

HOW 'JUST' IS THE PROTEIN TRANSITION UNFOLDING FOR CONSUMERS IN THE NETHERLANDS?

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ABSTRACT

Animal-based protein consumption accelerates the nitrogen and carbon cycles, which contribute to climate change. From the environmental perspective, today's meat consumption levels are therefore unsustainable. This study investigates the transition to plant-based protein consumption, the "Protein Transition", which is expected to decrease greenhouse gas emissions through reduction of animal-based protein production and consumption. In the context of any transition, issues of social injustice need reflection and consideration. This research focuses on injustices induced by this plant-based Protein Transition in the Netherlands and investigates to what extent the different parts of the population are included and enabled to move away from animal-based proteins and make the necessary dietary changes. This study combines for the first time the Just Transition framework with the seven Technological Innovation Systems functions and is used as a proclaimed framework to analyse the presence of potential injustices in the Dutch Protein Transition. The results from extensive interviews with seventeen stakeholders, ranging from producers and marketers to consumers and policy makers, are analysed in a qualitative case study. The findings indicate that the Dutch Protein Transition induces geographic and ethnic inequalities. The engagement and involvement of rural areas and ethnic cultures present in the Netherlands are currently insufficient, and local knowledge of these consumer groups is lacking, which results in non-inclusive communication and marketing strategies. Additionally, the lower and middle socio-economic consumer groups are less participatory because of the high product prices resulting from the novelty of the transition, as well as from an immature development state of the products and the lack of transparency in government policies. To make the Protein Transition 'just', consumer focus should significantly shift towards rural areas and ethnic consumer groups, and become inclusive to all parts of Dutch society.

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ABBREVIATIONS

JT	Just Transition
PT	Protein Transition
TIS	Technological Innovation System
PBPP	Plant-based protein product

INTRODUCTION

It is increasingly recognized that current meat consumption is unsustainable for the environment. Animal-based protein consumption results in the acceleration of the nitrogen and carbon cycles which contribute to climate change (Aiking & De Boer, 2020). Extensive literature shows that reducing animal-based protein production and consumption could decrease greenhouse gas emissions (Andreoli et al., 2021). It is therefore beneficial for the long-term sustainability of the environment to move away from animal-based protein diets (Andreoli et al., 2021; Chai et al., 2019).

Recently, a promising alternative to meat and animal products emerged, namely plant-based protein substitutes. Plant-based meat substitutes are described by Tziva et al. (2020) as *“products that take the place of meat in human diet and have an appearance, texture and taste similar to meat products”* (p218). The advantages of these products are that they generally have a much lower impact on the environment (Cleveland & Gee, 2017). Additionally, these plant-based protein products (PBPP's) diversify diets and could provide health benefits (Qin, Wang & Luo, 2022). PBPP's could thus help to create a more sustainable food sector.

It was shown by Tziva et al. (2020) that changing consumer values and norms concerning animal-based protein consumption are among the drivers of the PT. Dietary changes take place at different levels of context and detail. As described by Meiselman (2009) the scope of change ranges from diets and dishes to ingredients and bites. To evaluate nutritionally, environmentally, and culturally acceptable changes in dietary patterns of consumers, these different levels are important. For a transition like PT to be 'just' it should include and enable all different parts of the population to adapt to dietary changes in moving away from animal-based proteins. So far, the PT discussion has been mostly about sustainability, but it seems important not to ignore justice problems in the transition trajectory still ahead of us.

It is getting acknowledged that issues of social injustice need reflection and consideration in the context of transitions (Kaljonen et al., 2021). It has been shown that food production, distribution, and consumption can lead to social inequalities (El Bilali et al., 2018). Additionally, social injustices that could result from a transition like the PT have not been studied extensively. Social inequality is described by Warwick-Booth (2018) as *“the condition where people have unequal access to valued resources, services, and positions in the society”* (p2). Thus, in the PT, consumer groups may not have equal access to these alternative food products or might not be equipped to adapt to these necessary changes in their diets. This thesis will therefore focus on the identification of social injustice for consumers resulting from the transition to PBPP's.

To study social injustices in the transition to PBPP's, this thesis will focus on the Netherlands. The development of the Dutch meat replacement market started in the 1990's and this market has developed and matured significantly. The Netherlands is very innovative in the development of plant-based meat substitutes. Leading companies like Vivera and Meatless are located in the Netherlands and contribute to the industry association (Tziva et al., 2020). Next to this, plant-based meat substitutes have been included in the updated Dutch dietary guidelines in 2015 (Ministerie van Volksgezondheid, Welzijn en Sport, 2015). The Netherlands is a relatively large and growing market for meat substitutes making the country suitable for this study (Changing markets foundation, 2018).

The aim of this research is to map the justice issues concerning consumers present in the unfolding of the Dutch PT. The Research Question posed in this thesis is:

How 'just' is the Protein Transition unfolding for consumers in the Netherlands?

To answer this Research Question, social injustices for consumers will be investigated across the whole innovation system including research, market actors and legislation. Next to this, injustices that relate to the non-inclusivity of consumers into PT in the Netherlands with respect to the diversity of consumer communities will also be taken under consideration.

The PT will be studied using the Just Transition (JT) frameworks by Jenkins et al. (2016) and the Technological Innovation System (TIS) which will be further discussed in chapter 2. The JT framework has been developed to allow the inclusion of social inequalities and tensions that emerge in transitions (Kaljonen et al., 2021). The framework helps to examine which social injustices are present and how they come about. The theoretical framework of Jenkins et al. (2016) is well-developed and describes three tenets: distributional, recognition-based and procedural justices. These tenets will be used to map the factors that impact social justice within the Dutch PT. The TIS theory explores "*conditions for the success of emerging sustainable technological fields or products/product groups*" (Tziva et al., 2020, p218). The TIS functions will be used to identify specific areas of injustices in the PT.

To answer the Research Question, interviews will be conducted by a variety of key stakeholders in the Dutch PT. Through these interviews, many insights and motivations will be collected regarding injustices held by consumers in the Dutch PT. Such a qualitative method is justifiably applicable to the PT because very limited knowledge is currently available regarding present injustices.

Answering the above posed research questions can be seen as a first step towards more 'just' access to and distribution of PBPP's. This study is expected to contribute to a better understanding of JTs. With the application of JT with TIS functions, the place of injustices in an innovation system can be identified, which improves the understanding of the injustices and their remedies. The results from this study could be beneficial for policy making to incorporate different parts of society better into the PT. For consumers this would mean that their society would become more inclusive resulting in better access to and distribution of PBPP's.

Sustainability of the Dutch food system is important, but so is equal and 'just' access to food.

THEORY

Following some early findings and observations on the PT, this Chapter provides the theoretical underpinning of JT theory and how it can be applied to identify injustices for consumers in the PT. The framework of Jenkins et al. (2016) will be used to identify key issues that contribute to inequality influences in the PT. Finally, the innovation system will be outlined with the help of TIS theory, to enable the identification of where injustices occur in this system.

2.1 The Protein Transition

The PT can be described as the shift away from the consumption of animal-based proteins towards plant-based proteins and other sources. Various social scientists have already studied the PT. They have mainly studied the development, drivers, and consumer behavioural aspects of the transition.

First, social scientists looked at the development and how to diffuse this transition (Tziva et al., 2020; Cheah et al., 2020). The diffusion of the PT is also influenced by consumer behaviour which will be discussed later in this chapter. They mostly investigated the development by taking a holistic system perspective which means that the system is incorporated and assessed in its entirety. Even though the whole innovation system is of importance, the point of view of the consumer stands central in this thesis. Cheah et al. (2020) states that consumer decision making processes are influenced by factors like health beliefs and environmental benefits. Additionally, social aspects like consumption habits and attitudes are also of importance (Cheah et al., 2020). By understanding the interactions of these motivators, intervention packages can better facilitate and support the transition.

Secondly, various studies showed a comparison of the drivers of different alternative protein sources (Andreoli et al., 2021; Aggarwal, & Drewnowski, 2019). They found that sociodemographic factors associated with plant-based protein consumption included eating healthier and higher education (Aggarwal, & Drewnowski, 2019).

Thirdly, scientists studied consumer preferences and consumer behaviour (Sanchez-Sabate, Badilla-Briones & Sabate, 2019; De Boer et al., 2016) and found that beliefs about personal behaviour, meat, and food in general hinder consumer awareness (Sanchez-Sabate, Badilla-Briones & Sabate, 2019). Next to these, enablers and barriers to changing food customs were found to be nutrition, health, and taste. According to Tziva et al. (2020) behaviour is deemed important because consumers tend to change very slowly when it comes to dietary habits. The study highlighted the leverage that users and their cognitive and normative institutions have on sustainability in the food sector.

What is mostly absent in this literature, however, is a consideration of inequality and social justice. This is remarkable because there are several reasons that suggest that these have a critical impact. Studies of food justice have already shown that deep injustices like unequal distribution of income, wealth, and power are present in the current food systems (Gilson & Kenenhan, 2021; Glennie & Alkon, 2018; Clapp et al., 2009). Good nutrition for all is not ensured by the current global food system. This affects approximately three billion people around the world that suffer from the burdens of malnutrition (including undernutrition, micronutrient deficiencies, and overweight and obesity) (Document Card | FAO | Food and Agriculture Organization of the United Nations, n.d.). Tziva et al. (2020) have also indicated

that the costs of meat replacements were usually higher than the costs of products that they replace. Generally, these products with distinct characteristics were only bought by conscious, early adopters who were willing and able to pay the relatively high price (Akaichi et al., 2019; Hughner et al., 2007). As a result, at the start of this transition, inequality is introduced immediately because of limited access to these products for certain consumer groups, such as low-income groups. The transition could thus unintentionally be steered to the availability of only a certain limited range of products and consumers, which would then create injustices.

2.2 The Just Transition

Now the aspect of social injustice within JT theory will be discussed, including the theory, framework and examples.

2.2.1 JUST TRANSITION THEORY

The history of the JT started around the 1970s and has since been used by activists and labor unions (Newell & Mulvaney, 2013; Stevis & Felli, 2020). Different strands have been described in JT literature. For instance, in the conceptual review of García-García et al. (2020) specific attention is paid to the impact of the low-carbon transition on labor income. Jenkins et al. (2016) focus on the applications of the energy justice framework in low-carbon transition studies. A similar approach was conducted by Sovacool and Dworkin (2015), who develop a conceptual, analytical, and decision-making tool. From a climate justice perspective, Klinsky and Dowlatabadi (2009) provided a conceptual review focusing on distributive justice implementation and its potential application in international climate policies. None of these studies has mentioned the application of JT theory to the PT.

On the topic of dietary transitions, Kaljonen et al. (2021) found that the elaboration of dietary transitions could contribute to justice questions in sustainability transitions research, which is the closest subject to PT. The dietary transition puts the focus on basic needs like food security and nutrition, which broadens justice considerations. It is known that across socio-economic groups, genders, and cultures the patterns of our diet vary (Rippin et al., 2020; Masella & Malorni, 2017; Fourat & Lepiller, 2015). Policies aimed at these transitions affect the socio-economic groups in varying degrees. Policies could for example influence the access to and affordability of food. Energy or carbon taxation resulting in higher food prices will put a greater burden on people with low incomes because a higher share of their income will have to be spent on basic needs (Gough, 2017; Tiffin & Salois, 2011).

2.2.2 JUST TRANSITION FRAMEWORK

The research in this thesis will be based on the Jenkins et al. (2016) framework. This framework aims to capture issues of justice among different dimensions. Their focus is to evaluate: *“(a) where injustices emerge, (b) which affected social classes are ignored, (c) which processes already exist for their remediation in order to (i) reveal, and (ii) reduce such injustices”* (Jenkins et al., 2016, p175). This framework forms the basis for the three justice tenets: distributional justice, recognition-based justice and procedural justice. An alternative framework is from Fuller and Bulkeley (2012) who’s work was centered on the utilization of distributional and procedural justice considerations. Another interesting framework was developed by Fraser (2014) who focused more on the recognition-based approach.

However, Jenkins et al. (2016) combined both frameworks to create a more complete view on injustices and it became one of the main and most accepted frameworks of JT.

Jenkins et al. (2016) introduced evaluative and normative questions which establish the judgement of value and meaning of injustices. These core tenets and their questions are listed in Table 1.

Table 1 Tenet contributions (Jenkins et al., 2016)

Tenets	Evaluative	Normative
Distributional	Where are the injustices?	How should we solve them?
Recognition	Who is ignored?	How should we recognize them?
Procedural	Is there a fair process?	Which new process should be incorporated?

2.2.2.1 Distributional justice

The distributional dimension assesses *“where the desirability of technologies in principle becomes entangled with issues that relate to specific locations and represents a call for even distribution of benefits and ills over all members of society regardless of income, race, etc.”* (Jenkins et al., 2016 p176). In other words, this tenet includes for example the allocation of environmental benefits and ills or the uneven distribution of responsibilities (Walker, 2009). Next to this, Jenkins et al. (2016) developed the notion of analysing the distribution of ills and the re-distribution of benefits.

In a study by Kaljonen et al. (2021) ills and benefits were investigated by applying main parts of the framework to the dietary transition. They suggest that in the dietary transition it should be investigated which social groups benefit and suffer from the transition and in what ways, and it should be analysed which disparities in distribution matter to achieve justice (Newell & Mulvaney, 2013). For the dietary transition this could imply great changes in for example supply chains and type of work. Any attempts to shift diets would be wise to consider the existing inequalities in food security, cultural values and social practices related to food.

As an example of distributional injustice during a transition, Jenkins et al. (2016) discuss the ‘Energiewende’ in Germany. The distribution of ills for electricity consumers caused by this new energy strategy is discussed regarding its justice implications. The Energiewende’s objective was to decarbonize the energy sector, and it also aims at removing nuclear power from the energy mix. As a result, the cost of energy increases. A higher financial burden is put on lower income communities, because a higher share of their income must be spent on energy. However, it is clear that the nuclear risk to the surrounding area is decreasing (Jenkins et al., 2016). Arguably, this contributes to more ‘just’ health risks distribution from the generation of electricity. This example shows how potential positive distributional justice effects can contribute to the benefits.

2.2.2.2 Recognition-based justice

Recognition-based justice means that *“individuals must be fairly represented, that they must be free from physical threats and that they must be offered complete and equal political rights”* (Jenkins et al., 2016 p177). Dietary transitions like the PT raise questions about recognition at the forefront because changes are urged in what people eat and what they perceive as healthy diets: these questions challenge present life, norms and values (Kaljonen et al., 2021). Recognition also highlights historical injustices that have

impacted minorities and other vulnerable groups, which is crucial for the understanding that not all actors are in the same starting situation when adaptations become necessary for a transition (Kaljonen et al., 2021).

Jenkins et al. (2016) focus on three main categories of misrecognition first formulated by Fraser (1999). These three main categories of injustice are: non-recognition, misrecognition, and disrespect. Non-recognition entails the failure or refusal to recognize something or someone. Misrecognition is the action of mistaking the identity of a person or thing. Lastly, disrespect is a lack of respect for certain consumer groups, for example based on different norms and values.

As an example of recognition-based injustice during a transition, Jenkins et al. (2016) discussed non-recognition in UK's policy of 'fuel poverty'. This policy was developed under the assumption that heating fuel was consumed more by consumer groups that were less educated on climate impact and related costs. Therefore, the information provision was targeted at those specific groups. However, the developers of the policy failed to recognize that the most important group of high heating fuel users were in fact the elderly. This group was using more fuel consistently because of their physical needs and health, requiring an above average room temperature (Walker & Day, 2012). This resulted into government-sponsored programmes that were for example more focussed on the 'energy poor' who would have a 'knowledge deficit'. The provision of objective information, subsidies, and other incentives for increasing the energy efficiency of electrical and heating appliances stood central in the initiatives to counteract 'fuel poverty'. The insights of these non-recognized groups were therefore not included. Just, legitimate, and inclusive compromises and solutions thus require recognition and respect (Jenkins et al., 2016).

2.2.2.3 Procedural justice

Procedural justice concerns itself with access to decision-making processes. Procedural justice draws attention to *"the forms and premises of participation in designing and realising low-carbon transitions and tensions arising in the process"* (Kaljonen et al., 2021, p474). This manifests itself as a call for fair procedures. All stakeholders should be involved in a non-discriminatory way in a fair procedure. Procedural justice has been applied to class, gender, and religion. Other, softer and non-regulatory, drivers are practices, norms, values, and behaviours.

Jenkins et al. (2016) make three mechanisms explicit. The first mechanism of procedural justice identified is mobilization of local knowledge. Local knowledge has been raised in literature as a critical motivating factor for seeking the inclusion and engagement of affected social groups (Jenkins et al., 2016).

Overlooking indigenous knowledge on the environment causes harm to communities and puts at risk the sustainability of decision-making. For an effective process of consultation, early intervention can be crucial. Thus, engagement of local communities is necessary for the recognition of procedural justice. The second mechanism requires meaningful participation and full information disclosure for example by government or industry (Davies, 2006) as well as appropriate and sympathetic engagement mechanisms (Todd & Zografos, 2005). The third mechanism is unequal representation in a wide range of institutions. For example, in governing bodies inequalities regarding gender and ethnic minority have long been observed. Thus, a larger appreciation of the "social dynamics of the social production of inequality" is needed (Pellow and Brulle, 2005 p.298).

As an example of procedural justice during a transition, Jenkins et al. (2016) discuss a newly proposed windfarm development in Finnmark, a predominantly Sámi populated country in the northern part of Norway. Guidance was sought on for example location and speed for the construction of this windfarm from the Sámi Council (Jenkins et al., 2016). Procedural justice can be more than simple inclusion for example though the mobilization of local knowledge. Local knowledge, discourse and stories are relevant and their inclusion in policy decisions can have a very positive impact.

2.2.2.4 Interlinkages between distributional, recognition-based and procedural justice
The questions regarding the three justice tenets are essentially interlinked and require careful context-specific analysis that should address JT considerations (Kaljonen et al., 2021). While procedural rules may ensure that social groups are allowed to have a voice in decision-making, recognition ensures that these views of different actors are taken seriously (Schlosberg, 2007). The recognition-bases justice tenet is thus closely linked to procedural justice tenet. The latter tenet provides room for negotiation of value tensions and trade-offs in transitions. Questions regarding the inclusion and capacities for participation are procedural aspect (Kaljonen et al., 2021). These three justice tenets are of importance for a complete investigation of the different forms of inequality that could be present in a transition such as the PT.

2.3 Technological Innovation Systems

With the understanding of the relevance of social injustice within JT, as explained above, this paragraph describes the innovation system in which the PT is taking place. The use of TIS theory will enable the identification of where these social injustices occur in the innovation system.

The TIS is described by Markard and Truffer (2008) as *“a set of networks of actors and institutions that jointly interact in a specific technological field and contribute to the generation, diffusion and utilization of variants of a new technology and/or new product”* (p.611). A TIS consists of actors, networks and institutions which are called structural components (Bergek et al., 2008; Markard & Truffer, 2008). Table 2 describes these components.

Table 2 Components of a TIS (Hekkert et al., 2007)

Component	Definition
Actors	They generate, diffuse, and utilize technologies. Examples of actors are knowledge institutes, educational organizations, market actors, government bodies and other supportive organizations.
Institutions	Formal institutions consist of codified rules enforced by an authority (such as legislation). Informal institutions refer to more tacit codes and norms between actors.
Networks	The network component refers to the interactions between these actors, through formal or informal network and individual contacts.
Infrastructures	Infrastructures are necessary to the development and diffusion of innovation and comprise of physical infrastructures (technology artefacts and infrastructure), knowledge infrastructures (knowledge, expertise, and know-how) and financial infrastructure (e.g., subsidies, investment, and grants).

To study the development and diffusion of a novel technology, such as plant-based protein alternatives, the TIS uses seven system function which are listed in Table 3. The functional approach translates the

present activities of the development process to the innovation system (Jacobsson & Bergek, 2011; Wieczorek et al., 2015). Thus, the TIS functions will be used to identify where the injustices of the PT take place in the innovation system.

Table 3 Functions of a TIS (Hekkert et al., 2007; Wieczorek et al., 2015)

Function	Definition
F1 Entrepreneurial activities	Refers to the ability to exploit the potential of new knowledge, networks, and markets into new business opportunities. Through exposure to market dynamics, entrepreneurs will learn about the products, processes and services developed.
F2 Knowledge development	The creation of new knowledge development is at the start of new innovations. It can be generated through science-based research and through activities such as 'learning by searching' and 'learning by doing'.
F3 Knowledge diffusion	The diffusion and exchange of technological knowledge to potential entrepreneurs can be used to develop innovations.
F4 Guidance of the search	Refers to the activities that positively affect the visibility, vision, and expectations that stakeholders can have around a new technology. It is necessary to identify and select the direction for technological development. This guidance can occur through expressed visions or expectations, strategies, and policies by institutional and industry actors.
F5 Market formation	When innovations are brought to the market, their acceptance and adoption is still uncertain. The more disruptive the innovation is, the greater the need to form, or generate new markets, for instance through niche markets.
F6 Resource mobilisation	Refers to the allocation of resources needed to support the innovation, such as infrastructures, financial capital, or human resources.
F7 Creation of legitimacy	Refers to the perceived resistance to set up a new and unfamiliar technology in the market and the actions taken to counteract or overcome resistance to change.

2.4 Theoretical framework

In summary, three justice tenets on justices in transitions have been established from the literature: Distributional justice (T1), Recognition-based justice (T2) and Procedural justice (T3). These tenets will form the basis for the theoretical framework of this research. JT framework focusses on identifying inequalities. However, this framework is lacking the context to analyse these injustices in the whole innovation system. By combining the JT framework of Jenkins et al. (2016) with the TIS framework, the identified injustices can be positioned in the innovation system. The TIS enables a systemic perspective on the evolutionary nature of sustainability transitions. The seven functions of the TIS shed light on the functioning of a technology throughout an innovation system. Useful activities and patterns of injustices for consumers can be identified within the context of the TIS framework. An overview of this theoretical framework is shown in Figure 1.

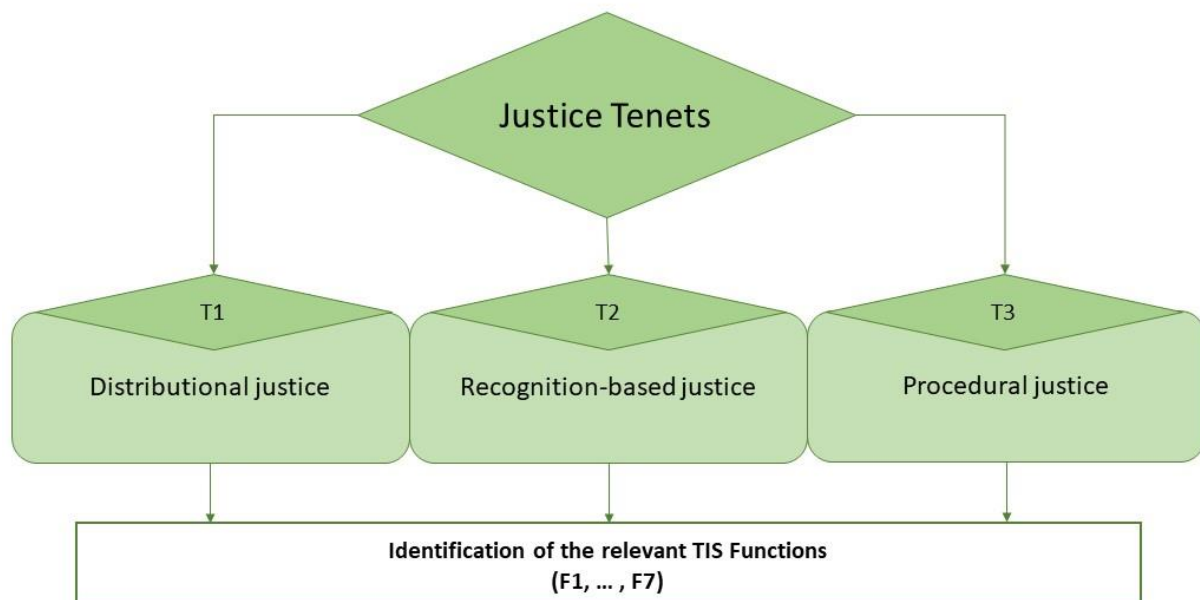


Figure 1 Theoretical framework of the combined JT and TIS frameworks

METHODOLOGY

The theoretical and analytical frameworks discussed in the previous chapter have given this research the indications and perspective it needs to properly analyse the findings. Next to this, it is important to discuss how the data and information were gathered in this research. Thus, an overview will be given about what data were collected, who they were collected from, how the data were collected and how they were analysed.

3.1 Research design and steps

Qualitative research methods are more concerned with collecting unquantifiable insights and motivations (Aspers & Corte, 2019). These methods are suitable to obtain in-depth insights that are not yet described by literature. Furthermore, qualitative methods are effective at gaining insights and motivations which in this context would be hard to quantify (Aspers & Corte, 2019). By employing a qualitative research methodology, this research is expected to gain more insights on which, why and how injustices play a role in the PT.

The research steps of this study were built upon the theoretical framework and are listed with the proposed sub-steps and descriptions in Table 4.

Table 4 Research steps

Steps	Sub-steps	Description
Actor analysis	Identify relevant actors from knowledge institutes, educational organizations, industry, market actors, government bodies, other supportive organizations, and consumer organisations	Evenly distribute actors per actor type of the Dutch PT.
Data collection	Contacting actors	Contact actors through email.
	Interview preparation	Set up interview guide.
	Conduct interview	Collect the information.
Data analysis	Transcribe interviews	Verbatim transcribe interviews.
	Code interviews	Relevant information will be labelled and grouped.
	Analyse results	Analysing identified themes and identify possible patterns of the system. Identification of where inequalities occur in the innovation system with TIS functions.
Reliability and validity	Link results to the Research Question	Explain how the results answer the proposed Research Question of this thesis.
	Reflect	Reflect upon the approach and data.

3.2 Actor analysis

The actor analysis was used to determine useful interview candidates. Important actor groups within the system are knowledge institutes, educational organizations, market actors, governmental bodies, NGO's, and consumer organizations that can represent large and diverse groups of consumers.

The actors of the Dutch PT have been identified through desk research. Data was collected from secondary online sources. These sources included news articles, firms and industry associations' websites, policy reports, research reports and scientific literature. These sources need to have a clear link with the PT in order to be selected. Such a link would be identified when organisations expressed their role, influence or knowledge about the PT. Furthermore, it was deemed important to get a diverse and complete representation of the different actor groups to get a holistic systems perspective. Thus, multiple actors were identified per group to make sure that every group's diversity will be respected.

One consumer organisation, two governmental organisations, three educational organisations, four supportive organisations and 7 market actors were interviewed. An overview of the seventeen interviewed participants as well as some key information about their organisations can be found in Table 8 interviewees information in Appendix B.

3.3 Data collection

As the first step in the data collection process, identified actors in the Dutch PT were contacted. Background information concerning the PT and this research was very crucial for the actors to identify the appropriate participants from their organisation for the interview. These participants could contribute with their knowledge and involvement in the PT. This first contact was thus already a very important step that needed careful consideration and preparation. Preceding the interviews, participants were asked to give consent at the start of the interview, which enabled the researcher to use the data and record the interview.

Next to this, the interview questions were prepared carefully on the basis of the theoretical framework presented before. The interview questions were drawn up using the justice descriptions of Jenkins et al. (2016). Semi-structured interviews enabled the researcher to provide some direction to the participants, yet also introduced flexibility (Bryman, 2016). This approach was chosen because unforeseen injustices could be identified this way which could otherwise be overlooked. The three justice tenets of Jenkins et al. (2016) were discussed in the interviews in the context of consumers and the PT. The first tenet, distributional justice focussed on how the benefits and ills were distributed over consumers irrespective of income, race, etc. Thus, questions were asked about possible benefits and ills of the PT induced on consumers. Next, distribution issues, for example of PBPP's to supermarkets, were discussed in this tenet. The second tenet, recognition-based justice concerned itself with the proper representation and involvement of the consumer in product design and product experience. Within this tenet the inclusivity of different socio-economical groups was of importance. Mentioning of certain consumer groups by interviewees, as well as failure to mention certain groups provided important information. The third tenet, procedural justice targeted the decision-making processes in which different consumers were included. The role of inclusivity in these processes was discussed. Questions were asked concerning for

example organisational consumer involvement policies, as well as questions about in which processes consumers were incorporated. Example questions of the three tenets can be seen in Table 5.

Table 5 Example questions

Justice Tenet	Example question
Distributional	Could you tell me about to who your products are distributed in the Netherlands?
Recognition-based	Could you tell me about your target group in the Netherlands?
Procedural	Could you tell me about the designing processes that include consumer participants?

The present inequalities in the different justice tenets were identified according to the different interviewees' perspectives. Through prepared questions, interviewees were asked to explain their view upon possible injustices for consumers in the PT.

The interviews were conducted using an interview guide which can be seen in Appendix A interview guide. The interview guide has prepared questions and follow-up questions. However, the interview guide left room for deviation from these questions when necessary or opportune. The research scheme that was used to draw up the data flow from the interviews is shown in Figure 2.

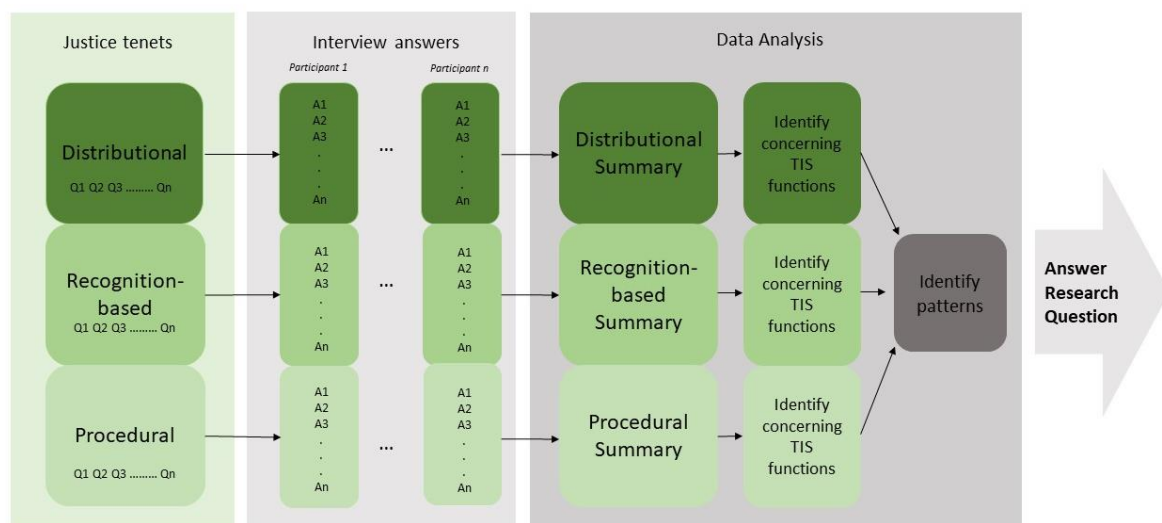


Figure 2 Research scheme

Interviews were conducted between April and June 2022. The duration of the interviews was between 30 and 60 minutes. Because this research was conducted in the Netherlands, the interviewee was given the choice in which language the interview would take place (Dutch or English). This was to ensure that the interviewees were as comfortable as possible during the interview and could express themselves in the best possible way.

During the data collection process, it sometimes happened that interviewees were not able to answer a question posed by the researcher. This often concerned organisations' general policies on consumer involvement. However, they were allowed to supply an answer later through email after consultation with colleagues. It was also noticed by the researcher that in other interviews, answers given by

participants concerning organisations policies were rather vague. Reflection upon the collected results can be found in 5.1 Research limitations and alternative explanation. During the interviews no additional relevant lines of questioning appeared necessary, so there was no need to alter the prepared interview guide. Therefore, apart from delayed (e-mailed) responses to unanswered questions, no additional gathering of data took place.

3.4 Analysis

The results collected related to the three different tenets were first analysed separately per tenet. The TIS functions were used to identify where inequalities occurred in the system. According to the definitions of the TIS functions presented in Table 3, identified inequalities of the justice tenets were linked to one or more of the system functions and their described activities. Table 6 will be further filled in and completed into Table 7 using the results discussed in the next chapter.

Thereafter, the three tenets were put in context of the whole innovation system, following Jenkins et al. (2016) who argued that all three tenets are required to investigate potential injustices present in a transition. Table 6 shows the identification of patterns for the whole system.

Table 6 Example overview of injustices within the innovation system

Occurrence within the innovation system (represented through the TIS functions)	Identified injustices	Justice tenets
F1 Entrepreneurial activities	<i>Example: Bigger cities have more plant-based protein options in their supermarkets than in the outskirts of the Netherlands.</i>	<i>Example: Distributional</i>
F2 Knowledge development		
...		
F7 Creation of legitimacy		

All interviews were transcribed verbatim directly after taking place. Since some of the interviews were conducted in Dutch (whenever interviewees insisted on this), all quotes were translated into English. The transcripts of the interviews were manually coded using a qualitative content analysis approach and followed three coding steps (open, axial, and selective coding) as defined by Corbin and Strauss (1990). Open coding breaks up the text into discrete relevant parts. This coding provided first insights into recurring themes. Axial coding draws connections between the codes. During this step, some of the existing codes were reiterated to improve their descriptive value and connections between relating codes emerged. Lastly, selective coding was used for the identification of central categories that connect the codes reflecting the essence of this research. This step initiated the connection of codes to the justice tenet which shed light on which injustices were present in which justice tenet.

The initial coding categories were based on the three tenets and context factors. Possible codes of the three different tenets were identified in the literature (see Chapter 2) and are shown in Figure 3. These codes were only integrated during the axial coding and selective coding process.

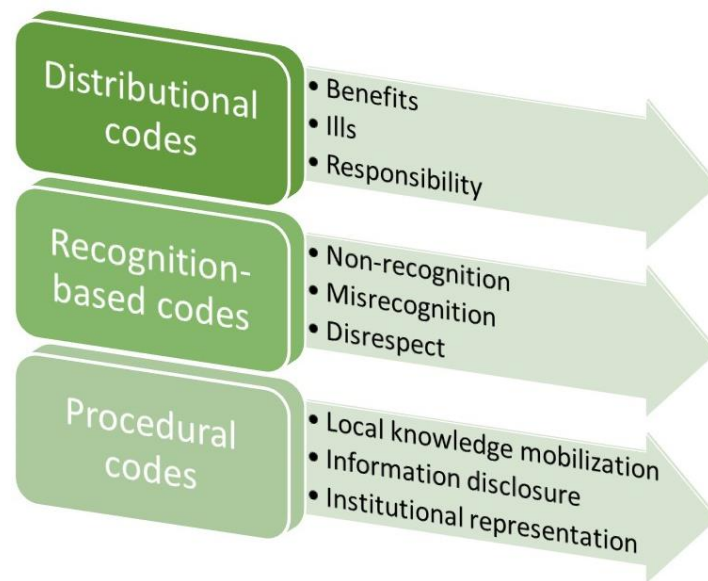


Figure 3 Possible justice tenet codes

In the final coding process, central categories and themes were identified. First, the major themes were identified for each justice tenet. Subsequently, a broader system perspective was taken using the overview of Table 6. This facilitated the identification of similarities and differences between the tenets and where they took place in the innovation system.

3.5 Reliability and validity

The interviews were recorded and transcribed to ensure traceability and auditability of information collected and used. By being transparent on the theoretical framework and method of operationalisation, reliability was increased. Reflecting upon the collected data mitigated the risk of possible misinterpretations on the researcher's side. Member checking was implemented to establish higher credibility and trustworthiness of used quotes from interviewees. The system functions enabled the identification and occurrence of the injustice in the system and were used to determine whether this injustice was present in different parts of the system.

The methodical steps used in this research, using a combination of TIS and JT theories, have not been published in literature and therefore are cutting edge research. Because of this innovative aspect, it was appropriate to evaluate the method. We will return to this evaluation and how the theoretical and analytical framework can be used to improve future research.

RESULTS

In total, 17 key results have been distilled from this research, which will be denoted R1 through R17. These observations directly lead to the main result of this thesis:

A divide has developed in the PT between well-educated, affluent, flexitarians from urban areas on the one hand and lower and middle socio-economic consumer groups, including ethnic cultures and rural areas on the other hand. This divide is mainly driven by lack of adequately understanding certain consumer groups and by non-inclusive communication and distribution strategies that only reach limited consumer groups. This divide is strongly hindering the 'just' progress of the PT in the Netherlands.

These key results will be listed first, and in the paragraphs below these results and their identified injustices will be discussed in more detail per tenet. Additionally, the relation of the identified injustices to the TIS functions will be analyzed to position them into the innovation system.

- R1 Ethnic supermarkets are not part of the various supermarkets that offer PBPP's, which results in PBPP's being inaccessible to ethnic consumers.
- R2 Placement of PBPP's in the various supermarkets of the Netherlands is much more limited in rural areas.
- R3 The relatively high price of PBPP's does not meet the acceptable price range of product placement in many supermarkets, which creates inaccessibility for all consumers regardless of income.
- R4 The out-of-home distribution channel of PBPP's requires high product quality, which contributes to inaccessibility to consumers with a low income.
- R5 The relatively high price of PBPP's results in low accessibility of these products to middle and low socio-economic consumer groups.
- R6 The plant-based protein market too often mimics popular products and does not acknowledge the large variety of products in general, for example non main-stream products used by ethnic consumers.
- R7 Taste, texture and the general eating experience of PBPP's often do not meet the expectations of consumers who have little intrinsic motivation to decrease their animal product intake.
- R8 Slow legislation (for example to allow the use of certain enzymes) concerning PBPP's hampers accessibility of these products to all consumers.
- R9 Current marketing and communication strategies of PT market actors are reaching only more aware and involved consumers.
- R10 While food cultures of ethnic minorities are being recognized by market actors, very few ethnic customers are directly involved in decision making related to the PT.
- R11 It is not clear why the strategy of market actors to target rural areas by mimicking existing food products appears to be unsuccessful.
- R12 Consumer research does not result in the inclusion of all consumer groups in the PT.

- R13 Concept testing is scarcely used, which prevents the identification of new community needs and opportunities to develop products in more diverse directions.
- R14 While product testing is critically influencing the PT, it is done at a much lower rate in areas where ethnic consumers live and in rural areas.
- R15 Too little effort is undertaken to collect information and understand the cultural wants and needs (the local knowledge) of consumers groups living in rural areas or of different ethnicity.
- R16 Providing transparency about PBPP's ingredients and how they are produced is not a current focus of actors in the PT, which hinders acceptance in all consumer groups.
- R17 Inclusiveness of the PT is hindered because actors and institutional representation in the PT are still predominantly western-cultured and urban centered.

4.1 Distributional justice

Different factors influence which consumer groups are reached with the distribution channels in the PT. I have identified three main factors from the interviews that shape distributional justice of PBPP's: distribution channels, product properties and marketing, and they will be discussed next.

4.1.1 DISTRIBUTION CHANNELS

Two main distribution channels are described by the interviewed market actors, namely retail via supermarkets and the out-of-home via catering industries. The distribution channel retail entails supermarkets at which the PBPP's are sold to consumers. The out-of-home distribution channel entails industrial catering and restaurants. There is an apparent difference in sold PBPP's per distribution channel which will be discussed further per distribution channel.

- R1 Ethnic supermarkets are not part of the various supermarkets that offer PBPP's, which results in PBPP's being inaccessible to ethnic consumers.

Various supermarket chains are present in the Netherlands. These chains have different profiles which target and attract specific consumer groups. For example, Albert Heijn and Jumbo are large and well-spread chains. and they typically focus on and sell A-brands. Interviewed market actors note that PBPP's that are currently marketed by A-brands find their way more easily to these large chains, while PBPP's are not always represented similarly by supermarkets that do not focus on A-brands. The latter include the many ethnic-dedicated supermarkets focussing on Middle Eastern, North African, Eastern European and Asian food cultures. This part of the retail isn't recognized by any of the interviewed PBPP market actors as a possible distribution point. Also, supermarkets targeting lower income groups (often used by ethnic consumers when ethnic-dedicated supermarkets are not available) do not focus on A-brands: *"If you look at Lidl, they have in general many more off-brands there than A-brands, so I don't think you'll see our PBPP A-brand product itself there as often"* (Interview 5). The discussed distribution points concerning retail are associated with the fifth TIS function, market formation, because the distribution channels impact the consumer makeup of the market. Injustice is introduced because certain consumer groups are not reached through the retail channel.

R2 Placement of PBPP's in the various supermarkets of the Netherlands is much more limited in rural areas.

Next to the unavailability of certain PBPP's at certain chains of supermarkets, the level at which PBPP's are offered by branches of the same supermarket chain differs per location. Producers and suppliers spoke about their negotiating position with retail chains concerning their products, however retail chains keep control over product placement in their different locations *"Which product of ours is in which supermarket is really decided by the supermarket chain itself, for example in Enschede the salmon substitute is nowhere to be found, while in Wageningen, where I studied, it would have already been in the supermarket so to speak."* (Interview 5). All market actors speak of an uneven distribution of the PT throughout the Netherlands. Supermarkets in urban areas offer more PBPP's and are currently further along in the PT than rural areas which are described as harder to penetrate. The market formation (F5) of the PT is therefore progressing differently from location to location in the Netherlands. This induces injustice concerning the accessibility of products at different locations which mainly concerns the rural areas of the Netherlands.

R3 The relatively high price of PBPP's does not meet the acceptable price range of product placement in many supermarkets, which creates inaccessibility for all consumers regardless of income.

The price of PBPP's isn't only of interest to consumers. Retail also has a very competitive attitude towards the price of products. Products are rejected based on price, and impacts their distribution and availability, for example *"By offering a luxury version of a doner kebab sandwich you can make up the price difference between alternatives and real meat. But supermarkets don't see that, they continue to offer consumers at the lowest possible price."* (Interview 4). More expensive but still desirable products are therefore often not made available at a selling point that positively influences market formation (F5). Diversification of the current quite homogeneous assortments is important to attract new consumer groups. Thus, the price of products has major impact on product placement in the market which influences the accessibility to consumers. Currently, the PT features an injustice to all consumers as a result of the lack of heterogeneity of the plant-based protein assortment.

R4 The out-of-home distribution channel of PBPP's requires high product quality, which contributes to inaccessibility to consumers with a low income.

Next to retail, another distribution channel, out-of-home, operates via restaurants and catering industries. The catering industry supplies companies, factories, universities, hospitals, and other organisations with canteen food. Interviewed market actors note that relative to retail the out-of-home distribution channel gets off to a slower start: *"The out-of-home responds often a little bit later on healthier food trends compared to retail. Often people say, 'it just has to taste good, as I need to enjoy my food when I'm eating out of home'. That's why reformulated products like protein alternatives are often introduced at a later stage in out-of-home."* (Interview 8). For the same reasons, these products need to mature to a higher quality level before they are included into the catering industry, where the demand for quality products is also higher. In both channels, the resulting higher price is more easily accepted: interviewed market actors from companies that joined the PT market at a later stage note that it was easier to enter this market via the out-of-home channel than through retail because of the demand for

quality. But because these channels are generally available only to higher income consumers, market formation (F5) therefore develops differently for different incomes, which creates an injustice.

To summarize section 4.1.1 Distribution channels, the used distributional channels of the PBPP's limit accessibility to ethnic cultures, lower income groups and rural areas. The distribution channels and product price are also influenced by differences in the quality of PBPP's. These factors influence market formation (F5) of the PT.

4.1.2 PRODUCT PROPERTIES

R5 The relatively high price of PBPP's results in low accessibility of these products to middle and low socio-economic consumer groups.

Price is also an important product property for understanding distributional justice. The price of a product has a major influence on the accessibility of a certain product as is also noted by many of the interviewees *"How accessible are all these products to everyone? Well mostly not, right! Because they're really expensive. Because there's still a lot of development to be done. Many of them are still premium products."* (Interview 14). While market actors have every intention to make the price more acceptable to lower and middle socio-economic consumer groups, before costs reductions are feasible, the current 4% market share of PBPP's in the total meat industry should first grow above 10 percent (Haas, 2022). Therefore, the dilemma is that before price can be decreased the market needs to be established through idealistic or well-to-do consumers who are willing to pay a higher price. *"That's kind of tricky for the consumer. They must start buying a product at relatively high cost to eventually let it become cheaper."* (Interview 11). Current economic inflation makes this issue worse (NOS, 2022). Therefore, the current, relatively high price of protein alternatives creates an inaccessibility for consumers with lower incomes, which is an injustice. This influences the market formation (F5) of the PT.

R6 The plant-based protein market too often mimics popular products and does not acknowledge the large variety of products in general, for example non main-stream products used by ethnic consumers.

All interviewed market actors' products mimic animal products and it is clear that meat mimicking is currently the main strategy followed in the PT of the Netherlands. In meat mimicking, copying the look and taste of existing animal-based meat and dairy products are central. Because of this focus on existing look and taste, the meat mimicking strategy leads the development of products into a very narrow direction, which concerns the fourth TIS function, guidance of the search. As a result, the plant-based protein market consists of rather homogeneous products resembling main-stream animal products. Only one interviewee mentioned hybrid products in which meat and plants are combined. This homogeneous offering of products limits the appeal of these alternative products to only a narrow audience which is inclined to buy such ready-made products. Many consumers who for example have other food preferences like sheep or lamb, or wish to eat an alternative for pork in a different size or shape do not have the option to buy such PBPP's. This creates inaccessibility of products to ethnic consumer groups who have food preferences different from the main-stream products in the Netherlands which creates an injustice.

R7 Taste, texture and the general eating experience of PBPP's often do not meet the expectations of consumers who have little intrinsic motivation to decrease their animal product intake.

Mimicking a certain type of meat has another potential downside as it also creates expectations of what that PBPP should taste like. Most interviewed market actors put emphasis on product taste, texture and general experience of their PBPP's. This is also supported by de Haas' finding that taste is still the most important property to persuade the consumer to buy the product (2022). Additionally, taste was also mentioned by other actor groups as an important product property, for example by governmental agencies *"The ING bank study into the acceptance of meat substitutes, showed for example that the acceptance is growing. This is also due to the supply, the taste and the convenience of these products."* (Interview 16; (Europese Markt Voor Vlees- En Zuivelvervangers Groeit Naar 7,5 Miljard Euro in 2025, n.d.). Research focusses also still on improvements of taste *"The fact is that proteins from plant sources are not yet comparable to animal proteins in terms of taste and texture, and that is what we are mainly concerned with. To develop these properties further so that it will eventually be better accepted by consumers."* (Interview 11). However, the interviewed market actors describe that PBPP's are often not able to sufficiently match the taste and experience of the products that they are mimicking and do not yet align with the expectations from customers. Taste, texture and experience are thus very important product properties and relate to the fifth and seventh TIS function, market formation and creation of legitimacy.

R8 Slow legislation (for example to allow the use of certain enzymes) concerning PBPP's hampers accessibility of these products to all consumers.

Legislation concerning PBPP's is also of importance to distributional justice. Legislation in the PT is behind, which slows down the development of these products *"If you want to put new plant-based proteins on the market, you first have to obtain permission from the EFSA (EU) and/or the FDA in the US, and, I know, for proteins for example, there are several procedures going on. But for microbial casein proteins, which are proteins comparable to casein proteins in milk needed to make cheese, those procedures have only recently started. It will thus certainly take another three years."* (Interview 14). Legislation is concerned with the fourth TIS function, guidance of the search. The policies and procedures concerning PBPP's from institutional organizations like governments are important for the development. Slow implementation of procedures by the government results in slower development of products and maintain general inaccessibility to consumers which creates an injustice.

To summarize section 4.1.2 Product properties, I have thus identified that ethnic consumers, lower and middle socio-economic consumer groups are less inclined to join the PT, which is the result of product properties like price and taste of PBPP's. This concerns the guidance of the search (F4), market formation (F5) and creation of legitimacy (F7) of the TIS functions.

4.1.3 MARKETING

Marketing and communication strategies are an important part of distributional justice because of the information and awareness that they provide to consumers. Consumer contact is generally described by interviewees to include physical as well as online contact. Additionally, there are supportive organizations that focus on changing the (buying) environment that consumers are exposed to, such as the layout of a

supermarket, to motivate and encourage the customers to participate in the PT. Physical contact with consumers usually takes place at fairs or at public locations. Online contact of interviewees with consumers mostly occurs through internet websites, social media, e-mail, and the news.

R9 Current marketing and communication strategies of PT market actors are targeted only to more aware and involved consumers.

Advertisement is not well implemented by the interviewed market actors in their marketing and communication strategies. Different reasons for this are given, for example that the financial situation of the company does not enable them to implement a lot of advertisement for their products. Lack of financial capital corresponds with the sixth TIS function, resource mobilization. Even the larger market actors that were interviewed described that they consider marketing important, but that they do not utilize this often for their products. Consumers are thus not often made aware of the PBPP's through advertisements. It was described by the interviewed market actors that consumers often find the products or companies themselves, online, to obtain input concerning the products *"We have a communications department, and they use different channels. Social media are of course a very important channel nowadays and then for each type of expression they consider which channel they will use for example LinkedIn, Instagram or Facebook. We also have our own website of course. People can Google us and find us."* (Interview 6). However, consumers which are less interested in PBPP's will thus come less into contact with these companies and products which influences the fifth TIS function, market formation. S. de Waart (n.d.) states that in 2019 still fewer than 50% of the Dutch consumers consider themselves flexitarian and many consumers may not concern themselves yet with the PT. Thus, the current marketing and communication strategies reach more aware and involved consumers of the PT which creates an injustice for unaware and uninvolved consumers in the PT.

To summarize section 4.1.3 Marketing, I have identified that physical and online channels are utilized for the communication with consumers. The financial situation of the companies does not enable them to implement a lot of advertising for their products which corresponds with the sixth TIS function, resource mobilization. The current rather minimal marketing and communication strategies reach more aware and involved consumers of the PT which creates an injustice for unaware and uninvolved consumers in the PT.

4.2 Recognition-based justice

Most interviewees noted that the PT aligns well with consumers that are concerned with issues like animal welfare, climate issues and health. De Haas (2022) makes a similar claim concerning animal welfare and the environment. However, to involve new consumer groups in the PT, it is important to also recognize and understand these consumers' point of view. Rural areas of the Netherlands have been noted by most of the interviewees as hard to reach, which might be because the inhabitants of the rural areas are less engaged and involved with issues associated with the PT. This would be an issue of misrecognition of this consumer group, which is an injustice and will be further discussed below. Furthermore, ethnic consumer groups are hardly noticed and discussed by the involved interviewees, which is a non-recognition issue and an injustice. Examples and links to the third recognition category

'disrespect' were not discovered in this research and this fact will be addressed and reflected upon in section

4.2.1 NON-RECOGNITION

R10 While food cultures of ethnic minorities are being recognized by market actors, very few ethnic customers are directly involved in decision making related to the PT.

Food cultures of ethnic minorities have been discussed and are recognized by the interviewed market actors. Market actors described different efforts they undertake to diversify their food supply to consumers by incorporating ideas from different food cultures. For example, one of those efforts was described as *"We're changing menu's four times a year to focus on a specific kitchen, partly or fully offered in the restaurant. This is a concept called POP UP – the traveling kitchen. If a product turns out to be very popular at a certain location, we continue it on the menu for that location. So, for example the flatbread with humus turned out to gain traction in the POP UP, therefore we decided to add it to the menu"* (Interview 9). While these implementations diversify the Dutch food culture, ethnic consumer groups themselves receive little recognition, which causes an injustice. For example, companies may choose to introduce falafel in their product assortment based on the interest of Dutch consumers, because they appear to like it. However, they fail to check with ethnic consumer groups whether this particular recipe is also what ethnic consumers would like. The food cultures from Middle-East, North-Africa, Eastern-Europe and Asia have settled in the Netherlands. Consequently, various ethnic supermarkets have also manifested themselves in the Netherlands to provide consumers with food not provided by the commercial supermarkets. However, these ethnic supermarkets are not approached and involved in the PT. This injustice concerns the first of the TIS functions, entrepreneurial activities, because there is an inability of the interviewed market actors to exploit or recognize knowledge, networks and markets here.

To summarize 4.2.1 Non-recognition, even though ethnic food cultures are getting attention from some of the interviewed market actors, no PBPP's are specifically made available to these ethnic consumer groups which is an injustice. In addition, the needs or values of these ethnic consumer groups haven't been mentioned or recognized in the development and entrepreneurial activities of PBPP's. This also makes it challenging to discover which properties of the PT transition are of interest to ethnic consumer groups. Ethnic consumer groups are clearly not recognized in the PT and little knowledge and ideas are in place to properly involve them in the PT.

4.2.2 MISRECOGNITION

R11 It is not clear why the strategy of market actors to target rural areas by mimicking existing food products appears to be unsuccessful.

Six interviewees from different actor groups described that rural residents are substantially different from urban residents and that they currently are not reached sufficiently. Two market actors describe that the attitude of rural residents towards new ideas like meat substitutes or other protein sources is very reluctant *"If you ask a local man on the street in a rural area 'what do you think about vegetarianism?' then you usually get the response 'I am not a fan'."* (Interview 1). Resistance towards the PT concerns the seventh TIS function, creation of legitimacy. Additionally, it is noticed by supportive

organizations that with specific initiatives like the ‘week without meat’, urban areas are sufficiently reached while rural areas are not. To understand why the strategy to mimic existing products does not reach the consumers from the rural areas, research into these consumers and their local cultures is required. Therefore, two supportive organizations have put their focus on rural areas to further the PT in these areas and to research why the current mimicking strategy isn’t successful. An interesting approach for example is the concept ‘boosting’, which resulted from that research: *“The construct is called boosting with which we are committed to conscious behavioral change. We want to intrinsically motivate consumers to make vegetable choices more often. A choice that is value-driven and thus no longer dependent on the context in which it is offered, it is an aspiration for sustainable (long-term) behavioral change.”* (Interview17). Another method to involve consumers, so-called ‘area panels’, was set up to determine which interventions would make the PT in a particular area more ‘just’. Another supportive organization made funds available for special projects to reach rural areas: *“We always try to make the projects as accessible as possible for everyone. We also often ask partners if they can reach specific target groups. For example, through the meatless week initiative, the reach in the big cities is already very high, so our funding was really intended to reach people in the rural areas.”* (Interview 6). The current PBPP’s and marketing do not align well with residents of rural areas, which is an injustice. Knowledge development seems to be a crucial first step to gain the necessary means to involve rural areas in the PT.

To summarize 4.2.2 Misrecognition, the currently implemented meat mimicking strategy is not aligned with the interest of the consumers in rural areas. Rural areas resist differently to the PT than the urban areas of the Netherlands which concerns the seventh TIS function, creation of legitimacy. Apparently, the fact that the PBPP’s mimic meat is not sufficient for rural residents to accept it as an alternative.

4.3 Procedural justice

Interviewees identified three areas of procedural justice: research, concept testing and product testing. These decision-making processes are mostly used to involve consumers. They only mentioned these three processes while there are potentially other useful processes in which consumers could contribute. Companies mostly outsource market research to specialized organizations. The results provide general consumer information for the sector to develop food and policies. Next, there is product and concept testing to gain information about consumer groups. Product testing is used to test product prototypes with consumers and is described by all interviewed market actors as the main test procedure of products in the PT. In addition to these decision-making processes, local knowledge mobilization, information disclosure and institutional representation, which influence procedural justice which will be discussed.

4.3.1 DECISION-MAKING PROCESSES

R12 Consumer research does not result in the inclusion of all consumer groups in the PT.

The (mostly outsourced) consumer research is used by market actors to chart marketing information, for example the willingness of consumers to buy, the packaging of products and of course price. Market actors claim that there are no justice issues in their consumer research because they outsource this to representative organizations that are expected to make sure that the samples are representative. However, this study could not identify whether the conclusions of those reports truly are representative of the average Dutch consumers. Additionally, which conclusions or policies were in fact based on

consumer research has not become apparent, and therefore no injustice could be positively identified. The use of surveys was mentioned twice by interviewees. However, there is much disagreement about the reliability and representability of surveys in general, and it could thus well be that injustices are present here. Apart from research commissioned by market actors, there are other reports and findings describing the opinions of Dutch consumers regarding the PT, which are also of interest. These research organizations are thus often closely followed to keep up with the developments in the PT. Consumer research concerns the first TIS function, entrepreneurial activities, and second TIS function, knowledge development, because it sheds light on potential developments of knowledge and markets. While there is disagreement about the representability, no hard evidence of an injustice concerning the consumer research was found.

R13 Concept testing is scarcely used, which prevents the identification of new community needs and opportunities to develop products in more diverse directions.

Concept testing assesses ideas about new products and usually takes place before product testing. For example, what would you think about having seaweed as part of your dinner in comparison to testing a burger made of seaweed. Concept testing is scarcely used in the PT because market actors describe that merely a concept of a new product or ingredient is hard to test with consumers. For example, testing the concept of new protein sources is challenging *“People don't know what it tastes like. People don't know what it looks like.”* (Interview 5). Thus, market actors stated that concept testing is not effective and more scarcely done than product testing. Nevertheless, concept testing could be very beneficial for the second TIS function, knowledge development, providing insight into society. Concept testing is also related to the fourth TIS function, guidance of the search, which doesn't align currently with rural areas and ethnic consumer groups. Governmental and supportive organizations state to still be in the trial phase of realizing the PT. This entails concept testing like field labs to investigate the role of citizens in the food sector or retail pilots to investigate the stimulation of intrinsic motivations of consumers.

R14 While product testing is critically influencing the PT, it is done at a much lower rate in areas where ethnic consumers live and in rural areas.

Product testing is widely implemented in the PT and many interviewees state that getting people to taste and experience the PBPP's is very important *“Tasting is believing.”* (Interview 8). Product testing mainly provides concrete information about the product and the experience of the consumer. Product testing involves mainly tasting sessions at different locations. These locations vary the product company or supermarket to fairs and public places. Product testing is associated with the second TIS function, knowledge development, and fourth TIS function, guidance of the search, but it provides different information than concept testing. Even though many of the interviewed market actors wish to reach rural areas and ethnic consumer groups, less product testing is specifically focused on these groups or locations. Fewer locations were mentioned that are more targeted and appropriate to ethnic consumer groups or rural areas. There is thus an injustice concerning testing of products, in that it is not as accessible for rural areas and ethnic consumer groups. In addition to these standard testing procedures, there are also products which are specifically tested in the supermarket and do not undergo a long product testing procedure *“We will immediately start marketing the product via different channels and based on that we will look at what the feedback from consumers is.”* (Interview 8). These projects were

named 'test and learn' which connects to the first TIS function, entrepreneurial activity. Through direct exposure to the market, entrepreneurs can learn about the products, processes and services of the product. However, this isn't widely implemented in the Netherlands, even though it could contribute to a more diverse product assortment.

To summarize 4.3.1 Decision-making processes, it has become clear that in the decision-making processes rural areas and ethnic cultures aren't recognized appropriately and involved sufficiently. The potential decision-making mechanisms are appropriate in principle, but they should be used more often and more effectively.

4.3.2 LOCAL KNOWLEDGE MOBILIZATION, INFORMATION DISCLOSURE & INSTITUTIONAL REPRESENTATION

R15 Too little effort is undertaken to collect information and understand the cultural wants and needs (the local knowledge) of consumer groups living in rural areas or of different ethnicity.

Little local knowledge is obtained through decision-making processes. Product testing and outsourced consumer research don't contribute much to local knowledge, which could hamper the seventh TIS function, creation of legitimacy. Outsourced consumer research mostly deals with general information and does not specifically target local knowledge. Product testing isn't necessarily focussed on local knowledge but instead on product specifications and how consumers experience these. This could give some insights into local knowledge however this didn't become apparent from the interviews. Testing concepts locally would be more effective for the mobilization of local knowledge because the alignment of the local culture could be compared with the concept. Ethnic consumer groups aren't involved equally in the product and concept testing. It has become clear that the current approach of the PT is mostly aligned with urban areas as opposed to rural areas and ethnic consumer groups, which is an injustice. Thus, testing out new concepts in the rural areas and with ethnic consumers is of vital importance to involve these groups in the PT.

R16 Providing transparency about PBPP's ingredients and how they are produced is not a current focus of actors in the PT, which hinders acceptance in all consumer groups.

Transparency issues mentioned by interviewees of the food sector include limited product information, the reasoning of placing the product on specific food shelves, how the product was produced, and unclear government steering. Placement on specific food shelves and product information are vital marketing instruments. However, often information concerning the origin of ingredients (for example soy) is lacking. Market actors explained that more information is needed to educate consumers about the product and its implications on the environment. Visibility, vision, and expectations of the PT are therefore lacking, which concerns the fourth TIS function, guidance of the search. Also, transparency about the prices of PBPP's is quite low. Recently, de Haas (2022) claimed that the PBPP's do not have a fair price yet, by explaining how the price of PBPP's is determined by production scale, profit margins and mutual competition. The influence of the government from lobbies, subsidies and policies should become more transparent to create an even playing field in the protein markets. Current engagement mechanisms are not appropriate and not sympathetic towards the complete spectrum of consumer groups present in the Netherlands, which fuels injustices.

R17 Inclusiveness of the PT is hindered because actors and institutional representation in the PT are still predominantly western-cultured and urban centered.

Even though many of the interviewees discussed diversification of entrepreneurs of the food sector, the rather limited range of representation of institutions in the PT still creates injustices. This mainly concerns geographical and ethnical inequalities. Different change strategies are being implemented, and supportive organisations and provinces are now implementing campaigns and projects specifically directed to rural areas and ethnic consumer groups. The creation of legitimacy and ways to counteract resistance concerns the seventh TIS function. Market actors approach it differently by looking at composition and representation in their own teams and companies. Both approaches haven't yet counteracted the present injustices and haven't been able to reach the rural areas and ethnic consumer groups.

To summarize 4.3.2 Local knowledge mobilization, information disclosure & institutional representation, the above discussed mechanisms of procedural justice concerning the local knowledge, transparency in the sector and institutional representation give insight into possible causes of insufficient involvement of consumer groups into the decision-making processes. Inclusiveness of the PT is held back because actors and institutional representation in the PT are still predominantly western-cultured and urban centered. Even though, local knowledge and its importance are now getting attention, more initiatives are necessary to involve and incorporate rural areas and ethnic consumer groups into the PT. Lastly, more transparency about PBPP's should be provided concerning ingredients and how they are produced, which would be helpful to create and manage the expectations of consumers for the PT.

4.4 TIS functions

The 17 results that observe injustices were identified through the framework of the three justice tenets of Jenkins et al. (2016). Their occurrence within the innovation system was identified through the TIS functions of Hekkert et al. (2007) and Wieczorek et al. (2015). The overview of the injustices and linked TIS functions is shown in Table 7 below.

Table 7 Overview of identified injustices with occurrence within the innovation system

Occurrence within the innovation system (represented through TIS function)	Identified injustices	Justice tenets
F1 Entrepreneurial activity	<i>R10 While food cultures of ethnic minorities are being recognized by market actors, very few ethnic customers are directly involved in decision making related to the PT.</i>	Recognition-based
	<i>R12 Consumer research is not inclusive of all consumer groups in the PT.</i>	Procedural
F2 Knowledge development	<i>R12 Consumer research does not result in the inclusion of all consumer groups in the PT.</i>	Procedural
	<i>R13 Concept testing is scarcely used, which prevents the identification of new community needs and opportunities to develop products in more diverse directions.</i>	Procedural
	<i>R14 While product testing is critically influencing the PT, it is done at a much lower rate in areas where ethnic consumers live and in rural areas.</i>	Procedural
F3 Knowledge diffusion	-	-
F4 Guidance of the search	<i>R6 The plant-based protein market too often mimics popular products and does not acknowledge the large variety of products in general, for example non main-stream products used by ethnic consumers.</i>	Distributional
	<i>R8 Slow legislation (for example to allow the use of certain enzymes) concerning PBPP's hampers accessibility of these products to all consumers.</i>	Distributional
	<i>R13 Concept testing is scarcely used, which prevents the identification of new community needs and opportunities to develop products in more diverse directions.</i>	Procedural
	<i>R14 While product testing is critically influencing the PT, it is done at a much lower rate in areas where ethnic consumers live and in rural areas.</i>	Procedural
	<i>R16 Providing transparency about PBPP's ingredients and how they are produced is not a current focus of actors in the PT, which hinders acceptance in all consumer groups.</i>	Procedural
F5 Market formation	<i>R1 Ethnic supermarkets are not part of the various supermarkets that offer PBPP's, which</i>	Distributional

	<i>results in PBPP's being inaccessible to ethnic consumers.</i>	
	<i>R2 Placement of PBPP's in the various supermarkets of the Netherlands is much more limited in rural areas.</i>	Distributional
	<i>R3 The relatively high price of PBPP's does not meet the acceptable price range of product placement in many supermarkets, which creates inaccessibility for all consumers regardless of income.</i>	Distributional
	<i>R4 The out-of-home distribution channel of PBPP's requires high product quality, which contributes to inaccessibility to consumers with a low income.</i>	Distributional
	<i>R5 The relatively high price of PBPP's results in low accessibility of these products to middle and low socio-economic consumer groups.</i>	Distributional
	<i>R7 Taste, texture and the general eating experience of PBPP's often do not meet the expectations of consumers who have little intrinsic motivation to decrease their animal product intake.</i>	Distributional
	<i>R9 Current marketing and communication strategies of PT market actors are targeted only to more aware and involved consumers.</i>	Distributional
F6 Recourse mobilization	<i>R9 Current marketing and communication strategies of PT market actors are targeted only to more aware and involved consumers.</i>	Distributional
F7 Creation of legitimacy	<i>R7 Taste, texture and the general eating experience of PBPP's often do not meet the expectations of consumers who have little intrinsic motivation to decrease their animal product intake.</i>	Distributional
	<i>R11 It is not clear why the strategy of market actors to target rural areas by mimicking existing food products appears to be unsuccessful.</i>	Recognition-based
	<i>R15 Too little effort is undertaken to collect information and understand the cultural wants and needs (the local knowledge) of consumers groups living in rural areas or of different ethnicity.</i>	Procedural
	<i>R17 Inclusiveness of the PT is hindered because actors and institutional representation in the PT are still predominantly western-cultured and urban centered.</i>	Procedural

Before we describe the relationships between individual TIS functions, a few remarks can be made for each justice tenet based on the table above.

The distributional injustices have been linked to the fourth, fifth, sixth and seventh TIS function: this study showed that consumers from rural areas and ethnic cultures are not involved properly into the PT. This is to a large extent because product properties do not align with these consumer groups. Additionally, appropriate channels to reach these consumer groups are also much less utilized. Thus, geographical and ethnical disparities induce distributional injustices in the PT.

The recognition-based justice tenet is concerned with the observation of this research that ethnic consumer groups are not recognized and the consumers from rural areas are misrecognized in the Dutch PT. The first and seventh TIS functions have been linked to this justice tenet. With respect to ethnic consumer groups, their potential to form new knowledge and markets is not recognized, which links them to the first TIS function because this function is concerned with the exploitation of new markets. Consumers from rural areas are targeted by some market actors, however these consumers show great resistance to the PT. Thus, the PT lacks legitimacy with the consumers of rural areas because of misrecognition of these consumers and their local knowledge.

The procedural justice tenet is mainly concerned with the second TIS function, knowledge development. The creation of knowledge is at the start of new innovations and is of crucial importance. Local knowledge from certain consumer groups (rural areas, ethnic cultures) is however not gathered. Improving the creation of local knowledge might be the starting point for remedying the injustices in the PT. Procedural justice goes far beyond knowledge development and is also found in the first, fourth and seventh TIS functions. However, at least in this research knowledge development seems to have the highest impact in incorporating consumer groups into the decision-making processes of the PT.

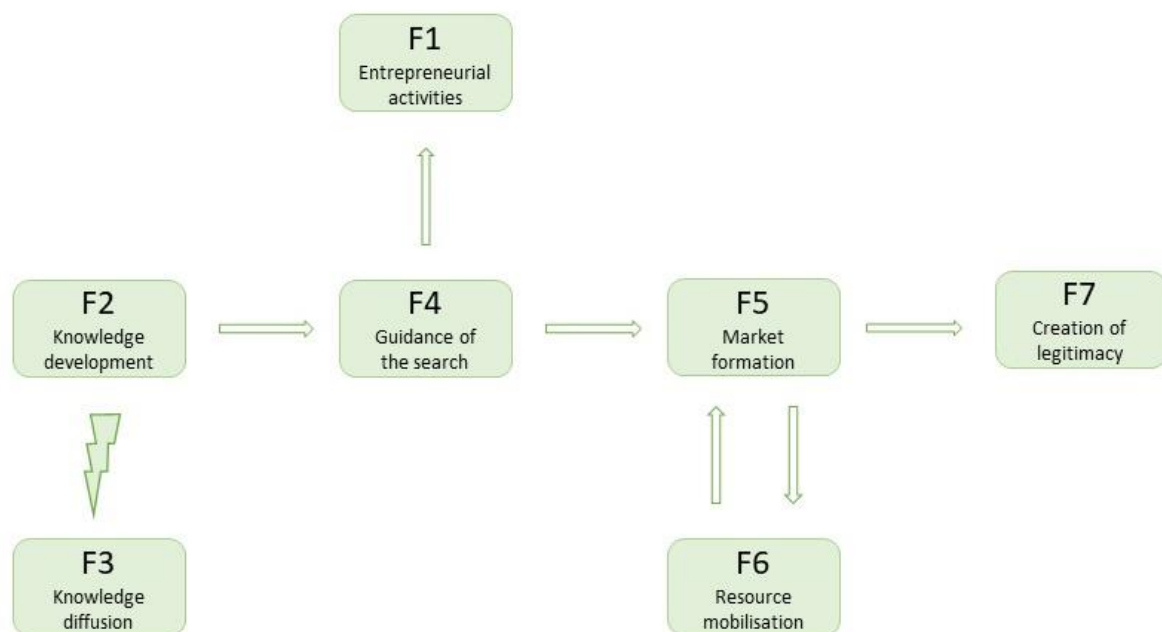


Figure 4 TIS functions and their influence on each other

Figure 4 shows how TIS functions mutually influence each other. The central part of this figure is formed by the second, fourth, fifth and seventh TIS function. Within these functions most injustices have been identified. The previous sections of this chapter discussed (the lack of) knowledge development, which

influences the vision and expectations of consumers in the PT, upholding the dominant meat mimicking strategy. This strategy steers the guidance of the search into specific technological developments resulting in homogenous products that influence the formation of the market. This results in limited creation of legitimacy in society. The other functions in this figure will now be discussed further.

First, the relationship that is expected between knowledge diffusion and knowledge development has not been observed in this study and is therefore broken. The third TIS function, knowledge diffusion, has, for now, not been associated with an injustice in the PT. The lack of the observation of knowledge diffusion may be an important result in itself. This may be partly the reason for the insufficient development of local knowledge.

Next, this research identified that entrepreneurial activities are influenced by guidance of the search through the meat mimicking strategy: because this strategy is dominating the industry's approach to the PT, it hinders the entrepreneurial activities into other plant-based protein developments.

Lastly, we consider the closed loop between the fifth and sixth TIS functions. When it becomes clear what the needs and wants are from these untapped parts of society, the market can be formed concerning these consumer groups. The fifth TIS function, market formation, only concerns itself with distributional justices. However, when these markets begin to develop, resource mobilization might become feasible for the market actors. The sixth TIS function, resource mobilization, forms a closed loop with the fifth TIS function, market formation, because the lack of resources influenced the spread of the message of the PT to various consumer groups and vice versa.

Table 4 also shows that TIS functions can have linkages with multiple justice tenets. In fact, only the second and fifth TIS function have a linkage with only a single justice tenet. The seventh TIS function, creation of legitimacy, is found in all three justice tenets. The aspect of resistance described in this function concerns all three different justice aspects. This resistance is fueled by limited local knowledge about certain consumers groups, specifically consumers from rural areas and ethnic groups. Lack of local knowledge is a reoccurring theme which influences all justice tenets from the distribution methods to the decision-making processes. Therefore, to align the interventions necessary to realize a 'just' PT, it is of great importance to understand these consumer groups and their point of view.

DISCUSSION

This chapter provides a critical reflection on both the established theoretical framework and the empirical results of the previous chapter. Research limitations of the results will be discussed first. Thereafter, reflections and contributions made to the theories are delineated. Lastly, possible future research directions are proposed.

5.1 Research limitations and alternative explanation

In this research, during the collection of results some limitations became clear. For example, interview questions about the policy of an organization regarding consumer involvement were often not answered clearly. The implications, or actions taken, resulting from organizational policies were often lacking or unclear. To ensure that the most relevant data were found, multiple participants per actor group were contacted. In total, data were collected from 17 interviews, which provided acceptable saturation for all actor groups except one: consumer organizations, of which only one was represented, which is a limitation of this research. Furthermore, this particular consumer organization is known to have a relatively progressive attitude towards the vegetarian kitchen. Thus, it is likely that this consumer organization is not fully representative of the whole of Dutch society. The data collection period was extended to create more opportunity to include another participating data source from this actor group. Unfortunately, no new interview could be added, and a more acceptable representation of consumer organizations wasn't obtained.

Another challenge to the validity of this study is provided by the novelty of the used theoretical framework. This theoretical framework was designed to increase the explanatory power of the JT when looking for injustices in innovation systems, and more specifically that of the PT. To solidify and further validate the coupling of the JT theory with the TIS functions, it is recommended to conduct additional studies. These studies could be done in the food sector, however other transitions could also be used for the development of this framework. Additionally, to further investigate the positioning of JT in innovation systems, different innovation system theories could be studied with the JT. For example, another suitable theory when looking at justices at the national level is the National Innovation System which investigates the flow of technology and information (Godin, 2009). A broader heuristic framework than TIS could for example be the Multi-Level Perspective which looks at transformative societal processes (Geels, 2019). Further research into the coupling of JT with innovation system theory could provide useful information about the justice tenets and their place in an innovation system.

A potential generalization to other societies and countries of the results from this research is another limitation. Given that only a single case study has been performed – one concerning the Netherlands -, external validity is limited. It was shown in this study that present food cultures and habits have a major influence on the affiliation of consumers with the PT. Food habits and cultures can differ significantly even between neighboring countries (Askegaard & Madsen, 1998). This makes it important to investigate the different effects that food cultures could have on the presence of justice issues in the PT. Thus, additional insights concerning different countries and their local cultures should be obtained. To get reliable generalizable results, multiple case studies from different areas should be compared to allow more general conclusions.

An alternative explanation for the results presented in this research could be that the consumer groups that have not adopted the PT are not early adopters in general. Early adopters of products or technologies are known to be driven by different motives than late adopters and the masses in general, (for example strongly driven by ideology or pulled towards the latest technology) (Palm, 2020). Even though, the theory concerning early adopters might explain the current adoption of the PT by certain consumer groups, it is not able to provide insights into the inclusion and involvement that is currently lacking concerning particular groups of the Netherlands. The results of this research could thus not be explained fully by this alternative theory.

5.2 Reflections and contributions to theory

Social injustices resulting from the PT haven't received much attention in PT literature in the past. This research examined present injustices concerning the PT of the Netherlands and where these happen in the innovation system. This provides new knowledge concerning the injustices of the PT. Through the coupling of the justice tenets with the TIS functions, injustices were linked to activities and their place in the innovation system. Through this coupling, the appropriate activities resulting in injustices can be addressed in order to remedy injustices. The results of this study contributed to the understanding of the present injustices and creates awareness about subordinated consumer groups. This study provided suggestions to move towards the ultimate goal, which is to counteract the identified PT injustices. The gained understanding from this research would also be beneficial to all the different actors of the food sector.

In the Dutch PT, sufficient knowledge development concerning rural areas and ethnic minorities is lacking, which concerns the second TIS function. This deficiency has implications on entrepreneurial activities, guidance of the search, market formation and even creation of legitimacy. The seventh TIS function, creation of legitimacy, is shown to be very important and currently injustices from all tenets have been linked to this TIS function. The third TIS function, knowledge diffusion, has not been linked to any of the justice tenets. However, the insufficient development of knowledge may be related to lacking knowledge diffusion of the PT. This was not investigated further in this research.

Disrespect is a sub-category of recognition-based justice tenet and has not been discovered explicitly in this study. Although the reason for this non-observation has not been investigated further in this research, two effects could be responsible: First, unconscious bias of the researcher, not being able to recognize disrespect while conducting the interviews and the study. Second, the option that disrespect is hidden or at least mixed in with non-inclusive communication and non-inclusive marketing, which one could argue are forms of dis-respect.

The consumer groups that according to this study experience injustices have also been identified in other JT studies. It is stated by McCauley & Heffron (2018) that ethnic diversities generally perceive more disadvantages resulting from transitions. Additionally, they mention that areas of social deprivation also have to face more negative results. Results from this study substantiate that lower socio-economic classes align less with the PT and might encounter more negative issues from it. The concerning consumer groups found in this study thus have certain overlap with identified groups from other studies.

The validity of generalizing the discussed injustices and associated TIS functions to other sustainability transitions is uncertain. Knowledge development is very important at the start of any innovation. The type of knowledge that is necessary for a given transition might be very different from the knowledge that is necessary for a 'just' PT in the Netherlands, which was discussed in this research. Knowledge development could also include technological knowledge, while in this research only local and social knowledge were involved. The latter resulted from the focus of this research on consumer groups, while in general the focus could have been on any other actor present in the sector which likely would have changed the type of knowledge significantly.

The first contribution of this thesis is applying and testing of justice considerations to a wider research area by including data from the PT. Justice questions not always receive focus in sustainability transitions while they affect all citizens and their ability to take care of basic needs. The PT has implications on people's daily live, for example the uneven distribution of resources or the variation in capacity to adapt to these new innovations. This research contributes to understanding this change by putting focus on the justice implications of the PT in the Netherlands.

A second contribution concerns the JT theory. To the best of my knowledge, this study combined for the first time concerning the food sector the Just Transition framework with the Technological Innovation Systems functions. The TIS functions do not focus on the justice aspects of transitions. However, this study has used and applied them to further the identify injustices in the Dutch PT. The TIS functions brought tangibility to the identified injustices and made them visible within the Dutch PT context. The identification of injustices in the innovation system enabled better understanding of these injustices, which is necessary and helpful to eliminate and prevent injustices in subsequent stages of the PT and other future transitions. This knowledge can contribute to more specific implementations of interventions to realize a 'just' PT.

The final contribution of this research is to social aspects of transitions, whose implications for society are often overlooked. Thus, through this research strong awareness is directed at society, about the implications that transitions impose in real life on different socio-economic groups and the inequalities that are created for these groups.

5.3 Direction of future research

Plant-based protein industry has a very dynamic character, and the market still leaves a lot of room for development. There are therefore many opportunities for research about current and new strategies to continue implementing the PT. Currently, the meat mimicking strategy is applied most, and examining the role of this strategy in relation to the spread of the PT would also be an interesting avenue for further research. Researching the impact that meat mimicking strategy still has on the animal-based products, could also be of interest. New strategies that focus less on mimicking existing animal-based products and instead implement a more diverse plant-based product assortment could accelerate the PT significantly.

The justice implications of transitions have not received a lot of attention in the past. Further research concerning justice implications of the PT could shed light on the current injustices in the Netherlands. However, extending the justice notion in future transitions is of even greater importance. The acknowledgement and considerations of injustices during the preparation of transitions could decrease

the occurrence of injustices. The incorporation of justice notions in existing transition theories could stimulate justice considerations in transitions, and further studies would be beneficial for this incorporation.

Considering the current economic inflation and possible shortage of many ingredients, further studies could explore these effects on the protein industry. Even though the Netherlands is not confronted with serious food shortages at the moment, due to worldwide political instabilities and climatic changes, food security is becoming less obvious and clear-cut, and is getting more attention. The role of the PT in mitigating and counter-acting the reduction of food security could be further investigated, also for Western-Europe.

CONCLUSION

This research examined the injustices resulting from the unfolding of the Dutch Protein Transition by posing the following Research Question:

How 'just' is the Protein Transition unfolding for consumers in the Netherlands?

My first main conclusion while analysing the results of this study is that a divide has developed in the Protein Transition between well-educated, affluent, flexitarians from urban areas on the one side and lower and middle socio-economic consumer groups, including ethnic minorities and rural areas on the other side. This divide is being sustained by lack of understanding of certain consumer groups and their local knowledge, by non-inclusive communication and distribution strategies. This divide is strongly hindering a 'just' progress of the Protein Transition in the Netherlands.

To analyse exactly how 'just' the Protein Transition is unfolding, the Just Transition framework has been utilized in combination with the Technological Innovation Systems functions. To the best of my knowledge, this study combined for the first time concerning the food sector the Just Transition framework with the Technological Innovation Systems functions. This study provided insights on the occurring injustices in the Dutch Protein Transition. The results were gathered through a qualitative method, which included 17 detailed semi-structured interviews with different actor groups of the Protein Transition.

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My second main conclusion is that the Dutch Protein Transition unfolding in the Netherlands induces injustices and therefore has unjust aspects. In all three justice tenets of the Just Transition framework, injustices have been identified and sub-conclusions have been drawn. There is a lack of knowledge development and exchange, which results in the insufficient involvement and alignment of the PT with consumers from rural areas and ethnic cultures. These consumers are insufficiently recognized, which might be the cause of this misalignment of the PT. These consumers are insufficiently involved in the decision-making processes that are used to develop plant-based protein products, to determine proper distributional channels and how to communicate regarding the PT. Therefore, I conclude that the Protein Transition in the Netherlands is unfolding in an unjust way.

To further substantiate the second main conclusion, three sub-conclusions are drawn about the three justice tenets:

Firstly, the lack of knowledge development (the second TIS function, F2) and knowledge diffusion (F3) concerns the procedural justice tenet. The creation of knowledge is at the start of new innovations and is of crucial importance. Local knowledge from certain consumer groups (rural areas, ethnic cultures) is however not sufficiently gathered. Improving the creation of local knowledge for these consumers might be the starting point for remedying the injustices in the Protein Transition. Procedural justice is impacted

by more than knowledge development and is also found in entrepreneurial activities (F1), guidance of the search (F4) and creation of legitimacy (F7). However, at least according to this research, knowledge development seems to have the highest impact in incorporating consumer groups into the decision-making processes of the Protein Transition. Given that the necessary information concerning the above-mentioned consumer groups is still not available, an appropriate incorporation of these consumer groups into the decision-making processes of the Protein Transition is prevented.

Secondly, the insufficient recognition of consumers from rural areas and ethnic cultures concerns the recognition-based justice tenet. With respect to ethnic consumer groups, the potential to form new knowledge and markets is not recognized (F1). Consumers from the rural areas are targeted by some market actors, however these consumers show great resistance to the Protein Transition. Thus, the Protein Transition lacks legitimacy (F7) with the consumers of rural areas because of misrecognition of these consumers and their local knowledge.

Thirdly, the insufficient involvement of consumers from rural areas and ethnic cultures results in non-inclusive distribution channels, product properties and communications, which concerns the distributional justice tenet. For example, the dominating strategy to mimic existing meat products limits the range of product properties. This study links these issues of the distributional justice tenet to guidance of the search (F4), market formation (F5), resource mobilisation (F6) and creation of legitimacy (F7). As a result, consumer groups are not reached by appropriate channels and product properties do not align with the needs and wants of these consumer groups. Thus, geographical and ethnical disparities induce distributional injustices in the Protein Transition.

In general, my results and conclusions support Just Transition theory. The framework of three justice tenets and their role in the identification of injustices was recognized and confirmed in the results and their analysis during this research. Through the use of these three justice tenets, injustices have been identified, the affected consumer groups were found, processes were discovered, and future remedies could be recommended. However, I did not find evidence for one category of recognition-based justice namely disrespect, which could be explained by either unconscious bias of the researcher or disrespect being mixed in with other effects like non-inclusive communication and non-inclusive marketing.

In comparison with other studies, I can specifically support the claim that transitions are generally more disadvantageous to ethnic diversities. The second area of disadvantage that I identified was based on residential location, namely rural areas of the Netherlands. This specific location dependent disadvantage was not identified by other studies.

To remedy the above presented injustices, knowledge development concerning local cultures of rural areas and ethnic cultures of the Netherlands would be a good starting point. Involving these consumer groups into the decision-making processes would help to align the PT with these groups. Thereafter, it is of importance to apply newly obtained insights to product development, distribution and marketing strategies of the Protein Transition to create legitimacy for these currently overlooked consumer groups.

By ensuring just access to food for all consumer groups, The Dutch Protein Transition, being an important part of sustainability, would receive a significant boost. Sustainability of the Dutch food system is important, but so is equal and just access to food.

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APPENDIX A INTERVIEW GUIDE

Interview guide (EN)

Equality of the Protein Transition in the Netherlands

You are invited to participate in this study regarding the consumer justice of the Protein Transition in the Netherlands. It is commissioned by the Utrecht University. The results will be presented and published. In this interview you are asked to discuss a number of questions which will take up to 1 hour. You are asked for some personal data that will be anonymized in the final results. Furthermore, the meeting will be recorded with your consent (or audio only). Only the researchers have access to this data.

- Reaction of interviewee concerning the consent for the recording of the interview.

General questions

1. Could you please briefly introduce yourself and tell us something about the company/organisation that you work for?
2. What are the core activities of your company/organization with regards to the Protein Transition, could you give an example?

In-depth questions

The distributional dimension

3. How do consumers benefit from the Protein transition?
 - a. Whom benefits, could you give an example of these consumer groups?
 - b. Why do these groups benefit?
 - i. What lead to these choices?
 - ii. Why did you target those consumers?
 - iii. Are there influences from outside the organisation like policies (government) or research that have steered your organisation?
 - c. Are there consumer groups for which these benefits are not approachable?
 - i. Could you explain this?
 - ii. What lead you to these choices?
 - iii. Why did you not target those consumers?
 - iv. Are there influences from outside the organisation/company like policies (government) or research that have steered your organisation?
4. Which disadvantages could consumers face in the Protein Transition?
 - a. Could you give an example?
 - b. Could you think of how this came about?
 - i. Could you sum these different influences or give examples?

The Procedural dimension

5. What is your organisations/companies policy concerning the involvement of consumers with your organisation?
 - a. Can you tell me in which processes are consumers involved?
 - i. Why were these groups chosen for their involvement?
 - ii. Which groups were not applicable for their involvement?
 - iii. Can you give an example?

6. How do consumers get involved in research conducted by your organisation/company?
 - a. Or where does your organisation/companies get's it insights from?
7. How do consumers get involved in the designing of products of your organisation/company?
8. How do consumers get involved in the distribution of products of your organisation/company?
 - a. Could you give an example of where your products/services/informatoin are sold?
 - b. How does your organisation/company market its product/services/information to the consumer?
 - i. And if you have a broader goal, how do you convey this to the consumers?
9. Are their process steps in which the consumer does not actively participate?
 - a. Is this through an inability?
 - b. Is this lack of will?
 - c. Or lack of need to participate?

Recognition-based dimension

10. How is your organisation's/companies general view upon the involvement of different stakeholder (socio-economic) groups?
 - a. Could you describe any cultural hurdles that your organisation/company needed to overcome?
11. Can you describe what your typical target group looks like?
 - a. Can you give an example of the different consumers?
12. (How did your organisation/company came to this particular target group for the products?)
13. How does your organisation/company reach the target group?
 - a. Why do you incorporate certain options?
 - b. Why do you not incorporate certain options?
14. Which target groups does your organisation/company wish to reach in the future?
 - a. How does your organisation incorporate new target groups?
 - b. How does your organisation creates these new markets?
 - c. Which allocation of resources was necessary to form the current market?
 - i. What kind of means like human resources, infrastructures or financial capital would be necessary for future expansions?

Closing

15. Do you have any last comments to add regarding the content of this interview?
16. Do you have any contacts that would be interested in also having this interview?

APPENDIX B INTERVIEW INFORMATION

Table 8 interviewees information

Interview	Actor group	Estimated size
1	Market actor	S
2	Consumer organisation	S
3	Educational institution	L
4	Market actor	S
5	Market actor	L
6	Supportive organisation	S
7	Supportive organisation	M
8	Market actor	L
9	Market actor	M
10	Supportive organisation	M
11	Education institution	L
12	Market actor	L
13	Market actor	S
14	Government	M
15	Educational institution	L
16	Government	M
17	Supportive organisation	M