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Policy framing of the protein transition in Dutch governmental documents from 2007 to 2018

MASTER'S THESIS INTERNSHIP – MASTER SUSTAINABLE BUSINESS AND INNOVATION

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ABBREVIATIONS AND ACRONYMS

BuZa: Ministry of Foreign Affairs
EU: European Union
EZK: Ministry of Economic Affairs and Climate Policy
FAO: Food and Agriculture Organization of the United Nations
GHG: Greenhouse gasses
I&W: Ministry of Infrastructure and Water Management
NGO: Non-governmental organisation
LNV: Ministry of Agriculture, Nature and Food Quality
OS: Ministry of Development Cooperation
PBL: Netherlands Environmental Assessment Agency
RLI: Council for the Environment and Infrastructure
RIVM: National Institute for Public Health and the Environment
RTRS: Round Table on Responsible Soy
VROM: Housing, Spatial Planning and Environmental Management
VWS: Ministry of Health, Welfare and Sport
WRR: Scientific Council for Government Policy

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SUMMARY

The current Dutch food system is unsustainable, as it contributes to climate change and biodiversity loss and creates challenges in animal welfare and public health. To decrease the environmental impact of diet and to stimulate public health, a protein transition is proposed: switching from a diet focused on animal-based protein towards a diet more focused on plant-based protein could lead to less environmental impact and better public health. Governmental policies could help to stimulate this complex transition.

The development of policies has a strong cognitive component, as policy makes' perceptions of the protein transition determine what policy is formed. These perceptions are studied using framing theory. Understanding these perceptions can give insight into what frames can help to successfully achieve this protein transition and how frames are used to make sense of this complex transition. In the Netherlands, the protein transition was placed on the governmental agenda in 2007, after a report from the Food and Agriculture Organisation (FAO) linking climate change to meat consumption. Therefore, this research investigated the following research question:

How has the protein transition been framed in Dutch governmental policies in the period between 2007 and 2018 and what are the implications for policy making?

To research this, 169 policy documents published between 2007 and 2018 were analysed and 21 semi-structured interviews were held with policy makers, politicians, researchers, advisors from governmental research agencies and other relevant stakeholders. It was found that the problem was mainly framed as the *ecological (un)sustainability of the livestock industry*, and the solution was framed as *making production in livestock industry more sustainable* and *investing in innovation of novel proteins*. This indicates a focus on the production side, and a lack of focus on the consumption side. The vision of the future is framed as *holistic sustainable production of animal-based products* and *becoming a global leader in sustainable production/circular agriculture*. The responsibility for enactment is framed as a *shared responsibility for the whole chai*n, however it seems that the consumer is hardly included in this responsibility to change.

Although several policy initiatives have been implemented between 2007 and 2018, there has not been a system change in the way protein is produced and consumed in the Netherlands. The implementation has been mainly focused on improving the production side of protein, with a strong focus on animal-based protein rather than plant-based protein.

EXECUTIVE SUMMARY

The current Dutch food system is unsustainable, as it contributes to climate change and biodiversity loss and creates challenges in animal welfare and public health. To decrease the environmental impact of diet and to stimulate public health, a protein transition is proposed: switching from a diet focused on animal-based protein towards a diet more focused on plant-based protein could lead to less environmental impact and better public health. Governmental policies could help to stimulate this complex transition.

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Although several policy initiatives have been implemented between 2007 and 2018 and certainly some progress is made, there has not been a system change in the way protein is produced and consumed in the Netherlands. The implementation has been mainly focused on improving the production side of protein, with a strong focus on animal-based protein rather than plant-based protein.

Based on the results in this thesis, the following is recommended for policy makers:

- **Focus policy on protein consumption rather than production.** Dozens of scientific reports recommended to implement policy intended to change consumers' diet towards a lower protein consumption, especially less animal-based protein, and to shift protein intake towards more plant-based options. However, this recommendation has not been converted into explicit policy.

- **Change the system, instead of adapting the current system.** The policies that were implemented between 2007 and 2018 mainly focused on changing the production side of the livestock industry, thereby only adapting the current system instead of changing the system. This will not lead to the vision of holistic sustainable production. Therefore, it is needed that the policy focusses on changing the whole system by addressing all the topics associated with protein production and consumption, such as animal welfare, public health, ecologic sustainability and economic opportunity, while incorporating the stakeholders in the global food chain. This is something that cannot be left to the market, but that needs strong and clear governmental guidance.

- **Shift the focus towards human food rather than animal feed.** From 2012 and onwards, the production of protein crops in Europe started to appear. However, most of these protein crops are intended for animal feed rather than human consumption. Even though this regional production of animal feed makes the production of animal-based protein more sustainable, it remains an inefficient way of producing food. It is therefore much more useful to stimulate the production of plant-based products using these regional grown protein crops.

- **Acknowledge the economic opportunities of plant-based proteins.** Even though the livestock industry is framed as having big economic importance, the production of plant-based proteins could in theory reach the same economic importance. The Provinces of Gelderland, Overijssel, Flevoland and Noord-Brabant are acknowledging this economic importance already, and it the protein transition could be stimulated if the economic opportunity of plant-based proteins was also more emphasised in national policy.

1. INTRODUCTION

The current Dutch diet with high intake of animal-based protein is not sustainable and contributes to climate change, deforestation, eutrophication of aquatic ecosystems, loss of biodiversity and arable land (Pohjolainen, Tapio, Vinnari, Jokinen, & Räsänen, 2016; Pohjolainen, Vinnari, & Jokinen, 2015; Sabaté & Soret, 2014; Tilman & Clark, 2014). It has also created public health challenges, such as increased risk of several non-communicable diseases (Abete, Romaguera, Vieira, Lopez de Munain, & Norat, 2014; Wolk, 2017) and animal welfare problems related to intensive framing, such as overcrowding and overuse of antibiotics (Planbureau voor de Leefomgeving, 2012).

Estimations show that the food system contributes to 19-29% of global greenhouse gas (GHG) emissions, with 80-86% of these emissions related to agricultural production (Steinfeld et al., 2006; Vermeulen, Campbell, & Ingram, 2012). This impact is predicted to grow due to global population and wealth growth (McMichael, Powles, Butler, & Uauy, 2007; Myers & Kent, 2008; Ranganathan et al., 2016).

Consuming more plant-based protein could reduce GHG emissions caused by food consumption by 20-30% compared to the current Western diet (Baroni, Cenci, Tettamanti, & Berati, 2007; Berners-Lee, Hoolohan, Cammack, & Hewitt, 2012; Tilman & Clark, 2014), as well as increase public health (Dinu et al., 2017; Hallström et al., 2017). The most promising recommendation for achieving a sustainable diet is to achieve a protein transition: switching from high consumption of animal-based protein to a diet rich in plant-based protein (Hallström et al., 2015; Pohjolainen et al., 2015; Ranganathan et al., 2016; Sabaté & Soret, 2014; Tilman & Clark, 2014; Tukker et al., 2011).

Despite the clear advantages for the environment and health to consume more plant-based protein, most protein intake in Western diets comes from animal-base sources. In Western countries such as the Netherlands, the consumption of animal-based protein is around twice the global average (Westhoek et al., 2011). The Dutch consume around 77 kg of meat (carcass weight) (Dagevos, Verhoog, van Horne, & Hoste, 2018) and 128 kg of dairy per capita per year ('Consumptie van zuivel(producten)', n.d.). Only 3-6% of the Dutch population identifies as vegetarian (De Bakker & Dagevos, 2010; Flycatcher, 2018; Keuchenius & van der Lelij, 2015), and this number has been relatively stable for the past decade.

This raises the question: how could the protein transition be stimulated in the Netherlands? According to a literature review from Garnett et al. (2015) on interventions to stimulate the protein transition, the government should take the lead and should introduce strong regulatory and tax-related policies. These strong policies would not only influence Dutch consumers, but also the Dutch agri-food sector and all other stakeholders in the food system and could therefore change the whole food system.

Policy has many definitions and can apply to a wide range of institutions, such as corporations, non-governmental organisations (NGO's) or universities. In this thesis, policy is defined as "a deliberate system of principles to guide decisions and achieve rational outcomes" (Beqiri & Rexhepi, 2017, p. 120) and the focus will be on governmental policies made by the Dutch Government. The development of policies has a strong cognitive component, as policy makers´ perceptions about the problem and solution of the protein transition determines how policy is framed. 'Framing theory' is a cognitive approach that considers how actors use frames (e.g. beliefs, perceptions and appreciations) in order to make sense of ambiguous and complex problems (Sengers, Raven, & Van Venrooij, 2010; Whitley, Gunderson, & Charters, 2018). When frames are expressed in policy documents, they are referred to as 'policy frames' (Dekker, 2017). These policy frames affect information processing and therefore influence the policy debate and decision-making.

Framing theory has been used in previous studies on policy making in general (Dekker, 2017; Ward, Donaldson, & Lowe, 2004) and on environmental policies in particular (Dijk & Montalvo, 2011) as it can help to understand why governments respond in a particular way to environmental challenges (Fletcher, 2009). However, it has not been applied yet to study policies regarding the protein transition. This research can give insight into how policy makers deal with the protein transition, a complex problem without a clear situation, and how policy makers deal with heterogenous interests of the involved stakeholders. Furthermore, studying policy frames regarding the protein transition can create understanding about how policies construct social reality and influence the public opinion, thereby reinforcing or decreasing the likelihood that consumers will change their diets (Whitley et al., 2018). Vice versa, this research can also give insight in how policy frames are influenced by personal and public frames of the protein transition.

Since 2007 the debate about the protein transition has been placed on the Dutch governmental agenda (Blonk, Kool, & Luske, 2008), following a report from the Food and Agriculture Organisation (FAO) linking climate change and meat consumption (Steinfeld et al., 2006). In order to understand what policy steps could be taken in the future to simulate the protein transition, the role of policy framing regarding the protein transition in the Netherlands will be studied, using the following research question:

How has the protein transition been framed in Dutch governmental policies in the period between 2007 and 2018 and what are the implications for policy making?

This research provides a reconstruction of protein transition policy frames in the Netherlands from 2007 to 2018. Understanding the perception of the protein transition by its stakeholders through framing can give insight into how to successfully achieve this protein transition. The results lead to recommendations to improve the efficiency of these policies, to achieve higher intake of plant-based protein, and in turn a more healthy and sustainable Dutch consumption pattern.

In Section 2, the theoretical framework explaining policy framing is discussed. Section 3 explains the qualitative methodology used for this research. This is followed by the results in Section 4, which consists of a reconstruction of the protein transition policy frames from 2007 to 2018 at the national and provincial level, followed by an analysis of these frames. Finally, this thesis ends with conclusions in Section 5 and a discussion with recommendations to improve the efficiency of policies regarding the Dutch protein transition in Section 6.

2. THEORETICAL FRAMEWORK

The protein transition involves changing the Dutch diet from a diet rich in animal-based protein towards a diet rich in plant-based protein. To achieve this, the whole Dutch agri-food system needs to change (Zwartkruis, Moors, Farla, & van Lente, 2012). It requires technological, structural, institutional and social changes, such as innovation in meat-alternatives (technological change), emergence of a new market for plant-based foods (structural change), changes in the policy and regulations to stimulate production of plant-based products (institutional change) and changed consumer habits (social change).

The Dutch agri-food system is a complex network involving a diverse set of stakeholders, such as farmers, societal organizations and NGO's, food processors, retailers and governmental organisations (see figure 1), each with different backgrounds, goals and ideas (Zwartkruis, 2013). For example, farmers could be mainly concerned with producing in the most cost-effective way, while NGO's could be more concerned with sustainable, but less cost-effective, production. This could lead to heterogeneous perspectives on the protein transition and conflicting interests. To reach a system change, all stakeholders should collaborate to achieve a protein transition.

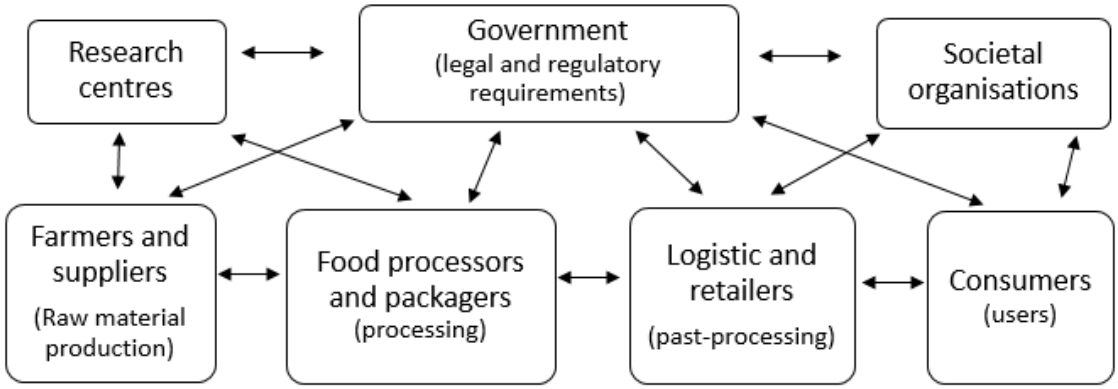

Figure 1. A simplified overview of the principal agri-food system stakeholders

Policy can help to structure and potentially align these different perspectives, thereby supporting system innovation (Edler & Fagerberg, 2017). It should be noted that policy-making is not solely based on rational and technical criteria (Addams & Proops, 2000; Schön & Rein, 2002). Rather, the frames policy actors, such as politicians and policy makers, use to perceive reality, determine the observed problems and solutions. Frames are defined as schema of interpretation to simplify the complex reality (Whitley et al., 2018). These frames are relatively static but can change when the context changes. For example, the Paris Agreement (2015) could influence the sense of urgency policy actors experience to tackle climate change. Studying frames over a longer period of time can help to understand how policy maker's interpretation of the protein transition has changed over the years and what has influenced this change.

Framing theory is part of discourse analysis. A discourse is a collection of expressions that provide social and physical phenomena with meaning (Hajer & Versteeg, 2005)**.** A discourse is likely to contain several ''interpretive packages'' that give meaning to an issue (Gamson & Modigliani, 1989). At the core of these packages is a frame. The content of frames is shaped when individuals start to talk about their own frames, for example during meetings between policy actors. This creates framing, an unavoidable process "through which actors define problems, attribute causality and responsibility, and generally influence the meaning of issues or problems" (Elzen, Geels, Leeuwis, & van Mierlo, 2011, p. 265).

Policymakers use framing to make sense of reality, both for the variety of *problems* they perceive as for the possible *solutions*. The focus of framing theory is how language constructs – rather than reflects – reality (Fletcher, 2009). Framing theory is therefore not focused on what the best

solution is to facilitate the protein transition. Rather, this approach focusses on how the proposed solution is socially constructed through policy documents: who and what have influenced the frame?

According to social constructivists, reality is based on perceptions (Kim, 2001). Therefore, the same facts about the protein transition can lead to different perceptions of problems and solutions, based on how actors perceive the issue. For example, what action is taken to decrease the impact of dairy in the Netherlands, depends on how the problem is framed. If it is, for example, framed as a production problem, the farmers should enact change by producing in a more sustainable way. However, if the solution is framed as a consumption problem, then stimulating consumers to drink more plant-based milk, for example, could be the most suitable option.

Policy frames are the frames presented in policy documents and are understood as "the outcome of a policy process in which multiple frames are contesting, but where one frame prevails and characterizes policies" (Dekker, 2017, p. 127). However, policy frames are not always coherent interpretations of a policy issue, as conflicting interests can also lead to ambiguous and contrasting policy frames (Dekker, 2017). For example, livestock farmers probably have little interest in reducing meat production because this could have financial consequences for their business, while researchers or societal organisations could see reducing meat production as a suitable solution to reach a protein transition. This could lead to two contrasting policy frames regarding the protein transition.

One of the main criticisms of framing theory, is its vague operationalisation (Scheufele, 1999). In order to make framing more precise, Zwartkruis (2013) defined three interconnected levels of social dynamics at which framing can take place: *global discourse*, *face-to-face interaction* and *localized collective (*see figure 2). The *global discourse* level is concerned with how frames are presented in society, for example the presentation of the protein transition in mass media. It is a macro-level perspective and research at this level is focused on society as a whole. What is highlighted or left out in this presentation of frames can influence the public opinion about the protein transition (Zwartkruis, 2013). The *face-to-face interaction* level investigates how individual frames develop over time in small-scale interaction (Zwartkruis, 2013). This level is a micro perspective that focuses on framing at the level of actors, such as policymakers. The third level, called the *localized collective* looks at the development of a shared vision by different stakeholders (Zwartkruis, 2013). This level is a meso perspective that is influenced by individual frames of the stakeholders and can be enabled or constrained by frames from the global discourse.

Many studies that use framing theory focus either on the individual perspective at the level of face-to-face interaction or on the framing of issues in the mass media at the global discourse level. Since policy frames are not solely the result of policy makers' individual frames or frames from the global discourse, studying the face-to-face interaction level or the global discourse level is not suitable for this study. Instead, policy frames result from the interaction of different actors that try to develop a shared vision, which is studied at the level of the localized collective. This research, therefore, focusses on the level of the localized collective to study changes over time in the policy framing regarding the protein transition.

At the level of the localized collective, an aligned vision is created (Zwartkruis, 2013). This aligned vision is presented in different so-called *topics* that are framed in policy documents. A topic can be defined as "a problem or a goal, relevant to one or more participants in the interaction" (Zwartkruis et al., 2012, p. 102). These topics can be traced back in policy documents and interviews. One way to investigate how policy frames about the protein transition have changed, is to study how topics on the protein transition are discussed in policy documents over time and what frame emerges within these topics. This is presented in the conceptual model in figure 2.

Framing analysis can be used to study many topics. However, based on the literature, five topics seem to be most relevant for policy framing. Frames can define what is problematic and what has caused these problems, leading to *problem identification* (Cuijpers, 2018; Dewulf, 2013; Elzen et al., 2011; Fletcher, 2009). The *problem identification* can lead to *solution identification,* framing what

options exist to solve the problem and what option should be selected to deal with the problem (Cuijpers, 2018; Dewulf, 2013). When there is a *solution identification*, a *vision for the future* can emerge from the shared understanding of the problem and solution at the level of the localized collective (Zwartkruis et al., 2012). This vision can lead to framing of *responsibility for enactment* (Elzen et al., 2011), identifying which stakeholder(s) are responsible for solving the problem of the protein transition. Finally, the *implementation of policy* is another important topic (Dewulf, 2013), as the implementation of policy can also influence the problem identification. For example, if an implemented policy is successful at solving a part of the problem, then this will change the framing of the problem identification.

The topics of *problem identification*, *solution identification, responsibility for enactment, vision for the future* and *implementation of the policy* (Cuijpers, 2018; Dewulf, 2013; Elzen et al., 2011; Fletcher, 2009; Zwartkruis et al., 2012) are expected to give insight into how the policy framing of the protein transition by stakeholders has changed over the period between 2007 and 2018. Further elaboration on the operationalisation of these five topics is done in Section 3, which covers the methodology.

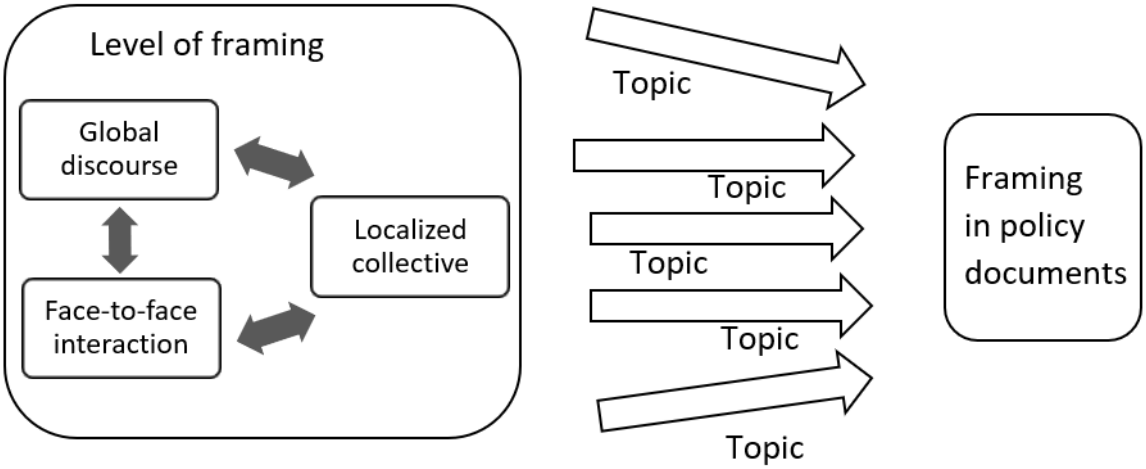

Figure 2. Conceptual model to analyse policy framing of the protein transition from 2007 to 2018 in Dutch governmental policy documents

3. METHODOLOGY

This section explains the research design and case selection (3.1), the operationalisation of the conceptual model (3.2), data collection of policy frames regarding the protein transition (3.3) and data analysis (3.4) to understand framing of the protein transition in Dutch governmental policy documents has changed from 2007 to 2018. Finally, Section 3.5 discusses the quality of the research.

3.1 RESEARCH DESIGN

This study made use of qualitative research methods including collection of data using document analysis and in-depth semi-structured interviews. Qualitative research allowed for detailed insights regarding individuals' perspective of the world (Bell, 2014). The data was derived from relevant stakeholders, such as Dutch ministries and governmental research agencies, with the aim to understand how policy framing on the protein transition has changed from 2007 to 2018.

This study was a case study of policy framing on the protein transition in the Netherlands. A single case study offers the opportunity to study one aspect of a problem, such as policy framing on the protein transition, in detail (Bell, 2014).

Data was collected over an eleven-year period because the aim of the study was to understand how policy frames have changed over time. The starting year 2007 was chosen because in this year the link between meat and its environmental effects was placed on the Dutch governmental agenda (Blonk et al., 2008), as a result of the FAO report 'Livestock's Long Shadow' (Steinfeld et al., 2006).

The Netherlands was considered an interesting case to analyse how policy framing of the protein transition has taken place for several reasons. Firstly, the Dutch consume twice the global average of animal-based protein (Westhoek et al., 2011) and consumed the least amount of plant-based protein in Europe in the year before the protein transition was placed on the Dutch governmental agenda (de Boer, Helms, & Aiking, 2006).

Secondly, the Dutch agri-food sector, especially dairy and meat production, are important for the Dutch economy: the dairy industry produced 14.5 billion kg of cowmilk in 2017 (ZuivelNL, 2017), contributing 1.3% (€8.3 billion) to the Dutch economy. The livestock industry produced €10,4 billion worth of meat in 2017 (AgriFoodTech platform, 2017). The protein transition can have financial drawbacks for dairy farmers and meat producers, which could lead to resistance, ambiguous policy framing and conflicting interests between stakeholders.

Thirdly, the protein transition is an interdepartmental theme for the Dutch Government, meaning multiple ministries are involved. The most involved ministries are the Ministry of Economic Affairs and Climate Policy (EZK), which is concerned with creating a strong economy and a climate neutral society; the Ministry of Infrastructure and Water Management (I&W), which is concerned with creating a clean and safe living environment; the Ministry of Agriculture, Nature and Food Quality (LNV), which is concerned with producing sustainable food and maintaining a vital countryside; and the Ministry of Health, Welfare and Sport (VWS), which is concerned with public health and food safety. These different ministries could have different visions or policy measures, and it is interesting to study how these different perspectives can lead to an aligned vision.

Frames cannot be directly observed but the expression of policy frames and framing can be analysed through textual expression in policy documents. The focus of this research was on the policy framing that takes place at the level of the localized collective. Framing theory lacks a unified methodology, but consists of a diversity of methods to analyse discourse (Scheufele, 1999). In this study, frames were studied by tracing back topics in policy documents and interviews. A *biography of the topic* (Zwartkruis et al., 2012) is a reconstruction of the appearance and departure of topics in policy documents. This can give insight into how framing of topics has changed in the political discourse over time. In section 3.2 these *topics* will be operationalised.

3.2 OPERATIONALISATION

The conceptual model presented in figure 2 was operationalised as follows:

A *policy frame* about the protein transition was defined as text in a policy document that describes the transition from the Dutch consumption and production of animal-based protein towards the consumption and production of more sustainable animal-based protein and plant-based proteins.[1]

The following *topics* derived from literature were used to study policy framing of the protein transition at the level of the localized collective (see Table 1).

Table 1. Topics derived from literature to study policy framing of the protein transition by stakeholders

Topic	Definition	Reference
Problem identification	The framing of why a protein transition is necessary. What parts of the problem are most emphasised? Has the problem identification changed based on previous policies?	Cuijpers, 2018; Elzen et al., 2011; Dewulf, 2013; Fletcher, 2009
Solution identification	The framed solution to solve the problem related to the protein. What parts of the solution are most emphasised? Has the solution identification changed based on previous policies?	Cuijpers, 2018; Elzen et a.l, 2011; Dewulf, 2013; Fletcher, 2009
Responsibility for enactment	The stakeholders that are identified as responsible to solve the problem. Who should act?	Elzen et al., 2011
Vision for the future	The vision for the future. What does sustainable consumption and production of protein in the future look like? What are the targets/goals?	Zwartkruis et al., 2012
Implementation of policy	The framing of the implemented policy measures. How have the policies been enacted, taken up, modified, ignored and/or rejected?	Dewulf, 2013

The *localized collective level* was operationalised as the policy documents that result from collective interaction with policy makers (and their own individual frame) and the global discourse. The policy frames at this level were collected using the topics described in Table 1.

The *global discourse level* was operationalised as (inter)national events, (climate) conferences, research papers or reports that have influenced Dutch governmental policy regarding the protein transition. Examples are the Paris agreement that was signed in 2015 and the United Nations (UN) Sustainable Development Goals (SDG's) that were signed in 2016. The global discourse level was analysed in policy documents when these documents mentioned an event or report that influenced the writing of this policy document. This influence could be recognised by sentences in policy documents such as 'as a result of … [event X]' or 'as a response to… [report Y]'. These sentences were

[1] There are several definitions of the protein transition, but this is the definition used in documents from the Dutch central government and therefore it will be used in this research.

mainly found in the introduction of the policy document and were seen as the context in which framing has been taking place.

The *face-to-face interaction* level was operationalised as the individual opinion of policy makers or other relevant stakeholders. In this research this level is not specifically included, as the frames presented in policy documents are a result of the individual frames of several stakeholders combined.

Section 3.3. will explain how the policy frames regarding the protein transition were collected.

3.3 DATA COLLECTION

Two qualitative methods were used to collect the data: in-depth semi-structured interviews with policy makers and policy experts; and a document analysis of governmental policy documents published between the years 2007 and 2018.

3.3.1 DOCUMENT ANALYSIS

Documents published between January 2007 and December 2018 by Dutch governmental stakeholders (Table 2) were gathered, using the public database on the website of each ministry, agency or council from the website from each relevant stakeholder. All sort of documents were gathered: meeting documents, public letters, speeches, annexes to documents and (policy) reports. From now on, these are referred to as 'policy documents'. All documents found during the database search were first scanned to identify if there were actually protein transition policy frames present. If this was not the case, the document was excluded. Duplicated reports or summaries of already included documents were excluded.

Documents were searched for using the following Dutch keywords: *eiwit-* (protein-*), vlees-* (meat), *melk-* (milk) and *plantaardig (*plant-based*)*. The dash means that trailing letters are permitted, leading to more search results. These keywords were chosen based on a small search pilot. In total, 5767 documents were scanned, of which only 3% were relevant (169 documents).

Table 2. Relevant governmental stakeholders for data collection

Stakeholder	Organisation	Database for publications
Ministry of Economic Affairs and Climate Policy (EZK)	Ministry	https://www.rijksoverheid.nl/ministeries/ministerie-van-economische-zaken-en-klimaat/documenten For example: - October 2017: *"Reactie op de 'Voedselvisie naar een gezond en duurzaam voedselsysteem in 2030' van Stichting Natuur & Milieu''* - December 2010: *"Schaalvergroting, een waarde(n)volle ontwikkeling?''*
Ministry of Infrastructure and Water Management (I&W)	Ministry	https://www.rijksoverheid.nl/ministeries/ministerie-van-infrastructuur-en-waterstaat/documenten For example: - January 2018: "*Transitie-agenda circulaire economie: biomassa & voeding''* - October 2015: *"Kamerbrief over de voedselagenda voor veilig gezond en duurzaam voedsel"*
Ministry of Agriculture, Nature and Food Quality (LNV)	Ministry	https://www.rijksoverheid.nl/ministeries/ministerie-van-landbouw-natuur-en-

		voedselkwaliteit/documenten For example: - September 2018: *''September 2018: Kamerbrief over reactie RLI-advies "Duurzaam en gezond, samen naar een houdbaar voedselsysteem"* - October 2008: *"Milieueffecten van Nederlandse consumptie van eiwitrijke producten"*
Ministry of Health, Welfare and Sport (VWS)	Ministry	https://www.rijksoverheid.nl/ministeries/ministerie-van-volksgezondheid-welzijn-en-sport/documenten For example: - April 2018: *"Kamerbrief over accenten in het voedselbeleid voor de komende jaren"* - July 2013: *"Beleidsbrief Duurzame Voedselproductie''*
Scientific Council for Government Policy (WRR)	Independent scientific council	https://www.wrr.nl/publicaties For example: -March 2016: *"Antwoorden op schriftelijke vragen over Naar een voedselbeleid"* - September 2014: *"Naar een voedselbeleid''*
Council for the Environment and Infrastructure (RLI) (from 2012)	Independent advisory board	https://www.rli.nl/publicaties For example: - March 2018: *"Duurzaam en gezond, samen naar een houdbaar voedselsysteem"*
National Institute for Public Health and the Environment (RIVM)	Governmental research agency, part of VWS	https://www.rivm.nl/publicaties For example: -March 2016: *"Wat ligt er op ons bord? Gezond, veilig en duurzaam eten in Nederland"*
Netherlands Environmental Assessment Agency (PBL)	Governmental research agency, part of I&W	https://www.pbl.nl/publicaties For example: - September 2018: *"Analyse van het Voorstel voor hoofdlijnen Van het klimaatakkoord"* - September 2008: *"Vleesconsumptie en klimaatbeleid''*
Dutch Health Council	Independent scientific advisory board for government and parliament	https://www.gezondheidsraad.nl/documenten For example: - November 2015: *"Richtlijnen goede voeding 2015''*
	Archives of Governmental documents	http://rijksoverheid.archiefweb.eu/#archive For example: - October 2008: *"Brief van de ministers van landbouw, natuur en Voedselkwaliteit en van volkshuisvesting, ruimtelijke ordening en milieubeheer"*

3.3.2 SEMI-STRUCTURED INTERVIEWS

After the document search and analysis, in-depth semi-structured interviews were held to gain access to information about the protein transition that was not covered in the documents and to triangulate the results from the policy documents with experts. Semi-structured interviews allowed for flexibility and structure in the questions asked (Bryman, 2016). The topics addressed were: *problem identification of the current protein consumption and production, solution identification, vision for the future, responsibility for enactment* and *implementation of policy.* To understand the context in which policy framing took place, also questions were asked about developments in the global discourse that might have influenced the policy frames on protein transition (see appendix A for interview guide).

Before the start of the research, two pilot interviews were held with key stakeholders to verify the conceptual model and the identified stakeholders (Table 2) and to explore the Dutch policy context in which the protein transition has been taking place.

Interviewees were acquired using purposeful and referral sampling. They were (formerly) working as scientists, (policy)advisors, politicians or policy makers in relevant Dutch organisations dealing with policy regarding the protein transition (see Table 2). These included the Dutch Ministry of Economic Affairs and Climate Policy (EZK), the Dutch Ministry of Agriculture, Nature and Food Quality (LNV), universities, relevant independent advisory scientific councils and governmental research agencies. Also, stakeholders from four Dutch provinces (Overijssel, Gelderland, Flevoland and Noord-Brabant) were interviewed, as these provinces were the first to implement provincial policy regarding the protein transition and because they started working together with the Ministry of LNV to develop a national protein strategy in 2019.

Interviews continued until theoretical saturation was reached. Interviews were held in Dutch and lasted 30-60 minutes per interviewee. The interviews were transcribed ad verbatim. Interviewees remained anonymous and were described using their job title (see appendix C). The interviewees got the opportunity to proofread the results before publication. In total, 21 interviews were held.

Section 3.4 will explain how the collected data was analysed in order to understand how the policy frames regarding the protein transition have changed from 2007 to 2018.

3.4 DATA ANALYSIS

In order to analyse the policy frames, a qualitative data analysis was conducted. All policy frames found in the documents and the transcripts from the semi-structured interviews were organised and analysed in the qualitative data program NVivo 12. In order to understand how framing took place in between 2007 and 2018, it is important to look at the political context during the time the policy was created. It is not only important to know *what* was framed, but also *who* framed it, as individual frames from ministers or political parties could also influence policy frames of the protein transition. Therefore, the governmental policy frames regarding the protein transition were analysed in four time periods, corresponding with four Dutch cabinets that were active between January 1st, 2007 and ending on December 31st, 2018. These cabinets were Balkenende IV (from 2007 to 2010), Rutte I (from 2010-2012), Rutte II (from 2012-2017) and Rutte III (from 2017 until time of writing, but the scope of this thesis is between 2007 and 2018). In this way, changes over time in framing could be observed.

The documents and transcripts of the interviews were coded in Dutch. The quotes used in the results section, the interview guide (appendix A), codebook (appendix B) and frames were translated from Dutch to English. Documents and interviews were coded using a combination of data-driven and concept-driven coding. This is done to also include concepts that arise from the data and that have not been previously identified from the theory. The concept-driven concepts were *problem identification*, *solution identification, vision for the future, responsibility for enactment* and *implementation of policy* (see section 3.2). For the data-driven coding, a three coding procedure using open, axial and selective coding was used (Corbin & Strauss, 1990). During open coding, all policy frames were read in order to

come up with conceptual labels. These concepts had to be repeatedly present in the text. The next step involved axial coding and looked for a relation between the concepts, in order to come up with new categories. Finally, selective coding related all categories to one core category.

In the next and final section of the methodology, the research quality of this research will be discussed.

3.5 RESEARCH QUALITY

In this section, the research quality is discussed by assessing the research quality indicators validity, reliability, generalisability and the methodological limitations of the methods.

Validity in qualitative research means "the 'appropriateness' of the tools, processes, and data" (Leung, 2015, p. 325). To ensure validity, data triangulation was used. By using several data sources, multiple perspectives were gained, providing a more holistic picture of reality (Adami & Kiger, 2005). The expert interviews were held to gain additional information, but also to confirm the stakeholders and the policy documents. This served as a check that no important stakeholders or documents were left out of the analysis. In order to get a complete picture of the framing of the protein transition, interviews were held until theoretical saturation was reached and no new information came up. To establish consistency and validity of the coding of the documents and interviews, an interview guide (appendix B) and a codebook was used (appendix B).

Reliability refers "to exact replicability of the processes and the results" (Leung, 2015, p. 326). To ensure reliability, the codebook and interview guide are provided in appendixes A and B. However, since this is a qualitative study, exact replicability will not be possible, as some sort of subjectivity from the researcher and the interviewees will always be present.

Another research quality indicator is generalisability. This research only considers the protein transition in the Dutch context. Therefore, it is not generalisable to other countries or to other subjects that are framed in policies. The results from this research could be used as inspiration for new research, but this is not the main goal of this research.

The methods of document analysis and semi-structured interviews have limitations, such as recall bias during the interviews. Since this is a retrospective study, possibly not all interviewees remember exactly what happened ten years ago. Limitations of the document analysis could be that not all documents are publicly available, or that document are incomplete, inaccurate, inconsistent or biased. This, however, could also be seen as another way of framing: by leaving out certain aspects and emphasizing others.

In the next section, the results from the analysis of the policy frames regarding the protein transition will be explained.

4. RESULTS

In order to reconstruct the policy frames of the protein transition in Dutch policy documents from 2007 until 2018, 169 documents were analysed (see Table 3) and 21 semi-structured interviews were held with key stakeholders. Several topics were analysed in order to see how the protein transition had been framed in policy documents: *problem identification of why a protein transition is needed, solution identification to reach this protein transition, responsibility for enactment, vision for the future* and *implementation of policies regarding the protein transition.*

Table 3. Collection of policy documents divided per stakeholder and year of publication
***EZK** = Ministry of Economic Affairs and Climate Policy*
***I&W** = Ministry of Infrastructure and Water Management*
***LNV** = Ministry of Agriculture, Nature and Food Quality*
***VWS** = Ministry of Health, Welfare and Sport*
***WRR** = Scientific Council for Government Policy*
***GR** = Dutch Health Council*
***RLI** = Council for the Environment and Infrastructure*
***PBL** = Netherlands Environmental Assessment Agency*
***RIVM** = National Institute for Public Health and the Environment*
***Gov docs** = documents originating from the Government, but not published by one specific Ministry*
***Other** = other documents originating from non-governmental organisations, such as NGO's*
***n.a** = not applicable, because Ministry of LNV was part of EZK from 2011-2017 and RLI was established in February 2012.*

	EZK	I&W	LNV	VWS	GR	PBL	RIVM	RLI	WRR	Gov doc	Other	Total
2007	0	1	5	0	0	3	0	n.a	0	0	0	9
2008	0	0	8	0	0	3	0	n.a	0	0	2	13
2009	0	2	9	0	0	1	0	n.a	0	0	1	13
2010	4	1	7	1	0	3	0	n.a	0	0	0	16
2011	2	0	n.a	0	1	2	0	n.a	0	1	1	7
2012	1	0	n.a	0	0	3	1	0	0	1	0	6
2013	4	0	n.a	0	0	2	0	0	0	1	0	7
2014	2	0	n.a	0	0	1	0	0	1	0	0	4
2015	3	1	n.a	1	1	2	2	0	2	0	1	13
2016	11	4	n.a	2	0	1	2	0	1	3	3	27
2017	12	1	n.a	0	0	2	1	0	0	0	5	21
2018	3	2	17	2	0	2	0	2	0	2	3	33
Total	42	12	46	6	2	25	6	2	4	8	16	169

Documents were collected from different stakeholders, such as Dutch ministries, independent advice councils and governmental research agencies (Table 3). Most analysed documents originated from the Dutch Ministry of Agriculture (LNV), which is the ministry concerned with agricultural policy and food policy. It should be noted that some of the documents were interdepartmental. This is not taken into account in Table 3. Between 2007 and 2018, the names of the ministries have changed several times due to appointments of new cabinets (for an overview, see Table 4). In order to prevent any confusion in the names of the ministries, the names of the ministries used in current Cabinet Rutte III will be used in the rest of the thesis from section 4.2 and onwards.

Section 4.1 further explains these changes, while also giving a chronological historical overview of national governmental policy documents and their policy frames regarding the protein transition. For readability and a global overview, only the policy documents that were mentioned most often in the interviews, or contained the most policy frames, will be described in this section. Section 4.2 provides illustrative examples of the policy frames found in provincial policy in five Dutch provinces. Section 4.3 gives an analysis of the policy frames per topic, so that differences in framing over time can be understood, and also introduces new topics that emanated from the results.

4.1 POLICY FRAMES REGARDING THE PROTEIN TRANSITION IN NATIONAL GOVERNMENTAL POLICY

This section discusses the policy frames regarding the protein transition that were found in Dutch national governmental policy documents between 2007 and 2018. From 2007, the protein transition started to appear on the political agenda, mainly because of the FAO report Livestock's Long Shadow (Steinfeld et al., 2006). During the years 2007 to 2018, four cabinets were active in the Netherlands. These changes in the cabinet also led to changes in the names and responsibilities of ministries, since new ministries were formed, or ministries were merged (see Table 4). These changes as well as the policy frames regarding the protein transition will be discussed in Section 4.1.1 to 4.1.4.

Table 4. Cabinets that were active between 2007 and 2018 and responding Ministries and their Ministers or Secretary of State that were involved in the protein transition

Time period	Ministries	Minister/Secretary of State	Cabinet
2017-2018	**Economic Affairs and Climate Policy (EZK)**	Eric Wiebes (VVD)	Rutte III
2012-2017	Economic Affairs (EZ)	Co Verdaas (PvdA; 2012-2012) Sharon Dijksma (PvdA; 2012-2015) Martijn van Dam (PvdA; 2015-2017)	Rutte II
2010-2012	Economic Affairs, Agriculture and Innovation (ELI)	Henk Bleker (CDA)	Rutte I
Until 2010	Economic Affairs (EZ)	Maxime Verhagen (CDA)	Balkenende IV
2017-2018	**Agriculture, Nature and Food Quality (LNV)**	Carole Schouten (CU)	Rutte III
2010-2017	(part of EZ)	-	Rutte I&II
Until 2010	Agriculture, Nature and Food Quality (LNV)	Gerda Verburg (CDA)	Balkenende IV
2017-2018	**Infrastructure and Water Management (I&W)**	Stientje van Veldhoven (D66)	Rutte III

2012-2017	Infrastructure and Environment (I&M)	Wilma Mansveld (PvdA; 2012-2015) Sharon Dijksma (PvdA) (2015-2017)	Rutte II
2010-2012	Infrastructure and Environment (I&M)	Joop Atsma (CDA)	Rutte I
Until 2010	Housing, Spatial Planning and Environmental Management (VROM)	Jacqueline Cramer (PvdA)	Balkenende IV
2017-2018	**Health, Welfare and Sport (VWS)**	Paul Blokhuis (CU)	Rutte III
2012-2017	Health, Welfare and Sport (VWS)	Edith Schippers (VVD)	Rutte II
2010-2012	Health, Welfare and Sport (VWS)	Edith Schippers (VVD)	Rutte I
Until 2010	Health, Welfare and Sport (VWS)	Ab Klink (CDA)	Balkenende IV

4.1.1 FROM 2007 TO 2010: MEAT AS A CABINET PRIORITY FOR CABINET BALKENENDE IV

From February 2007 until February 2010, Cabinet Balkenende IV was active in the Netherlands. In the coalition agreement, sustainability was explicitly included (R18; R20), leading to a cabinet-wide approach to sustainable development (R21). This cabinet had identified six strategic and sustainable priorities. ´Biodiversity, food and meat´ was one of them (R18), and this theme also included the protein transition. The protein transition was put on the agenda mainly because of the FAO report Livestock's Long Shadow (Steinfeld et al., 2006), which linked meat consumption to climate change (R5; R18; R20). Due to the urgency and complexity of the protein transition, Cabinet Balkenende IV made this a cabinet priority with its own policy agenda: the interdepartmental programme on sustainable food systems. This programme was carried out in cooperation with from former Minister Gerda Verburg (Ministry of Agriculture, Nature and Food Quality; LNV), Minister Jacqueline Cramer (Ministry of Housing, Spatial Planning and Environmental Management; VROM) and Minister Bert Koenders (Minister of Development Cooperation; OS, which is part of the Ministry of Foreign Affairs; BuZa).

Several parliamentary questions were asked by Marianne Thieme, political leader of the Party for the Animals (PvdD) on how the cabinet wanted to discourage meat consumption in the years 2007 and 2008 (Cramer, 2007; Verburg & Cramer, 2007b, 2007a). It was the first time that PvdD was part of the House of Representatives and the party's aim was to put animal welfare on the political agenda. Thieme framed reduction of meat consumption as a solution to tackle climate change and to reduce the high greenhouse gas emissions related to agriculture (Cramer, 2007; Verburg & Cramer, 2007b, 2007a). The Minister of LNV, Gerda Verburg, replied: "I expect that these [climate goals] can be achieved without interfering with consumption patterns. Of course, a change in consumption pattern, as advocated by you [to Marianne Thieme], can help with that."(Verburg & Cramer, 2007b, p. 1) and she continues that: "climate policy will not explicitly focus on reducing the consumption of meat and dairy products. This does not alter the fact that greenhouse gas emissions from agriculture will have to be reduced. Explorations are being conducted on the possibilities to do this.'' (Verburg & Cramer, 2007b, p. 2).

The policy of the Minister of LNV was therefore aimed at stimulating innovations in the agricultural chain, resulting in a focus on the production side of the food chain. Interviewee R18 mentioned that this focus on innovation was mainly because of a dichotomy in the House of Representatives: although there were political parties that wanted a decrease in meat consumption (e.g. PvdD), several political parties (e.g. the traditional 'livestock' parties, such as CDA and VVD) were against this decrease in consumption as it would threaten the intensive livestock industry and the farmers. Since Verburg herself was a member of CDA, it became difficult for the Minister of LNV to implement new policy that would shrink the intensive livestock industry. Instead, the strategy focused

on stimulating new plant-based innovations and stimulating the current livestock farming industry to produce in a more sustainable way.

The Government had not planned any specific communication activities to actively promote a more plant-based diet. Information regarding nutrition and its environmental aspects was – and still is – provided by the Dutch Nutrition Centre '*Voedingscentrum*' and the Dutch NGO '*Milieu Centraal*', with financial support from the Government (R5;R20; Cramer, 2009; Klink & Verburg, 2010; Mansveld, 2015; Schouten & Blokhuis, 2018; Van Dam, 2016). The Dutch Nutrition Centre provides information regarding healthy, safe and sustainable food choices based on scientific research, for example using campaigns such '*Jij kan kiezen'* (You can choose) from 2009, that focused specifically on sustainable food choices (Cramer, 2009; Verburg, 2008a, 2010b). *Milieu Centraal* is an NGO that provides information based on scientific research regarding sustainable choices in the household, which also includes food choices.

During the period between 2007 and 2010, several parties (such as GroenLinks, D66 and PvdD) were suggesting increasing the VAT on meat from 6% to 19%, in order to discourage meat consumption (Cramer, 2007; Elzen et al., 2011; van den Wijngaart, Elzenga, & van den Brink, 2007). The cabinet framed trade related, tax-legal and administrative objections against such a meat tax(Cramer, 2007), and therefore a meat tax was not implemented.

In the global discourse, social resistance against the livestock industry increased in 2007, mostly because of the citizen's initiative ('*Stop fout vlees*', 2007*)* (Stop wrong meat) from NGO '*Milieudefensie'* (Friends of the Earth Netherlands) and the documentary Meat the Truth (2007) from the scientific department of the Party for the Animals (PvdD). These initiatives were framing the problem of eating meat as issues with animal welfare and the big environmental impact. As a response, Minister Gerda Verburg (LNV) released '*Toekomstvisie veehouderij'* (Future vision for sustainable livestock farming) (Verburg, 2008b). In this document she envisioned that in 2023 the Dutch livestock farming industry would produce in an 'holistic sustainable' way, meaning with respect for people, animals and the environment worldwide. Verburg mentioned that focussing only on one value (e.g. animal welfare) could lead to trade-offs with other values (e.g. environmental sustainability or profit) and emphasised that the Dutch livestock industry should also be careful not to price itself out of the (international) market. It was therefore necessary to focus on all aspects of the triple bottom line: people, planet and profit. Verburg framed achieving this vision as one of the most important tasks in her policy for food, nature and agriculture. She framed four main challenges for the livestock industry to tackle: meeting the growing demand for protein crops, producing food in a climate- and energy neutral way, increasing animal welfare and innovating products and production methods.

In order to produce more sustainably, Verburg framed that adequate cooperation between the sector, society and government as necessary, also at the international level.

In her 2008 vision for livestock framing (Verburg, 2008b), Verburg mentioned six priorities for the livestock sector to focus on:

1) System innovations, especially innovative and holistic sustainable stable systems
2) Increasing the welfare and health of animals
3) Connecting the farmer and society by increasing transparency about production
4) Reducing energy use and nuisance for the environment, mainly focused on reducing GHG emissions, ammonia, particulate matter and odour, as well as reducing the use of artificial manure
5) Strengthening innovative and sustainable entrepreneurship
6) Making the consumer aware of responsible consumption and increasing the sustainable supply of food products

No concrete solutions were mentioned for how the sector could become more sustainable. Verburg stated: “I do not want to impose on the sector and society a blueprint from The Hague for sustainable animal husbandry. I don't believe in that. [...] The concrete interpretation must come from the dynamics and the interaction between the entrepreneurs and society itself. [..] I mainly want to encourage, not prescribe. … I do, however, want to set clear standards with a clear timetable.” (Verburg, 2008b, p. 6-7)

A motion from the PvdD (Koffeman, Smaling, & Eigeman, 2008) was adopted by the Senate in March 2008, which requested that the Government prioritised projects in its knowledge and innovation policy aimed at the transition from the production and consumption of animal proteins to more efficient equivalents of plant origin. As a response, Minister Verburg (LNV) wrote a letter to the Senate in December 2008 (Verburg, 2008a). In this letter, Verburg mentioned two projects the Ministry of LNV had funded to support the protein transition:

1) The research programme ‘*Programma Innovatie EiwitKetens’* (Programme for innovation in protein chains; PIEK), which aimed to make the protein chain more sustainable through innovations in product development and stimulating market introduction
2) The innovation programme Small Business Innovation Research (SBIR), which aimed to support protein innovation in small-medium enterprises (SME’s)

Verburg emphasised that this research on proteins was being conducted in parallel with research aimed at making livestock farming more sustainable. “In this way I want to work along multiple tracks to make the production and consumption of proteins more sustainable.” (Verburg, 2008a, p. 2). She also acknowledged that until then, the consumer side of protein consumption had not gained much attention in policy. “It is clear that a shift in consumption patterns can contribute to reducing the environmental impact. Various replacement strategies are conceivable here.” (Verburg & Cramer, 2008, p.1).

Commissioned by the Ministry of LNV, Blonk Milieuadvies researched what replacement strategies would be possible to decrease the environmental effects of the consumption of protein-rich products in the Netherlands (Blonk et al., 2008). They concluded that there were various options, such as eating less protein, choosing plant-based protein instead of animal-based, switching from beef to chicken or eating more in accordance with the Dutch nutrition guidelines (‘*Schijf van Vijf´´)* (Stichting Voedingscentrum Nederland, 2018).

The Ministry of LNV, together with the Ministries of VROM and Development Cooperation (OS), released the *´Nota duurzaam voedsel´* (Sustainable food note) in June 2009 (Ministerie LNV, 2009), which elaborated on the challenges for a sustainable food system and discussed how to stimulate sustainable production and consumption. The problem of the current food system was framed around a variety of issues, such as food security and the world food problem: worldwide enough food was being produced to feed the whole population, but still 17% of the world population was suffering from food shortage. However, simultaneously, obesity was a big problem in the West, resulting in public health issues. Furthermore, the necessity to change the food system was framed as the high pressure that food production puts on the global ecosystem and that the demand for animal-based protein was rising due to wealth- and population growth. However, Minister Verburg also framed the value and necessity of the livestock industry using three frames:

1) the big economic value of the production of animal products

2) animals can use farmland that is not suitable to grow crops for human consumption

3) the usage of animal manure can increase soil fertility and decrease the need for synthetic fertilizer

The current food system was not only framed as a problem, but also as a part of the solution according to Verburg: “our country can make an important contribution to global food security and maintaining the vitality of the global ecosystem” (Ministerie LNV, 2009, p. 3).

It was the vision of the Minister of LNV that in 2023 the national food production systems of the Netherlands would be "based on sustainability in all respects" (Ministerie LNV, 2009; Verburg, 2008b, p. 3). To realise this vision, Verburg framed the solution for a more sustainable food system as a more efficient use of resources; using more sustainable raw materials; reducing pollutants, CO2 emissions and mineral depletion; preventing loss of protein sources and food waste; and investing in innovation to make production more sustainably. However, these proposed solutions were focused on the food production system as a whole. The solution to reach a protein transition was framed as the need for innovations on alternative (plant-based) proteins, such as new types of meat-replacers, products based on algae, insects or possibly cultured meat, was emphasised. The policy measures in 2009 were mainly focused on financial incentives and subsidies to make this plant-based innovation happen.

As a sequel to the nota (Ministerie LNV, 2009) the Ministry of LNV released '*Beleidsagenda duurzame voedselsystemen*' (Policy agenda on sustainable food systems) (Ministerie of LNV, 2009) which was focused on the Dutch contribution to making the global food system more sustainable, with a special focus on producing more sustainable protein. Minister Verburg mentioned that the protein issue was one of the central challenges for the food system. Here, the protein problem was framed in the same way as in the nota (Ministerie LNV, 2009) from June earlier that year: ''The problem is that the production of animal products requires extra input from agricultural raw materials, energy and space. Unchanged policies and unchanged consumption patterns of old and new economies can endanger food security and the capacity of the global ecosystem. The food security of the poorest groups in poor countries is the most compromised and therefore deserves special attention.''(Ministerie of LNV, 2009, p. 5).

As a long-term goal, the Ministry of LNV envisioned a food chain where production and consumption contributed to global prosperity and food security, while remaining within the capacity of the Earth's ecosystem. Minister Verburg framed this ambition as not only requiring more sustainable production, but also a transition in the consumption from animal proteins to more sustainably produced animal proteins and plant-based proteins.

Verburg chose several activities to reach a more sustainable food system: making the animal protein chain more sustainable, broadening the supply of sustainable food, stimulating more conscious consumption and influencing the international agenda. Since the protein transition was "fundamentally intertwined with the current global food system and solutions only make sense if they are viewed in the broad context of a more sustainable food system'' (Ministerie of LNV, 2009, p. 6), the Ministry of LNV wanted to put sustainable production and consumption on the international political agenda. She reasoned that the current global food system needed a solution with a global approach.

In 2010, the health frame started to appear as a reason to eat fewer animal products, but it was not implemented in policy yet. Marianne Thieme (PvdD) asked parliamentary questions in which she framed public health as a reason to actively discourage the use of animal fats. She asked the Minister of Health, Welfare and Sport (VWS) Ab Klink if he wanted to take active measures to reduce the use of animal fat (Klink & Verburg, 2010). As a response, Minister Klink framed food as an individual choice for the consumer to make: "My nutrition policy is based on making the supply healthier and informing [through the *Dutch Nutrition Centre*] so that the consumer is able to make healthy choices. I do not want to take this responsibility away from the consumer." (Klink & Verburg, 2010, p. 2).

The Netherlands Environmental Assessment Agency (PBL), which is a national institute for strategic policy analysis, released a report in 2010 called *´Op weg naar een duurzame veehouderij´* (Towards sustainable livestock farming) (Zeijts, 2010) as a response to '*Toekomstvisie veehouderij'* (Future vision for sustainable livestock farming) (Verburg, 2008b). In this report, PBL analysed the developments from 2000 to 2010 and the proposed vision from the Ministry of LNV for the future. Their conclusion was that Dutch livestock farming had become more sustainable in the period from 2000 to 2010 with regard to the environment and animal welfare. This was partly due to Government

subsidies, regulations and the demands of consumers. However, PBL framed the pace of these sustainable developments as too slow and that more efforts were required from farmers, the Dutch Government, consumers and other parties involved in order to reach a more sustainable Dutch livestock industry. In a reaction to this report, Verburg said: "I'm glad the report [from PBL] is there. It confirms that we are on the right track. It also shows that a lot still needs to be done to achieve further acceleration and upscaling of sustainability." (Verburg, 2010a, p. 2).

Cabinet Balkenende IV was active for 3 years. After a crisis in the cabinet about the military mission in Uruzgan, Cabinet Balkenende IV applied for dismissal in February 2010 but remained active until the new Cabinet Rutte I was formed in October 2010.

4.1.2 FROM 2010 TO 2012: SUSTAINABILITY AS A BUSINESS OPPORTUNITY DURING CABINET RUTTE I

Cabinet Rutte I was put into force in October 2010. As a result, some changes were made in the names of Ministries: the Ministry of LNV merged with the Ministry of Economic Affairs, leading to a new ministry called the Ministry of Economic Affairs, Agriculture and Innovation (EL&I). In this new ministry, Secretary of State Henk Bleker was responsible for agriculture. The Ministry of Housing, Spatial Planning and Environmental Management (VROM) was abolished. The portfolio of 'Spatial Planning' and 'Environmental Management' were added to the newly formed Ministry of Infrastructure and Environment (IenM).

In December 2010 Secretary of State Henk Bleker published a letter in which he announced the policy on sustainable food (*´Voedingsbeleid´*) (Bleker, 2010). Again, the necessity for a transition was framed around the expected population growth combined with welfare growth and the need for global food security. Secretary of State Bleker emphasised that he wanted to continue the ambitions of the former Minister of LNV, Gerda Verburg, but he also stated that he would choose to cooperate with business rather than choosing for legislation and regulation. "The opportunity lies in the development and marketing of food innovations: a joint statement of business, knowledge and policy" (Bleker, 2010, p. 1). The aim of these food innovations was framed by Secretary of State Bleker in a way that emphasised the importance of the economy: "a targeted investment in innovation and sustainability to maintain the global leading position and to strengthen the economic strength of entrepreneurs" (Bleker, 2010, p. 2). This focus on the economy could be explained by the global financial crisis that started in 2008 and also led to an economic recession in the Netherlands from 2010 until 2012. This made it more difficult for Dutch farmers to earn a good living.

Bleker also stated that he simultaneously wanted to raise consumer awareness to stimulate demand of sustainable innovations (Bleker, 2010). This awareness about sustainable food was mainly spread by the Dutch Nutrition Centre and *Milieu Centraal*, with funding from the Government.

According to the interviewees (R2, R5, R18; R19; R20; R21), Secretary of State Bleker's focus was not on nutrition or sustainability. Furthermore, because of the global financial crisis that also affected the Netherlands, he also got an austerity assignment. Projects concerning the latter topics, such as the project group sustainable nutrition that was established by Cabinet Balkenende IV, were terminated (R18; R20; R21). However, even though Secretary of State Bleker had abolished the focus on the protein transition, several policy makers at the Ministry of EL&I realised the importance of this topic and agreed to follow the societal developments in business, consumer organisations and societal organisations regarding this topic (R20). The policy makers had the opinion that this topic would return because of its big societal implications (R20). By following these developments in society and business, the protein transition could slowly be put back on the agenda, especially when new Cabinet Rutte II took office in 2012.

In 2011 the Dutch Health Council published the *´Richtlijnen goede voeding ecologisch belicht'* (Guidelines for good nutrition from an ecological perspective) (Gezondheidsraad, 2011) and framed healthy food as having many similarities with sustainable food. This report therefore strengthened the

frame that a change in consumption could lead to improvements in public health and environmental impact. According to the guidelines, the largest ecological and health gain could be achieved by eating a less animal-based and more plant-based diet. In health terms, this would be beneficial, because it would increase the consumption of whole grains, legumes and vegetables. This increased consumption was associated with lower risk for heart- and vascular disease. The production of these plant-based foods would also create less environmental impact, as plant-based products would be more efficient to produce (Gezondheidsraad, 2011). Another environmental and health gain would be to reduce overconsumption of calories. This would lead to lower food production, and therefore less environmental impact, but also to a healthier weight, and therefore lower risk for diabetes and heart- and vascular disease (Gezondheidsraad, 2011).

In the global discourse, the social resistance against the livestock industry still continued, especially in provinces where the livestock industry was clearly present, such as the province Noord-Brabant. The Van Doorn Committee, commissioned by the Provincial-Executive of Noord-Brabant at the end of 2010, released the report *'Al het vlees duurzaam in 2020'* (All the meat sustainable in 2020) in October 2010, with the goal to investigate how conventional livestock farming in Noord-Brabant and in the rest of the sector could become more sustainable (Commissie van Doorn, 2011). The Committee framed the intensive livestock industry as necessary in order to feed the growing world population. The ambition of the report was to connect the intensive livestock industry with sustainability, to create a ´carefully´ intensive industry where "animal welfare is central, safe and healthy (inter alia by minimal use of antibiotics) and the nuisance for the environment and society has been reduced to acceptable proportions." (Commissie van Doorn, 2011, p. 4). To reach this, a radical solution was framed by the Committee: the sector had to make a definitive choice to only produce sustainable meat. This meant chain-wide involvement to make sure that sustainable production was not a choice, but the standard. The advice of the Van Doorn Committee went beyond the provincial boundaries and led to a signed declaration called '*Het verbond van Den Bosch'* (The covenant of Den Bosch, 2011) supported by 27 actors, such as supermarkets, meat processors, animal feed companies and interest groups for the agricultural sector, such as LTO Nederland (Agriculture and Horticulture Organization of the Netherlands). According to the Committee, not only the farmers were responsible for realising a sustainable livestock industry, but also retail should play a key role to guarantee a baseline for sustainable meat (Commissie van Doorn, 2011).

The Van Doorn Committee envisioned that the entire sector could – on a national level - make the transition to sustainable meat production before 2020. The Committee stated that this vision was ambitious, but also realistic and necessary. They stated that sustainable production was the only remaining asset for the agri-food chain to remain internationally distinctive and competitive, as well as to maintain public support from society.

The proposed measures were mainly framed around improvement of animal welfare (e.g. no more preventative administration of antibiotics, but only when animals were sick), and technical measures to close raw material cycles within Europe. Normally, animal feed (e.g. soy) was imported from South America, leading to high emissions due to transportation. However, to close the material cycles, growing more protein crops in Europe was needed. The Committee set a target that at least 50% of protein-crops used for animal feed should be produced in Europe.

PBL published the report *'Balans van de leefomgeving'* (Balance of the environment) in October 2012 (Planbureau voor de Leefomgeving, 2012) that evaluated the effects of governmental policy focused on environment, nature and space.

In this report, PBL framed the problem of the food system as having five problems:

1) The *use of scare resources* such as land; nutrients, such as nitrogen and phosphate; water; and fossil fuels for energy
2) *Quality of the environment*: significant surplus in nitrogen, phosphate and ammonia emissions were still present. Also, there was increasing social resistance to the intensive livestock

industry, which was mainly framed around concerns about animal welfare, public health and changes of the landscape.

3) *Income*: the power in the food chain was mainly concentrated around supermarkets, which made it difficult for farmers to get a good price for their products. Financial risks made it difficult for farmers to innovate.
4) *Health*: the Dutch consumed too much protein, salt and saturated fats. Eating in accordance with the dietary guidelines could lead to considerable health and environmental benefits.
5) *Fair sharing*: there is enough food produced to feed the world population, but it is not evenly distributed. Furthermore, there was an uneven distribution of income across the production chain, where margins were lowest for the farmers.

PBL framed three complementary solutions to produce a more sustainable food system:

1) *Consuming differently*: consuming fewer animal products, choosing white instead of red meat and preventing food waste.
2) *Producing more efficiently*: implementing technical measures to produce higher crop yields, better feed conversions, fewer losses in the food chain and fewer emissions. This was seen as the most promising solution, because of its possible economic advantages such as cost reductions.
3) *Producing more carefully*: improving animal welfare, reducing the use of antibiotics and pesticides, and making more contributions to nature and landscape quality.

In many cases, more careful production was at odds with more efficient production: more animal welfare often meant more feed per kilogram of meat and an increased cost price for farmers.

According to PBL, it seemed that the entire food chain was willing to take action to improve sustainability, as there were many voluntary initiatives from farmers, producers, retailers, citizens and consumers to make the food chain more sustainable. However, this did not always lead to the realization of concrete sustainability initiatives.

The Ministry of EL&I created the so-called Top Sector policy in 2011, aimed at stimulating the knowledge economy, connect companies to increase the market success of innovations and to bring economic opportunity and solutions for societal problems together. In the Top Sector policy market parties were expected to take the lead to realise sustainable food systems: “The Top Sector policy assumes that market parties know best which ambitions are promising, also with regard to sustainability.” (Planbureau voor de Leefomgeving, 2012, p. 155). The Top Sector policy focused on innovation in nine Dutch Top Sectors, of which Agro & Food is one of them. The Top Sector Agro & Food was seen as an important sector for the Netherlands, as it had an added value of € 48 billion to the Dutch economy (TKI Agri & Food, 2012) and the Netherlands has been the second agricultural exporter in the world.

A Green Deal, which is an agreement between the Government and companies or social to facilitate opportunities in green growth more easily, was established in June 2012 called *‘Insecten voor feed, food en farma*’ (Insects for feed, food and pharma) (Rijksoverheid, 2018). This Green Deal focused on identifying and removing barriers in legislation and regulations concerning the cultivation of insects on residual flows and subsequently processing and marketing these insects for animal feed.

Similar to policy from the former Minister of LNV (Verburg), during Rutte I there was no specific policy to influence consumer choice towards more plant-based protein. In response to parliamentary questions from the PvdD whether Secretary of State Bleker would promote meat substitutes, he replied: “In my opinion, it is the consumer's own responsibility whether or not to opt for plant-based meat substitutes.” (Bleker & Atsma, 2012, p. 3). Instead, the government financed the Dutch Nutrition Centre and *Milieu Centraal* to inform consumers about sustainable food choices.

Cabinet Rutte I was only active for two years, and the reason for its earlier retirement was a cabinet crisis about the budget for 2013. Premier Rutte requested resignation of Cabinet Rutte II in April 2012, which was followed by elections for a new cabinet.

4.1.3 FROM 2012 TO 2017: THE START OF AN EXPLICIT FOOD POLICY DURING CABINET RUTTE II

In November 2012, this new cabinet was formed: Cabinet Rutte II. The former Ministry of Economic Affairs, Agriculture and Innovation (ELI) changed its name to Ministry of Economic Affairs (EZ). Even though agriculture was no longer mentioned in the name, it was still part of the ministry. In this period, three people filled the position of Secretary of State responsible for agriculture: Co Verdaas, who was only in charge for a few months, Sharon Dijksma, who claimed this position from 2012 to 2015 and then became Secretary of State of I&W and Martijn van Dam who fulfilled the last two years of the cabinet period of Rutte II (2015-2017).

PBL released a report called '*Macht van het menu*' (Power of the menu) in June 2013 (Westhoek & Nijdam, 2013), which described the tasks and opportunities for sustainable and healthy food. PBL framed the problem of the current food system as unhealthy and unsustainable. Food waste and excessive use of resources were framed as a problem, as well as overconsumption of saturated fats and calories in general, which led to obesity and other health issues. Furthermore, PBL framed the challenge to produce enough food in 2050 for the growing world population, without this being at the expense of biodiversity and the climate. PBL framed the same solutions as in their previous report (Planbureau voor de Leefomgeving, 2012): producing more efficiently, producing more carefully and changing consumption patterns. "If the Dutch were to consume half of their current meat and dairy consumption, the land use for Dutch food consumption would be reduced by a quarter. Moreover, this consumption pattern would contribute to a healthier diet." (Westhoek & Nijdam, 2013, p. 8). Additionally, reducing food waste would lead to a more sustainable food pattern.

PBL mentioned that the Government was reluctant to influence the current consumption patterns of consumers. "There are various policies and programs in the area of food safety and healthier consumption, but there is little integrated policy for more sustainable and healthier consumption. A relatively large number of policies are aimed at more efficient food production. In the current political debate, much attention is being paid to local effects, such as animal welfare and the use of antibiotics, and to the fair distribution of income across the chain, especially for farmers." (Westhoek & Nijdam, 2013, p. 24).

PBL framed a lack of a common picture about the future of the food system as being the reason for the limited progress in the improvement of sustainability of the food system. In order to speed up the progress towards sustainability, PBL concluded that the Government should come up with a holistic and coherent vision that covers all of these themes, from local effects and fair wage to sustainability and health. Especially more attention needed to be paid to changing consumption patterns through policy, according to PBL (Westhoek & Nijdam, 2013).

The *´Agenda verduurzaming voedsel 2013 -2016´* (Agenda sustainable food 2013-2016) (Ministerie EZ, 2013) was published in June 2013. This initiative from the Alliance for Sustainable Food and the Ministry of EZ provided a shared ambition to make the agri-food chain produce significantly more sustainably in 2020, with extra attention to a more sustainable meat production, reducing food waste and using residual flows more efficiently, as well as improving communication and transparency in the food chain.

In the same month, Secretary of State Sharon Dijksma (EZ) sent *'Beleidsbrief duurzame voedselproductie'* (Policy letter sustainable food production) (Dijksma, 2013) to explain what policy

was currently implemented in the field of sustainable food production. Again, the need for a more sustainable food system was framed as the need for food security: ''In 2050, the world population will count 9 billion people. We will therefore have to produce sufficient and high-quality food with fewer raw materials. A major challenge.'' (Dijksma, 2013, p. 2). To stimulate sustainable innovations, Secretary of State Dijksma continued with the Top Sector policy and she also stimulated innovations for alternative or 'new' proteins, such as proteins derived from legumes, insects or algae (Dijksma, 2013). Furthermore, Dijksma facilitated several initiatives to reduce food waste, by funding research to stimulate innovation and campaigns to spread awareness. To make raw materials for agriculture more sustainable, the Secretary of State from EZ supported the Round Table on Responsible Soy (RTRS). This Round Tables set standards with requirements that the production chains must meet in order to produce sustainably.

In order for consumers to consume sustainable food, Dijksma mentioned that offering objective information to the consumer is important. This information was provided by the Dutch Nutrition Centre. However, she also stated: "choosing more sustainable food is primarily a responsibility of the consumer." (Dijksma, 2013, p. 6).

In October 2014, a report from the Scientific Council for Government Policy (WRR), an independent advisory body that had the task of advising and informing the Government on important societal issues, was released: *´Naar een voedselbeleid´* (Towards a food policy) (WRR, 2014). In their report they mentioned that the Dutch Government has had an 'implicit' food policy for years, that coincided with the policy for agriculture and food security. However, they advised the Government to implement an explicit food policy. "The transition from agricultural to food policy does not mean that less value should be attached to agriculture: the primary sector remains a crucial part of the food network. It means that current and future social tasks in the field of ecology, public health and robustness require policies that besides agriculture also focus on other important players and demands in the food network."(WRR, 2014, p. 11).

The council described the following four major developments that had taken place since the 1950s and that had influenced the need for an explicit food policy:

1) Agriculture and fishing had become industrialized and large-scale.
2) The food supply was internationalized, and production chains had become longer.
3) The economic importance of non-agricultural players, such as seed, fertilizer and animal feed producers, the processing industry, and supermarkets, had increased considerably, while the economic importance of farmers in the agri-food sector had clearly decreased. In addition, there was a strong concentration of firms in the sectors, meaning that a big part of the market rests in the hands of a small number of companies. For example, Friesland Campina – the biggest milk processor in the Netherlands - had a market share of 80 percent in the domestic dairy industry and Vion – the biggest meat processor in the Netherlands - had a market share of more than 50 percent in pig slaughterhouses (WRR, 2014).
4) Consumption patterns had changed: resulting in increased consumption of meat and other animal products, as well as processed products, and a decrease in the consumption of fruit and vegetables.

The WRR used three frames to describe the main problems within the Dutch food system:

1) It was *ecologically untenable* to continue producing in the same way. This was mainly framed around the increased demand for food in the future due to population and welfare growth, but also due to competition with crops used for biofuels. Other frames mentioned by the WRR that made it important to change the current food system were the use of scare resources (phosphate, water, energy from fossil fuels), climate change, biodiversity loss and food waste.

2) The production of food could lead to *public health risks*, such as use of toxic pesticides or the spread of animal diseases. Also, the consumption of food could lead to public health risks, such as suffering from malnutrition or a micronutrient deficiency. Excessive intake of calories and certain ingredients (sugar, salt and unhealthy fats) could lead to obesity and increased risks of chronic diseases such as diabetes.
3) The *robustness of the food system*: as a result of climate change, more extreme weather conditions and a rising sea level could produce more external shocks to the food system. Could the food system deal with such shocks and changing circumstances?

The WRR framed the Netherlands as an important country to produce, import, transit and export agri-food products worldwide. In this way the Netherlands contributed to the emergence of problems related to the agri-food sector, but Dutch knowledge of the agri-food sector also offered the opportunities to solve the challenges. "[There are chances for the Netherlands] to produce and export more sustainable and healthier food, and leverage its knowledge of innovative production systems globally." (WRR, 2014, p. 77).

The Secretary of State from EZ and the Minister of VWS reacted to the WRR report (WRR, 2014) with '*Voedselagenda voor veilig, gezond en duurzaam voedsel'* (Food agenda for safe, healthy and sustainable food) in October 2015 (Dijksma & Schippers, 2015). They acknowledged that the three challenges described by the WRR (ecological sustainability, public health and robustness) were the main challenges for the food system. The food agenda was aligned along these three main challenges. In terms of public health and sustainability the Minister wrote: "A healthy food choice is often a sustainable choice. For example, eating more fruits and vegetables is good for both health and the environment. The WRR indicates that less consumption of meat and dairy is desirable from an environmental and public health point." (Dijksma & Schippers, 2015, p. 4). In order to make the healthier and sustainable choice easy and attractive for consumers, the Government supported innovation via the Top Sector policy Agro & Food and provided information about sustainable and healthy food consumption through the Dutch Nutrition Centre and *Milieu Centraal*. The Government also supported and facilitated education for children with regards to healthy and sustainable food.

For ecological sustainability, the Ministers commented: "The WRR rightly notes that a lot of sustainability policy is focused on the production sector. We agree that the entire [food] chain bears responsibility for increasing the ecological sustainability of the food system. The Government therefore wants to focus on the entire food chain and also involves consumers" (Dijksma & Schippers, 2015, p. 4). The mentioned governmental activities to stimulate a more ecologically sustainable food chain were mainly focused on a more efficient food production sector, less food waste in the food chain, researching how the true price of food could be implemented, stimulating innovation for alternative proteins, and informing consumers about sustainable consumption behaviour. In terms of robustness, the Government mentioned more research into protein crops that can be grown in Europe, in order to create a more regional cultivation of protein crops and less dependency on South America for import.

Shortly after this letter in 2015, Secretary of State Sharon Dijksma was succeeded by Martijn van Dam. Sharon Dijksma moved towards a new function as the Secretary of State of I&W, while Martijn van Dam took over her role as Secretary of State of EZ.

In 2015, the public health frame of the protein transition started to gain more attention after the Dutch Health Council released *´Richtlijnen goede voeding 2015´ (*Guidelines for good nutrition 2015) (Gezondheidsraad, 2015). Their main recommendation was to eat according to a more plant-based and less animal-based diet. In accordance with the guidelines from 2011 (Gezondheidsraad, 2011), this also had environmental benefits. However, the Dutch Health Council also emphasised that

it was not necessary to stop eating meat completely, as meat also contains useful nutrients. These guidelines were translated by the Dutch Nutrition Centre into the dietary guidelines of the *Schijf van Vijf* (Stichting Voedingscentrum Nederland, 2018). In these guidelines, refined meat was no longer recommended as part of a healthy diet, as it would increase the risk of diabetes, stroke and colon cancer (Stichting Voedingscentrum Nederland, 2018).

However, while reducing meat intake was framed as a solution to increasing public health, it was simultaneously used as a framed solution to decrease the environmental impact of diet. Members of the PvdD asked parliamentary questions in June 2015 (Mansveld, 2015) on how the Government would take into account the advice from the Intergovernmental Panel on Climate Change (IPCC) and PBL (Westhoek & Nijdam, 2013) to consume less meat as a way to decrease environmental impact. Wilma Mansveld, State of Secretary from Infrastructure and Environment (I&M), answered that this advice was included in the food policy: "Together with other parties (companies, social organizations, society), we are looking at how, with the help of behavioural science insights, it can be made easy and attractive for the consumer to eat more plant-based food. Consumers are approached and encouraged in various ways to change their diet. Examples of this are the provision of information about sustainable food via *Milieu Centraal* and the *Voedingscentrum* [Dutch Nutrition Centre]." (Mansveld, 2015, p. 8).

In 2015 and 2016 two important events happened in the global discourse: at the end of 2015 the climate conference in Paris (COP21) was held, and this led to the Paris Agreements that entered into force on November 2016 (United Nations, 2015). The goal of these agreements is to reduce GHG emissions and to limit global warming to 1.5 degrees Celsius (with a maximum of 2 degrees Celsius) compared to the pre-industrial era. Furthermore, in 2016 the Sustainable Development Goals (SDG's) were implemented by the UN. The SDG's were a follow-up to the Millennium Development Goals (MDG's) from 2000 and were intended to put an end to extreme poverty, injustice, and climate change.

The social resistance against livestock industry because of questions about animal welfare and environment continued the be a problem for the livestock industry. In a letter from February 2016 (Van Dam, 2016b), Secretary of State Van Dam announced that he commissioned the Nijpels Committee to look into the future of the Dutch livestock farming industry. Van Dam framed the Dutch agricultural sector as a global player and an engine for the economy. "In recent times, dairy farming and pig farming have had to contend with major market problems. Strengthening market power and market orientation is important for future-oriented, sustainably-producing livestock farming." (Van Dam, 2016b, p. 1). He mentioned that the Government aimed to improve the sustainability of the livestock industry sector, and that advice from the Nijpels Committee would lead to concrete actions to reach this goal. Ultimately, the necessity to improve the sustainability of the livestock industry was framed as a way to lead to better embedding of the industry in society.

The Nijpels Committee published this advice in the report *'Versnelling duurzame veehouderij'* (Acceleration sustainable livestock farming) in October 2016 (Sociaal Economische Raad, 2016). They concluded that "up to now strong direction has been lacking to actually initiate the acceleration of sustainability. [..] Governments must dare to set limits and intervene without hesitation if agreements made are not met." (Sociaal Economische Raad, 2016, p. 25). The Committee also framed change as unavoidable, because the economic position of many farmers was dramatic and the environmental pressure and risks of livestock farming for public health were no longer socially accepted. The acceleration of the sustainability of livestock farming was needed to make livestock farming accepted by society again.

In order to gain insight into the environmental impact of the Dutch food consumption, the Ministry of IenM commissioned the National Institute for Public Health and the Environment (RIVM)

to conduct research. The RIVM published the report *´Milieubelasting van de voedselconsumptie in Nederland´* (Environmental impact of food consumption in the Netherlands) in which they researched the environmental pressure of the food consumption in the Netherlands (de Valk, Hollander, & Zijp, 2016). The RIVM concluded that there were several ways to make the Dutch food consumption more sustainable, such as reducing waste along the chain, making production more sustainable, reducing consumer food waste and eating less calories or shifting from animal to plant-based food products (de Valk et al., 2016).

In 2017, the RIVM published another report called *´Wat ligt er op ons bord?´* (What's on our plate?) (Ocké et al., 2017) in which they analysed the facts and numbers regarding the safety, health and ecological sustainability of food in the Netherlands. Their conclusion was provided similar solutions for a healthier and more sustainable consumption pattern: 1) preventing overconsumption of calories; 2) eating more plants and less animals-based products and 3) eating less sugar and consuming fewer alcoholic drinks. However, there could also be trade-offs between healthy, sustainable and safe food, and the convenience and price of these food products. "To find a solution, an active role of the Government is needed, which works together with the agricultural sector, companies, citizens and social organizations. This requires not only good information provision for consumers, but also a healthier and more sustainable supply." (Ocké et al., 2017, p. 6).

However, even with these clear recommendations from the RIVM, the Dutch Cabinet did not want to interfere with citizens' diets. Members of D66 asked parliamentary questions (Dijksma, 2016) about what the Dutch Cabinet was doing in order to reduce meat consumption in June 2016. Secretary of State Dijksma (VWS) replied: "The cabinet appreciates it when consumers make a choice for a more sustainable consumption pattern, but we do not want to prescribe what consumers should eat. That does not mean that the cabinet does not pursue a policy aimed at bringing the consumer to a healthier and more sustainable choice. Information and awareness play an important role in this, for example through the *Voedingscentrum* [Dutch Nutrition Centre]." (Dijksma, 2016, p. 7). To the parliamentary question from members of PvdA what the Minister of EZ did to promote meat replacements (Van Dam, 2016a), Secretary of State Van Dam answered that there were several initiatives to stimulate production and consumption of plant-based proteins. "In recent years, the Ministry has invested heavily in research in this area, including via the Top Sector policy, via an SBIR [Small Business Innovation Research] and through the financial support of social initiatives such as the Green Protein Alliance, Dutch Cuisine and the National Fruit and Vegetable Action Plan." (Van Dam, 2016a, p. 13).

Cabinet Rutte II was terminated in March 2017 because after four years new elections had to be held. In the period between 2007 and 2018, Cabinet Rutte II was the only cabinet that was active the entire governmental period of four years.

4.1.4 FROM 2017 TO 2018: PRESSURE INCREASES TO DEVELOP POLICY ON THE PROTEIN TRANSITION DURING CABINET RUTTE III

In October 2017, when Cabinet Rutte III was put into force, there were changes in the names and responsibilities of the ministries again. The Ministry of LNV was re-established, so agriculture had its own Ministry again and was no longer a part of Economic Affairs. The Ministry of Economic Affairs included the portfolio climate policy, changing its name to the Ministry of Economic Affair and Climate Policy (EZK). The Ministry of Infrastructure and Environment (IenM) changed its name to Infrastructure and Water Management (I&W).

The *'Transitieagenda biomassa en voedsel'* (Transition agenda biomass and food) (Minsterie IenM, 2018) was published in the beginning of 2018. This transition agenda, written by a transition team composed of actors from social parties, government and the market, was meant to provide inside into what is needed to accelerate the transition towards a circular economy. This transition team was

commissioned by the Cabinet. In this agenda, also a specific section was dedicated to the protein transition. In this document, the problem of animal protein was framed around the enormous land use needed to produce animal feed, the global disruption of the nitrogen cycle and the GHG emissions associated with producing animal protein. The transition agenda envisioned a clear goal: "The ratio between animal and vegetable protein in our diet has to be reversed in 2050 from 60% animal, 40% plant to 40% animal and 60% plant. The total protein consumption per person should decrease by 10-15% in 2050." (Minsterie IenM, 2018, p. 36). The agenda mentioned some national initiatives related to the protein transition such as the Green Protein Alliance, an alliance from supermarkets, processors NGO´s, scientists and government bodies that wants to increase consumption of plant-based proteins; the Green Deal: Dutch Soy to stimulate the local cultivation of soy; Dutch cuisine, a programme to stimulate plant-based protein in the hospitality sector; the New Food Challenge to stimulate plant-based product innovation and research into meat substitutes in the Top Sector Agri & Food. "The aforementioned initiatives each have their focus on the protein chain, from primary production to consumption. The protein transition action line focuses on the connection [of these initiatives]" (Minsterie IenM, 2018, p. 36).

The Dutch Council for the Environment and Infrastructure (RLI), the strategic advisory board for the Government and Parliament regarding sustainable development of the living environment and infrastructure, published *'Duurzaam en gezond: samen naar een houdbaar voedselsysteem'* (Sustainable and healthy: towards a sustainable food system together") in March 2018 (RLI, 2018). In the report, the solution was framed around changing production and consumption: production of (animal) proteins needed to become more sustainable, while also reducing food waste and consuming less protein in general and eating more plant-based protein.

The problem was framed around the need to meet the Paris agreement (United Nations, 2015). According to this agreement, greenhouse gas emission had to be reduced with 95% in 2050 compared to 1990. If all known technical measures were taken to reduce these emissions, the Council calculated that the CO2 emissions from agriculture will fully take up the total amount of greenhouse gas that the Netherlands may still emit in 2050 (10 Mton CO2 equivalents). Therefore, the RLI "considers it likely that in the long term the livestock population will have to become smaller in order to achieve the climate goals and to spread the burden in a balanced way across the various sectors.'' (RLI, 2018, p. 7). Furthermore, the RLI framed a lot of chances for innovation in the food sector, such as a bigger focus on plant-based alternatives for the processing industry and retail. Simultaneously there were also chances for innovation in the livestock industry: new business models focused on a nature-inclusive approach using circular principles seem to be promising new ways to do business.

The RLI framed several problems with the livestock industry. First of all, the effect on climate change due to its high emission of GHG, and other environmental issues, such as manure surplus, which leads to decreased quality of surface water, as well as the release of ammonia in the form of odour, nitrogen deposition or particulate matter. The livestock industry was also framed as a risk to public health, as the emission of ammonia and particulate matter can have negative effects on long functioning. The intensive livestock industry could also lead to outbreak of zoonoses or antibiotic resistance due to overuse antibiotics.

Finally, the RLI come up with four recommendations for the Government:

1) To provide clarity to the farmers as soon as possible about the emission allowances for livestock farming in 2030 and 2050.
2) To start a dialogue with provinces in which livestock-tight areas were located, to see what additional requirements or policies were needed to address the remaining environmental, biodiversity and public health problems.

3) To set the goal to reduce the consumption of animal proteins to 40% of total protein consumption by 2030.
4) To work together with all actors in the food chain to support sustainable and healthy production and consumption and the development of the market for plant-based protein products.

In September later that year, the Minister Carola Schouten (LNV) and State of Secretary Paul Blokhuis (VWS) reacted on the report from the RLI, saying that they acknowledge the need to reduce emissions from agriculture and land use (Schouten & Blokhuis, 2018a). "We agree with the RLI on the preconditions that a sustainable and healthy food system must meet: an agricultural and food system with a future has a financially and economically sound revenue model. Also, a sustainable and healthy meal must be affordable for everyone." (Schouten & Blokhuis, 2018a, p. 3). Minister Schouten and Blokhuis wrote another letter in April 2018, explaining their emphasis in the food policy (Schouten & Blokhuis, 2018b). "The cabinet does not focus solely on food production, but on the entire chain and sustainable food systems, rooted in sustainable economic development." (Schouten & Blokhuis, 2018b, p. 11). In this letter, they framed five important areas to focus on:

1) Further stimulation of healthy and sustainable food choices, in which the *Schijf van Vijf* (Dutch dietary guidelines) formed the basis for these choices, while also focussing on reducing food waste.
2) New business models for farmers
3) Transparency and consumer trust in the food chain, in order to reduce the distance between farmers and consumers
4) Food interventions aimed at specific target groups, mainly through education of children
5) The global and European context, as the Netherlands could play an important global role with its strong knowledge and innovative capacity in the field of agriculture and food

It is interesting to note that these five important areas do not specifically include the protein transition, while changing protein consumption patterns was specifically mentioned in the reports from the RLI (RLI, 2018) and in the transition agenda (Minsterie IenM, 2018).

The Climate Council, a coordinating consultative body consisting of civil society organizations, local authorities and NGOs with the goal to arrive at a national climate agreement, published the Dutch policy document *'Voorstel klimaatakkoord'* (Proposal climate agreement) in July 2018 (Nijpels, 2018). In this document, the goal was to reduce 3,5 Mton CO2-eq emissions from agriculture and land use in 2030. The Climate Council saw this not "as an 'additional public goal, which also needs to be added, which makes entrepreneurship more difficult', but rather as a catalyst for innovation." (Nijpels, 2018, p. 43). The solution was mainly framed as technical measures in the pig- and dairy industry to reduce methane and nitrous oxide, but also as measures to promote sustainable consumption, such as less food waste and more consumption of fruit and vegetables and more plant-based proteins.

PBL analysed the proposal of the climate agreement (Hekkenberg & Koelemeijer, 2018), and concluded that for agriculture there were plenty of options to reach the stated goal of 3,5 Mton CO2-eq reduction. The proposed solutions in the livestock sector focused mainly on optimization of the existing system using new technologies and processes. Other proposed solutions to reduce CO2 emissions from the food sector focus on the consumption side: to halve food waste and to reduce protein consumption as well as consuming more plant-based protein.

Minister of LNV Carola Schouten presented her vision for the Ministry in a report called '*Visie Landbouw, Natuur en Voedsel: Waardevol en Verbonden'* (Vision Agriculture, Nature and Food:

Valuable and Connected) in September 2018 (Ministerie LNV, 2018), in which she envisions the Netherlands as leader in circular agriculture in 2030. “A leading position, such as we currently hold, goes hand in hand with responsibility for the future of farming, horticulture and fisheries. After all, no matter how good our results may be right now, the way in which we produce our food is shifting ever more out of balance. We are taking more than the planet can give, and this is not sustainable.” (Ministerie LNV, 2018, p. 5). In the vision of Minister Schouten, the word ‘protein’ was not mentioned at all. Furthermore, Schouten emphasised the important contribution of livestock farming for efficient resource use in order to reach a circular food system. In 2019, Minister Schouten will publish a realisation plan with more elaboration on how exactly this circular agriculture could be reached in 2030.

After the policy frames found in national governmental policy from 2007 to 2018, Section 4.2 will talk about the important developments found provincial policy in the Dutch provinces Gelderland, Overijssel, Flevoland, Noord-Brabant and Utrecht.

4.2 PROVINCIAL POLICY FRAMES TO STIMULATE PROTEIN TRANSITION AND THE ECONOMY

Policy frames regarding the protein transition were not solely limited to the national level but were also made on a provincial level. In 2018, four Dutch provinces (Gelderland, Overijssel, Flevoland and Noord-Brabant) approached the ministry of LNV to work together on a national protein plan (R11; R12; R14; R15; Section 4.2.4). In order to understand how this provincial approach influenced the national policy, several initiatives from the Provinces Gelderland (section 4.2.1), Overijssel (Section 4.2.2), Flevoland (Section 4.2.3) and Noord-Brabant (Section 4.2.4) and the surrounding global discourse will be elaborated below. Also, shortly the provincial policy from the Province Utrecht (Section 4.2.5) is mentioned, because Gelderland and Utrecht were working together with the Ministry of LNV on a regional deal (Regio Deal Food valley) aimed to stimulate the transition towards a healthy and sustainable food system.

4.2.1 GELDERLAND: PROCESSING PLANT-BASED PROTEINS AS AN ECONOMIC OPPORTUNITY

In the Province Gelderland, the protein transition was put on the agenda in June 2016 after an adopted amendment issued by the Party for the Animals (PvdD) (‘Amandement plantaardige eiwittransitie’, 2016). This amendment proposed to further stimulate the protein transition in the economic provincial policy and to make the province of Gelderland a leader in innovative plant-based protein products (R12). As a response to this amendment, interviewee 12 from the Province conducted an exploration amongst stakeholders in the region to find out where opportunities in the protein transition lay for Gelderland. It turned out that about of 40% of SMEs involved in the processing of plant-based proteins were located in the province. The Province had not been aware of this until this exploration (R12). “Then we decided: we are going to help that cluster of SMEs to do their business. In this way, they can contribute to the protein transition.” (R12) This led to the establishment of the Protein Cluster, a platform to connect SME’s that focused on processing of plant-based protein. As a result, these processing companies focused on plant-based proteins could more easily work together and organize themselves, so they could quickly exchange knowledge and insights and new product-market combinations based on plant-based proteins could arise (R11; R12).

As a result of the amendment from the PvdD, the protein transition was included in the economic policy and the Circular Economy programme (Provincie Gelderland, 2016). The main change in policy was the funding of the Protein Cluster to stimulate SME’s to focus on innovation regarding plant-based proteins.

Interviewee R12 mentioned that before June 2016 there was no explicit provincial policy to stimulate the protein transition. “It was never really an issue until then. But that also has to do with the fact that our innovation or SME policy was fairly broad at the time. Now, we see that it is easier to contribute to a development if you are unique in something. We have taken a better look at where we are really distinctive compared to other regions, and this is the case for the protein transition.” (R12).

4.2.2 OVERIJSSEL: COOPERATING WITH GELDERLAND

A month later, in July 2016, also in the Province Overijssel a motion from the PvdD was adopted, which framed the need to stimulate the production of plant-based protein in the province and to facilitate (starting) entrepreneurs in the field of plant-based protein to find financial capital and connect them to research institutions, education and business (‘Motie stimulering eiwittransitie’, 2016). As a result, the Province Overijssel contacted Province Gelderland if they could join the Protein Cluster and they started working together to stimulate the innovation of processing plant-based proteins in SMEs in 2017 (R11; R12; Provincie Overijssel, 2016).

4.2.3 FLEVOLAND: GROWING GREEN PROTEINS AS AN ECONOMIC OPPORTUNITY

The Province Flevoland will organise the world horticultural exhibition Floriade in 2022. In the run-up to the Floriade, the Province organised an innovation challenge to challenge companies to come up with innovative ideas for the future of food. This challenge finished at the end of 2017. As a result of this challenge, the Province discovered that many submitted ideas were focusing on plant-based proteins. For the Province, this was the reason to start a programme to facilitate the innovation in the field of plant-based proteins: Growing Green Proteins in 2018 (R14). This new programme focused on growing and processing plant-based proteins and supporting farmers in finding a good business model to start growing these proteins (R14). The programme framed the protein transition mainly as an economic opportunity to stimulate innovation and employment. “Flevoland is a real arable province**.** If you look at what the protein transition needs, then it would be good if there more plant-based proteins were grown. Not just for the farmers, but also for the knowledge economy. That knowledge can be distributed to other countries.” (R14) However, soon other frames also started to appear, such as changes to increase the soil quality, stimulate biodiversity or improve public health.

At first, the programme Growing Green Proteins was solely focused on the Province Flevoland, but the Province discovered quickly that most of the retailers and processors for plant-based proteins were in other provinces. “So, then I started looking for supra-regional cooperation. First with Overijssel and Gelderland that have the Protein Cluster. Noord-Brabant joined us later.’’ (R14). The Protein Cluster was focused on the processing side of the food chain (R11; R12), which was interesting for Flevoland because the Province Flevoland was mainly focused on growing novel protein crops and these crops needed processing.

The Province Flevoland thought they were not involved in the protein transition when they started including it in their policy in 2018. However, interviewee 14 found out that policymakers at the Province just used other terminology and were not aware of the fact that the protein transition also included many other topics. “In our programmes on water, soil, circular and health, it was eventually also about the protein transition.’’ (R14).

4.2.4 NOORD-BRABANT: HIGH POLITICAL PRESSURE TO FOCUS ON PLANT-BASED PROTEINS

Also, in the Province Noord-Brabant the protein transition started to appear in the Provincial policy in the project ‘Circular Economy’ in 2017. The Province showed interest to work together with Flevoland, Gelderland and Overijssel in order to accelerate the innovation in plant-based proteins.

The initiatives in the Province Noord-Brabant were threefold:

1. A cultivation programme focused on growing new plant-based proteins, in order to increase soil quality, water quality and biodiversity.
2. A smart processing programme, which focused on the production technology to process plant-based proteins.
3. A residual flow processing/food waste programme, which focused on making the food chain more efficient.

As a reason to implement policy on the protein transition, interviewee R15 mentioned that the political pressure from the States-Provincial (*'Provinciale Staten')* to develop policy on the protein transition was high: everybody was talking about the protein transition, so the Province could not stay behind. Furthermore, interviewee R15 mentioned: "We have paid so much attention to the livestock sector in recent years, and now we have to do focus more on plant-based, because agriculture consists of animal and plants and not just only animals."

4.2.5 THE START OF A NATIONAL PROTEIN STRATEGY

In 2018, the four Provinces of Gelderland, Overijssel, Flevoland and Noord-Brabant went to the Ministry of LNV because they had heard that at the end of 2019 the Netherlands should come up with a national protein strategy, to fill in the European protein strategy (R1; R11; R12; R14; R15; European Commission, 2018). "Right now, the four of us [the Provinces] have an idea of what a national [protein] program could look like. We all realize: this topic exceeds province boundaries." (R15). This is also something that Interviewee R11 from Overijssel emphasises: "Innovation, especially for such a big theme that actually touches the whole system, doesn't stop at the province boundaries. You should come up with a holistic solution.'' (R11). Interviewee R11 framed this cooperation with the Ministry of LNV essential in order to reach a protein transition: "We can act as a Province, but if the Government does not take part in that, it will become very difficult. It also works the other way around, I think. If the Government does what they want on their own, without cooperating with the Province, then it will also become difficult to implement change.'' (R11)

The first meeting already took place in June 2018, with more than 50 partners attending. The meeting discussed global, European, national and regional opportunities and challenges for a protein transition (R1; R11; R12; R14; R15). At the moment of writing, the exact follow-up is unknown, but it is expected that a national protein strategy could be presented to the House of Representatives in the summer of 2020.

4.2.6 UTRECHT: NO POLICY FOR THE PROTEIN TRANSITION

However, not all Provinces have applied the protein transition in their policy. In an interview with the parliamentary leader of the PvdD of the Province Utrecht was done (R13), she mentioned that up until now there was no policy on the protein transition in the province of Utrecht. In the Province Utrecht the PvdD had submitted a motion to include the protein transition in its policy for the Regio Deal Food valley ('Motie Eiwittransitie Food valley Utrecht', 2018), but this motion was rejected. Interviewee R13 explained: "The issue with the province of Utrecht is that it is known as a top region. Most political parties are very proud of that, because they focus mainly on economic growth and knowledge."

Section 4.1 and 4.2 explained the policy frames in respectively national and provincial policy frames. In the next section, the national policy frames regarding the protein transition will be analysed to see how the framing has changed from 2007 to 2018.

4.3 ANALYSIS OF POLICY FRAMES REGARDING THE PROTEIN TRANSITION

After the chronological historical overview of the policy documents on the protein transition and their frames, an analysis of these frames per topic is given to understand differences in framing over time per topic can be understood. Five topics in policy frames have been identified:

- *Problem identification*: why is a protein transition necessary and what parts of the problem of the current protein production and consumption are mostly emphasised?
- *Solution identification*: what should be done in order to solve the problem?
- *Vision for the future*: what are the targets for the future?
- *Responsibility for enactment*: which stakeholders are identified as responsible to solve the problem?
- *Implementation of policy*: how have the policies been enacted, taken up, modified, ignored and/or rejected?

Based on the data coding, also the topic of *contrasting frames* emerged, which are frames that seem to be contra dictionary with each other, and which make policy implementation more difficult.
Table 5 shows the protein transition policy frames found in Dutch governmental policy documents from 2007 to 2018. The following subsections will explain the topics in more detail, to get a better understanding of the dynamics of policy framing regarding the protein transition in Dutch governmental policy documents from 2007 to 2018 on the topics problem identification (4.3.1), solution identification (4.3.2), vision for the future (4.3.3), responsibility for enactment (4.3.4), implementation of policy (4.3.5) and contrasting frames (4.3.6).

Table 5. Policy frames regarding the protein transition found in Dutch governmental policy documents published between 2007 and 2018. The frames in **bold** are considered the most dominant policy frames of that time period.

	Cabinet Balkenende IV (2007-2010)	**Cabinet Rutte I (2010-2012)**	**Cabinet Rutte II (2012-2017)**	**Cabinet Rutte III (2017-2018)**
Problem identification	○ **Food security** ○ **Ecological sustainability of livestock industry** ○ Social resistance against livestock industry	○ **Economic pressure on livestock industry** ○ Food security ○ Ecological sustainability of livestock industry ○ Social resistance against livestock industry	○ Economic pressure on livestock industry ○ Food security ○ **Ecological sustainability of livestock industry** ○ Social resistance against livestock industry ○ **Public health** ○ Robustness	○ Economic pressure on livestock industry ○ Food security ○ **Ecological sustainability of livestock industry** ○ Social resistance against livestock industry ○ Public health ○ Robustness
Solution identification	○ **Making production in livestock industry more sustainable**	○ **Economic opportunity to innovate** ○ Making production in	○ Economic opportunity to innovate ○ **Making production in**	○ Economic opportunity to innovate ○ **Making production in**

	○ **Innovation on novel proteins** ○ Raising awareness of healthy and sustainable consumption ○ Influencing international agenda	livestock industry more sustainable ○ Innovation on novel proteins ○ Raising awareness of healthy and sustainable consumption	**livestock industry more sustainable** ○ **Innovation on novel proteins** ○ Raising awareness of healthy and sustainable consumption ○ Protein crops in Europe	**livestock industry more sustainable** ○ **Circular agriculture** ○ **Innovation on novel proteins** ○ Raising awareness of healthy and sustainable consumption ○ Protein crops in Europe ○ Influencing international agenda
Vision for the future	○ **Holistic sustainable production in 2020**	○ **Netherlands as world leader sustainability**	○ Netherlands as world leader sustainability ○ **Holistic sustainable production in 2050**	○ **Netherlands as world leader circular agriculture in 2030** ○ 40% animal-based and 60% plant-based protein in 2050
Responsibility for enactment	○ **Farmers** ○ Processing ○ Retail ○ Consumers	○ **Farmers** ○ **Processing** ○ **Retail** ○ Consumers	○ **Farmers** ○ **Processing** ○ **Retail** ○ Consumers	○ **Farmers** ○ **Processing** ○ **Retail** ○ Consumers
Implementation	○ **Innovation programmes** ○ Funding Dutch Nutrition Centre & *Milieu centraal* ○ RTRS	○ **Top Sector policy** ○ Innovation programmes ○ Funding Dutch Nutrition Centre & *Milieu centraal* ○ RTRS	○ Top Sector policy ○ **Innovation programmes** ○ Funding Dutch Nutrition Centre & *Milieu centraal* ○ RTRS	○ Top Sector policy ○ **Innovation programmes** ○ Funding Dutch Nutrition Centre & *Milieu centraal* ○ RTRS
Contrasting frames	○ Economic importance versus less animal-based protein consumption ○ Increasing animal well-fare versus increasing environmental sustainability ○ Prescribing consumption versus consumer's personal choice			

4.3.1 PROBLEM IDENTIFICATION

From 2007 to 2018 there has been a common agreement between all stakeholders that the overall impact of the animal protein was too high and that the current consumption patterns cannot be sustained on the long term. A lot of problems had been identified with the production and

consumption of animal products in the Netherlands, yet the emphasis that has been put on these particular frames has changed during the years 2007 and 2018. These dynamics will be elaborated below.

During Cabinet Balkenende IV from 2007 to 2010 the main motivation to change the food system was primarily framed around *food security,* which was introduced by future projections of population and wealth-growth, and thereby the demand for agricultural products, and the necessity to feed 9 billion people in 2050 within the limits of the earth.

An additional dominant frame was the *ecological (un)sustainability of protein production*. Minister Gerda Verburg (LNV) framed the problem as ecological untenable, because the livestock industry had been producing a lot of GHG emissions, requiring a lot of land, water and energy resources, leading to mineral surpluses (e.g. ammonia and nitrogen) and manure surplus, creating particulate matter, stimulating loss of biodiversity and had been a less efficient way to produce protein compared to plant-based protein (Blonk et al., 2008; Stehfest et al., 2008; Verburg, 2008a).

Another problem associated with the livestock industry was framed as issues of *social resistance against the livestock industry*, which was caused by citizens that were fed up with the *environmental nuisance,* such as odour, caused by the livestock industry, and concerns regarding *animal welfare*, such as shown by the citizen's initiative 'Stop fout vlees' ('Burgerinitiatief Stop fout vlees', 2007).

During Cabinet Rutte I from 2010 to 2012, the *economic pressure on the livestock industry* frame got more attention. The global financial crisis that started in 2008 had its consequences in the Netherlands. It became more difficult for the livestock farmers to earn a good living. This was a problem, because the agri-food sector was framed as very important for the Dutch economy. The Netherlands had been the second export country of agricultural products worldwide, and the lack of sustainability in the agri-food sector could threaten this economic position of the Netherlands.

Secretary of State Bleker (EL&I) also mentioned the other frames of *food security*, *ecological sustainability* and *social resistance against livestock industry* in his policy documents, but the main focus was on the *economic pressure on the livestock industry.*

When Cabinet of Rutte II took place from 2012 to 2017, the problem identification was framed as the unhealthy and unsustainable food system. The frames of *food security*, *ecological sustainability* and also *economic pressure on the livestock industry* were mentioned in policy documents. However, also the frame of the *public health* of consumption of (animal) protein started to receive more attention, mainly because of the report Guidelines for Good Nutrition published by the Dutch Health Council (Gezondheidsraad, 2015). The problem with the current Dutch diet was framed as unsustainable and unhealthy, with excessive food waste and use of resources (Westhoek & Nijdam, 2013). Also the report from the WRR *'Naar een voedselbeleid'* (Towards a food policy) (WRR, 2014) shifted more attention to the consumption side of the food chain instead of the traditional focus on the production side. The Food Agenda that was released as a response to the WRR report (Dijksma & Schippers, 2015) adopted the three main frames introduced by the WRR: *public health*, *ecological sustainability* and *robustness of the food system*. The frame of *food security* was incorporated in the *robustness of the food system* frame. However, this latter frame was broader, and also included dealing with extreme weather conditions as a result of climate change.

During Rutte III, from 2017 until now (scope for this research is until 2018), the same problem identification frames were present: *food security, economic pressure, ecological sustainability, social resistance against livestock industry* and *public health.* From the global discourse, more social pressure started to appear to change the unhealthy and unsustainable Dutch consumption patterns, but this frame was hardly recognised by Minister Schouten (LNV). The main problem around the Dutch production and consumption of protein was framed around the *ecological sustainability of protein production,* with more focus on the production side than on the consumption side of the food chain.

From this analysis of problem identification frames that indicated the necessity to change the current consumption and production of protein, it can be seen that five frames existed: *economic pressure on the livestock industry, food security, ecological sustainability of the livestock industry, social resistance against livestock industry* and *public health.* During Cabinet Balkenende IV, the focus was mainly on *food security* and *ecological sustainability*, during Rutte I the focus was on *economic pressure on the livestock industry,* Cabinet Rutte II focused mainly on *ecological sustainability of livestock industry* and *public health* and during Rutte III the main frame was *ecological sustainability of livestock industry.*

4.3.2 SOLUTION IDENTIFICATION

In order to reach a more sustainable production and consumption of protein, there was a common agreement between the stakeholders that the entire food chain should become more sustainable. However, based on the policy frames found in the Netherlands, the solution frames towards a protein transition were mainly focused on *making the livestock industry more sustainable* by using technical measures such as increased efficiency and innovation, and *innovation of new alternatives protein* (R2; R3; R5; R7; R8). The dynamics and emergence of these dominant frames and the other frames that were present, will be discussed below.

During Cabinet Balkenende IV, Minister Gerda Verburg (LNV) framed several solutions to stimulate a protein transition, such as *more sustainable production in livestock industry* through efficiency and innovation, broadening the supply of plant-based food through *innovation of alternative proteins* (such as meat-replacers, products based on algae, insects or cultured meat), *raising awareness on healthy and sustainable consumption* by funding the Dutch Nutrition Centre to provide information and *influencing the international agenda to change the food system.* Since the food system is a global system, Verburg framed the necessity for other countries in and outside the European Union (EU) to also take action on the protein issue.

When Cabinet Rutte I came into force in 2010, the focus on the solutions changed, as State of Secretary Henk Bleker (Ministry of EL&I) framed sustainability as an *economic opportunity* to gain competitive advantage and as a solution for the Netherlands to remain its position as second export country of agricultural products worldwide. This frame saw innovation in agriculture and innovation in novel proteins as the way for reaching a more sustainable food system and simultaneously achieving economic growth. Innovations to stimulate *more sustainable production in livestock industry* were primarily focused around more efficient production, to limit the use of scarce raw materials, save energy, reduce greenhouse gas emission and to increase quality of soil and surface water. Furthermore, *innovation on novel proteins* was also stimulated. Although the frame to *stimulate healthy and sustainable consumption* was still present, it only received attention through funding of the Dutch Nutrition Centre.

During Cabinet Rutte II from 2012 until 2017, the focus shifted from this *economic opportunity* towards more focus on *more sustainable production in livestock industry*, by using residual flows more efficiently and producing more efficient, and *innovation on novel proteins,* such as proteins derived from legumes, insects or algae. It became clearer that a healthy diet was often also a sustainable diet, and the frame of *raising awareness on healthy and sustainable consumption* received more attention. In this cabinet period a new frame emerged: the *production of protein crops for animal feed in Europe*, as a way to produce a more robust food system that was less dependent on import of animal feed from South America.

During Cabinet Rutte III in 2017 and 2018, Minister Carola Schouten from LNV framed the solution towards a sustainable food system as implementing *circular agriculture*. This was basically a new way to frame the same message that other ministers already gave: *make the livestock industry produce more sustainably.*

The frame of *circular agriculture* emphasises that a sustainable balance is needed between the consumption of both animal and plant-based proteins. This had to do with the fact that some residual streams are not suitable for human consumption but are suitable for animal consumption. Therefore, it is framed as necessary to consume some animal-based protein.

Other solution frames remained present in the policy documents, such as *economic opportunity to innovate, more sustainable meat production, innovation on novel proteins, raising awareness of healthy and sustainable consumption* and *protein crops in Europe.*

It is interesting to see that the suggestion to reduce the consumption protein, and in particular of animal-based protein, and to increase intake of plant-based protein is framed as one of the most effective measures by actors outside the government to reduce environmental impact as well as increase health (Blonk et al., 2008; Gezondheidsraad, 2011; Gezondheidsraad, 2015; RLI, 2018; Ocké et al., 2017; Westhoek & Nijdam, 2013), yet the Government did not adopt this frame as a dominant solution frame. The main argumentation for this is the fact that the Government does not want to dictate what citizens should and should not eat. Also, other frames were rejected as possible solutions, such as a *meat tax.* This frame was discussed in all four Cabinets during 2007-2018, but every time it was decided not to implement such a tax instrument to discourage meat consumption.

Summarising, the two most dominant frames were *more sustainable production in livestock industry* and *innovation on novel proteins*. However, five other solutions were also framed as ways to reach a protein transition: *economic opportunity, circular agriculture, raising awareness on healthy and sustainable consumption*, *protein crops in Europe,* and *influencing the international agenda to change the food system.* Two solutions frames were rejected by the Government: *meat tax* and *reduce protein consumption.*

4.3.3 VISION FOR THE FUTURE OF PROTEIN CONSUMPTION OF PRODUCTION

Between 2007 and 2018 several visions on the future of protein consumption and production emerged. During her time as Minister of LNV in Cabinet Balkenende IV, Gerda Verburg envisioned a Dutch livestock farming industry that would produce with respect for people, animals and would contribute to global prosperity and food security, within the capacity of the Earth in 2020. So here the frame of *holistic sustainable production* was present.

However, during Rutte I, Secretary of State Henk Bleker had a different vision for the transition towards a more sustainable food system and used the frame of *Netherlands as world leader sustainability*. This envision the Netherlands remaining its global export position and strengthening the economy by using sustainability as a business model.

During Rutte II, Secretary of State Sharon Dijksma shared her vision to produce enough food to meet the growing demand in 2050 while using fewer resources. This meant that the production had to become more efficient, which is also a continuation of the *holistic sustainable production* frame. However, Dijksma did not copy the 2020 deadline, but rather focused on the year 2050.

However, most of these visions were not specifically focused on protein consumption and production but rather on the food system as a whole. Only during Cabinet Rutte III, a specific vision emerged: The '*Transitieagenda biomassa en voedsel'* (Transition agenda biomass and food) (Minsterie IenM, 2018) envisioned a consumption pattern that switched from 60% animal-based protein and 40% plant-based protein towards the opposite: *40% animal-based and 60% plant-based protein in 2050*. Furthermore, Minister Carola Schouten (LNV) released her vision for LNV (Ministerie LNV, 2018) in 2018 in which she framed the Netherlands as *leader in circular agriculture in 2050* and an example for other countries when it comes to sustainable production.

4.3.4 RESPONSIBILITY FOR ENACTMENT

The Government framed that the *whole food chain* was responsible for enactment (R2;R5). After all, consumers can only consume sustainably if the supply existed, and farmers could only produce more sustainably if they manage to market their products to consumers. The agri-food chain is a complex chain, that involves a lot of stakeholders, such as farmers and suppliers, food processors and packagers, logistic and retailers and consumers. Furthermore, these stakeholders are influenced by research centres, banks, societal organisations, NGO's and the Government (see figure 1).

However, in policy documents this responsibility is not equally placed on the whole chain and the focus on different stakeholders changed over time. During Cabinet Balkenende IV from 2007 to 2010 the focus was mainly on *the farmers*. The farmer had to innovate and produce in a more sustainable way and that would lead to a change in the rest of the system. So, the responsibility was put on the production side, and there was little attention for the responsibility on *processors*, *retail* or *consumers*.

During Cabinet Rutte I from 2010-2012, Secretary of State Henk Bleker (EL&I) was mainly interested in stimulating the market and saw this as the best way to initiate the protein transition. Here, the responsibility was mainly placed on *farmers (*to find innovative ways to produce sustainably), *processors* (to find new innovative protein alternatives) and *retail* (to market the sustainable food products). There was very little focus on responsibility of enactment for *consumers*, as this was framed as a personal choice.

From 2012 and 2018 the responsibility for enactment of the protein transition remained focused mostly on the production side and the business community, so it is mainly *farmers*, *processing* and *retail* that are framed as responsible for enactment regarding the protein transition. However, slowly, more and more it becomes acknowledged that the *consumer* also plays a role in the protein transition.

4.3.5 IMPLEMENTATION OF POLICY

Between 2007 and 2018 several policies regarding the protein transition have been implemented. These implementations will be elaborated below.

The Netherlands Environmental Assessment Agency (PBL) concluded that the livestock industry became more sustainable between 2000 and 2010, by implementing more sustainable stables (with investments supported by the Ministry of LNV), increasing animal welfare (amongst others through a campaign for the '*Beter leven'* (Better Life) eco-label that indicates animal welfare in supermarkets using a star system), reducing fossil based energy use (and using more renewable energy) and reducing GHG emissions (Zeijts, 2010). PBL concluded that this increased sustainability was mainly a result of policy that was already implemented in 2001. Even though the Ministry of LNV stated that with '*Toekomstvisie veehouderij'* (Future vision for sustainable livestock farming) (Verburg, 2008b) there would come a drastic increase in sustainability, this drastic change was not seen in the implemented policy.

To stimulate the *innovation of novel protein* (such as meat-replacers, products based on algae, insects or possibly cultured meat) two programmes were started in 2008 (Verburg, 2008a) to stimulate knowledge development and product development. The first was a research programme called '*Innovatie eiwitketens'* (Innovation protein chains; PIEK), which stimulated knowledge development and the innovation programme *Small Business Innovation Research* (SBIR), which supported amongst others protein innovation in SME's.

In order to *raise awareness of healthy and sustainable consumption* the Government has been funding the Dutch Nutrition Centre and *Milieu Centraal* to provide information on healthy and sustainable consumption. However, this information was not specifically focused on switching to a more plant-based protein, but also on reducing food waste and eating less. The Government was reluctant to actively promote a different consumption pattern from 2007 to 2018, leading to no explicit

policy to stimulate a more plant-based consumption pattern except from the information provided by the Dutch Nutrition Centre and *Milieu Centraal*.

Another solution was *influencing the international agenda.* Minister Verburg for example gave a speech at the World Summit on Food Security (2009) in which she called for investments in climate adaptation measures in the agricultural sector. The Government also supported the global multi-stakeholder platform Round Table on Responsible Soy (RTRS), an initiative that started in 2006.

During Cabinet Rutte I from 2010 to 2012, Secretary of State Henk Bleker implemented the *Top Sector policy* to stimulate the knowledge economy and innovation in nine Dutch Top Sectors, such as Agro&Food and also the Green Deal *'Insecten voor feed, food en farma*' (Insects for feed, food and pharma) (Rijksoverheid, 2018) was started.

During Rutte II from 2012 to 2017, the implementation of policy remained similar to the years before: the Dutch Nutrition and *Milieu Centraal* received funding to inform consumers how they could eat more healthy and sustainable, the Ministry of LNV did investments in research to stimulate production and consumption of plant-based proteins for example through the SBIR programme, the PIEK programme or the Top Sector Policy. Social initiatives such as the Green Protein Alliance, Dutch Cuisine and the National Fruit and Vegetable Action Plan were financially supported. The implementation of policy regarding the protein transition also remained similar when after Rutte II the Cabinet Rutte III was active.

So even though there were several initiatives to stimulate production and consumption of sustainable proteins implemented between 2007 and 2018, a system change in the way protein is produced and consumed has not happened. It seems that the implementation of policy regarding the protein transition has been focused on continuing policy that was already in place and that was mainly focused on sub-aspects of the food chain, such as producing more efficient or informing consumer about healthy and sustainable food. Implementation of a chain-wide solution is still lacking and most implementation is rather focused on improving the livestock industry instead of focusing on the production and consumption of plant-based proteins.

4.3.6 CONTRASTING FRAMES IN PROTEIN TRANSITION POLICY DOCUMENTS

During coding of the documents, also a new topic emerged from the policy documents: *contrasting frames in protein transition.* In the policy documents, several contrasting frames were mentioned than can lead to trade-offs and barriers for policy implementation. These three contrasting frames will be elaborated below.

Economic importance of livestock industry versus recommendation for less animal-based protein consumption

The *economic importance* of the agricultural sector is considered very high by the Government, with the Netherlands being the second agro-exporter in the world and the agricultural sector having an added value of € 48 billion to the Dutch economy (TKI Agri & Food, 2012).

Furthermore, since there is a common agreement by the stakeholders that the demand for animal-based product is expected to rise due to population and wealth growth (Dijksma, 2013; Ministerie LNV, 2009; WRR, 2014; Verburg, 2008b), this provides an economic opportunity for the sector to grow. Since the Government frames the Netherlands as the most efficient producer of animal-based products, they argue that it does not make sense to cut production in the Netherlands from an economic perspective but also from an environmental perspective. If there is less production in the Netherlands, the gap between demand and supply could be filled by other countries that produce less efficient. Therefore, less production could lead to less GHG emissions in the Netherlands, but globally this would lead to more emissions as the production is moved to other less efficient producing countries.

However, actors from outside the Government recommend changing the current consumption pattern towards more plant-based protein as a promising solution for a healthier and more sustainable diet (de Valk et al., 2016; Gezondheidsraad, 2011; Gezondheidsraad, 2015; RLI, 2018; Stichting Voedingscentrum Nederland, 2018; Westhoek & Nijdam, 2013). If the Government would recommend consumers to consume less animal-based protein, there would be the potential financial consequences for the Dutch farmers and the Dutch economy. However, the frame of economic importance of livestock importance neglects the possibilities and economic opportunities in the production of plant-based proteins. In theory, the Netherlands could become just as effective in exporting plant-based proteins as they are currently with animal-based protein.

Increasing animal well-fare versus increasing environmental sustainability

Measurements to increase animal well-fare, such as increased space per animal and using slower growing breeds that live longer, will lead to more feed consumption and therefore more land use. This also means that increased animal well-fare in most cases leads to more emission per animal and increased costs for the farmer (and ultimately for the consumer as well). Not all farmers are able to invest in this more careful way of producing (Westhoek & Nijdam, 2013). This trade-off between animal well-fare and environment makes it seem that animal well-fare and environment cannot co-exist.

There is also a trade-off between the type of animal that is consumed from a perspective of animal well-fare and an environmental perspective. From an animal well-fare perspective, it makes more sense to eat big animals, such as ruminants, because this requires less animals. However, from an environmental perspective, it is better to eat small animals, such as chicken and pigs, because of their lower emissions and large feed-to-meat ratio (Sebek, Kuikman, & Vriesekoop, 2008). Chicken and pigs are also able to consume residual flows that are not suitable for human consumption.

Prescribing consumption versus consumer's personal choice

In most policy documents, the focus was on the production of protein, and the consumption side was not mentioned that much because most ministers saw consumption as a personal choice. This indicated that there is a clear tension between the frame of *healthy and sustainable consumption* and the frame of *consumer's personal choice.* The current Dutch diet is not in accordance with the Dutch nutrition guidelines, and this has consequences for public health and environment. However, it is a taboo for politicians to state that consumers should consume less meat (R2; R4; R5; R14; R18; R19) as it caused resistance from the livestock industry and the consumers. Dutch people do not want to be told what they should and should not eat, even though there are environmental and health advantages to changing the current Dutch consumption pattern.

5. CONCLUSION

The current Dutch food system is unsustainable, as it contributes to climate change, biodiversity loss and it creates challenges in animal welfare and public health. Changing consumption patterns from a diet focused on animal-based protein towards a diet more focused on plant-based protein could lead to less environmental impact and better public health. This is called the protein transition. Governmental policies could help to stimulate this diet change. However, the way the protein transition is framed, impacts the way the policy is perceived. This research investigated how the protein transition has been framed in Dutch governmental policies in the period between 2007 and 2018 , including implications for policy making. To research this, 169 policy documents published between 2007 and 2018 were analysed and 21 semi-structured interviews were held with policy makers, politicians, researchers, advisors from governmental research agencies and other relevant actors.

Based on the analysed Dutch governmental policy frames and interviews regarding the protein transition, it was found that the problem was mainly framed around the *ecological sustainability of the livestock industry*, and the solution was framed as *making the livestock industry produce more sustainably* and *investing in innovation of novel proteins*. This indicates a focus on the production side of protein, whereas focus on the consumption side is lacking. The vision of the future is framed around *holistic sustainable production of animal-based products* and *becoming a global leader in sustainable production or circular agriculture*. The responsibility for enactment is framed as a *shared responsibility for the whole chai*n, however it seems that the consumer is hardly included in this responsibility to change. Furthermore, three contrasting frames emerged, that showed that there is tension between *the economic opportunity of the livestock industry versus the recommendation to consume less animal-based protein, increasing animal well-fare versus increasing environmental sustainability of animal-based protein* and *prescribing consumption versus consumer's personal choice.* Although several policy initiatives have been implemented between 2007 and 2018, there has not been a system change in the way protein is produced and consumed in the Netherlands. The implementation was mainly focused on improving the production side of protein, with a strong focus on animal-based protein rather than plant-based protein.

This conclusion leads to the following implications and recommendations for policy:

Focus policy on protein consumption rather than production. Between 2007 and 2018 dozens of scientific reports were published which showed the latest scientific insights and provided clear recommendations for policy making. One of the main recommendations was to implement policy intended to change consumers' diet towards a lower protein consumption, especially less animal-based protein, and to shift protein intake towards more plant-based options. However, to the day of writing, no concrete policy has been made that took this recommendation in account.

Change the system, instead of adapting the current system. The protein transition is a broad topic that touches to a variety of subjects, such as animal welfare, food security, public health and ecological sustainability. In order to simultaneously tackle these challenges, a system change is needed. The policies that were implemented between 2007 and 2018 mainly focused on changing the production side of the livestock industry, thereby only adapting the current system instead of changing the system. This focus on adaptation of the current system will not lead to the vision of holistic sustainable production. Therefore, it is needed that the implemented policy focus on changing the whole system and addressing all the topics simultaneously, while incorporating the stakeholder in the global food chain. This is something that can not be left to the market, but that needs strong and clear governmental guidance.

Shift the focus towards human food rather than animal feed. From 2012 and onwards, the production of protein crops in Europe started to appear. However, most of these protein crops are intended for animal feed rather than human consumption. Even though this regional production of animal feed makes the production of animal-based protein more sustainable, it remains an inefficient way of producing food. It is therefore much more useful to stimulate the production of plant-based products using these regional grown protein crops.

Acknowledge the economic opportunities of plant-based proteins. Even though the livestock industry is framed as having big economic importance, the production of plant-based proteins could in theory reach the same economic importance. The Provinces of Gelderland, Overijssel, Flevoland and Noord-Brabant are acknowledging this economic importance already, and it would be helpful if this economic opportunity of plant-based proteins was also more emphasised in national policy.

6. DISCUSSION

This research has investigated the Dutch governmental policy frames regarding the protein transition published between 2007 and 2018. It has looked at the national policy regarding the protein transition, but also explored policy initiatives regarding the protein transition in five of the twelve Dutch provinces. The starting year 2007 was chosen because in this year the protein transition was placed on the agenda of the Dutch Central Government during Cabinet Balkenende IV.

Based on the results, it was found that the protein transition in governmental policy documents between 2007 and 2018 was mainly framed as a production problem, and therefore the solution identification, vision for the future and implementation were mainly focused on initiatives to change the production side of the livestock industry in the Netherlands or on the development of innovative novel proteins.

From a historical perspective, it makes sense that the frames around problems and solutions are more focused on production than on consumption. Since 1950's the focus of the Netherlands has been to produce as much food as efficient as possible. In the past decades there always has been a very explicit Dutch agricultural policy. However, explicit food policy, which also looks at the consumption side, is relatively new and only started to emerge from 2014. It could therefore take some more time before the consumption side is properly imbedded in the way policy makers think about the protein transition.

Another explanation could be the strong influence of the livestock industry in the Netherlands. The discussion on protein consumption was polarized, with several stakeholders (such as PvdD) being in favour of reducing meat consumption and others (such as LTO, VVD, CDA) that were against this reduction. This polarization could explain why so much effort was placed on innovation in both the livestock industry and the production of plant-based products: the focus on innovation is less threatening than the idea of producing less meat or changing consumption patterns. This polarization could also explain why a system change in the way protein was produced and consumed did not happen between 2007 and 2018, even though several initiatives had been implemented to try and change production patterns (and to a small extent also to change consumption patterns).

This polarization of the discussion was also found in the contrasting frames that emerged as a new topic from the result. The main frame here was the tension between the economic opportunity of producing animal-based protein and recommendation to consume less animal-based products. However, also these contrasting frames are a matter of framing: even when there are trade-offs between two frames, there are also opportunities for combination of solutions. For example, sustainable agriculture could also become a new business model, which could generate higher income for the farmers.

There have been several recent developments regarding the protein transition that happened in 2019 and were therefore outside the scope of this research. However, these developments emphasise the relevancy of research on the protein transition, since it is becoming an increasingly important topic in governmental policy. In particular, three recent events could have big impact on the future of policy regarding the protein transition. The first one is the potential development of a national Dutch protein strategy, as a response to report **'**The development of plant proteins in the European Union**'** from the European Commission (European Commission, 2018), in which the European Commission calls all Member States to form a national protein strategy in order to promote self-sufficiency in the production of plant-based protein. The four provinces Flevoland, Gelderland, Overijssel and Noord-Brabant have contacted the Ministry of LNV to discuss the content of such a national protein strategy. The first meeting regarding this plan already took place, and it is expected that a national protein strategy could be presented to the House of Representatives in the summer of 2020. Such a strategy could be really accelerating the protein transition in the Netherlands and the EU.

The second interesting development is the sequel of the LNV vision on Circular Agriculture that was released by Minister Carola Schouten (LNV) on June 17th 2019, in which she made her vision to make the Netherlands leader in circular agriculture by 2030 more concrete with a policy action plan called '*Realisatieplan visie LNV: Op weg met nieuw perspectief' (*Realisation plan vision LNV: on the

road with new perspective) (Ministry LNV, 2019). In this report, the importance of plant-based protein and novel protein sources are emphasised and Minister Schouten that she wants to stimulate the production of protein crops in the region. However, these protein crops are mainly intended for animal feed, and not for human consumption.

The third one is the Dutch Climate Agreement that was released in June 28th 2019 (Nijpels, 2019), which explained the measures that the Netherlands would do to reduce GHG emissions with 49% in 2030 compared to 1990 and to reach the Paris Climate Agreement (United Nations, 2015). The Climate Agreement mentions what the livestock industry can do to reduce its GHG emissions, which is mainly focused on innovations to become more efficient. Furthermore, the Climate Agreement also mentioned that consumption should be changed and that a better balance between animal-based protein and plant-based protein is needed in the Dutch consumption patterns. This balance needs to be adjusted according to the guidelines from the Dutch Nutrition Centre, which recommends a 50:50 ratio. The report also states that a reduction in the total protein intake is desirable. This report has the same dietary recommendations as others (Blonk et al., 2008; Gezondheidsraad, 2011; Gezondheidsraad, 2015; RLI, 2018; Ocké et al., 2017; Westhoek & Nijdam, 2013) and hopefully this time the recommendations will be implemented in actual policies.

This research has used a conceptual model based on framing theory using the three levels at which framing can take place: the global discourse, face-to-face interaction and localised collective (Zwartkruis, 2013). In this research, the focus was at policy framing at the level of the localized collective, and in accordance with (Zwartkruis, 2013) it was found that the frames at the level of the localized collective were mainly influenced by the face-to-face interaction of the Ministers and the rest of the Cabinet, but also by the global discourse. For example, during Balkenende IV, the protein transition was placed on the agenda because of events in the global discourse (such as the influential rapport from the FAO linking meat and climate change, but also social pressure against the livestock industry) but also because of the personal frame of Minister Gerda Verburg who wanted to change the food system and to make it more sustainable. Her successor, Secretary of State Henk Bleker had a different personal frame and was less interested in changing the food system. Therefore, his policy focused on other topics rather than the protein transition. During the Cabinets Rutte II and III, the topic of the protein transition slowly became more urgent, because of global discourse events such as the Paris Climate Agreements in 2015 and the emergence of the UN SDG's in 2016, which showed the importance of the global discourse in putting frames on the agenda.

This research was the first to investigate policy framing regarding the protein transition and it used six topics to investigate how the policy frames have changed over time. These topics were *problem identification, solution identification, vision for the future, responsibility for enactment, implementation of policy* and *contrasting frames.* It proved to be very helpful to use these topics as a way to structure the policy frames, therefore making framing theory more operationalised.

The last topic of *contrasting frames* emerged from the results. Frames are in literature mainly understood as rather fixed and coherent. However, in reality, it was found that multiple frames can be contesting at the same time, and this does not necessarily lead to the prevalence of one dominant policy frame. This finding has been confirmed by Dekker (2017), who found that frames can be ambiguous when problems are controversial and complex, which is also the case for the protein transition.

This research used framing theory to look at policy developments regarding the protein transition. This provided a social constructivist perspective on this complex problem and helps to understand the cognitive aspect of policy making. However, to better understand the whole food system, it would be interesting to use the (technological) innovation systems perspective (Hekkert, Negro, Heimeriks, Harmsen, & Jong, 2011) or the multilevel perspective (Geels, 2002). These two theories focus on the (socio-)technological changes in system innovation. This would be suitable for the protein transition, because it was shown from the policy frames that the transition is mainly focused on technological changes on the production side.

This research knows several limitations. Since much has happened in from 2007 to 2018, the overview given in this research has a rather meso or macro perspective and is explorative. It could be interesting to zoom in on a shorter time period to get a more detailed overlook of the policy frames of the past years. This detailed research could include analysis of the debates, as a way to gain a better perspective. However, as a first overview of the policy frames regarding the protein transition from 2007 to 2018, this research provides an interesting general overview of the main events and policies.

This research made a start to also include provincial policy in the results, but these results are not complete and only looked at five provinces. Other provinces were not taken into account because of time limitations. In four of these provinces (Flevoland, Overijssel, Gelderland, Noord-Brabant), explicit policy on the protein transition was present, and in Utrecht this policy was lacking. In further research, it could be interesting to see what has been happening in the other provinces, also because this can help to understand the relationship between national and regional policy. This could potentially be combined with policy developments in the EU, since the EU also influences the Dutch agricultural policy.

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APPENDIX A: INTERVIEW GUIDE

Good afternoon. Thank you for taking the time to participate in this interview. Before I start the interview, I would like to introduce myself shortly. I am a master student Sustainable Business from Utrecht University. This interview is part of my master thesis, which is focused on the framing of the protein transition in Dutch governmental policies from 2007 to 2018.

With this interview, I hope to hope to gain insight in how the framing has changed over the years. I would like to talk about problem of the protein transition, the solution to reach a protein transition, responsibility for enactment, vision for the future, implementation and context.

Do you mind if I record the interview? I will not use this recording for anything else than to transcribe the interview for my analysis.

- **Introduction:** Can you tell me a little bit more about your position? To what extent have you been involved in the protein transition and in what period where you/have you been active?
- **Problem identification**: How was the protein transition understood in 2007 and how has this changed over the past ten years? What are the historical and political antecedent that situated it? What are the main issues identified? Has the vision of the Government changed in terms of the protein transition? Where certain problems left out of policies? Why? Have they been included, or do you think they will be included in the future?
- **Solution identification**: What is the proposed solution to create a protein transition in 2007 and has this changed over the past eleven years? Where certain solutions left out of policies? Why? Have they been included, or do you think they will be included in the future?
- **Vision for the future**: What is the vision for the future of protein consumption and production? Is there an aligned vision or do some people have a different vision? Has this changed along the years?
- **Responsibility for enactment**: Who is responsible for the enactment of the policies? Has this changed over the years?
- **Implementation:** How have the policies been enacted, taken up, modified, ignored and/or rejected?
- **Contrasting frames:** What barriers and trade-offs exist for policy implementation?
- **Context/global discourse:** how has the context changed and how has this influenced the policies about the protein transition? Where there certain events that heavily influenced the policies? Is there a lot of resistance against the protein transition? From whom? Has this changed over the years?

Is there anything important that is not covered, and you want to discuss?

Thank you for your time.

APPENDIX B: CODEBOOK

Appendix B provides the codebook that was used to code the 169 policy documents and the 21 interviews.

Table 6. Code book used to code policy frames regarding the protein transition

Topic	Concept	Description	Example
Problem identification	Ecological sustainability of livestock industry	Consumption of animal-based protein is mentioned as a cause of climate change, biodiversity loss, etc.	''Both the products from dairy farming and the products from the extensive and intensive livestock farming make a substantial contribution to the greenhouse effect and the use of space due to Dutch consumption.'' (Blonk, 2008)
	Food security/Robustness	Consumption of animal-based protein is mentioned as a risk for food security in the future	"The world is too small to simultaneously produce enough food (including meat) for everyone, and deploy large-scale biofuels to curb climate change, and also preserve biodiversity." (PBL, 2007)
	Social resistance against livestock industry	Consumption of animal-based protein is mentioned as a source of social resistance against the livestock industry	"Finally, there is a lot of social resistance to abuse in intensive livestock farming." (PBL, 2012)
	Public health	Consumption of animal-based protein is mentioned as a cause of decreased public health	"Relatively fewer animal and more vegetable proteins fit into a sustainable and healthy eating pattern." (RLI, 2018)
	Economic pressure on livestock industry	Consumption of animal-based protein is related to pressure on the livestock industry to reduce costs, leading to a difficulty for the farmers to make a good living.	"Characteristic in these sectors is the emphasis on cost reduction and production increase, which lead to an increase in scale. In the market this is accompanied by small, sometimes even negative margins that many agricultural entrepreneurs have to deal with." (LNV, 2018)
Solution identification	Making production in livestock industry more sustainable	Improving current agricultural practices in the dairy- and meat	"Making the livestock industry more sustainable

		industry is mentioned as a solution to mitigate climate change	remains high on the agenda of this cabinet." (LNV, 2011)
	Diet change of consumers	Increasing consumption of plant-based and/or reducing intake of animal-based protein is mentioned as a way to reduce the impact of diets	"The analysis shows that by replacing animal with plant-based proteins in the human diet, greenhouse gas emissions can be effectively reduced.'' (PBL, 2008)
	Meat tax	Increasing tax on meat to discourage meat consumption	"The government therefore has no plans to introduce a tax on meat." (PBL, 2007)
	Innovation on novel proteins	Research and development for new alternative protein sources	"In addition to plant-based proteins and sustainable animal proteins, LNV mentions cultured meat as a third promising long-term development." (LVN, 2010)
	Raising awareness of healthy and sustainable consumption	Making consumers aware about the effects of protein intake on health and the environment	"In 2009 the Voedingscentrum starts a public campaign about sustainability and food." (LNV, 2008)
	Protein crops in Europe	Producing protein crops in Europe for animal feed of human consumption	"For a complete circular nitrogen cycle, it is more important than before to get this raw material from Europe." (Commissie van Doorn, 2011)
	Influencing international agenda	Putting the protein transition on the international agenda to create more impact	"It is also important to seek support at the European level and to develop guidelines together." (GR, 2011)
Responsibility for enactment	Farmers	Farmers are responsible for decreasing impact of the protein by producing in a more sustainable way	"According to a majority of the respondents, the government and farmers are responsible for sustainable production." (LNV, 2008)
	Consumers	Consumers are responsible for decreasing impact of protein by changing	"Most consumers [felt] that consumers and market parties should also play a role." (LNV, 2008)

		their consumption patterns	
	Policy makers/Government	Policy makers are responsible for decreasing impact of protein by creating strong regulatory policies	"The government can use various instruments to seduce consumers into healthy and sustainable choices." (RLI, 2018)
	Retailers	Retailers are responsible for decreasing impact of protein by ensuring bigger supply of sustainable protein	"Supermarkets and manufacturers have a role to play in ensuring a wider range of sustainable products." (LNV, 2008)
	Processing/producers	Processors and producers s are responsible for decreasing impact of protein by ensuring bigger supply of sustainable protein	"Producers may be required to take responsibility for a more sustainable and healthier way of production." (RLI, 2018)
Vision for the future		What a sustainable diet should look like	"The parties involved have set an ambitious but achievable goal: a shift in the consumption of animal and plant proteins from the current 37:63 to a healthy balance of 50:50.'' (GPA, 2018)
Implementation		What measures have been taken in the previous years?	"Dutch livestock farming has become more sustainable in the last ten years when it comes to the environmental sustainability and animal welfare." (PBL, 2010)
Contrasting frames		Barriers or potential trade-offs that make it difficult to implement policy measures	"When implementing policies to reduce meat consumption, loss of income for meat and milk producers will be an important barrier." (PBL, 2008)

APPENDIX C: LIST OF INTERVIEWEES

Appendix C provides the list of interviewees and their position. In brackets is the date the interviews took place.

Scientists at universities or other research institutes
R1: Associate professor sustainability & food, Vrije Universiteit (April 15, 2019)
R2: Senior scientist, Wageningen Economic Research (April 17, 2019)
R3: Researcher protein functionality (April 18, 2019)
R4: Professor nutrition and sustainability at Wageningen University & Research (May 21, 2019)

Advisors/scientists at advisory councils or governmental research agencies
R5: Senior advisor at RLI (and former advisor for WRR and policy officer at Ministry of LNV) (April 29, 2019)
R6: Scientific advisor at the Dutch Health Council (*Gezondheidsraad)* (May 6, 2019)
R7: Scientific researcher at PBL, in the sector water, agriculture and food (May 23, 2019)

Members of current parliament (Rutte III)
R8: Member of parliament (opposition, SP) spokesman for agriculture (May 9, 2019)
R9: Member of parliament (government, D66) spokesman for agriculture (May 15, 2019)
R10: Member of parliament (opposition, PvdA) spokesman for agriculture (May 17, 2019)

Project leaders or politicians active at the provincial level
R11: Project leader agro & food at Province Overijssel (May 13, 2019)
R12: Project leader food & innovation at Province Gelderland (May 14, 2019)
R13: Parliamentary leader PvdD at Province Utrecht (May 14, 2019)
R14: Senior project leader protein transition at Province Flevoland (May 15, 2019)
R15: Project leader agro & food programme at Province Noord-Brabant (May 17, 2019)
R16: Alderman of municipality in province of Utrecht, coordinator protein transition at Food Valley (April 30, 2019)

Policy makers (formerly) active at Ministries
R17: Policy advisor nutrition at Ministry of VWS (April 23, 2019)
R18: Former coordinator sustainable food systems at Ministry of LNV (May 14, 2019)
R19: Policy officer at Ministry of LNV (May 21, 2019)
R20: Former policy officer at Ministry of LNV (May 24, 2019)
R21: Former Minister of VROM (June 24, 2019)

Pilot interviews
PR1**:** Professor at Wageningen University & Research (March 5, 2019)
PR2: Researcher and expert on protein transition (March 8, 2019)