' agreements to achieve environmental sustainability. Most food is produced by small and medium-sized (family) businesses that are highly dependent on input and output streams from other organizations as well as other factors such as the weather [55]. A perspective in which multiple smaller changes occur over time which eventually create a big impact seems more realistic, as portrayed in both the transformation and reconfiguration pathway [54].

In the transformation pathway, change is triggered due to outsiders who draw attention to negative side effects of current practices. If these pressures are strong and prolonged, they cause frictions within the network, and this is responsible for these negative side effects. These problems have structural characteristics and can lead to gradually questioning core beliefs and practices, which are needed for structural change [56]. In the reconfiguration pathway, radical add-on innovations are developed that can be easily adopted and that trigger additional changes which eventually result in fundamental change [54].

3.1.2. Governmental Policy for Sustainability Transitions

It is unrealistic that sustainability transitions occur without governmental interventions as they involve change in practice that brings environmental, societal and future generation benefits but not per se for the user [57]. In transition literature, many papers offer policy recommendations to assist the realization of sustainability transitions. A literature study analyzed 100 publications that collectively propose 80 transition tasks for governments that were clustered in the five categories: (1) give direction, (2) create governance, (3) support the new, (4) destabilize the unsustainable and (5) develop internal capabilities and structures [58]. Give direction is about the articulation of demands, formulation of a vision/ambitions and establishing goals and policy strategies. Create governance concerns motivating others to participate by developing and maintaining networks. Support the new is described as engaging with, supporting and funding new developments. Destabilize the unsustainable involves the proactive weakening, phasing out and banning unsustainable practices/techniques. Develop internal capabilities and structures is about critically reviewing the role and routines of the government and adopting it accordingly. Of these five categories, the task of support the new is that mostly referred to in transition literature. This demonstrates the importance that is given to product development, innovations, grassroot

movements and entrepreneurship in transition literature as a way to change the status quo. The least referred to category in the literature is destabilize the unsustainable.

Braams et al. [58] conclude that democratic governments have poor narratives of legitimation that provide sufficient argumentation to implement the 80 transition tasks that are proposed in the literature. This makes it hard for governments to proactively shape societal transitions. Transition tasks that fit poorest with prepositions from public administration traditions that legitimize governmental intervention fell under the categories of give direction (1) and destabilize the unsustainable (4) [58].

3.1.3. Inclusion of Stakeholders

Although many transition tasks fit poorly with traditional governmental policy, stakeholder engagement is the task that that fits democratic governments and align with collaborative tradition of governments. It is argued by many that an inclusive transition process, in which voices of diverse groups are taken into account, is important [57,59]. In addition to democratic legitimacy, inclusion of stakeholders, anticipated end-users and members of the general public are important to improve the techniques, policies and rules that are being created in order to achieve sustainability transitions. It is argued that social inclusion assists in uncovering overlooked uncertainties, negative side effects, opportunities and solutions. A downside of inclusions is that it usually involves deadlocked debates that hamper speed and action [60]. Although an 'opening-up' of innovations through anticipation and reflection with diverse societal actors is important, it is also argued that this process which involves many stakeholders makes it difficult to take action [53], whereas action is needed to actually realize a transition towards a more sustainable food system. It is for this reason that Voβ et al. [61] propose to also pay attention to 'closing-down', which means deciding sometimes that a transition plan is not successful, or to continue the process without some of the actors that are hindering the transitions. Van Mierlo et al. (p. 364, [60]) summarize that:

"Good governance (reflexive governance in the terminology of the authors) is essentially knowing when to maintain openness and when to reduce it in order to be able to make decisions and ultimately to act. This requires finding balance between opening up and closing down by combining them in different ways".

The challenge of ensuring environmental sustainability while safeguarding democracy is also addressed in environmental and policy literature and issues of "public participation and populism; technocracy and expertise; governance across scales; and ecological rights and limits" need further research (p. 1, [62]).

3.1.4. Diversity of Farm Types

When thinking about agri-food sustainability transitions, farms and farmers have an important role to play in improving the environmental performance [48]. It is important to realize that the business models of dairy farms differ [63]. A business model depends on aspects such as the location, history, size, soil type, business network, external circumstances and internal drives of the farmer and his/her social network(s).

Dagevos and de Lauwere [64] studied farmers who were working on radical (alternative) and incremental (adaptive) farm change to achieve (more) sustainable food production. They use the term 'alternative farms' for agricultural business models that offer far-reaching system change, such as, for example, proposed by the agroecological farming movement [65]. In this study, the term 'alternative pioneering farm' is used to describe the studied farmers who are working on radical and incremental farm change to achieve (more) sustainable food production.

In addition, there are also farms that are not yet classified as having a business model that puts emphases on addressing environmental concerns. We expect that achieving sustainability innovations and adaption for these farms is challenging because these changes are mostly about replacing existing practices that currently work well for the farmer but are less sustainable. These farmers will probably not invest spontaneously in new farm practices and/or technologies that offer better sustainability performance while offering

less or no benefits to the farmer such as labor savings, higher income, increased production, or a reduction of risks for animal and plant health [16]. This is rather problematic from a sustainability transition perspective. Therefore, the recognition by a government that transitions bring also loss (e.g., income and profit) is imperative.

Governments should have some insight in the magnitude and depth of loss as a consequence of transitions and should develop a strategy with regard to its response to this loss and the related resistance [66]; but recognition is needed not only for traditional farms, but also for alternative pioneering farms who already take steps towards sustainable solutions. This group is important because they experiment with more sustainable farming practices which involves taking risks and making investments that will eventually benefit the whole agri-food sector [67].

3.1.5. Market-Based Instruments for Sustainability Agri-Food

An issue that hampers a food transition is that in the current international markets environmental effects of farms are not 'priced' adequately [68]. Famers are paid for the amounts of harvest they produce, which stimulates dairy farmers to produce maximum liters of milk per cow and/or hectare instead of producing milk in an environmentally friendly way [2]. So, in the current international dairy market, it is extremely challenging, and some might say unrealistic, to reach a state where mainstream dairy farms produce according to the vision of Dutch circular agriculture in which both ecological and economic results are achieved [16].

In order to overcome this issue, environmental law and policy introduced the concept of market-based instruments (MBIs). MBIs are policy instruments that use markets, price and other economic variables to incentives actors to act more sustainable instead of enforcing detailed rules [69–71]. MBIs can assist making more sustainable businesses models also economically compatible. Already in 2005, the European Environment Agency recognized the importance of MBIs in the development of environmental policy instruments in Europe which provide a stimulus to consumers and producers to change their behavior towards a more eco-efficient use of natural resources by reducing consumption, by stimulating technological innovation and by encouraging greater transparency on how much we pay for what [72]. The EEA has concluded that MBIs can, therefore, also contribute to wider sustainable development objectives in the EU. Under competitive conditions, MBIs usually perform better than command-and-control [73].

An example of an MBI is motivating farmers to farm more sustainably using a clear set of Key Performance Indictors (KPIs) and rewarding farmers who score high results instead of piling up specific farm measures [46]. KPIs are a set of performance measurements that determine how effectively an organization is achieving key objectives [46,74]. In general, KPIs should be measurable, realistic, with low administrative burdens, robust and fraud-proof [46,48]. Sustainability assessment tools currently play an important role in determining the KPI scores of dairy farms [75]. These assessment tools make it possible for policy and chain partners to distinguish which farms produce in a more sustainable way [46]. However, it is questionable to what extent generalized MBIs, such as steering with KPIs, can effectively reach all farm types. Studies show that the success of these instruments depends on regulations, macro-policies, institutional conditions [76], the type of instrument adopted and the specific objectives pursued by the policy as well as market conditions [77,78].

3.1.6. Takeaways from the Literature

From the literature, we found various elements that can contribute to achieving a responsible transition in the Dutch agri-food. These are: (a) a step-by-step approach, (b) implementing a mix of transition tasks that at least cover the five categories of give direction, create governance, support the new, destabilize the unsustainable and develop internal capabilities and structures, (c) inclusiveness/multiple stakeholders and (d) seeking for

MBIs to stimulate/motivate. This section also notes that it is rather challenging for the government to govern transitions, among other reasons due to:

1. poor narratives of legitimation;
2. trade-offs between inclusiveness and strict governmental steering and actions;
3. the diversity of famers that need to be reached and the diversity of institutional contexts in which farmers are embedded that also need to change in order to achieve sustainability transitions.

So, how did this play out in the Dutch dairy sustainability transition case? The next section explores this question.

3.2. Sustainability Transition Approach of Dutch Dairy: Grey Literature

3.2.1. Circular Agriculture Vision and Approach by Ministry of Agriculture

During the past 35 years, Dutch dairy farmers had to change farming practices to comply with manure policy. Manure policy was put in place to minimize losses of nutrients from agricultural land to the environment. If nutrients pile up in the environment, this disturbs soil, air and water quality and has a negative impact on ecosystems [79]. In 1987, the Dutch Fertilizers Act limited the use of manure. Since 1991, the European Nitrates Directive limits the use of nitrogen for all member states in order to achieve the target of less than 50 mg/L nitrate concentrations in ground water [80]. Countries who are not able to reach this target, such as parts of the Netherlands, need to negotiate with the EU about their Environment Action Programme (EAP). The Dutch government feels pressure from the EU, the House of Representatives, research reports and society to meet international environmental and nature agreements related to manure surplus [44].

In 2018, the Ministry of Agriculture presented a new vision for Dutch Agriculture: a vision of circular agriculture [81]. Circular agriculture is foremost about minimizing polluting emissions through resource use efficiency and improving the nutrient efficiency by taking the whole farming system into account. The vision goes beyond that and includes goals such as improving the economic position of farmers, biodiversity and animal welfare [81]. Or, in the wording of the Ministry of Agriculture, the vision of circular agriculture is about: "closing cycles of minerals and other resources as far as possible, strengthening our focus on biodiversity and respecting the Earth's natural limits, preventing waste and ensuring farmers are paid a fair price for their hard work agriculture and nature go hand in hand" (https://www.government.nl/ministries/ministry-of-agriculture-nature-and-food-quality/vision-anf; accessed on 28 June 2022) [81].

A year later, the ruling of the Council of State voiced that the Netherlands must reduce the amount of anthropogenic nitrogen it emits, which pressured the Ministry to speed up the sustainability transition. The Realization Plan Vision was published by the Ministry which stated that the envisioned change: "is a transition process that takes a long time and cannot be implemented purely in a systematic manner. Rather, it is a quest in which we set clear goals and have to take the liberty to experiment" (p. 7, [82]). The plan also contained a broad collection of policy efforts to reach circular agriculture goals. Two highly relevant policy efforts in the light of the Dutch dairy sustainability transition were a fundamental rethink of manure policy and the plan to develop Key Performance Indicators (KPIs) to be able to reward farmers who produce more sustainably.

In 2020, the Ministry of Agriculture presented the contours for future manure policy and stated the ambition to achieve land-based dairy farming in the Netherlands in order to make manure policy simpler, more effective and more future-oriented [83]. Land-based livestock farming means that the land is tied to the livestock for the feed supply. This is in contrast with intensive livestock farming, such as pig-, poultry- and veal calf farming. The Ministry of Agriculture stated that land-based dairy farms have sufficient nitrogen placement space (or land) for the number of cows. A dairy farmer can manage the land him/herself or have a partnership with a nearby arable farmer. The Minister wrote that land-based dairy farming will result in a dairy sector with fewer emissions to the environment and more social support [84]. It is, however, estimated that roughly 40% of

Dutch dairy farmers do not meet the suggested definition of land-based dairy farming. The Minister recognized that some dairy farmers will face a challenge with this and that the scope and depth of the challenge depends on the detailed plans of the next cabinet [76]. A possible explanation as to why the Dutch government proposed these policies is that it has experienced high pressure to achieve lower emissions levels from dairy farming for a long time. For decades, the Netherlands has not been able to meet EU water quality agreements and must negotiate about its action plan for improvement in Brussels [79]. The ruling of the Council of State in 2019 recognized that more had to be done to protect Dutch nature, which motivated the government to take a guiding role in structural agricultural change.

The letter 'Roadmap Future Manure Policy of the Minister' [84] also refers to the idea to make a policy distinction between the most extensive dairy farms and less extensive dairy farms. As there are no environmental risks for the most extensive dairy farms, it makes sense not to burden them with manure administration. For dairy farms that want to harvest more grass from each ha, and therefore use more fertilizers, the possibility of using a nutrients cycles assessment tool, thereby assuring 'company-specific accountability' with regard to fertilizers use, is mentioned as a policy option to further explore. It is also argued that the suggested management tool of the dairy sector (i.e., Kringloopwijzer), has weaknesses such as limited oversight of the input data that farmers provide and poor enforceability prospects [84]. The KringloopWijzer was developed "to assess the agronomic and environmental performances of commercial dairy farms" (p. 143, [36]). The tool estimates the nitrogen and phosphate flows and use efficiencies of dairy farms by filling in input and output data from the herd, manure, soil and crop.

The idea to use company-specific accountability relates to the plan to develop Key Performance Indicators (KPIs) that are a linking pin between the goals of circular agriculture of the Dutch government and farming practices. In December 2021, a proposed core set of KPIs for circular agriculture were presented during an online working conference (https://www.werkconferentie-lnv.nl/; accessed on 28 June 2022). The conference started with an opening speech by the Minister of Agriculture who stated: "With KPIs we make concrete what performance of farmers we value and want to stimulate and reward as a society, i.e., public and private parties. (. . .) Rewarding entrepreneurial performance based on KPIs can provide part of the answer to the questions of how can farmers earn an income if they become more sustainable?" She explained that the proposed KPI core set was developed in collaboration with chain partners and that the dairy sector already had much experience with using company-specific accountability to reward farms who achieve high scores on sustainability Key Performance Indicators (experiences in the Dutch dairy sector are explained in [85]).

The idea was that assessments obtained with the KringloopWijzer tool (Nutrient Cycle Assessment) could also be used to start KPI pilot projects with rewarding farmers with high scores for specific sustainability goals. Currently, in the province of Drenthe, the project Sustainable Dairy Drenthe uses the KringloopWijzer tool to monitor progress on five sustainability goals which are: biodiversity, soil quality, landscape, climate and environment, and rewards dairy farmers with €500 per year per met target (maximum €7500 total with €2500 per year over a period of three years) (https://www.duurzamemelkveehouderijdrenthe.nl/; accessed on 28 June 2022). Other examples of similar regional initiatives are Biodiversiteitsmonitor Melkveehouderij (biodiversity monitor of Dairy farmers) of the province of Brabant and Kringloopboeren (Nutrient cycle farmers) of the municipality Midden-Delfland [86].

3.2.2. Sustainability Dairy Chain Approach of Dutch Dairy Sector

Next to governmental regulations, the Dutch dairy sector has a longstanding tradition with the development and implementation of company-specific accountability. Due to contamination risks related to dairy, which can cause serious health risks, the dairy sector installed quality and safety systems. The samples of delivered raw milk from each farm are

taken and tested for quality control. Farmers have digital access and see how their milk scores on various indicators.

Since 2008, Dutch dairy processing companies and farmers' organizations collectively work on improving the environmental and social-economic performance of supplying farms [60]. To achieve sustainability goals in the dairy sector, each dairy processing company motivates its member dairy farmers to produce more sustainably with sustainability programs. An example is the dairy cooperation FrieslandCampina that has sustainability programs for their farmers called Foqus Planet and Planet Proof. Foqus Planet is embedded in digital quality check program of farmers. Here, the farm is assessed, not only in terms of hygiene, milk quality and food safety, but also in terms of grazing, animal welfare and environmental aspects. The scores are assured through milk tests, administrative checks and physical checks on the farm. There are basic requirements regarding the scores that apply to all member dairy farmers. If a dairy farm does not meet these baseline standards, and no progress is made during a recovery period, the cooperative can refuse to accept the milk of this dairy farmer. Farmers with extra high scores are financially rewarded because the cooperative redistributes a small portion of the profit, to reward the sustainability performance of dairy farmers. In addition, the independent label PlanetProof was developed with additional sustainability and biodiversity requirements. FrieslandCampina pays 2 eurocents extra per liter of milk to farmers who produce under the PlanetProof label. Foqus Planet and PlantProof are examples of MBIs that make use of KPIs that are partly collected using the KringloopWijzer assessment tool [85].

3.2.3. Farmer's Association Reaction to Manure Policy

A position paper of Netherlands Agricultural and Horticultural Association [87] that responds to the 'contours for future manure policy' of the Ministry of Agriculture states: "in our view, despite repeated requests from our side, a real dialogue never took place. We regret this. (p. 1)" With regard to the ambition of the Ministry of Agriculture to achieve land-based dairy farming, they write that by forcing land expansion, "you smoke out companies" (p. 3). Moreover, they miss recognitions for the diversity of farmers and the diversity of goals that need to be met (that also include climate and biodiversity).

In 2019, the farmer's association (LTO Nederland) sent their manure policy plan to the Ministry of Agriculture. Their proposition resembled the idea to use company-specific accountability with KPIs as explained in the video message of the Minister in 2021 and for which pilots are being executed with dairy farmers in several provinces in the Netherlands. Although according to the farmer's association, a real dialogue never took place, one could argue that their ideas were picked up by the Dutch government and further explored (https://www.werkconferentie-lnv.nl/; accessed on 28 June 2022).

3.2.4. Reflection by Researchers on KPI Approach

A recent response paper about the opportunities and bottlenecks of KPIs to steer integrally towards the goals of circular agriculture [85] notes that it is not a cure-all solution for the realization of sustainable agriculture. It also reports the main discussion points of the online working conference (https://www.werkconferentie-lnv.nl/; accessed on 28 June 2022) that was commissioned by the Ministry of Agriculture. Issues that were addressed include concerns about effectiveness, implementation and hampering legislation, but also worries of additional piling of regulation, not being rewarded for sustainability performance, etc.

An additional issue is that it is questionable to what extent the pioneering dairy farmers can profit from the MBIs with KPIs. These pioneering dairy farms sometimes operate outside the traditional agricultural chains. Therefore, their data are not collected and stored. A study with a limited sample of alternative pioneering farms concludes that these farms collect and record little data themselves [88].

3.3. Pioneering Dairy Farmers Experience Limited Policy Support

3.3.1. Interviews

Farm A is an example of a circular and nature-inclusive farm as external inputs are kept to a minimum and marshland and bocage (tree/hedgerows) are maintained. No grain or maize are fed, and no antibiotics are used. The family farm used to be conventional, but in 2000 they decided to switch to organic and later on they became biodynamic. To be able to achieve this, the farm has a low number of cows per ha of land in comparison to other Dutch dairy farms. This also had consequences for the amount of milk they produce per ha. In 2000, this was 17,000 L/ha; this dropped to 8000 L/ha in 2020 [89]. Despite this, the revenue model is sufficient, as the costs are low, and the farmer is able to sell his/her products for a premium price [89]. According to the interviewee, the switch to this farming system took 10 to 15 years and it required (re)learning (a different) set of skills such as a different approach to soil, plants and animals. For example, the farm changed the breed of cows in a step-by-step way, to make the livestock more suited for a fully grass-fed lifestyle [89].

Although farm A produces milk in a sustainable way and has a straw rich biological manure for which biological arable farmers pay to be able to obtain it, farmer A has similar administrative accounting burdens as conventional farmers. For example, they need a specific form to transport very small amounts of biodynamic manure to a nearby area. Interviewee A is not against the manure accounting as she stated: "It is very good to know where the manure goes but it is a lot of administrative accounting for only small amounts of manure". Interviewee A reflects on the situation and notes that apparently the Dutch nutrient problem is so pressing that these administrative burdens are necessary. In addition, interviewee A must fill in the nutrient cycle assessment tool yearly for the dairy processing factory. She notes that this tool seems to be designed for more conventional farmers and does not recognize their farming system and therefore, specific important aspects of their farm cannot be filled in the digital forms. This issue was discussed with a researcher involved in the design of the nutrient cycle assessment tool. Apparently, the tool is flexible enough to include a diversity of farm types; but filling in specific details and fully understanding the tool usually requires assistance by an expert of the nutrient cycle assessment tool.

Interviewee A is positive about the current legislation that allows extensive farms to apply for an exemption of the rule to inject manure in the soil, which allows one to apply manure directly on the land, if specific conditions are met: "this is an important, well-appreciated factor that this is allowed, and we hope it stays that way". She is less positive about the situation that farmers who have already invested in becoming circular and nature-inclusive in the past are missing out on upcoming subsidies that assist mainstream famers to become more extensive and nature-inclusive. Interviewee A explains: "But we've already done it . . . Is there any type of reward or appreciation for us?"

Moreover, for dairy farmers that experiment with low-tech, nature-inclusive, low-input and land-based farms (i.e., branded as hay milk or biodynamic farming), it is difficult to get innovation subsidies. Currently, most funds go to high-tech solutions such as low emission stables. Interviewee A gives an example that they could not get public funds to fence the nature reserve to protect meadow birds. She noted that apparently low-tech solutions are not deemed innovative enough to gain public funding. In addition, there is little expertise available regarding such farming systems in a Dutch context (interviewee A).

In 2020, farm B received the NEWBIE (New Entrants into farming) prize for its unique farm that takes care of the goats and (soil) biodiversity, produces award winning cheeses, and generates an income [23]. Interviewee B shares the innovation barriers that she had to overcome to produce and sell goat cheeses in a natural way. Gaining food safety certifications is quite a procedure. Despite this success, the continuation of farm B is uncertain as the farm has no permits, and due to the nitrogen crisis, the municipality cannot give permits for new farms. There was a meeting between farmer B and the representatives of a municipality, the province and an intermediary to address the issue

and seek solutions. The province has recognized this undesirable situation and has asked the municipality to allow farm B to continue for a period of 18 months while the government seeks legal solutions.

In addition, farmer B explains that the calculation method used by the government to determine the nitrogen deposition does not consider the rare breed of goats she keeps, which are half the size of the breed of goats kept by Dutch goat farmers, and the way in which the herd is managed (i.e., little external feed and milking only once a day). Moreover, she cannot acquire the land that she needs to herd her goats due to fierce market competition on land. She currently owns less than 1 ha of land and leases around 11 ha of land.

Since 2016, farm C grows native Dutch soya and experiments with producing and selling Dutch soya milk, a product that is not available in the retail. The farm is run by two brothers who took over the family dairy farm. Soy milk has a lower climate footprint than cow's milk and the brothers are motivated to contribute to the protein transition. Interviewee C explains that setting up a new soymilk production and marketing chain is not easy. For example, no processing equipment was available that matched their production capacity and ambitions. In addition, the brothers had to organize the legal food safety protocols to be able to enter the food market. The government provided some support through a knowledge voucher and a subsidy for the proof-of-concept study. His experience is that civil servants that he talks to are really enthusiastic and want to assist in overcoming innovation barriers but that they are also bound by restrictive regulations that can hamper their ability to provide support (interviewee C).

The interviews with alternative farm A, B and C reveal that these farmers are driven to produce in a more environmentally friendly way and that they are experimenting with new farming systems and setting-up new markets. They had to conquer various innovation barriers, such as learning how to keep grass fed outdoor cows, goats and grow soy in a Dutch context and learning how to process their plant-based and goat milk into products they can sell, and organizing the legal registration, food safety and distribution of their products. Although these farmers have received lots of media attention, and praising from several policy makers, they receive limited financial, research and legal support which would share the innovation burdens. To address these issues with policy makers a stakeholders' workshop was organized.

3.3.2. Workshop

The workshop between policy makers, pioneering alternative farmers and researchers started with three pitches by the farmers in which issues were addressed that the farmers wanted to discuss with policy makers. After this, the twenty-two participants split in three sub-groups to discuss these issues in detail. The discussion on the topic of a lack of research and innovation support from the policy is included in this study, as this is the focus of this study. The discussions that are excluded from this study were about limited access to land and restrictive regulations.

The subgroup discussing the topic of lack of research and innovation support from the policy raised the following questions: how can alternative pioneering farmers that contribute to achieving circular agriculture goals of the Ministry of Agriculture become more visible in the policy? What kind of policy instruments are available that could support the research and innovations efforts of these farmers? How to create a connection between these alternative farmers and MBI?

During the workshop, a policy maker explained the current policy approach of setting clear policy goals and providing farmers the liberty to achieve this in different ways and the ambition to reward farmers who produce more sustainable products based on Key Performance Indicators (KPIs). A farmer responded by questioning how agro-ecological farmers can benefit from this, and how farmers who already stuck their neck out can be reached? Apparently, a subsidy was made for conventional farmers that want to switch to more sustainable farming systems. A researcher added that currently financial reward for producing more sustainability is organized per liter milk by dairy processors per ha through

EU subsidy payments and that this makes sense from the conventional dairy/arable farming perspective. However, these alternative pioneering farmers do not always have access to this subsidy due to the small size in terms of ha or milk production and due to alternative sales channels. During the discussion, it was recognized that apparently it was difficult to align current policy instruments to these alternative pioneering farmers. It was decided that the participating farmers would write a proposal for a quarterly meeting between these alternative pioneering farmers and the Ministry of Agriculture.

4. Discussion

This section reflects on the insights that the Dutch dairy case provides on the dynamics of governance of sustainability transitions in farming. In the Dutch dairy case, the dynamics of the transformation transition pathway can be recognized, in which core beliefs and practices change due to strong and continuous outside pressures [54]. For decades, the Dutch government and dairy sector were pressured by EU regulations as earlier made environmental agreements to achieve lower anthropogenic emissions were not achieved. These strong and prolonged pressures eventually led to stronger governmental interventions to structurally change Dutch farming practices.

Braams et al. [58] noted that most transition tasks fit poorly with current public administration traditions that legitimize governmental intervention., especially tasks that fall under the category of give direction and destabilize the unsustainable. Surprisingly enough, tasks that fall under these categories have been found in the case of Dutch governmental agricultural policy since the previous cabinet. For example, with the vision of circular agriculture, the Dutch government gave direction. The plans of land-based dairy farming can be recognized as a policy that destabilizes the unsustainable, as it hinders dairy farmer to keep a heard size that results in local manure surplus. So, although transition tasks fit poorly with current public administration traditions, when pressures to transform are strong and exist for long period of time, the legitimacy for the government to develop policies that destabilizes the unsustainable apparently rises.

Although several transition tasks were implemented by the Dutch government, it seems that less attention was given to the transition task of 'supporting the new'. This is rather surprising, as from a transition perspective 'supporting the new' is highly important. For example, in sustainability transition literature 'supporting the new' is most often mentioned as a governmental task [58]. Interviews with three alternative pioneering dairy farmers and an organized workshop between agroecological farmers and policy makers confirm that the task related to 'supporting the new' is limitedly experienced by pioneering farmers and according to policy makers difficult to implement. This is a missed opportunity, as supporting alternative pioneering farmers, who are already taking risky but important steps in realizing ecological and community benefits in addition to food, is important for achieving transition impact and ensuring a more socially responsible and inclusive transformation process.

A possible explanation as to why these pioneering farmers do not get sufficient governmental support is that this group does not demand policy attention as they do not cause an environmental problem for society. In addition, from a policy perspective, it makes sense to focus on changing the larger group of dairy farmers who need to take steps to become more sustainable, instead of focusing efforts on a smaller group of pioneers.

Concerning the policy plans and dairy industry approach of using MBI instruments with KPIs to motivate dairy farmers to produce more sustainability, it is questionable to what extend this will reach the alternative pioneering farmers. For example, most of these dairy products are not part of the regular dairy market and therefore, cannot benefit from the premiums provided by market players.

Overlooking pioneering alternative dairy farmers that experiment with more sustainable farming systems in policies for circular agriculture is unwise from a transition literature perspective and not inclusive. Additional tailored-made policy instruments are

needed targeted at pioneering farmers to distribute the costs and innovation burdens of these alternative sustainable farmers in a fairer way.

With regard to inclusiveness, we observe that the farmer's association felt excluded by the Ministry of Agriculture with regard to the fundamental rethink of manure policy, due to a lack of dialogue. However, the proposal of the association to include target steering with company specific accounting was included in the policy of the Ministry of Agriculture. This corresponds to an earlier finding that deliberation does not have to take place in order to integrate outside ideas. Other strategies, such as writing position papers and seeking media attention, are also ways to provide feedback on policy making [60].

5. Conclusions

The article explored the case of the Dutch dairy farming sustainability transition in an attempt to understand the governing of the sustainable farming transition in the Netherlands and to explore whether it takes place in a responsible and inclusive way. Dairy farming is one of the most debated agricultural sectors in the Netherlands when it comes to the emission of nitrogen and greenhouse gases into the environment. For decades, environmental policies have been developed and implemented for farming. Although emission levels lowered, international agreements are not yet met. Since 2019, the government has developed stronger governmental intervention to structurally change Dutch farming practices. These policies were mostly targeted at the larger group of dairy farmers who need to take steps to become more sustainable, and pioneering alternative dairy farmers seem to be overlooked. As the results of this study showed, overlooking such innovative farmers is a missed opportunity as transition literature argues that governments should implement a mix of transition tasks that cover the following aspects: give direction, create governance, support the new, destabilize the unsustainable and develop internal capabilities and structures. Excluding tasks that support the new make it hard to develop sustainable alternatives for the status quo, a central aspect of transitions, which is not only about breaking down and phasing out unsustainable practice but also about scaling sustainable alternatives.

The study has faced some limitation. First, there is no specific statistics available on the alternative dairy farms, as no distinction is made in Dutch Agricultural statistics on these farm types. Besides, the literature suggests that these pioneering dairy farms sometimes operate outside the traditional agricultural chains. Therefore, their data are not collected and stored making it hard to provide any precise quantitative information about these farms. Making a distinction in the statistics on these types of farms and keeping records will also allow one to quantify the impact that these farms have on sustainability improvements, which in its turn can help the Dutch government in designing tailor-made policies for a responsible and inclusive transition.

Author Contributions: Writing—original draft, A.-C.H. and L.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Wageningen University Knowledge Base program: Towards a circular and climate neutral society (Project KB-1-1D-1): Governance in transitions (Subtheme 1D), and the workshop was executed in collaboration with the Flagship 3 project (KB-40-002-001) and the Wageningen University Knowledge Base program: Nature inclusive transitions (Project KB-36-003-024). Both programs are supported by funding from the Dutch Ministry of Agriculture, Nature and Food Quality.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from interviewees involved in the study.

Acknowledgments: We thank the interviewees and reviewers for sharing their stories and providing feedback.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

References

1. World Economic Forum. *The Global Risks Report*; World Economic Forum: Geneva, Switzerland, 2021; p. 97. Available online: https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf (accessed on 15 June 2022).
2. Runhaar, R.; Funfschilling, L.; van den Pol-Van Dasselaar, A.; Moors, E.; Temmink, R.; Hekkert, M. Endogenous regime change: Lessons from transition pathways in Dutch dairy farming. *Environ. Innov. Soc. Transit.* **2020**, *36*, 137–159. [CrossRef]
3. Masi, M.; Vecchio, Y.; Pauselli, G.; Di Pasquale, J.; Adinolfi, F. A Typological Classification for Assessing Farm Sustainability in the Italian Bovine Dairy Sector. *Sustainability* **2021**, *13*, 7097. [CrossRef]
4. Bruil, J.; van den Berg, l.; Doornbos, S.; Oerlemans, N. *Farming with Biodiversity. Towards Nature-Positive Production at Scale*; WWF International: Gland, Switzerland, 2021; p. 27. Available online: https://www.wwf.nl/globalassets/pdf/farming-with-biodiversity_wwf-report-2021_spreads.pdf (accessed on 14 June 2022).
5. IPCC. Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems. Summary for Policymakers. Intergovernmental Panel on Climate Change. 2020, p. 41. Available online: https://www.ipcc.ch/srccl/chapter/summary-for-policymakers/ (accessed on 28 June 2022).
6. Moscovici, J.; Pierce, N.; Garvey, L.; Shalloo, T.; O'Callahgan, T. Invited review: A 2020 perspective on pasture-based dairy systems and products. *J. Dairy Sci.* **2021**, *104*, 7364–7382. [CrossRef]
7. Battini, F.; Agostini, A.; Tabaglio, V.; Amaducci, S. Environmental impacts of different dairy farming systems in the Po Valley. *J. Clean. Prod.* **2016**, *112*, 91–102. [CrossRef]
8. Cradock-Henry, N. Linking the social, economic, and agroecological: A resilience framework for dairy farming. *Ecol. Soc.* **2021**, *26*, 1–19. [CrossRef]
9. Polman, N.; Dijkshoorn, M. *Verdienmodellen Natuurinclusieve Landbouw*; Wageningen Economic Research: Wageningen, The Netherlands, 2019; p. 64. Available online: https://edepot.wur.nl/501143 (accessed on 28 June 2022).
10. Schreefel, L.; Schulte, R.; de Boer, I.; Pas Schrijver, A.; van Zanten, H. Regenerative agriculture—The soil is the base. *Glob. Food Sec.* **2020**, *26*, 1–8. [CrossRef]
11. Verduna, T.; Blanc, S.; Merlino, V.M.; Cornale, P.; Battaglini, L.M. Sustainability of four dairy farming scenarios in an Alpine environment: The case study of Toma di Lanzo cheese. *Front. Vet. Sci.* **2020**, *7*, 569167. [CrossRef]
12. Vermunt, D.; Wojtynia, N.; Hekkert, M.; Van Dijk, J.; Verburg, R.; Verweij, P.; Wassen, M.; Runhaar, H. Five mechanisms blocking the transition towards 'nature-inclusive' agriculture: A systemic analysis of Dutch dairy farming. *Agric. Syst.* **2022**, *195*, 103280. [CrossRef]
13. Jongeneel, R. *Notitie WUR Verdienmodel Agrarisch Ondernemers: Principes en Praktijken met de Melkveehouderij als Illustratie*; Wageningen Economic Research: Wageningen, The Netherlands, 2022; p. 6. Available online: https://www.tweedekamer.nl/downloads/document?id=ba00552b-ea6f-413a-a11f-f7fa7a764033&title=Position%20paper%20WUR%20t.b.v.%20rondetafelgesprek%20Verdienmodel%20agrarisch%20ondernemers%20d.d.%2017%20maart%202022.pdf (accessed on 28 June 2022).
14. Flaten, O.; Koesling, M.; Hansen, S.; Veidal, A. Links between profitability, nitrogen surplus, greenhouse gas emissions, and energy intensity on organic and conventional dairy farms. Agroecol. Sustain. *Food Syst.* **2019**, *43*, 957–983. [CrossRef]
15. Beldman, A.; Reijs, J.; Daatselaar, C.; Doornewaard, G. *De Nederlandse Melkveehouderij in 2030: Verkenning van Mogelijke Ontwikkelingen Op Basis van Economische Modellering*; Wageningen Economic Research: Wageningen, The Netherlands, 2020; p. 83. [CrossRef]
16. Hoes, A.-C.; de Lauwere, C. *Bedrijfsopties Die Bijdragen Aan Kringlooplandbouw: Beoordeeld Door Melkvee-, Varkens- Pluimveehouders, Glastuinbouwers en Akkerbouwers*; Wageningen Economic Research: Wageningen, The Netherlands, 2021; p. 59. [CrossRef]
17. Taskforce Verdienmodel Kringlooplandbouw. Goed Boeren Kunnen Boeren Niet Alleen. Rapport van de Taskforce Verdienvermogen Kringlooplandbouw. 2019, p. 64. Available online: https://edepot.wur.nl/502755 (accessed on 15 June 2022).
18. Leip, A.; Billen, G.; Garnier, J.; Grizzetti, B.; Lassaletta, L.; Reis, S.; Simpson, D.; Sutton, M.A.; De Vries, W.; Weiss, F.; et al. Impacts of European livestock production: Nitrogen, sulphur, phosphorus and greenhouse gas emissions, land-use, water eutrophication and biodiversity. *Environ. Res. Lett.* **2015**, *10*, 115004. Available online: https://iopscience.iop.org/article/10.1088/1748-9326/10/11/115004 (accessed on 28 June 2022). [CrossRef]
19. Van Zanten, H.H.; Van Ittersum, M.K.; De Boer, I.J. The role of farm animals in a circular food system. *Glob. Food Secur.* **2019**, *21*, 18–22. [CrossRef]
20. Segerkvist, K.A.; Hansson, H.; Sonesson, U.; Gunnarsson, S. Research on Environmental, Economic, and Social Sustainability in Dairy Farming: A Systematic Mapping of Current Literature. *Sustainability* **2020**, *12*, 5502. [CrossRef]
21. Geels, F. *Technological Transitions and System Innovations: A Coevolutionary and Socio-Technical Analysis*; Edward Elgar Publishing Ltd.: Cheltenham, UK, 2005; p. 328.
22. Grin, J.; Rotmans, J.; Schot, J. *Transitions to Sustainable Development. New Directions in the Study of Long Term Transformative Change*; Routledge: New York, NY, USA, 2010; p. 419.
23. Klingen, K. *Doetie's Geiten. Een Inkomen Met 75 Geiten*; Agrio, EKOLAND: 's-Heerenberg, The Netherlands, 2020; pp. 24–25.

24. Grin, J. The Governance of Transitions. An Agency Perspective. In *Transitions to Sustainable Development. New Directions in the Study of Long Term Transformative Change*; Grin, J., Rotmans, J., Schot, J., Eds.; Routledge: New York, NY, USA, 2010; pp. 265–284.
25. Rogge, K.; Reichardt, K. Policy mixes for sustainability transitions. An extended concept and framework for analysis. *Res. Policy* **2016**, *45*, 1620–1635. [CrossRef]
26. Kohler, J.; Geels, F.; Kern, F.; Markard, J.; Wieczorek, A.; Alkemade, F.; Avelino, F. An agenda for sustainability transitions research: State of the art and future directions. *Environ. Innov. Soc. Transit.* **2019**, *31*, 1–32. [CrossRef]
27. Hoes, A.-C.; Jongeneel, R.; van Berkum, S.; Poppe, K. *Towards Sustainable Food Systems: A Dutch Approach*; Wageningen Economic Research: Wageningen, The Netherlands, 2019; p. 56. Available online: https://edepot.wur.nl/498900 (accessed on 28 June 2022).
28. Jenkins, K.; Sovacool, B.; McCauley, D. Humanizing sociotechnical transitions through energy justice. An ethical framework for global transformative change. *Energy Policy* **2018**, *117*, 66–74. [CrossRef]
29. McCauley, D.; Heffron, R. Just transition: Integrating climate, energy and environmental justice. *Energy Policy* **2018**, *119*, 1–7. [CrossRef]
30. Onsongo, E.; Schot, J. *Inclusive Innovation and Rapid Sociotechnical Transitions. the Case of Mobile Money in Kenya*; Science Policy Research Unit, University of Sussex: Brighton, UK, 2017; p. 31. Available online: https://www.sussex.ac.uk/webteam/gateway/file.php?name=2017-07-swps-onsongo-and-schot.pdf&site=25 (accessed on 28 June 2022).
31. Agrimatie.nl. Available online: https://www.agrimatie.nl/ThemaResultaat.aspx?subpubID=2232&themaID=2286&indicatorID=2911 (accessed on 8 August 2022).
32. Agrimatie.nl. Available online: https://www.agrimatie.nl/SectorResultaat.aspx?subpubID=2232&sectorID=2245&themaID=2286 (accessed on 8 August 2022).
33. Agrimatie.nl. Available online: https://www.agrimatie.nl/PublicatiePage.aspx?subpubID=2523&themaID=2756&sectorID=3534 (accessed on 8 August 2022).
34. FAOSTAT. Available online: https://www.fao.org/faostat/en/?#data/QCL (accessed on 12 August 2022).
35. Jukema, G.; Ramaekers, P.; Berkhout, P. *De Nederlandse Agrarische Sector in Internationaal Verband*; Wageningen Economic Research: Wageningen, The Netherlands, 2021; p. 126. Available online: https://edepot.wur.nl/538688 (accessed on 28 June 2022).
36. Oenema, J.; Oenema, O. Intensification of Grassland-Based Dairy Production and Its Impacts on Land, nitrogen And Phosphorus Use Efficiencies. *Front. Agric. Sci. Eng.* **2021**, *8*, 1–10.
37. De Lauwere, C.; Bock, B.; van Broekhuizen, R.; Candel, J.; Geerling-Eiff, F.; de Koeijer, T.; Rougoor, C.; Termeer, K. *Agrarische Ondernemers over de Mestwetgeving: Beleving van Het Mestbeleid: Draagvlak, Knelpunten en Oplossingen*; Wageningen Economic Research: Wageningen, The Netherlands, 2016; p. 99. [CrossRef]
38. Fraters, B.; Hooijboer, A.; Vrijhoef, A.; Plette, A.; van Duijnhoven, N.; Rozemeijer, J.; Gosseling, M.; Daatselaar, C.; Roskam, J.; Begeman, H. Landbouwpraktijk en Waterkwaliteit in Nederland; Toestand (2016–2019) en Trend (1992–2019): De Nitraatrapportage 2020 Met de Resultaten van de Monitoring van de Effecten van de EU Nitraatrichtlijn Actieprogramma's. 2020. Available online: https://www.rivm.nl/publicaties/landbouwpraktijk-en-waterkwaliteit-in-nederland-toestand-2016-2019-en-trend-1992-2019 (accessed on 28 June 2022).
39. Aarts, H.; de Haan, M.; Schroder, J.; Holster, H.; de Boer, J.; Reijs, J.; Oenema, J.; Hilhorst, G.; Sebek, L.; Verhoeven, F.; et al. Quantifying the environmental performance of individual dairy farms-the annual nutrient cycling assessment. In *Grassland and Forages in High Output Dairy Farming Systems, Proceedings of the 18th Symposium of the European Grassland Federation, Wageningen, The Netherlands, 15–17 June 2015*; Dasselaar, A., Aarts, H., de Vliegher, A., Elgersma, A., Reheul, D., Reijneveld, J.V., Hopkins, A., Eds.; Ageningen Academic Publisher: Wageningen, The Netherlands, 2015; pp. 377–380.
40. PBL. *Grote Opgaven in een Beperkte Ruimte. Ruimtelijke Keuzes Voor een Toekomstbestendige Leefomgeving*; Planbureau voor de Leefomgeving: Den Haag, The Netherlands, 2021; p. 169. Available online: https://www.pbl.nl/sites/default/files/downloads/pbl-2021-grote-opgaven-in-een-beperkte-ruimte-4318.pdf (accessed on 28 June 2022).
41. Van der Wal-Zeggelink, C. Hoofdlijnen van de Gecombineerde Aanpak van Natuur, Water en Klimaat in Het Landelijk Gebied, en Van Het Bredere Stikstofbeleid. 2022, p. 24. Available online: https://www.rijksoverheid.nl/documenten/kamerstukken/2022/04/01/hoofdlijnen-van-de-gecombineerde-aanpak-van-natuur-water-en-klimaat-in-het-landelijk-gebied-en-van-het-bredere-stikstofbeleid (accessed on 28 June 2022).
42. Polit, D.; Beck, C. *Nursing Research. Generating and Assessing Evidence for Nursing Practice*, 9th ed.; JB Lippincott Williams & Wilkins: Philadelphia, PA, USA, 2012; p. 802.
43. Creswell, J.; Poth, C. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, 4th ed.; SAGE Publications: London, UK, 2018; 488p.
44. Hoes, A.-C.; van der Valk, O.; Kisters, T.; Termeer, E. *Gesprek Over Koeien, kringlopen En Mest; Melkveehouders en Ambtenaren over Mestpraktijk en Beleid*; Wageningen Economic Research: Wageningen, The Netherlands, 2022; p. 35. [CrossRef]
45. Hoes, A.-C.; Beers, P.; van Mierlo, B. Communicating tensions among incumbents about system innovation in the Dutch dairy sector. Environ. *Innov. Soc. Transit.* **2016**, *21*, 113–122. [CrossRef]
46. Van Doorn, A.; Reijs, J.; Erisman, J.; Verhoeven, F.; Verstand, D.; de Jong, W.; Andeweg, K.; van Eekeren, N.; Hoes, A.-C.; van Kernebeek, H.; et al. *Integraal Sturen op Doelen Voor Duurzame Landbouw via KPIs*; Wageningen Environmental Research: Wageningen, The Netherlands, 2021; p. 14. [CrossRef]

47. Hoes, A.-C.; Slegers, M.; Savelkouls, C.; Beldman, A.; Lakner, D.; Puister-Jansen, L. *Toekomstige Voedselproductie : Een Portret van Pionierende Boeren die Bijdragen aan Kringlooplandbouw in Nederland*; Wageningen Economic Research: Wageningen, The Netherlands, 2020; p. 47. [CrossRef]
48. Reijs, J.; Beldman, A.; Zijlstra, M.; Vrolijk, M.; Hoes, A.-C. *Building Farm-Level Sustainability Programmes in Agribusiness: A 5 Step Cycle Based on Lessons from Working with the Dairy Industry*; Wageningen University & Research: Wageningen, The Netherlands, 2021; p. 33. Available online: http://edepot.wur.nl/543101 (accessed on 28 June 2022).
49. Schagen, O.; Metze, T.; van Lieshout, M. *Samen Circulair; Tussen Theorie en Praktijk*; Wageningen University & Research: Wageningen, The Netherlands, 2021; p. 80. Available online: https://edepot.wur.nl/563644 (accessed on 28 June 2022).
50. Hassink, J.; Ottburg, F.; Bufe, C.; Schrijver, R.; Kruit, J.; Hoes, A.-C. Agroecology for Biodiversity. In *Circular@WUR 2022 Biosphere: Rethinking Our Food and Bio-Based Systems*; de Boer, I., Muller, A., van Apeldoorn, D., Kjerulf Petersen, J., Doornbos, S., Eds.; Wageningen University & Research: Wageningen, The Netherlands, 2022; pp. 1–3. Available online: https://library.wur.nl/ojs/index.php/CircularWUR2022/article/view/18232 (accessed on 28 June 2022).
51. Braun, V.; Clarke, V. Using Thematic Analysis in Psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [CrossRef]
52. Loorbach, D.; Frantzeskaki, N.; Avelino, F. Sustainability Transitions Research: Transforming Science and Practice for Societal Change. *Annu. Rev. Environ. Resour.* **2017**, *42*, 599–626. [CrossRef]
53. Raworth, K. Why it's time for doughnut economics. *IPPR Progress. Rev.* **2017**, *24*, 216–222. Available online: https://onlinelibrary.wiley.com/doi/10.1111/newe.12058 (accessed on 28 June 2022). [CrossRef]
54. Geels, F.; Schot, J. Typology of sociotechnical transition pathways. *Res. Policy* **2007**, *36*, 399–417. [CrossRef]
55. Vrolijk, H.; Reijs, 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; p. 37. Available online: https://edepot.wur.nl/533842 (accessed on 29 June 2022).
56. Geels, F. Reconceptualising the co-evolution of firms-in-industries and their environments: Developing an inter-disciplinary triple embeddedness framework. *Res. Policy* **2014**, *43*, 261–277. [CrossRef]
57. Hoes, A.-C.; van Der Burg, S.; Overbeek, G. Transitioning Responsibly Toward a Circular Bioeconomy: Using Stakeholder Workshops to Reveal Market Dependencies. *J. Agric. Environ. Ethics* **2021**, *34*, 21. [CrossRef]
58. Braams, R.; Wesseling, J.; Meijer, A.; Hekkert, M. Legitimizing transformative government: Aligning essential government tasks from transition literature with normative arguments about legitimacy from Public Administration traditions. *Environ. Innov. Soc. Transit.* **2021**, *39*, 191–205. [CrossRef]
59. Inigo, E.; Blok, V. Strengthening the socio-ethical foundations of the circular economy: Lessons from responsible research and innovation. *J. Clean. Prod.* **2019**, *233*, 280–291. [CrossRef]
60. Van Mierlo, B.; Beers, P.; Hoes, A.-C. Inclusion in responsible innovation: Revisiting the desirability of opening up. *J. Responsible Innov.* **2020**, *7*, 361–383. [CrossRef]
61. Voβ, J.; Bauknecht, D.; Kemp, R. *Reflexive Governance for Sustainable Development*; Edward Elgar: Cheltenham, UK; Northampton, MA, USA, 2006; p. 480.
62. Pickering, J.; Bäckstrand, K.; Schlosberg, D. Between environmental and ecological democracy: Theory and practice at the democracy-environment nexus. *J. Environ. Policy Plan.* **2020**, *22*, 1–15. [CrossRef]
63. Erisman, J.; Verhoeven, F. *Kringlooplandbouw in de Praktijk: Analyse en Aanbevelingen Voor Beleid*; Louis Bok Instituut: Bunnik, The Netherlands, 2019; p. 41. Available online: https://www.louis-bolk.nl/sites/default/files/publication/pdf/kringlooplandbouw-de-praktijk.pdf (accessed on 28 June 2022).
64. Dagevos, H.; de Lauwere, C. Circular business models and circular agriculture: Perceptions and practices of Dutch farmers. *Sustainability* **2021**, *13*, 1282. [CrossRef]
65. Dumont, A.; Warternberg, A.; Baret, P. Bridging the gap between the agroecological ideal and its implementation into practice. A review. *Agron. Sustain. Dev.* **2021**, *41*, 32. [CrossRef]
66. Frankowski, A.; Schulz, M.; van der Steen, M.; Schroer, L. *Omgaan Met Verlies in Transities. Voorbij een Focus Op Koplopers*; Nederlandse School voor Openbaar Bestuur: Den Haag, The Netherlands, 2021; p. 52. Available online: https://www.nsob.nl/sites/www.nsob.nl/files/2021-03/NSOB%20-%202021%20-%20Omgaan%20met%20verlies%20in%20transities.pdf (accessed on 28 June 2022).
67. Timmermann, C. *Social Justice and Agricultural Innovation*, 1st ed.; Springer: Cham, Switzerland, 2020; p. 236. [CrossRef]
68. Jongeneel, R. *Juiste en Eerlijke Prijzen Voor Voedsel*; Wageningen Economic Research: Wageningen, The Netherlands, 2020; p. 13. [CrossRef]
69. Driesen, D. Economic Instruments for Sustainable Development. In *Environmental Law for Sustainability*; Richardson, B., Wood, S., Eds.; Hart Publishing: Portland, OR, USA, 2006; pp. 277–308.
70. Gupta, J.; Shin, H.; Mattews, R.; Meyfroidt, P.; Kuik, P. The Forest Transition, the Drivers of Deforestation and Governance Approaches. In *Climate Change, Forest and REDD: Lessons for Institutional Design*; Gupta, J., van der Grijp, N., Kuik, O., Eds.; Routledge: London, UK, 2013; pp. 25–51.
71. Aramyan, L.; Valeeva, N.; Vittuari, M.; Gaiani, S.; Poltano, A.; Gheoldus, M.; Mahon, P.; Scherhaufer, S.; Paschali, D.; Cseh, B. *Market-Based Instruments and Other Socio-Economic Incentives Enhancing Food Waste Prevention and Reduction: Final Report*; Wageningen Economic Research: Wageningen, The Netherlands, 2016; p. 82. Available online: http://edepot.wur.nl/549089 (accessed on 28 June 2022).

72. EEA. *Market-Based Instruments for Environmental Policy in Europe*; European Environment Agency: Copenhagen, Denmark, 2005; p. 155. Available online: https://www.cbd.int/financial/doc/eu-several.pdf (accessed on 28 June 2022).
73. Requate, T. Dynamic incentives by environmental policy instruments—a survey. *Ecol. Econ.* **2005**, *54*, 175–195. [CrossRef]
74. Aramyan, L. *Measuring Supply Chain Performance in the Agri-Food Sector*; Wageningen Economic Research: Wageningen, The Netherlands, 2007; p. 175. Available online: http://edepot.wur.nl/121904 (accessed on 28 June 2022).
75. Doornewaard, G.; Hoogeveen, M.; Jager, J.; Reijs, J.; Beldman, A. *Sectorrapportage Duurzame Zuivelketen; Prestaties 2019 in perspectief*; Wageningen Economic Research: Wageningen, The Netherlands, 2020; p. 209. [CrossRef]
76. Da Motta, R.; Huber, R.; Ruitenbeek, H. Market based instruments for environmental policymaking in Latin America and the Caribbean: Lessons from eleven countries. *Environ. Dev. Econ.* **1999**, *4*, 177–201. Available online: https://www.jstor.org/stable/44379566#metadata_info_tab_contents (accessed on 28 June 2022). [CrossRef]
77. Jung, C.; Krutilla, K.; Boyd, R. Incentives for advanced pollution abatement technology at the industry level: An evaluation of policy alternatives. *J. Environ. Econ. Manage.* **1996**, *30*, 95–111. [CrossRef]
78. Montero, J. Permits, standards, and technology innovation. *J. Environ. Econ. Manag.* **2002**, *44*, 23–44. [CrossRef]
79. Remkes, J.; van Dijk, J.; Dijkgraaf, E.; Freriks, A.; Gerbrandy, G.; Maij, W.; Nijhof, A.; Post, E.; Rabbinge, R.; Scholten, M.; et al. Niet Alles Kan Overal: Eindadvies over Structurele Aanpak Op Lange Termijn. Adviescollege Stikstofproblematiek. 2020. Available online: https://edepot.wur.nl/523657 (accessed on 28 June 2022).
80. PLB. Evaluatie Meststoffenwet 2016: Syntheserapport, Den Haag: PBL. 2017. Available online: https://www.pbl.nl/publicaties/evaluatie-meststoffenwet-2016-syntheserapport (accessed on 28 June 2022).
81. MinLNV. *Agriculture, Nature and Food: Valuable and Connected | The Netherlands as a Leader in Circular Agriculture*; Ministry of Agriculture, Nature and Food Quality: The Hague, The Netherlands, 2018; p. 21. Available online: https://edepot.wur.nl/509271 (accessed on 28 June 2022).
82. MinLNV. *Realisatieplan Visie LNV*; Ministry of Agriculture, Nature and Food Quality: The Hague, The Netherlands, 2019; p. 85. Available online: https://open.overheid.nl/repository/ronl-131789fb-29dd-4d3e-b541-32b22d204b5a/1/pdf/LNV%20Realisatieplan_Juni_2019_WEB.pdf (accessed on 28 June 2022).
83. Schouten, C. Contouren Toekomstig Mestbeleid. Letter to Parliament from Minister of Agriculture, Nature and Food Quality. Date of Letter 8th September 2020. Available online: https://www.rijksoverheid.nl/documenten/kamerstukken/2020/09/08/kamerbrief-contouren-toekomstig-mestbeleid (accessed on 28 June 2022).
84. Schouten, C. Routekaart Toekomstig Mestbeleid. Letter to Parliament from Minister of Agriculture, Nature and Food Quality. Date of Letter 13th April 2021. Available online: https://www.rijksoverheid.nl/documenten/kamerstukken/2021/04/13/kamerbrief-over-routekaart-toekomstig-mestbeleid (accessed on 28 June 2022).
85. Reijs, J.; van Doorn, A.; van Hal, O.; de Jong, W.; Verhoeven, F. *Kansen en Knelpunten van een Systeem van Kritische Prestatie-Indicatoren (KPI's) om Integraal te Sturen naar de Doelen van Kringlooplandbouw*; Wageningen Economic Research: Wageningen, The Netherlands, 2022; p. 30. [CrossRef]
86. Erisman, J.; Verhoeven, F. *Integraal op Weg Naar Kringlooplandbouw 2030: Een Voorstel Voor Kritische Prestatie Indicatoren Systematiek*; Louis Bok Instituut: Bunnik, The Netherlands, 2020; p. 52. Available online: https://edepot.wur.nl/528146 (accessed on 28 June 2022).
87. LTO Nederland. Position Paper 'Contouren Toekomstig Mestbeleid LTO Nederland. 2020. Available online: https://www.lto.nl/wp-content/uploads/2020/11/Position-paper_Contouren-toekomstig-mestbeleid.pdf (accessed on 28 June 2022).
88. Van Dijk, J.; Van der Veer, G.; Woestenburg, M. *Waardevolle Informatie Natuurgedreven Kwaliteit. Onderzoek Naar een Kennisbasis Voor Natuurgedreven Landbouw*; Louis Bok Instituut: Bunnik, The Netherlands, 2020; p. 52. Available online: http://www.naturgedreven.nl/wp-content/uploads/2020/05/Eindrapport-WINK-LR.pdf (accessed on 28 June 2022).
89. Strootman, B.; Janseen, C.; de Boer, J. *Boer Doet Leven, Portretten van Landschapsboeren*, 1st ed.; Lecturis: Amsterdam, The Netherlands, 2020; p. 304.