



CO-CREATING BEHAVIOURAL CHANGE TOWARDS CLIMATE-SMART FOOD SYSTEMS

D4.2 Portfolio of fair value propositions v2

PROJECT ACRONYM: BEATLES

PROGRAMME: HORIZON Europe

Grant Agreement: No 101060645

TYPE OF ACTION: HORIZON Research & Innovation Actions

START DATE: 1 July 2022

DURATION: 48 months

Document Information

Issued by:	Wageningen Research
Issue date:	30 June 2025
Due date:	30 June 2025
Work package leader:	WUR
Start date:	1 July 2022
Dissemination level:	PU

Document History

Version	Date	Modifications made by
0.1	05/06/2025	Katja Logatcheva, Michiel van Galen, Gohar Isakhanyan. Draft report
0.2	19/06/2025	Additions by Christopher Jr. Galgo; Comments by reviewers processed by Katja Logatcheva, Michiel van Galen

Authors

First Name	Last Name	Beneficiary
Katja	Logatcheva	WR
Michiel	Van Galen	WR
Gohar	Isakhanyan	WR
Christopher Jr.	Galgo	WU

In case you want any additional information, or you want to consult with the authors of this document, please send your inquiries to: katja.logatcheva@wur.nl

Contributors

First Name	Last Name	Beneficiary
Arno	Rosemarin	SEI
Nelson	Ekane	SEI
Liselotte	Puggard	Food & Bio-Cluster Denmark
Magdalena	Nertinger	Naturland e.V.
Urté	Raubyté	Agrifood Lithuania DIH
Natasja	Doelman	Delphy
Jon	Bienzobas Adrián	INTIA

We wish to acknowledge the contributors for brainstorming, co-creating the workshop agenda, and their support in the data collection.

Quality Reviewers

First Name	Last Name	Beneficiary
Søren Marcus	Pedersen	UCPH
Marilena	Gemtou	AUA

Disclaimer

Funded by the European Union under GA no. 101060645. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or REA. Neither the European Union nor the granting authority can be held responsible for them.

© BEATLES Consortium, 2025

Reproduction is authorised provided the source is acknowledged.

Executive Summary

This deliverable aims to explore which value propositions can make climate-smart agriculture (CSA) successful by investigating the conceptualization, operationalization, and empirical assessment of fairness in agri-food supply chains. In response to the first research question, i.e. “What makes climate-smart agri-food supply chains fair?”, the report defines fairness as *a perception of the farmers and the buyers of their products that the business relationship produces fair outcomes for all actors, applying fair procedures to reach the outcome, based on fair information exchange, and with fair interpersonal treatment*. Grounded in inter-organisational fairness and organizational justice theories, the research identifies four key dimensions, i.e. distributive, procedural, informational, and interpersonal fairness, as essential to understanding these perceptions. A conceptual framework integrating collaborative practices, fairness norms, and institutional context was developed and validated across five EU case studies. Findings reveal fairness to be subjective and dynamic, influenced by power asymmetries, governance modes, and broader sustainability concerns such as ESG performance and intergenerational equity.

To address the second research question, i.e. “Which value propositions are currently used in EU retail supply chains and how do they relate to fairness?”, the report analysed over 6,500 new food product introductions across EU retail. This analysis surfaced 15 distinct value propositions linked to themes of environmental stewardship, social equity, and trust-building. Fairness-related claims, particularly those highlighting rainforest protection, human well-being, and certification, are increasingly visible, though their legitimacy hinges on credible, transparent validation. Together, these findings affirm the central role of fairness in CSA transitions, calling for participatory governance and continuous refinement of value propositions to align market practices with ethical and sustainable outcomes.

Table of Contents

EXECUTIVE SUMMARY.....	3
TABLE OF CONTENTS.....	4
1. INTRODUCTION	9
1.1 FAIR VALUE PROPOSITIONS AS A DRIVER FOR CLIMATE-SMART AGRICULTURE	9
1.2 RESEARCH QUESTIONS.....	9
1.3 DELIVERABLE OUTLINE.....	9
2. LITERATURE REVIEW OF FAIRNESS IN SUPPLY CHAINS	11
2.1 INTRODUCTION.....	11
2.2 METHODOLOGY	11
2.3 WHY FAIRNESS IN SUPPLY CHAINS MATTERS.....	13
2.4 DEFINITION OF FAIRNESS IN SUPPLY CHAINS.....	14
2.5 HOW CAN FAIRNESS BE MEASURED?.....	16
2.6 NORMS SHAPE FAIRNESS PERCEPTIONS	18
2.7 SUPPLY CHAIN PRACTICES AFFECTING FAIRNESS PERCEPTIONS.....	20
2.8 CONTEXTUAL AND INSTITUTIONAL FACTORS	26
2.9 CONCLUSIONS.....	29
3. FRAMEWORK OF FAIRNESS IN CLIMATE-SMART AGRI-FOOD SUPPLY CHAINS	31
3.1 INTRODUCTION.....	31
3.2 FRAMEWORK.....	31
3.3 VALIDATION INTERVIEWS WITH ACADEMIC EXPERTS	32
3.3.1 <i>Methodology</i>	32
3.3.2 <i>Results</i>	32
3.4 CONCLUSIONS.....	33
4. APPLICATION TO THE BEATLES CASE STUDIES.....	35
4.1 INTRODUCTION.....	35
4.2 METHODOLOGY	35
4.3 PIG SECTOR IN DENMARK	36
4.4 DAIRY SECTOR IN THE ALPINE REGION OF GERMANY.....	39
4.5 CEREAL SECTOR IN LITHUANIA	42
4.6 POTATO SECTOR IN THE NETHERLANDS.....	45
4.7 APPLE SECTOR IN NAVARRA PROVINCE OF SPAIN.....	48
4.8 CONCLUSIONS.....	52
5. FAIR VALUE PROPOSITIONS	53
5.1 INTRODUCTION.....	53
5.2 DATA AND METHOD.....	53
5.3 DESCRIPTIVE RESULTS OF CLAIMS	54
5.4 FAIR VALUE PROPOSITIONS FOR CSA.....	58
5.5 CONCLUSIONS.....	63
6. SUMMARY OF CONCLUSIONS AND DISCUSSION.....	65
7. LITERATURE AND WEBSITES	67
8. APPENDIX.....	74
8.1 QUESTIONS AND INTERVIEWEES FOR FRAMEWORK VALIDATION	74
8.1.1 <i>Questions</i>	74

8.1.2	<i>The list of the interviewees from academics</i>	75
8.2	QUESTIONS AND INTERVIEWEES FOR APPLICATION TO THE BEATLES CASE STUDIES.....	75
8.2.1	<i>In-depth interview open questions to the case leads</i>	75
8.2.2	<i>The list of the interviewees from case studies</i>	76
8.3	QUESTIONS ABOUT FAIRNESS AND NORMS FOR THE QUESTIONNAIRES DURING THE CO-CREATION WORKSHOPS FOR THE BEATLES CASE STUDIES.....	76
8.4	LIST OF PRACTICES FOR SELECTION DURING THE CO-CREATION WORKSHOPS FOR THE BEATLES CASE STUDIES.....	78

List of Figures

Figure 1: Number of papers per year (excluding papers later added from snowballing), 1998-March 2025.....	13
Figure 2: Overview of fair business practices. Source: authors based on literature.....	26
Figure 3: Fairness framework for climate-smart agricultural chains.....	32
Figure 4: Pearson phi correlation matrix, all cases, only significant correlation with $p < 0.05$ shown.....	57

List of Tables

Table 1: Terms and Definitions.....	8
Table 2: Overview of search results of the literature review (excluding papers later added from snowballing).....	12
Table 3: Selection method of fair practices that will improve fairness within the case study context. Location: the co-creation workshops, one per case study, facilitated by the BEATLES project.....	36
Table 4: The averages of fairness perceptions of the respondents in the case of pigs in Denmark (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=6.....	37
Table 5: The averages of fairness norms of the respondents in the case of pigs in Denmark (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=6.....	38
Table 6: Selected top-practices for making a climate-smart supply chain fairer in the case of pigs in Denmark. Between 0 and 4 votes attributed per workshop participant with a maximum of 1 per practice. Source: Workshop selection exercise, n=8.....	39
Table 7: Fairness perceptions of the respondents for the case of dairy in the Alpine region of Germany (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=11.....	40
Table 8: Fairness norms of the respondents for the case of dairy in the Alpine region of Germany (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=11.....	41
Table 9: Selected top-practices for making climate-smart supply chain fairer in the case of dairy in the Alpine region of Germany. 8 votes attributed per workshop participant with a maximum of 1 per practice. Source: Workshop selection exercise, n=11.....	42
Table 10: Fairness perceptions of the respondents for the cereal sector in Lithuania case (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=12.....	43
Table 11: Fairness norms of the respondents for the case of cereal sector in Lithuania (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=12.....	44
Table 12: Selected top-practices for making climate-smart supply chain fairer in the case of cereal in Lithuania. 2 votes within each fair practices category attributed per workshop participant with a maximum of 1 per practice. Source: Workshop selection exercise, n=12.....	45
Table 13: Fairness perceptions of the respondents for the case of potato sector in the Netherlands (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=13.....	46
Table 14: Fairness norms of the respondents for the case of potato sector in the Netherlands (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=13.....	47

Table 15: Selected top-practices for making climate-smart supply chain fairer in the case of potato sector in the Netherlands. 2 votes within each fair practices category attributed per workshop participant with a maximum of 1 per practice. Source: Workshop selection exercise, n=16..... 48

Table 16: Fairness perceptions of the respondents for the case of apples in Navarra (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=14..... 50

Table 17: Fairness norms of the respondents for the case of apples in the Navarra region of Spain (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=14..... 51

Table 18: Selected practices for making climate-smart supply chain fairer in the case of apples in the region of Navarra, Spain. Source: Workshop selection exercise, n=14..... 51

Table 19: CSA related values on new product introductions in the EU that have both an environmental and a social claim, Jan 2023 - May 2024. Source: WR based on data from Innova database..... 55

Table 20: Fairness related values on new product introductions in the EU that have both an environmental and a social claim, Jan 2023 - May 2024. Source: WR based on data from Innova database..... 56

Table 21: Certifications and company labels on new product introductions in the EU that have both an environmental and a social claim, Jan 2023 - May 2024. Source: WR based on data from Innova database. 56

Table 22: Pattern matrix, PCA with promax rotation, limited to 10 components, for all records (A) 59

Table 23: Pattern matrix, PCA with promax rotation, limited to 7 components, for organic products (B)..... 61

Table 24: Components and examples of fair value propositions in use..... 63

List of Terms and Definitions

Abbreviation	Definition
AgriFood Lithuania	Digital Innovation Hub and Cluster. BEATLES project partner from Lithuania.
CAP	EU Common Agricultural Policy
CSA	Climate Smart Agriculture
CSRD	Corporate Sustainability Reporting Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022
Delphy	Crop growing knowledge and consultancy company. BEATLES project partner from the Netherlands.
ESG	Environmental, Social, Governance; framework to assess company's sustainability impact
EU	European Union
Food & Bio Cluster Denmark	Cluster organisation that helps companies to accelerate innovation and sustainable development in food and bio-based. BEATLES project partner from Denmark.
FSC	Forest Stewardship Council
GMO	Genetically Modified Organism
INTIA	Instituto Navarro de Tecnologías e Infraestructuras Agroalimentarias Sociedad Anónima. BEATLES project partner from Spain
Naturland	International association dedicated to organic agriculture, setting standards for organic agriculture, promoting ecological and social responsibility. BEATLES project partner from Germany.
PCA	Principal Component Analysis
PO	Producer Organisation
SEI	Stockholm Environment Institute. BEATLES project partner from Sweden.
SMK	Stichting Milieukeur from the Netherlands. Standard setting organisation, e.g. for On the way to PlanetProof label.
UTP	Unfair Trading Practice

Table 1: Terms and Definitions

1. Introduction

1.1 Fair value propositions as a driver for climate-smart agriculture

Farmers who practice climate-smart agriculture (CSA) go beyond conventional agricultural practices to improve the quality of the soil, water and air, and reduce impacts to the environment and the climate. In order to make their business model fair, it is important to internalise as much of the currently externalised impacts (environmental and social). Only if buyers and final consumers in the value chain recognise this value it is possible to internalise the costs and benefits of CSA. A fair CSA value proposition is understood as a result of CSA practices along the entire supply chain, including the production, distribution, and consumption that is perceived as fair to all the partners involved. However, the literature and the practice lack a clear definition of what is fair in the supply chain and which practices can determine fair value propositions when CSA practices are applied. Therefore, we explicitly incorporate fairness in the value propositions, which can serve as an important asset for communication with the end consumers. While farmers implement CSA practices, manufacturers and retailers branding is ultimately used to communicate value to end consumers and have significant influence over pricing of CSA products.

We employed multiple methods to study the phenomenon. First, we studied the literature to learn more about fairness and the factors that influence fairness perceptions in the agri-food supply chains to understand the crucial elements that can change the business model for CSA into a fair one. Based on the literature study results, we built a conceptual framework that summarises fairness aspects. Second, we conducted semi-structured interviews with experts and academics that publish in fairness domain to verify and validate the literature findings. Following, we applied this framework to the EU five BEATLES project case studies. We interviewed the case leads about the context of each case and conducted a quick survey and a selection exercise with the participants of co-creation workshops with the five BEATLES use case stakeholders. Finally, we analysed Innova database and extracted a list of fair value propositions that are used in practice, especially to communicate with the end consumers, e.g., labelling.

In this deliverable we use the definition and classification of the CSA practices and technologies defined in the BEATLES D1.1. We consider sustainable productivity, resilience and greenhouse gas mitigation as the outcomes of CSA (Christensen et al. 2023). A climate-smart agri-food supply chain that is successful and fair should capture the value created through CSA and distribute that value in a fair manner across the various stages of the supply chain.

1.2 Research questions

The main objective of the deliverable is to explore which value propositions can make CSA successful while also emphasising the fairness of the climate-smart agri-food supply chain to consumers and other stakeholders. Two research questions are guiding the research:

1. What makes climate-smart agri-food supply chains fair?
2. Which value propositions are currently used in EU retail supply chains and how do they relate to fairness?

1.3 Deliverable outline

This deliverable is structured as follows. Chapter 2 is dedicated to the literature study about fairness in supply chains. It highlights the search strategy and methodology of the literature study

and the findings. In Chapter 3, a conceptual framework of fairness in CSA chains is presented, based on the literature study. In addition, this chapter discusses the outcomes of a number of validation interviews with academic experts. Chapter 4 presents the results of five co-creation workshops in which a part of the framework was used to assess the fairness of the BEATLES case studies. Finally, in chapter 5, fair value propositions for CSA chains are derived from an analysis of claims information on new food products introduced in EU retail in 2023-2024.

2. Literature review of fairness in supply chains

2.1 Introduction

Supply chains are characterized by interorganizational relationships, meaning they involve collaboration and coordination between multiple independent organizations. These relationships are essential for the efficient flow of goods, services, information, and resources across different stages of production and distribution. On the other hand, they give rise to issues concerning the distribution of profits, sharing of information, and chain governance. In this deliverable, we focus on fairness between organisations, i.e. inter-organisational fairness. Fairness has been studied from various disciplines and perspectives. With regard to interorganizational fairness various issues have been studied from transaction cost economics and strategic supply chain management (Poppo and Zhou, 2014; Ireland and Webb, 2007), operations research (Ireland and Webb, 2007; Griffith et al., 2006; Liu et al., 2012), marketing (Xia et al., 2004), and behavioural economics (Fehr and Schmidt, 1999; Kahneman et al., 1986). Fairness as a concept evolves from earlier literature and most notably from social exchange theory (Thibaut and Kelley, 1959; Griffith et al., 2006) and Rawls (1971) theory of justice as fairness. Our goal is to explore the role of fairness and primarily the drivers of improving fairness perceptions in supply chains. The concepts of fairness and justice have been used to describe similar but slightly different aspects, although they have also been used to describe the same thing in different papers. We chose to use the word fairness, unless the context specifically warrants the use of the word justice to emphasize the difference.

2.2 Methodology

In our narrative literature review we focus on empirical and some theoretical literature from mostly strategic management, operations research and marketing. Pure game-theoretic approaches have been omitted as they generally tend to focus on rather specific details in experimental settings but without concrete links to actual supply chain behaviour. Nevertheless, we acknowledge that behavioural economics and game theoretic approaches may be valuable in further testing the premises from the literature.

For our literature review we search in the Scopus citation directory. The search strategy was developed by extending earlier versions and scanning for much cited literature that was not included in our results. The aim was to focus on literature concerning fairness in supplier-buyer relationships (or interorganizational or supply chain related), hence we had to add a number of criteria limiting the search to exclude e.g. intra-organizational fairness focusing on employer-employee relations. The search strategy was also built to at least have an element of fairness or justice. Searching however for just the words fairness or justice yielded too many results, and hence we limited the first part of the search to specific types of fairness (e.g. distributive, procedural, interactional, informational, interpersonal fairness) and the second part to justice or fairness in relation to supplier-buyer relations or supply chains.

The search was not limited to agriculture, to get a broad overview of the factors that influence fairness and because initial search strategies showed that the amount of agriculture focused fairness literature is limited. The literature about fairness in supply chains is not limited to a certain sector or industry. Agricultural supply chains are studied in certain papers, but the overall fairness literature is much broader. Only few articles empirically address fairness in relation to CSA. The search strategy was as follows:

TITLE-ABS-KEY ((("al fairness" OR "ive fairness" OR "ive justice" OR "al justice" OR "price fairness") AND ("buyer" OR "supplier*" OR "seller*" OR "inter-organi*" OR "interorgani*")) OR*

(("inter-organi*" OR "supplier-buyer" OR "buyer-supplier" OR "vertical" OR "value chain" OR "supply chain") AND ("justice" OR "fairness")) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "AGRI")) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "ch") OR LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "re")) AND (LIMIT-TO (LANGUAGE , "English"))

The search yielded 1585 results. A first screening of titles and abstracts was done to exclude papers that were deemed irrelevant; we excluded studies that are not related to the supply chain context or that only briefly mention fairness, but do not operationalize or discuss the concept in more depth. E.g., a lot of papers study fair trade supply chains but do not actually research the nature of the concept of fairness in those chains. This step limited the results to 167 papers remaining. A second screening was then performed to see which of those papers are useful for answering our research question about the drivers of fairness in CSA chains. We read to full articles to search for relevant connections with our research question. Those relevant connections were categorized in four themes:

1. Definitions and measurements of fairness in supply chains
2. Business practices that enhance fairness in supply chains
3. Contextual and institutional factors that affect fairness in supply chains

For each paper we identified whether relevant information regarding these themes is present in the papers. We also categorized the papers according to the research methods used (literature review, qualitative empirical, quantitative empirical, game-theory, theoretical; or combinations thereof) We excluded papers that focus solely on game-theory. This step resulted in 94 papers (see Table 2). Almost all of the papers discuss some definition of fairness (83 out of 94), and 52 of them also operationalize the concept in a specific (empirical) measure. Although the exact meaning of business practices may vary between papers, we concluded that 60 of them have in their analysis a relation to what we call business practices, i.e. actual supply chain practices that involve actions by the chain actors regarding e.g. distribution of profits, risk sharing, contracting, sharing of information, or governance of the supply chain. Finally, 37 papers discuss elements of the business context or institutional environment in relation to fairness that we deemed relevant for our analysis.

	Number of papers, total	Empirical	Theoretical	Review
Total	94	73	15	13
Fairness definition	83	65	13	11
Fairness measurement	52	49	2	6
Business practices	60	42	12	11
Context and institutional factors	37	27	6	8

Table 2: Overview of search results of the literature review (excluding papers later added from snowballing)

Most of the papers that we included in our search are of an empirical nature, 15 papers were purely theoretical (mostly in the sense that new models of fairness are developed in a conceptual way by building on the existing literature). 13 papers are categorized as review papers.

The oldest paper included in our results was from 1998 (see Figure 1). We did not restrict our search to a range of years. Although the fairness literature is much older than 1998, the conceptualization and empirical application of fairness in the context of buyer-supplier relations has developed from this period onwards. An increase in attention to the topic is observed. Our search was performed in March 2025, meaning that the number of papers in 2025 is not comparable with the earlier years.

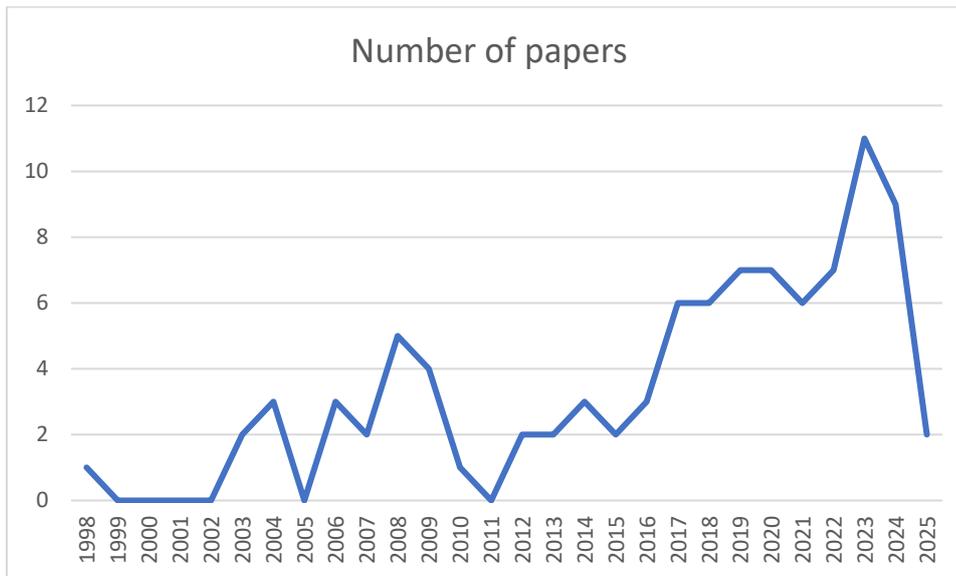


Figure 1: Number of papers per year (excluding papers later added from snowballing), 1998-March 2025

With respect to the journals that published the papers, most of these are from the business economics field, supply chain management, operations management, and marketing. Journal of Business Research published 6 papers in our search results, Journal of Business and Industrial Marketing published 5 papers. Although most of the papers are not agriculture related, there are a number of papers from agricultural supply chains. E.g., some papers were published in British Food Journal, in Agriculture (Switzerland), Journal of Food Quality, International Food and Agribusiness Management Review, Journal of Dairy Science, Journal of Sustainable Agriculture, and Acta Horticulturae. In addition, journals include Journal of Cleaner production, and Cleaner and Circular Bioeconomy with both 1 paper. 17 of the papers in our search results are specifically about agriculture and food. Although we searched specifically for papers about CSA, these could not be found. However, some papers are e.g. about organic supply chains which is also seen as a CSA practice.

In addition to this search, we added about 15 papers to our research by a snowball method, where relevant articles were identified by following the references and citations of the included studies. These are mainly seminal papers that are referenced in multiple studies.

2.3 Why fairness in supply chains matters

Bouazzaoui et al. (2020) highlights the importance of fairness in the functioning of supply chains by discussing organizational justice and its impact on inter-organizational relationships. Organizations seek justice when comparing rewards and costs involved in interactions, suggesting that justice is perceived as a balanced and equitable treatment within inter-organizational exchanges. Justice perceptions affect behavioural, attitudinal, and organizational outcomes in inter-organizational contexts. From the literature, four major groups of consequences of fairness perceptions can be discerned.

- Fairness perceptions influence **opportunistic and relational behaviour**. Perceptions of unfairness can invoke opportunistic behaviour as actors seek to balance the perceived inequity. Fairness can mitigate opportunism and stimulate relational behaviour. (e.g. Griffith et al., 2006; Alghababsheh et al. 2020; Gudbrandsdottir et al., 2021)

- Fairness perceptions impact **relationship quality**, defined in terms of trust, commitment, and conflict. Perceptions of unfairness lead to trust deterioration, lack of commitment and potential conflicts, which may result in the termination of relationships. (e.g. Suh, 2004; Luo, 2006; Brown et al, 2006; Thorpe, 2018; Sun et al., 2021; Oyedijo et al., 2023)
- **Business relational investments and performance:** Knowledge sharing, relationship investment, which are crucial for enhancing relationship performance. (e.g. Bouazzaoui et al., 2020; Sun et al., 2021)
- Fairness in supply chains helps firms gain **access to valuable resources**, capabilities, and knowledge, which is essential in dynamic markets with increased interdependence between firms (e.g. Bouazzaoui et al., 2020).

The desire of organizations to mitigate opportunism and uncertainty and emphasizing the role of fairness in interactions is explained by Social Exchange Theory, Equity theory and Transaction Costs Economics (Zaefarian et al., 2016; Bouazzaoui et al., 2020). A perspective on business-to-business relationships where power relations play a pivotal role ties in with the Social Exchange theory, as the party that has more powerful exchange position, takes the lead in establishing policies relating to the relationship's administration and distribution of rewards (Griffith et al., 2006; Jack et al., 2018). From transaction cost perspective, Poppo and Zhou (2014) stated that without considerations of fairness, contracts result in asymmetric rather than mutual gain by simply favouring the player with the greatest bargaining power.

2.4 Definition of fairness in supply chains

Poppo and Zhou state that *fairness* is a perception “that a decision, outcome, or procedure is both balanced and correct” (Poppo and Zhou, 2014, p. 1511). Fairness is a socially constructed concept based on the perceptions of individuals (Gudbrandsdottir et al, 2021). In the context of supply chains, organizations seek justice when comparing rewards and costs involved in interactions. *Fairness* is often used interchangeably with *justice*, but fairness generally refers to the subjective judgment of whether actions, decisions, and distributions are morally right, based on equity, equality, and need, while justice is more about adherence to certain rules, or manifestation of certain practices. In the literature, fairness has been found to be a multi-faceted construct, in which elements of **distribution, procedures, information** and **interpersonal interaction** play a role (Brito and Miguel, 2017; Matopoulos et al., 2019; Bouazzaoui et al., 2020; Alghababsheh et al., 2020). According to Benmehaia et al. (2024), understanding fairness in agro-industrial systems involves examining of these fairness elements.

Distributive fairness concerns resource allocation, balance, and perceived equity in inter-organizational relationships. It plays a crucial role in maintaining trust and cooperation within supply chains. Many of the definitions of distributive and procedural fairness in the found literature go back to Kumar et al. (1995) and Kumar (1996), emphasizing that distributive fairness involves comparing actual outcomes to what a firm believes it deserves (e.g. Yilmaz et al., 2004), or that distributive fairness in supply chains relates to how profits are shared and how benefits and burdens are divided between two parties (e.g. Duffy et al., 2003; Brito and Miguel, 2017). Griffith et al. (2006) state that distributive justice pertains to the equitable distribution of resources between parties in social or economic relationships. It focuses on how firms perceive the allocation of relationship resources relative to the inputs provided (equity from a Social Exchange Theory perspective). Kadefors (2005) states that distributive justice is perceived as the proportion of an individual's inputs and outputs within a relationship compared to those of relevant others.

Procedural fairness refers to the perceived fairness of the processes and decision-making procedures followed in business-to-business interactions. It focuses on how decisions are made, communicated, and executed. Procedural fairness fosters trust, minimizes conflicts, and promotes

equitable treatment in business-to-business relationships, ultimately contributing to successful partnerships. Procedural fairness is linked to firm's perception of the development and administration of relationship policies and decision-making process to be fair and equitable (Griffith et al., 2006; Brito and Miguel, 2017; Jack et al., 2018). Many studies use the definition of Kumar (1996) describing procedural justice as the fairness of a party's procedures and policies for dealing with its vulnerable partners and refers to the fairness of the means used to determine the outcomes in the relationship (e.g. Duffy et al., 2003, Yilmaz et al., 2004). Gudbrandsdottir et al. (2021) emphasize that it is important that individual organisations can express their feelings about the procedures and influence them. E.g. in agriculture, powerful buyers may force environmental requirements on farmers, and the procedures to design and implement such requirements should be done in consultation with the farmers. Samoggia and Beyhan (2022) explain how fairtrade certification also relates to procedural fairness because it strengthens farmers' positions and formulates procedures. Yilmaz et al. (2004) conceptualize procedural justice in supply chain relationships as an assessment of procedures and processes used by an exchange partner, and whether the decisions are applied based on just principles. Some earlier literature does not explicitly distinct formal aspects of processes and the social interaction as aspects of these processes, i.e. **informational** and **interpersonal fairness**, and include also interactional components as courteous behaviour (Yilmaz et al., 2004; Duffy et al., 2003).

Informational fairness refers to the perceived fairness of how information is shared, communicated, and accessed within interactions between firms. It encompasses transparency, accuracy, and timely provision of relevant information. Informational justice is related to procedural as being justice of information and explanation of the procedures during interactions (Kadefors, 2005). Transparent sharing of information fosters trust between supply chain partners. When both parties have access to accurate data, they can make informed decisions, reducing uncertainty and enhancing collaboration (Bouazzaoui et al., 2020; Matopoulos, 2019).

Interpersonal fairness refers to how individuals within interactions between firms treat each other. It encompasses respectful communication, empathy, and ethical behaviour. It relates to human reaction in social interactions, such as the treatment of communication and interpersonal relationships (Brito and Miguel 2017; Bouazzaoui et al., 2020). According to Lee and Ha (2020) interpersonal justice appears to be related to interpersonal sensitivity, where the treatment of others with respect, dignity and honour helps to facilitate and expedite decision-making process.

Diller (2008) conceptualized a specific type of fairness, **price fairness**, using distributive fairness as a starting point and adding components that are related to procedural and interactional fairness: consistency (interaction procedures between partners follow the same rules consistently), price reliability (observance of prices established at the time the contract was signed), pricing honesty (providing accurate, clear, and complete pricing information), right of influence and co-determination (allowing partners to exert influence and participate in shaping the business relationship), respect and regard for the partner (showing understanding and not exercising excessive pressure over the weaker partner), and finally fair dealing (demonstrating generosity and flexibility in the face of unforeseen circumstances).

At the same time, in the literature about sustainability and fairness, related concept of **environmental** fairness, or justice, emerges that goes beyond the boundaries of the agricultural supply chain, with different focus about what is being evaluated as fair, and who the stakeholders are. According to Ryan and Hoes (2023) the concept is about unfair burdens rooted in the vulnerability of those who are harmed by environmental degradation. Ryan and Hoes (2023) reflect this concept on the government manure policy towards farmers in the Netherlands showing unfair economic disadvantages and burdens, unfair procedures, lack of inclusion of farmers' context, and challenges across farming generation being key unfair issues related to policy making. Maluf et al. (2023) look at the Brazilian soy supply chain from a justice perspective and analyse how global changes in the supply chains impact distributive, procedural and recognitive

justice on different regional scales. They consider these injustices as part of social justice and environmental justice and just food transitions. Other studies have elaborated the concept of environmental justice as part of justice related to sustainable supply chains (Elkington, 1997; Matthews et al., 2025). The concept refers to the idea that environmental goods need to be equitably distributed in a society to achieve overall justice. The idea is stemming from the development of the Triple Bottom Line, which extends traditional business model thinking and reporting to include not only profit, but also planet and people-focused considerations. Although Matthews et al. (2025) point to the inherent ambiguity of the concept of environmental justice, they discern several commonalities that are rooted in familiar dimensions of fairness: distribution, procedure, recognition and capabilities. Schlosberg (2007, 2013) argues that communities and movements will draw on one or more of these dimensions in their struggles against environmental injustices depending on the context-specific nature of the environmental justice conflict. Schlosberg's (2007) environmental justice framework argues that the inequitable distribution of environmental risks and harms are shaped by recognitional injustices and that the struggles for equitable distribution and recognition occur in the procedural arena. Further, Schlosberg (2007, 2013), adopts a "capabilities approach" to environmental justice that expands the concept of environmental "goods" from just resources to also include rights, freedoms and opportunities. A capabilities approach shifts the emphasis from reducing environmental injustices to seeing environmental justice as essential for the flourishing of individuals and their communities (Schlosberg, 2007, 2013). Environmental fairness is linked to distributive justice, which emphasizes the fair allocation of resources, opportunities, rights, and liberties within society. Matthews et al. (2025) Building on Schlosberg's (2007, 2013) environmental justice framework, the environmentally just supply chain is defined as a supply chain that supports an equitable distribution of environmental goods, according to the principles of procedural and recognitional justice to support the capabilities of all its stakeholders to flourish.

Environmental fairness is closely related to climate-smart agriculture because CSA explicitly aims to address both current environmental challenges and future food security in a sustainable, equitable way. However, we do not explicitly elaborate further on this type of fairness. In the remainder of this deliverable, we connect CSA to the inter-organisational fairness, which is perceived fairness in relationships between organizations in a business network or supply chain, with stakeholders involving companies, i.e. suppliers and buyers.

2.5 How can fairness be measured?

The reviewed literature presents a variety of methods for assessing fairness, highlighting its multifaceted nature within the business context. Most studies focus on measuring fairness perceptions, which are inherently subjective (Konow, 2009). There are studies which evaluate **overall fairness** of a certain outcome or practice, e.g., Vaidyanathan and Aggarwal (2003), Nguyen and Meng (2016), Ferguson et al. (2017) and Maxwell and Comer (2010) evaluate the fairness of price changes and pricing strategies by simply asking to what extent respondents find these as fair. The measurement scales vary between dichotomous (fair or unfair) and five- or seven-point Likert scale, e.g. from extremely unfair to extremely fair.

On the other hand, most of the literature about the supply chain context consists of studies evaluating fairness by differentiating into elements of distribution and procedures, and, to lesser extent into elements of information and interpersonal interaction. According to Hornibrook et al. (2009), the study by Colquitt (2001) is the first one that has explored and validated measures for each of the four dimensions of organizational justice. This study adopts an indirect measure of fairness, assessing various fairness criteria derived from the seminal works in the justice literature, and deriving a scale that can be tailored to specific contexts. Several found studies build their fairness measurement framework basing on Colquitt (2001) when addressing all four dimensions.

Overall, the interchangeability between fairness and justice is visible as some ask respondents to evaluate factual outcomes or procedures according to their level of fairness, others ask to rate the extent to which outcomes or procedures that are considered as fair had been present.

For **distributive fairness** various approaches capture different facets, considering factors such as contributions, expectations, and industry norms. The varied approaches reflect the complexity and context-specific nature of measuring distributive fairness in business relationships. Several authors evaluate the degree of fairness. Poppo and Zhou (2014), Wang et al. (2022), and Cassia et al. (2021) evaluate the degree of fairness (a 7-point Likert scale) of an outcome given the duties, responsibilities, contributions, and knowledge/expertise with items from Blader (2007) and Luo (2007) adjusted to the context of the study. Sun et al. (2018) and Yilmaz et al. (2004) focus on outcomes relative to efforts, roles, industry earnings, and partner earnings basing on items from Price and Mueller (1986). Ando and Kee Rhee (2009) modify scales to assess fairness and favourability in the context of joint ventures, emphasizing managerial, technological, and financial contributions. Lim et al. (2022) use a 5-point scale to describe the level of fairness and relate it to effort and investment. Duffy et al. (2003) rely on open interviews to explore fairness in terms of price, payment terms, and costs.

Different other authors measure distributive fairness and justice evaluating the degree of agreement with the presence of a certain aspect. Griffith et al (2006) employ a 7-point scale to evaluate the level of contributions and outcomes for both firms and their suppliers. Srinivasan et al. (2018) use a comparable approach by focusing on the high outcomes or rewards received by suppliers. Yang et al. (2019) and Alghababsheh et al. (2023) ask about the presence of fairness of profit distribution relative to market positions, investments, and efforts. Che et al. (2024) assess fairness in relation to input resources, labour, responsibilities, and efforts. Park and Kim (2023) utilize a five-point scale to compare outcomes and earnings against roles, responsibilities, and contributions within buying groups. Liu et al. (2023) integrate multiple dimensions of distributive fairness, including expectations, distribution, roles, responsibilities, and contributions, to capture a comprehensive view of distributive justice.

Procedural fairness is mainly measured by assessment of the presence of certain fair procedures, or the level of actual procedures' fairness. Some authors do not differentiate procedural fairness into the structural and social concepts and include interactional components such as consistent treatment and communication into the procedural fairness measure.

Most authors apply Likert scales when assessing the criteria. Griffith et al. (2006) use a 7-point scale to assess fair policies. Siadou-Martin et al. (2017) and Mir et al. (2022) use scales to assess consistent policies, and the legitimacy of operating procedures. Wang et al. (2019) and Wang et al. (2022) measure consistency in applying procedures during negotiations and implementation.

Cassia et al. (2021) and Sen et al. (2023) use Likert scales to evaluate negotiation, and consideration of objections (based on Kumar et al., 1995). Poppo and Zhou (2014) and Matopoulos et al. (2019) focus on opportunities to express views, influence decisions, and adherence to agreed-upon standards. Lastly, Che et al. (2023) and Park and Kim (2023) emphasize fair management of alliances, and the ability to appeal decisions, highlighting the procedural aspects of justice within interorganizational relationships. In another approach, Soundararajan and Brammer (2018) employ qualitative coding to differentiate between sensible and insensible procedures regarding social sustainability.

Most authors measure **informational fairness** by assessing the quality and transparency of communication between business partners. Lee and Ha (2020) use a five-point Likert scale and Ha and Lee (2024) use a seven-point Likert scale to evaluate honest communication, proper and detailed explanations, and the exchange of opinions. Yang et al. (2019) also employ a five-point Likert scale to assess routine information exchange, the presence of information-sharing channels, the importance of transparent communication, awareness of important issues, and explanations

of relevant policies. Wang et al. (2019) utilize a seven-point Likert scale to gauge the extent to which the other party acts truthfully, provides timely feedback and justification for decisions, thoroughly and reasonably explains procedures, and communicates openly and directly.

Measures of **interpersonal fairness** in the interorganizational fairness literature are aimed at evaluating the respect, courtesy, and sincerity shown in interactions between business partners. Lee and Ha (2020) use a five-point Likert scale to assess levels of courtesy, respect, and the absence of inappropriate speech and behaviour. Wang et al. (2019) employ a seven-point Likert scale to measure the extent to which partners are treated with respect and dignity, honesty, and whether improper remarks are refrained from. Additionally, they assess if both parties strive for a complete understanding of each other's positions during conflicts. These measures emphasize the importance of respectful, sincere, and dignified interactions in assessing interpersonal fairness.

Interactional fairness is measured by putting the above-mentioned components of interpersonal and informational fairness into one measure. Matopoulos et al. (2019) utilize a five-point Likert scale to assess the politeness, respect, and dignity demonstrated by retail staff and management, as well as the clarity and honesty in explaining decisions and policies. Wang et al. (2022) similarly assess procedural consistency and adherence to agreed-upon standards. Liu et al. (2023) stress the importance of proper explanations for changes, effective communication, and respectful interactions in cooperative processes.

Only a very limited amount of found studies aim to introduce an objective measure to fairness. Just one study of Gudbrandsdottir et al. (2021) suggests an operational definition of interorganizational fairness in the form of objective indicators in order to evaluate fairness in food systems using simulation modelling. Here, the distributive and procedural elements of fairness are measured by proxy, using indicators like profit margin, availability of buyers/suppliers, company size and mark-down index (buyer power).

2.6 Norms shape fairness perceptions

Norms shape how individuals understand, perceive, and act upon the concept of fairness. Norms are the (shared) expectations or rules that guide behaviour within a particular context, and they can influence how people define what is "fair" or "unfair." Maxwell and Comer (2010) show that personal factors and social acceptability can modify fairness perceptions of price increases by sellers. In the assessed fairness literature different (applications of) norms are seen in different contexts. The literature does not provide an integrated picture of effect of norms that could apply in specific CSA contexts, with a potential for more exploration. Overall, from the assessed literature could be generalised that different types of norms are related to the four different types of fairness: distributive, procedural, informational and interpersonal.

Norms related to fairness in the **distribution** of resources generally revolve around three key principles: equity, equality, and need. These norms serve as rules for evaluating the fairness of reward allocation (Kadefors, 2005; Mir et al., 2022). Equity focuses on fairness based on contribution, although the definition of "justifiable contribution" can vary. Kadefors (2005) finds for example that cost-based norm of procurement prevails in the construction industry with competitive tendering. However, Vaidyanathan and Aggarwal (2003) show through case studies that price increases due to external factors are seen as justifiable, but price increases due to internal factors are not perceived in the same way. Another norm can be equality, which is grounded in the idea that all individuals should be treated equally in terms of opportunities and resources. In addition, the norm of need suggests that resources should be allocated based on individual needs rather than contributions, abilities, or merits (Gassenheimer et al., 1998).

Gassenheimer et al. (1998) propose that equity, equality, and need should be assessed before evaluating the fairness of other parties' behaviour. Kashyap et al. (2008) tested these distributive

norms (equity, equality, and need) in a measurement model for distributive justice, developed from field interviews. Additionally, several authors emphasize, above all other norms, the importance of equity in interorganizational relationship for controlling fairness in reward distribution, as seen in the work of Yilmaz et al. (2004), Beugré and Acar (2008), Alghababsheh et al. (2023), and Wang et al. (2022).

At the same time, norms related to **procedures** and **interactions** are found to influence fairness as well. Yilmaz (2004) and Suh (2014) use different elements of bilateral communication, impartiality, refutability, explanation, knowledgeability and courtesy from Kumar et al (1995) as operationalization factors for procedural fairness, reflecting the early development of the procedural justice concept including interactional aspects. Likewise, bilateral communication, voice, explanation, consistency, credibility as elements related to procedural justice are found to be positively related with the long-term orientation within supply chain relationships by Griffith and Lusch (2000). In their empirical study, Ando and Khee Ree (2009) adopt bilateral communication, ability to refute decisions and provision of explanations as operational items related to perceived fairness of joint decision making in interorganizational context of international joint ventures. In a more specific topic of fair pricing, Diller's (2008) fair price model outlines other six criteria of a fair price next to distributive fairness, including elements as consistent behaviour, personal respect, fair dealing, price honesty, price reliability, and the right to influence or co-determine the price.

With particular respect to **procedures**, Alghababsheh et al. (2023), Theodorakopoulos et al. (2015) and Boyd et al. (2007) adopt normative procedural principles outlined by Leventhal (1980), which include applying criteria of consistency, suppressing bias to ensure impartiality, using accurate information, and providing opportunities for error correction and ethicality, with Alghababsheh et al. (2023) adding conformity with contractual terms from Luo (2007) as a criterium to assess fairness of chain relationship procedures. Theodorakopoulos et al. (2015) focus on how large companies implement the norms of unbiasedness, accuracy and correctability for procedural justice in procurement from suppliers in disadvantaged communities, while Boyd et al. (2007) use these norms to advise on a procedural justice-based framework for corporate social responsibility (CSR) in supplier relationships. Supporting this, Konow (2009) provides empirical evidence showing that high levels of information enhance the impartiality of quasi-spectators, such as judges, juries, and independent arbitrators. Consistency of the decision-making process is also a central element related to operational items for procedural fairness in exchange relationships in the study of Wang et al (2022). Kadefors (2005) further builds on Levinthal's framework by adding the need for representativeness of all stakeholders and ensuring alignment with prevailing ethical standards to guarantee fairness in decision-making processes. Based on the case studies in the construction sector with fixed price contracts procured by tendering, Kadefors (2005) finds that intuitive cost-based norm of fair pricing shapes interaction in construction projects, but that consequences vary between projects because of procurement practices and communication leading to poor risk management and distrust.

Interaction norms, which influence both information exchange and interpersonal relationships, can be divided into two categories: **information** norms and **interpersonal** relation norms. According to Mir et al (2022), depending on the context, interactional justice (interpersonal and informational) can reflect politeness, proper remarks, honesty or thoroughness of explanations. Lee and Ha (2020) operationalize informational justice using honest bilateral communication and detailed explanations, and interpersonal justice through norms of courtesy, respect, mutual exchange of opinions, and appropriate behaviour.

For interpersonal justice in the intercultural interorganizational Beugré and Acar (2008, based on Luo, 2007) emphasize the importance of social sensitivity, including fairness in treatment, honesty, courtesy, openness, mutual understanding, and respect for cultural norms. Beugré and Acar (2008) discuss that these norms influence interpersonal justice by shaping boundary spanners'

perceptions of fairness, which can mitigate the negative effects of behavioural uncertainty on relational commitment in interorganisational relationships. Kadefors (2005) discusses politeness and respectfulness in interpersonal relations as aspects influencing perception of justice.

2.7 Supply chain practices affecting fairness perceptions

In this section we explore which business practices can improve fairness perceptions of supply chain actors. The focus is on those practices that involve both sides of the dyad, the supplier and the buyer, i.e. practices that involve collaboration and interaction.

As a starting point, Samoggia and Beyhan (2022) provide a review of the literature on business practices that promote fairness in agro-food supply chains. Samoggia and Beyhan made a comprehensive list of upstream business practices that are considered to enhance fairness. At the same time, while Samoggia and Beyhan do distinguish distributive, procedural, and interactional fairness in their paper, they do not systematically classify business practices according to those dimensions. Gudbrandsdottir et al. (2021) also study antecedents of fairness in agri-food and give a categorized overview of factors and references, in which factors of financial outcomes, operational outcomes and information sharing are discerned. However, not all their factors can easily be interpreted as actual business practices and the classification is not entirely in line with the four dimensions of fairness. In our overview, the relevant results are summarized according to the four dimensions of fairness – distributive, procedural, informational and interpersonal – although we emphasize that many of the relations found are complex and involve multiple effects of business practices on different dimensions of fairness.

Distributive practices

Price as fair compensation

Ensuring farmers' remuneration and paying fair prices (Simões et al., 2025; Shoniwa and Terera, 2024; Samoggia and Beyhan, 2022; Sun et al., 2021) is a very important aspect in the fairness literature, often at the heart of measuring distributive fairness itself. Diller (2008) uses distributive fairness as one of the components of price fairness and explicitly mentions that fairness relates to “the fact that the price and the service/product stand in a standard market-acceptable relation to one another” (Diller, 2008, p. 354). Note that this definition also implicitly refers to a norm of fairness. Although fair prices (e.g. through the payment of premiums) are important for fairness perceptions, other distributive aspects are also important. Simões et al. (2025) studies satisfaction of dairy farmers in Brazil with the prices they receive. They conceptualize price fairness in as “the perception that milk buyers offer fair prices to a group of similar suppliers and do not gain undue advantages due to market power”. In their results, this price fairness is less important for overall satisfaction than price transparency, price-quality ratio, price credibility, and price confidence. This research shows that not only the (relative) price is important for overall fairness in the supply chain, but also practices related to product quality and support, price risks and transparency of the price setting procedures. The latter are included under informational and procedural practices in our framework (see chapter 3.2).

Product quality, delivery performance, and operational support

Chiu et al. (2013) find a positive influence of product quality (perceptions), delivery performance and distributive fairness. Yilmaz et al. (2004) test the relationship between various performance measures and distributive and procedural fairness. They find operational support and financial and sales performance being related to distributional fairness, and that delivery performance, operational support and financial and sales performance were also positively related to procedural fairness. They do not find a significant effect of delivery performance on distributive fairness and rather argue that delivery performance has to do with how well contract parties adhere to the terms of the contract instead of to the actual distribution.

Risk sharing and joint investments

Gudbrandsdottir et al. (2019) explain that fairness is about “the ratio of a business’ inputs to its outcomes and how they compare to the ratio of others”. They define inputs as either cost or risk and unfair risk burden as a fairness concern. Consequently, we see risk sharing practices as a way of mitigating unfair risk burdens. Gudbrandsdottir et al. (2019) mention specific investments (from Huo et al., 2016) and relationship investment (idiosyncratic investments) (from Liu et al., 2012) as a way of building relationships in supply chains and decreasing risks. Oyedijo et al. (2023, p. 4906) conclude that “collaborative activities such as dedicated investment [...] were found to improve aspects of distributive fairness”. Sun et al. (2018, p. 3) state that “studies of suppliers and manufacturers argue that the benefits of distribution and risk sharing are principal factors that affect distributive fairness. However, existing studies do not conduct further research on the antecedents of fairness perceptions.” They do not explain which studies make these arguments and do not further investigate actual risk sharing practices in their paper. However, from our own experience in agricultural supply chain research, we know that risk sharing is a major concern for agricultural producers, especially in times of high volatility. For this deliverable, a distinction is being made between actual risk shared as a component of distributive fairness and the procedures that lead to or govern risk sharing, such as contractual arrangements, which are put under procedural fairness practices.

Procedural practices

Unfair trading practices

The first business practice that Samoggia and Beyhan (2022) mention is a ban on unfair trading practices (UTP’s). The absence of unfair trading practices seems like a logical starting point for procedural practices. The EU Directive 2019/633 on unfair trading practices in the agricultural and food supply chain was adopted by the European Parliament and Council on 17 April 2019 and lays down minimum rules regarding unfair trading practices in business-to-business (B2B) settings. In the regulation 16 business practices are considered as unfair, and prohibited by law, divided between 10 blacklisted practices and 6 grey practices. The blacklisted practices include Late payments (later than 30 days for perishable agricultural and food products); Short-notice cancellations; Unilateral contract changes by the buyer; Payments not related to a specific transaction, Risk of loss and deterioration transferred to the supplier; Refusal of a written confirmation of a supply agreement by the buyer, despite request from the supplier; Misuse of trade secrets by the buyer; Commercial retaliation by the buyer; Transferring the costs of examining customer complaints to the supplier. The grey-listed practices include return of unsold products, and payment of the supplier for stocking, display and listing, and for promotion, marketing and advertising, and these are only allowed when agreed upon beforehand in a clear and unambiguous way. However, in the implementation into national law, many member states have gone beyond the minimum requirements from the directive and banned grey practices the same as black-listed practices. The regulation on unfair trading practices has been developed to complement measures from the common agricultural policy (CAP) that aim to increase fairness such as the promoting of producer cooperation in Producer Organizations (POs). Gudbrandsdottir et al. (2021) mention the problem of unfair trading practices and study the antecedents and consequences of fairness in food system, however, they do not actually list the absence unfair trading practices specifically as fair trading practices under the antecedents of fairness. It becomes clear however that UTPs can shape fairness perceptions, are driven by power imbalances, and can have also effects on governance structures as farmers seek to join forces in e.g. producer organisations to avoid unfair trading practices by buyers.

Chen et al. (2022) explore unfair and fair practices during the covid pandemic. They list several practices that are recognized as unfair and discuss the differences between normal times and during the covid pandemic. The unfair practices are related to pricing, trade practices and payment of workers. For unfair prices they list e.g. price gouging during shortages. Hidden charges

on top of prices. Deliberate holding up production to create shortages. For unfair trade practices they mention not honouring previously agreed terms, manipulating legal loopholes for advantage, excessive price increases and sudden changes in capacity allocation rules.

Contracting and control practices

Benmehaia et al. (2025) study the relationship between contracting practices and contract performance in the Algerian processing tomato supply chain. Although the direct link between practices and fairness perceptions was not studied, to improve fairness and contractual performance, the article suggests implementing fair and transparent pricing mechanisms; enhancing communication and trust between growers and processors; providing incentives and support to growers; and introducing flexibility in contracts and efficient enforcement mechanisms.

Wang et al. (2024) study how different forms of contractual enforcement, control and coordination, influence the extra-role altruistic behaviour of the supply chain partner through perceptions of fairness, in the context of Chinese distributors of household appliances. Contractual control is defined as the severity of a seller's disciplinary measures to contractual violations by the buyer, while contractual coordination was defined as the extent to which a seller resorted to contract clauses to make arrangements with a buyer in the event of contract violations (Wang et al., 2024). They find that the seller's contractual coordination encourages the buyer's altruistic behaviour (as the buyer's willingness to make voluntary efforts beyond what was required by the contract) by increasing the perceptions of distributive, procedural, and interactional fairness. Contractual control was found to lower the buyer's extra-role altruistic behaviour by reducing its perceptions of distributive, and interactional fairness. Wang and Dyball (2019) find that formal control is negatively affecting procedural fairness, distributive fairness and interactional fairness (as a second-order construct of informational and interpersonal fairness), whereas social control has a significant positive effect on all three types of fairness. This research shows that high correlation and interlinkages between various dimensions of fairness.

Poppo and Zhou (2014) focus contractual complexity and contractual recurrence (and controls among which relationship duration, contract duration, and exchange frequency) and study how they interact with distributive and procedural fairness. Contractual complexity relates to the number of contingencies included in the contract, while contractual recurrence is about expectations of contract renewal and duration. They find that contractual complexity adds to procedural fairness but not to distributive fairness, and that contractual recurrence adds to both procedural and distributive fairness. Socializing acts as a positive factor, while monitoring acts as a negative factor for fairness perceptions.

With respect to contracting, the study by Brown et al. (2006) is exploring how explicit and normative contracts relate to satisfaction of the business partner. They find that normative contracting (a mutual understanding of how each party is to perform and of what will happen in the case of unplanned events) has a positive influence on wholesaler economic satisfaction, while explicit contracting does not.

Governance structures

Wei et al. (2021) study internal and external supply chain integration in relation to fairness perceptions. Internal integration is defined as "the strategic system of cross-functioning and collective responsibility across functions (Wong et al., 2011, p. 605)". External integration is defined as "the degree to which a firm structures its interorganizational operations, such as information sharing and collaborative planning with supply chain partners, to achieve collective goals (Stank et al., 2001; Saeed et al., 2005)". They investigate how one type of integration affects the other and how they affect supply chain performance under moderation of fairness perceptions and find that distributive fairness negatively moderates the relationship between internal and external integration, and positively moderates the relationship between external integration and firm

performance. Procedural fairness positively moderates the relationship between internal and external integration and insignificantly moderates the relationship between external integration and firm performance. Although we are not primarily interested in the relationship between internal and external supply chain integration, it shows that, especially under uncertainty, distributive fairness may be an important mechanism to allow supply chain integration to contribute to supply chain performance.

In the context of banana supply chains in Zimbabwe, Shoniwa and Terera (2024) explore which factors determine the economic returns of smallholder farmers in relation to public-private-community partnerships (PPCPs). They find that PPCPs can enhance farmers' incomes by ensuring transparency and fair pricing of agricultural inputs and produce and by risk sharing through implementing mechanisms for fair sharing of risks among stakeholders. Furthermore, these governance structures can improve value addition by reducing post-harvest losses and increasing product value, and can provide access to inputs and technology, as well as facilitating market access. Finally, Shoniwa and Terera (2024) mention capacity building where training and support can improve farmers' skills and knowledge.

Joint relationship effort

Oyedijo et al. (2023) perform a qualitative assessment of fairness in supply chain relationships. In their study joint relationship effort is defined as collaborative activities between multi-tier supply chain partners that involve working together towards decision-making, joint problem-solving, planning, and other coordinated activities. It was shown to improve the procedural fairness and decision-making aspect of fairness. They further find that fairness perceptions also influence collaborative practices, such as information sharing, joint relationship effort, and dedicated investment. Furthermore, they find that such practices can influence trust, commitment, satisfaction, and these improvements in relationship quality contribute to better conflict resolution and overall relationship sustainability.

Countervailing power through brands and dependency

Countervailing power by farmers achieved through arrangements that strengthen farmers' collective action other than through cooperatives and fostering interdependence between farmers and other supply chain actors has been mentioned by Thorpe (2020). Although there is not an expectation that power be equally shared, countervailing power may be created through brands that link consumers to the producers; by giving the farmers a minority stake in the stronger party's operations to create a degree of mutuality, or when the business of the other actor depends on the economic sustainability of the farmers (Thorpe, 2020, p. 165).

Informational practices

Transparency: Information sharing

Many authors point to the role of transparency and information as a way of improving (informational) fairness. Sun et al (2021) quantitatively assess a model of fairness in agricultural wholesale market supply chains. Next to price satisfaction (the degree of satisfaction of suppliers with agricultural product prices), income level (the profit that the retailer can bring to the agricultural product supplier), environmental certainty (the predictability and stability of the agricultural product market demand), they include information sharing (the ability of agricultural product suppliers to share their own information with retailers) as a determining factor. They find that each of these elements has a significant positive influence on distributive and procedural fairness. Sun et al (2018) also study information sharing and find a positive relationship with procedural fairness. Lee and Griffith (2019) study information exchange in relation to distributive fairness and find no significant relationship, indicating that the two constructs are distinct.

Price transparency and operational transparency

Simões et al. (2025) and Samoggia and Beyhan (2022) also point to price transparency as a factor for fairness. Ferguson et al (2017) perform an experiment with partitioned pricing, showing that providing additional information about the build-up of a price can improve price fairness perceptions. This factor is linked to transparency.

Samoggia and Fantini (2023) study Colombian coffee chains and look at certification schemes as a way of improving fairness. They show that results are mixed, that most schemes work to improve the sustainability performance but that effects on farmer incomes and fairness are not always significant. Some positive effects on access to markets and price premiums are found, but these effects are offset by costs to farmers and the fact that often not all coffee is sold under the labels. Samoggia and Fantini highlight therefore the role of institutions and cooperatives “to ensure that certification costs are not overly burdensome for smallholders and that price premiums are distributed fairly among farmers” (Samoggia and Fantini, 2023, p. 10).

In relation to transparency and smart technologies, Kshetri (2023) delves into the use of blockchain technologies in agri-food chains. They find that blockchain has the potential to increase distributive fairness by providing transparent and immutable transaction records. Blockchain can help verify quality and processes throughout the chain and make payments transparent. Examples show that the use of blockchain, such as in coffee and pork supply chains, can improve contract fulfilment by lowering uncertainty. Additionally, blockchain fosters symmetric dependence among supply chain partners and enhances interfirm governance structures. Rambim and Awuor (2020) design a blockchain based recordkeeping mechanism for the Kenyan dairy chain, that also has the potential to increase fairness, most importantly because records of quantity and quality delivered cannot be changed unilaterally after the delivery of the milk by the farmers.

Transparency: information quality

Not only the information sharing itself but also the quality of the information is important. Giving adequate reasons and explanation for decisions is essential for fairness (Ha and Lee, 2024; Lee et al., 2020). Providing clear and detailed explanations can impact satisfaction with results, making practices that enhance informational fairness crucial in supply chain relationships. Chiu et al (2013) find that information quality positively affects procedural fairness. They use a six items construct for information quality adapted from McKinney et al. (2002).

Lee and Ha (2021) study the relationship between interpersonal justice, informational justice and information quality in the setting of pharmaceutical companies and pharmacies. In their model the assumed causality runs from justice to information quality. They define informational justice as the perceptions of the existence of fair practices in terms of information exchange like the honesty of the communication, accuracy and timeliness of the information exchange, which one may also regard as fair practices, while information quality is also defined in terms of practices, like sharing of detailed information, and timely sharing of opinions.

Contact channel

Furthermore, Chiu et al (2013) find that having accessible ways of contact (contact channel) is positively related to procedural fairness. Contact channel refers to the various methods or mediums through which communication occurs between parties. In the context of supply chains, contact channels can include emails, phone calls, video conferences, and even face-to-face meetings. Gudbrandsdottir et al. (2021) highlight that the choice of contact channel can significantly impact perceptions of fairness. For instance, using clear and direct communication channels can help ensure that all parties receive the same information simultaneously, reducing misunderstandings and fostering trust. This fairness in communication is crucial for maintaining strong, cooperative relationships within the supply chain.

Interpersonal practices

Interpersonal treatment/courtesy

Throughout the fairness literature, the ethical treatment of the other party such as (weaker) farmers, is essential. It is part of different dimensions of fairness such as the way that procedures are implemented. From an interpersonal point of view, ethical treatment is related to how the other party is treated, with respect, dignity and courtesy (Samoggia and Beyhan 2022; Brito and Miguel, 2017). In the abovementioned study by Lee and Ha (2021) interpersonal justice is defined as the perceptions of the existence of fair treatment in terms of politeness, respect, sharing opinions, and refraining from improper behaviour

In the study of Yilmaz et al. (2004), boundary personnel performance was conceptualized as a mixture of various procedural and interactional elements, including competence, courtesy and responsiveness of the boundary personnel. For our framework, we retain courtesy and responsiveness under interpersonal fairness.

Responsiveness

Chiu et al (2013) include in their analysis the concept of responsiveness in determining interactional fairness. The use four items adapted from Parasuraman et al. (1994), including “In the case of any problem, I think the seller will give me prompt service”. In the paper by Chiu et al (2013) interactional fairness is not further discerned into informational and interpersonal, but we classify this element as interpersonal.

Supply chain socialization

Another practice relates to supply chain socialization, which Kim and Chai (2019) describe as “the degree of interaction and communication between buyers and suppliers in assisting the establishment of familiarity, frequent communication, and solutions to problems in supply chains”. Supply chain socialization is meant to enhance inter-organizational relationships, through “social events, joint workshops, teams, conferences, and onsite visits” (Cousins and Menguc, 2006). Kim and Chai (2019) find that supply chain socialization improves perceptions of fairness. They include in their measure of fairness elements from distributive, procedural and interactional fairness and make no separate conjunctions about interactional fairness. However, their measures of supply chain socialization are defined in terms of holding frequent social events with suppliers, regular joint workshops, conferences, onsite visits, and team building exercises, and hence we classify such practices under interpersonal fairness practices.

Cultural adaptation

A related issue is cultural adaptation (Ando and Kee Rhee, 2009), which is about “the process by which individuals or organizations adjust their behaviours, practices, and strategies to align with the cultural norms and expectations of a different cultural context”. The authors study cultural adaptation as antecedents of fair joint decision-making process, fair distribution of bargaining power, and trust. They find positive relationships between the constructs. However, in their implementation of fair joint decision making processes (e.g. as “There has been frequent communication with our partner in the decision-making process”) and fair distribution of bargaining power (e.g. as “Our bargaining power in decision-making has fairly reflected our managerial, technological and financial contribution to the JV [joint venture]”), they actually test interconnections between various procedural, distributive, and interpersonal practices, instead of a direct effect on a fairness perception. Nevertheless, the results imply importance of cultural adaptation for fairness perceptions.

Overview of practices

From the literature, a list of business practices that have been found to enhance fairness has been developed (Figure 2). The list is meant as a general checklist of items that may need to be improved in supply chain relations. At the same time, the research shows that the complexities of real-world supply chains are large and contextual and institutional factors beyond the control of the supply chain partners can have an important influence on fairness and the effectiveness of such measures.

Distributive	Procedural	Informational	Interpersonal
<ul style="list-style-type: none"> • Fair compensation of costs • Fair compensations of (ESG) efforts • Product quality • Delivery performance • Giving operational support • Risk sharing • Sharing investments/co-ownership 	<ul style="list-style-type: none"> • Fair procedures • No unfair trading practices • Adequate contract duration • Explicit/normative contracting • Formal/informal (social) monitoring and control • Joint resource creation • Joint problem solving 	<ul style="list-style-type: none"> • Information sharing • Information quality • Operational transparency • Contact channel • Collaborative/frank communication 	<ul style="list-style-type: none"> • Politeness, respect and dignity in interpersonal contact • Responsiveness • Supply chain socialization • Cultural adaptation

Figure 2: Overview of fair business practices. Source: authors based on literature.

From the literature study, it is also concluded that the various dimensions of fairness are related in the sense that practices to improve fairness in one aspect may also influence fairness of another dimension, and that in many studies, fairness is conceptualised in the practices that lead to fairness perceptions. E.g. in the study by Lee and Ha (2021) fairness perceptions (informational and interpersonal) are operationalised largely in terms of actual practices being observed. They find that the link between informational fairness and informational quality is significant, and also, they find that interpersonal fairness influences informational fairness. The link between interpersonal fairness and information quality was positive and significant only for Korean firms but not for multinational firms, which may indicate that cultural differences make that companies rely more on formal procedures and less on personal contact. Zhou et al. (2020) similarly test if distributive fairness and procedural fairness (operationalized as existence of several fair practices like having fair policies and abstinence from discrimination) affect knowledge sharing (also defined as practices). They find no significant relationship, although the constructs are correlated. We conclude that operationalizing fairness perceptions in terms of fair practices complicates the causality and rather define practices as the level of actual things that the companies do, and fairness in terms of overall perception of the fairness of the distribution, procedures, information, and interpersonal treatment.

2.8 Contextual and institutional factors

Economic and social interactions are structured at various levels of society. Those structures influence behaviour, decision-making, and resource allocation. Bouazzaoui et al. (2020) show that the present literature on organisational justice generally focuses on one level of analysis and less on the interactions between the organisational levels. At the same time, some elements of the internal and external context of firms and firm relations have been used in the assessed fairness literature about business-to-business relations, although the type of their assumed relation to fairness differs. The elements of the internal and external context from the literature are all more or less related to four institutional levels of social analysis of Williamson (1998): resource allocation,

governance, institutional environment, and social embeddedness. Also, for these elements applies that they are not always specifically related to climate-smart agricultural chains, or to agriculture in general, revealing a potential for more exploration in this domain.

Resource allocation refers to how resources (financial, human, technological, etc.) are distributed and allocated within an organization or between organizations. Fairness in resource allocation involves ensuring that resources are distributed equitably between business partners. The found elements of resource allocation connected to fairness are for example the level of outcomes, value creation by internal resources, and the nature of tasks and assets. The outcome plays a critical role in fairness perception. If the outcomes are perceived as fair and meet expectations, both parties are more likely to sustain the relationship. On the other hand, when outcomes fall short, one party may perceive the transaction as unfair, potentially leading to the termination of the partnership (Griffith et al., 2006, Brito and Miguel, 2017, Alghababsheh et al., 2023).

From Brito and Miguel (2017) and Hornibrook et al. (2009) can be concluded that collaborative settings where both firms create value through their internal resources, fairness is often perceived as higher. However, when one party appropriates a disproportionate share of the value, especially in the presence of power asymmetry, the relationship may be viewed as unfair. Tasks that involve highly specific or tailored assets require careful governance to ensure that the risks and rewards are shared fairly. This dynamic is particularly significant in the context of interdependence: when one firm with certain assets is more dependent on the other, they may perceive the resource allocation as unfair (Bonatto et al., 2022). Sun et al (2021) found significant evidence that an income level and environmental certainty have positive impacts on fairness. The higher the income and environmental certainty (i.e. stability in the external environment), the fairer the perception of distribution of outcomes and the procedures.

Governance refers to the mechanisms and structures through which transactions are organized, monitored, and enforced, in other words, governance is about the rules of the game. For example, in a B2B contract, the terms and conditions laid out for pricing, delivery, and penalties for non-compliance are governance mechanisms that ensure fairness. Transactions may be governed in different ways, through markets and contracts. Neo-classical contracting aims for complete contracts, covering all contingencies. The literature finds that neo-classical contracting may produce a lot of transaction costs (Grandori, 2014). Obligational contracting on the other hand recognizes the difficulty of this and uses detailed clauses to manage uncertainties, lowering transaction costs to a certain extent. Relational contracting also acknowledges this challenge but relies on social norms and relationships for governance. The key differences are that neo-classical contracting strives for completeness, obligatory contracting uses detailed clauses, and relational contracting depends on social norms. Five types of global supply chain governance models are discerned by Hoang et al (2021): i) market, ii) modular, iii) relational, iv) captive, v) hierarchy. They study how different contractual arrangements in the Vietnamese milk sector impact fairness perceptions. They find that relational and cooperative models may be linked to higher perceptions of fairness and power of farmers, while the captive model may be better to improve milk quality and farming processes in the long run. They also find that certain business practices – such as strict quality control measures – may be perceived as unfair by farmers if the buyer is larger and more powerful. Grandori (2014) also studies various types of governance in agri-food supply chains and suggests that horizontal cooperation between farmers will increase fairness in the sense that it will improve distributional outcomes for farmers, as opposed to governance through a pure market or a hierarchical model, advocating associational contracts.

Samoggia and Fantini (2023) relate the contractual governance to the market failures in agricultural chains: 1) limited alternatives of farmers for trading, (2) technological dependence, and (3) informational asymmetry. They argue that informational asymmetry leads to incomplete or unclear contracts that enable opportunistic behaviour. In addition, uncertainty is a major driver for governance and contract design in agricultural markets. Due to uncertainty, contracts are almost

always incomplete, increasing transaction costs and fear of opportunistic behaviour. Associational and relational contracting, as well as more radical hierarchical integration may solve some of these issues.

In the interorganisational relations, power, environmental (market) uncertainty, market predictability and transparency, interdependence structure, value appropriation and governance, contractual and relational chain governance, perceived risk interdependence, and fierce competition are found in the literature to be connected to fairness at some point.

Power asymmetry can influence how value is appropriated between parties; when one party holds more power, it may capture a larger share of the value, leading to perceptions of unfairness (Brito and Miguel, 2017). Market uncertainty, especially when linked to environmental factors, can also affect fairness, as unpredictable market conditions make it harder for firms to anticipate outcomes, potentially undermining distributive and procedural fairness (Yilmaz et al., 2004). However, when market predictability and transparency are present, firms can make more informed decisions, which fosters fairness by aligning (mutual) expectations (Sun et al., 2018). The interdependence structure between firms - whether balanced or asymmetric - also shapes fairness; highly interdependent relationships tend to support more fair risk-sharing, while asymmetric interdependence may lead to perceived unfairness (Bonatto et al., 2022). Contractual and relational governance mechanisms (formal contracts and trust-based agreements) are central to maintaining fairness, as they help establish clear expectations and encourage cooperative behaviour. In competitive environments, fierce competition can amplify the need for fairness, as firms must avoid opportunistic behaviour to retain long-term partnerships (Essig and Amann, 2009). Finally, perceived risk interdependence, or the mutual recognition of shared risks, plays a key role in fairness perceptions, with balanced risk-sharing promoting trust and enhancing the relationship (Griffith et al., 2006; Yilmaz et al., 2004).

Institutional environment refers to the formal rules and regulations, including laws, regulations, standards, and industry practices, that govern and constrain business transactions, as well as the institutions of knowledge and education. Legal frameworks related to contracts, dispute resolution, and anti-corruption laws can set clear boundaries around what is considered fair or unfair behaviour. A clear example is the EU Directive 2019/633 on unfair trading practices in the agricultural and food supply chain.¹ In the studied literature, Theodorakopoulos et al. (2015) emphasize that regulatory pillars (rules, laws) and normative (social norms) and cultural-cognitive (shared beliefs) elements play a key role in establishing procedural justice in procurement processes, ensuring fairness through institutionalized frameworks within buyer-supplier relationships, although the latter two elements seem to be more linked to informal rules within social embeddedness. Likewise, Hemmert et al. (2016) concludes that formal and informal external dynamics, including legal protection, government support, and social networks, positively influence procedural and distributive justice in B2B relations, ultimately fostering trust in suppliers. Soundararajan and Brammer (2018) further argue that institutional context factors, such as regulatory focus and market support, influence the significance of fairness norms, particularly in developing countries where weak institutional frameworks require reliance on informal governance structures, like third-party certification, to mitigate fairness concerns in resource-scarce environments.

Robaey et al. (2022) consider inclusion as a driver of economic fairness. In their qualitative study of inclusive biobased supply chains, they point to the important aspects of different institutional environments. High or low technology availability culturally and historically determined learning

1

https://agriculture.ec.europa.eu/common-agricultural-policy/agri-food-supply-chain/unfair-trading-practices_en

practices and networks, and e.g. the accessibility of certification schemes was found to impact inclusion.

Barry and Graca (2019) discuss how the institutional environment affects buyer-supplier relationships. Although the paper focuses on relationship quality in terms of trust and commitment and satisfaction, the analysis is closely interlinked with fairness. The article examines how different governance environments (rule-based, relation-based, and family-based) impact relationship quality between buyers and suppliers. It highlights that the fairness and effectiveness of political and economic institutions in a buyer's country influence the rules of the game for business relationships. The study finds that in rule-based environments, communication quality is more critical, while in relation-based and family-based environments, interaction frequency and relationship benefits play a more significant role.

Wang et al. (2024) assesses how marketization distance as an institutional factor moderates the influence of contractual governance on fairness in Chinese buyer-seller relationships in the household appliances market, where marketization distance negatively moderates the positive effects of contractual coordination on all three types of fairness, but positively moderates the effect of contractual control on distributive fairness. The marketization distance is measured as a composite index of various market characteristics, including the government-to-market relationship, the nonstate economy development, the product market development, the factor market development, the market intermediaries and the legal environment. Although this research was directed at the control and coordination practices of a seller towards a buyer, it is probably fair to assume that it works both ways. The paper clearly identifies the moderating influence of the institutional factor.

Social embeddedness refers to the extent to which organizations are embedded in social networks, relationships, and communities. This concept highlights the importance of informal relationships, trust, and reputation in shaping interorganizational exchanges. In the studied literature relationship history, social networks, cultural power distance, uncertainty avoidance, and cultural distance, exposure and adaptation stand out in this perspective. For example, cultural power distance affects perceptions of procedural fairness, with high power distance cultures accepting hierarchical decision-making, while low power distance cultures favour egalitarian approaches (Lund et al., 2013). Uncertainty avoidance impacts outcome fairness, as cultures with high uncertainty avoidance prioritize stability in resource distribution. Cultural distance can lead to misunderstandings about fairness in cross-border relationships, creating behavioural uncertainty (Beugré and Acar, 2008). However, cultural exposure and cultural adaptation help bridge these gaps, fostering trust and aligning fairness expectations (Ando and Kee Rhee, 2009). Additionally, relationship history and social networks enhance fairness by building trust and facilitating mutual understanding, which are crucial for resolving conflicts and ensuring equitable exchanges (Hemmert et al., 2016).

2.9 Conclusions

Supply chains are characterized by interorganizational relationships. In the context of supply chains, fairness is a multifaceted subjective construct of several dimensions: distributive, procedural, informational and interpersonal fairness (Colquitt, 2001). Each of these elements influence the perceptions that actors have of the fairness or unfairness of a transaction or business outcome. Fairness perceptions depend on actual business practices and outcomes, e.g. in terms of distribution of profits or the adherence to certain prior agreed procedures, and the norms against which these practices are judged. Finally, the literature suggests that there are different outcomes in different business, social and institutional contexts.

In addition, from the literature review it is concluded that although many aspects of antecedents and consequences of fairness in supply chains have been studied, the literature is fragmented and

often focused on a limited number of practices, fairness dimensions, or consequences. For the purpose of our study and to develop climate-smart agri-food supply chains, we propose a framework that integrates the various findings from the literature in a larger framework. This framework, which is presented in the next chapter, focuses on the antecedents of fairness perceptions.

3. Framework of fairness in climate-smart agri-food supply chains

3.1 Introduction

Building on the findings of the literature review in Chapter 2, this chapter develops a conceptual framework for assessing fairness in climate-smart agri-food supply chains by integrating key dimensions and themes identified in existing research (Chapter 3.2). The aim is to bring coherence to the diverse and sometimes fragmented understandings of fairness across disciplines and supply chain contexts. The framework seeks to capture both structural and relational aspects of fairness, including distributive, procedural, and contextual dimensions. To ensure the framework's relevance and theoretical robustness, we validated its components through a series of semi-structured interviews with academic experts in supply chain ethics, sustainability, and fairness (Chapter 3.3). Their insights have been incorporated to refine and strengthen the framework, which is presented and discussed in the sections that follow.

3.2 Framework

The framework presents four construct relationships, see Figure 3.

- i) collaborative practices - fairness link
- ii) norms as moderator of the collaborative practices - fairness link
- iii) institutional context as moderator of the collaborative practices - fairness link
- iv) fairness

Fairness perceptions have four dimensions specified as distributive, procedural, informational and personal fairness, with collaborative practices and personal norms being related to these four dimensions as discussed in Chapter 2.4, 2.6 and 2.7. Building on the literature, we define fairness in the context of climate-smart agri-food chains as:

“a perception of the farmers and the buyers of their products that the business relationship produces fair outcomes for all actors, applying fair procedures to reach the outcome, on the basis of fair information exchange, and with fair interpersonal treatment.”

Furthermore, fairness norms in the context of climate-smart agri-food chains are defined as personal or shared expectations that serve as a benchmark for determining what is considered fair or unfair in a business relationship.

Finally, we define fair practices in the context of climate-smart agri-food chains as practices related to the business relationship that improve fairness perceptions of the farmers and the buyers of their products.

The mediating contextual factors have four aspects of institutions: resource allocation, governance, institutional environment and social embeddedness, as discussed in Chapter 2.8.

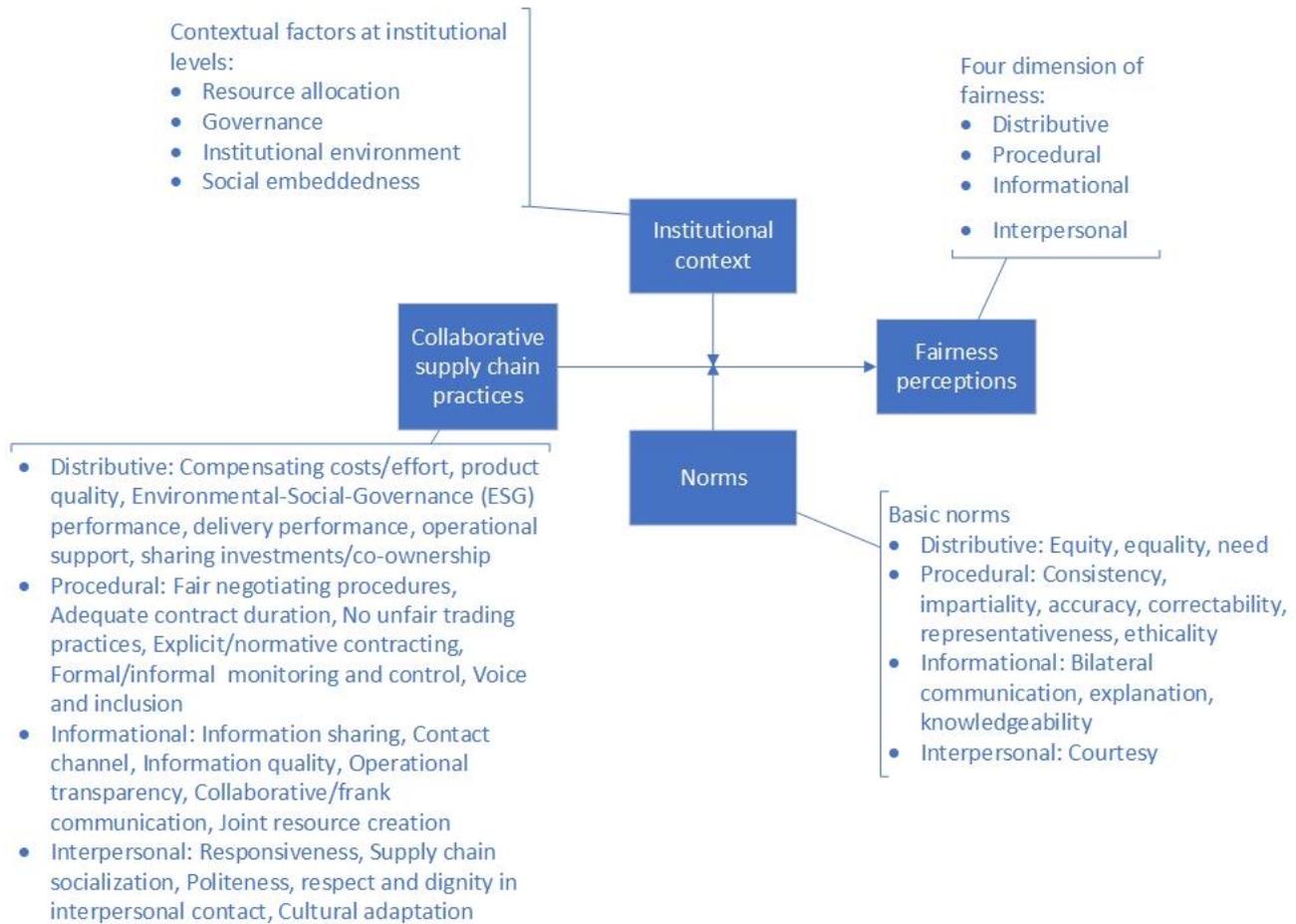


Figure 3: Fairness framework for climate-smart agricultural chains

3.3 Validation interviews with academic experts

3.3.1 Methodology

For validation of the framework of fairness in climate-smart agri-food chains five interviews were performed with experts in the field of fairness issues related to the climate-smart agricultural chains, mainly academics with a track record in agri-food supply chain ethics, sustainability and fairness. As a sampling strategy for the interviews, we were restricted to convenience sampling as we do not have an overview of the whole field of experts of CSA and fairness. We have drawn a list of experts from 1) our own network, 2) the literature, and 3) EU projects that concern the topics of CSA, business modelling and fairness, which are part of FOOD2030 network. In addition, we contacted these experts to identify potential other interviewees, who in their turn were assessed based on their publications and research interests. As a result, between January and March 2025, we had interviews with five academic experts. The experts were asked to assess the core structure of the framework of fairness and definitions. In our questions, we addressed the definition of fairness in the context of climate-smart agri-food chains, and the importance of the discerned norms and fair practices in this context. The interview questions and the list of the interviewees are provided in Appendix 8.1.

3.3.2 Results

When assessing the proposed inter-organizational definition of *fairness* in the context of climate-smart agri-food chains as presented in Chapter 3.1, the interviewees largely agreed with the

definition emphasizing that fairness is a subjective perception shaped by norms such as equity, equality, and need. Several interviewees highlighted that fairness extends beyond bilateral relationships and should be understood across the entire supply chain, involving multiple stakeholders.

Distribution of outcomes emerged as the most critical and frequently mentioned aspect of fairness, particularly due to power asymmetries that often restrict farmers' negotiation capabilities and influence over outcomes. Fairness was often framed in terms of prices. A key question is whether they reflect production costs and allow for sustainable livelihoods. Yet, the interviewees noted that price alone is insufficient without transparency, relational trust, and procedural integrity. Transparency, both within the chain and toward consumers, was considered key but insufficient unless paired with open, reciprocal relationships. Trust, developed through long-term engagement, was seen as both an outcome and a precondition of fairness.

Several interviewees called attention to intergenerational and environmental fairness in relation to CSA, which they felt were underrepresented in the definition, but could be highly relevant beyond the boundaries of a supply chain. Fairness was also linked to recognition and representation, pointing to the need for inclusive processes that give voice to less powerful actors, such as small farmers. Finally, fairness perceptions were noted to be context- and time-specific, requiring adaptive governance and feedback mechanisms.

The interviewees agreed that the proposed *fair practices* as in Figure 2 are broadly relevant but must be context-sensitive and adapted to different agricultural settings, such as small farms versus large processors. Information sharing was seen as vital for fairness, yet several interviewees warned that too much transparency can harm farmers, especially in digitalized systems and without clear data governance. Practices like horizontal cooperation, price renegotiation clauses, and reference pricing were cited as effective in reducing power imbalances and uncertainty in climate-smart agri-food chains. However, fair practices must be evaluated beyond individual transactions, considering broader system impacts and the potential external unfairness of otherwise fair internal actions. Practical examples included aquaculture contracts with spot price indexing and data-driven pricing negotiations by producer organizations.

The importance of *norms* as a moderating force for fairness was endorsed by all the interviewees. The interviewees widely emphasized distributive norms as the most critical for farmers, especially regarding equity. Interviewees noted that all four norm types, i.e. distributive, procedural, informational and interpersonal, interact, but the influence of distributive equity norm is expected to be relatively strong as fairness assessment starts with outcomes. The interpretation of equity norm varied among the interviewees, i.e. some applied it to outcomes and contributions, others to opportunities.

In a broader context of agricultural chains, i.e. beyond the interorganizational relation between firms, procedural norms drew attention in relation to the importance of how policies are implemented and the lack of fairness in bureaucratic practices. Several participants stressed the need to consider externalities (e.g., environmental and social contributions) and intergenerational fairness within distributive norms.

In addition to norms, power imbalances are believed to make fair distribution foundational for enabling other forms of fairness within agricultural chains, which is in line with the expectation of moderating effects of *contextual factors* in the presented framework in Chapter 3.1.

3.4 Conclusions

The presented conceptual framework for assessing fairness in climate-smart agri-food supply chains integrates key constructs, i.e. collaborative practices, fairness norms, institutional context, and fairness perceptions. The constructs are grounded in established fairness dimensions:

distributive, procedural, informational, and interpersonal. Academic experts, who were interviewed for validation of the framework, largely affirmed the core structure and definitions. The interviews reinforced the centrality of distributive fairness, particularly price fairness and power imbalances, but also emphasized the importance of trust, transparency, and the procedural integrity of relationships.

However, several relevant themes emerged from the interviews that were not yet fully captured in the framework. Notably, the significance of intergenerational fairness and environmental justice, especially in the broader sustainability context of climate-smart agriculture. Therefore, we added ESG performance under distributive fair practices. Just like production costs, product quality and delivery performance, ESG performance is part of the efforts of a company that warrant fair compensation.

Additionally, the interviewees highlighted the importance of recognition and representation of less powerful actors, suggesting that fairness also entails voice and inclusion in governance processes. Therefore, we added this to the framework under procedural practices.

Concerns were also raised about data governance and risks of transparency, particularly in digital systems where information asymmetries could be exploited. We did not alter the framework to include this element but are aware of its importance.

Finally, the interviews pointed to the need for adaptive governance mechanisms that can account for the time- and context-dependent nature of fairness perceptions.

These insights suggest areas for further development of the framework and emphasize the importance of continuous refinement through stakeholder engagement and empirical testing in diverse agri-food settings.

4. Application to the BEATLES Case Studies

4.1 Introduction

To evaluate the practical applicability and effectiveness of the fairness framework (Figure 3), we apply it to the five real-world case studies within the BEATLES project. The goal of this exercise is to explore whether the framework can be used to identify fairness concerns in the cases and business practices that improve fairness.

The cases are from the pig sector in Denmark, the dairy sector in the Alpine region of Germany, the cereal sector in Lithuania, the potato sector in the Netherlands, and the apple sector in Navarra province of Spain. This application serves as a critical test of the framework's ability to address fairness concerns in diverse contexts, bridging the gap between theoretical concepts and practical implementation. In Chapters 4.3 - 4.8, we present the results of this application per case, discuss the insights gained, and reflect on the strengths and limitations of the framework in real-world settings.

4.2 Methodology

The case studies of the BEATLES project represent a variety of environments where fairness in climate-smart agri-food supply chains is a key issue, enabling us to assess how the framework interacts with different chain dynamics. To gather insights into the experiences of participants, we employed a two-pronged approach.

First, we conducted in-depth interviews with the case study leads of the five case studies in order to understand the unique context of each case, their specific fairness-related challenges, and how these concerns manifest within their respective environments. The in-depth interview questions and the list of the interviewees are included in Appendix 8.2. The interviews provided qualitative data that helped to frame the broader fairness issues and shaped the subsequent application of the framework. The summaries of the interview results for each case are included at the beginning of Chapters 4.3 - 4.7.

Next, the co-creation workshops, one per case study, facilitated by the BEATLES project were organized in February and March 2025, as part of T1.3, with the participants from the cases. The workshops were organised by the local project partners. In the workshops different types of actors were present, including farmers, processors, traders, a retailer, and other stakeholders. The number of participants and the presence of various actors varied per workshop. In general, the number of participants was low.

In these workshops, the participants were asked to:

- 1) answer questions from a workshop questionnaire designed to capture their perceptions of fairness in the case from their point of view being a specific participant in the supply chain, and the norms they uphold.

For measuring fairness, we differentiated the four fairness dimensions (Colquitt, 2001), but at the same time we used a direct measure by assessing to what extent the respondents think the elements of the four dimensions are fair. For measuring norms, we differentiated four groups of norms related to four fairness dimensions, using a direct measure by assessing to what extent the respondents think the norms are important. A selection of norms has been made from the literature in Chapter 2 to keep the workshop questionnaire short due to time limitations during the workshop. Distributive norms of equality, equity and need, procedural norms of consistency, impartiality, accuracy, correctability, representativeness and ethicality,

informational norms of honesty, explanation and knowledgeability, and interpersonal norm of ethicality were adapted to the context and assessed. The questions are included in Appendix 8.3.

- 2) select fair practices that will improve fairness within the case study context from the list given in Appendix 8.4. The implementation of this part of the workshop varied per case and, because of different interpretation of the workshop protocol and time limitations. The selection method per case is given in Table 3.

Case study	Selection method
Pig sector in Denmark	Per workshop participant, attribute between 0 and 4 votes to the most relevant practices with a maximum of 1 vote per practice
Dairy sector in the Alpine region of Germany	Per workshop participant, attribute 8 votes to the most relevant practices with a maximum of 1 vote per practice
Cereal sector in Lithuania	Per workshop participant, attribute 2 votes to the most relevant practices within each fair practices category, with a maximum of 1 vote per practice
Potato sector in the Netherlands	Per workshop participant, attribute 2 votes within each fair practices category per workshop participant with a maximum of 1 per practice
Apples in Navarra, Spain	Per workshop participant, attribute a maximum of 1 vote per practice to practices that are relevant

Table 3: Selection method of fair practices that will improve fairness within the case study context. Location: the co-creation workshops, one per case study, facilitated by the BEATLES project

The project partners presented the questions to the participants in their local language. Results were then translated back in English and handed to the authors for the inclusion in this deliverable.

Due to the lower number of participants and various implementation of the workshops, the results will be treated only as a qualitative indication of fairness concerns of the participants and cannot be generalized to broader groups of actors. The results for fairness perceptions, norms and practices and their qualitative assessment for each case are included in the remainder of Chapters 4.3 - 4.7 **Error! Reference source not found.**

4.3 Pig sector in Denmark

The Danish pig sector faces some critical fairness challenges in implementing CSA. Farmers endure high pressure to meet sustainability goals while receiving low payments, especially in recent years due to fluctuating European market prices and insufficient government subsidies. The upcoming CO₂ tax under the Denmark's Green Tripartite Agreement threatens economically weaker farms, potentially forcing closures, while only innovative farms can afford the transition to low-emission practices. Danish Crown, the main cooperative, struggles with internal supply issues and low farmer satisfaction due to uncompetitive pricing, leading to farmer departures to alternatives like Tican, another cooperative in Denmark. Despite some efforts, such as Danish Crown's "Klimavejen programme", incentives for CSA remain limited. Farmers face penalties for excess CO₂ but lack adequate support or premiums for sustainable practices. Negotiations are formalized, with contracts shifting toward annual terms, but CSA elements are not yet central to pricing or terms. While communication and collaboration between pig farmers and their buyers exist through representative groups and industry networks, mutual understanding and a shared long-term vision are lacking. Without broader societal support, clearer market incentives, and potential compensation for disadvantaged actors, achieving fairness and widespread CSA adoption in the chain remains a major challenge.

The results of the workshop questionnaire show that workshop participants in this case somewhat differ in their fairness perception, see Table 4. On average, farmers rated the fairness of their earnings at 3.5, with a range 3 - 4 (on a scale from 1 = very unfair to 5 = very fair), which is a bit lower

than the consistent score of 4 (Fair) reported by other participant groups. One of two farmers feels relatively undercompensated in relation to her/his effort. Furthermore, farmers rated the fairness of their supply chain partners' earnings at just 2.5, with a wide range from 1 to 4, suggesting a perception of a relatively unfairly higher compensation of the supply chain partners given their effort in the chain, and hence a perception of some economic imbalance between the farmers and the supply chain partners. In contrast, farmers evaluated business procedures most positively, with an average score of 4.5 (Very fair) (range: 4–5), reflecting a higher level of satisfaction with procedural fairness. Communication and information exchange were rated at 4 (range: 3–5), showing general satisfaction but also variation in experiences. Interpersonal treatment by supply chain partners received a score of 3.5 (range: 3–4), indicating moderate satisfaction. Overall, while structural aspects such as procedures and communication were seen as fair, the farmers' evaluations reveal perceived unfairness in financial and relational dimensions of the supply chain.

	Farmer (n=2)		Input supplier (n=1)	Processors / trader (n=1)	Other stakeholder (n=2)	
	average	range	average	average	average	range
What is fair?						
Your earnings	3.5	3-4	4	4	4	4-4
The earnings of the supply chain partners	2.5	1-4		4	3	3-3
The business procedures in your supply chain	4.5	4-5		4		
The communication and information exchange in your supply chain	4	3-5	3		3	3-3
The way you are treated by supply chain partners in interpersonal contact	3.5	3-4	4		3	3-3

Table 4: The averages of fairness perceptions of the respondents in the case of pigs in Denmark (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=6.

In our fairness framework in Chapter 3.1 we propose that these results are influenced by the importance individuals place on specific fairness aspects, represented by the norms. In this case, the fairness norms reflect a merit-based, respectful, and consistent system, but with clear boundaries around income differentiation across the chain. Farmers in the co-creation workshop placed very high importance on being paid according to their efforts (5.0) but rejected the idea of equal pay with supply chain partners (2.5), highlighting a norm of fairness based on merit rather than equality, see Table 5. They also thought interpersonal respect (4.5) and procedural consistency are important but gave somewhat less importance to understandable information (3.5).

	Farmers (n=2)	Input suppliers (n=1)	Processors / traders (n=1)	Other stakeholders (n=2)
What are your norms?				
Distributional fairness:	4.0	3.3	4.3	4.3
That you are paid according to your efforts and investments	5.0	5.0	4.5	4,5
That you are paid the same as your supply chain partner	2.5	1.0	4.0	4,0
That you are paid at least enough to cover your costs	4.5	4.0	4.5	4,5
Procedural fairness:	4.1	5.0	4.2	4,2
That supply chain procedures are always followed in the same way	4.0		4.0	4,0
That supply chain procedures are applied to everyone in the same way	3.5	5.0	4.5	4,5
That the information that is provided to you for supply chain procedures is always correct	4.0	5.0	4.5	4,5
That mistakes in procedures can be challenged and corrected	4.0	5.0	4.5	4,5
That my specific interests and position is addressed in the procedures	4.0		3.5	3,5
That the procedures respect my rights	5.0		4.0	4,0
Informational fairness:	4.0	5.0	4.5	4,5
That the communication in the chain is honest	4.5	5.0	4.5	4,5
That your supply chain partner is giving you thorough, reasonable and timely explanation when something goes wrong	4.0	5.0	4.5	4,5
That the information that your supply chain partner gives is understandable	3.5	5.0	4.5	4,5
Interpersonal fairness:	4.5	2.0	3.5	3,5
That your supply chain partner treats you with respect, dignity and politeness	4.5	2.0	3.5	3,5

Table 5: The averages of fairness norms of the respondents in the case of pigs in Denmark (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=6.

Additionally, we confronted the workshop participants with a list of fair practices that was derived from the literature, see Chapter 2.7. During a co-creation workshop as a part of the BEATLES project, the participants were asked to select up to four fair practices that could make their climate-smart supply chain fairer. The fair practices prioritized in the Danish pig chain align with earlier fairness norms, especially the top-rated practice of concern: earnings, reflecting farmers' emphasis on being paid fairly for their efforts to make the CSA chain fairer. Votes for information quality and formal control match the importance placed on procedural and informational fairness norms. Surprisingly, interpersonal aspects like respect and communication, despite being valued, received no votes—indicating they may be seen as less urgent to improve. Generally, these workshop participants prioritized economic and structural improvements over relational ones, confirming a consistent focus on distributive and procedural fairness.

Practices	Votes
Distributive	
Earnings	3
Investment and ownership division	0
Operational support	0
Product quality performance	1
Risk division	0
Procedural	
Adequate contract duration	0
Explicit contracting	0
Fair negotiating procedures	1
Formal monitoring and control	2
Informal monitoring and control	1
No unfair trading practices	0
Normative contracting	1
Informational	
Collaborative/honest communication	0
Contact channel	0
Information quality	2
Information sharing	0
Joint resource creation	1
Operational transparency	0
Interpersonal	
Cultural adaptation	2
Politeness and respect in interpersonal treatment	0
Responsiveness	0
Supply chain socialization	0

Table 6: Selected top-practices for making a climate-smart supply chain fairer in the case of pigs in Denmark. Between 0 and 4 votes attributed per workshop participant with a maximum of 1 per practice. Source: Workshop selection exercise, n=8.

4.4 Dairy sector in the Alpine region of Germany

From the interview it shows that fairness concerns in the German Alpine dairy sector stem from low and stagnating prices for dairy products like milk, cream, and yoghurt, driven by intense retail competition and inflation-reduced consumer willingness to pay. A significant number of farmers in the region has organic certification. Farmers face limited power in the chain, with little price transparency. E.g., only certification organizations like Naturland Fair access pricing data during audits. Although dairies are cooperatives with farmer boards, many farmers feel excluded from decision-making. Retailers increasingly rely on their own organic brands, often undercutting prices, and small-scale farms (averaging 27 cows) bear disproportionately high production costs. Farmers are tied to long-term contracts with organic dairies, restricting their flexibility to switch buyers. While organic premiums exist, and e.g. Naturland Fair certification evaluates fairness and relationship quality, the sector risks losing this certification if prices don't improve. Government subsidies (like EU and organic farming support) help, but competition from e.g. lower-cost Austrian private-label milk adds pressure. Limited information sharing and lack of transparency further disadvantage farmers. Fairness solutions seem to include improving price transparency,

strengthening long-term relationships, and ensuring retailers contribute more fairly through pricing and co-investment in product promotion.

Looking at the results of the workshop questionnaire for the dairy sector in the Alpine region of Germany case, the farmers in the workshop reported surprisingly moderately positive perceptions of fairness, but also these data reveal areas needing improvement, see Table 7. Farmers rated their own earnings at 3.7 (range: 3–4), which is only slightly above neutral and suggests that income levels are not perceived as fully fair. This is reinforced by their rating of supply chain partners' earnings at 3.3 ('Neutral'), indicating some dissatisfaction with how value is distributed across the chain. Although communication and information exchange received the highest score of 4.5 (range: 3–5), the wide range suggests inconsistency in experiences, i.e. some farmers still perceive shortcomings in transparency or access to information. Business procedures were rated at 4.0 (range: 3–5), a relatively positive score, but again with varying experiences with room for improvement according to some of the farmers. Interpersonal treatment scored 3.8 (range: 3–5), pointing to generally respectful interactions, yet not uniformly so. In general, while these farmers acknowledge some strengths in communication and procedural fairness, concerns remain around earnings and consistency in treatment, highlighting that fairness in the dairy supply chain is perceived as uneven and still in need of enhancement.

	Farmers (n=4)		Processors / traders (n=3)		Other stakeholders (n=3)		Unknown (n=1)
	average	range	average	range	average	range	average
What is fair?							
Your earnings	3.7	3-4	3.3	3-4	3.0	3-3	4.0
The earnings of the supply chain partners	3.3	3-4	3.3	3-4	3.0	3-3	3.5
The business procedures in your supply chain	4.0	3-5	3.3	3-4	3.0	3-3	3.5
The communication and information exchange in your supply chain	4.5	3-5	3.7	3-4	3.0	3-3	3.5
The way you are treated by supply chain partners in interpersonal contact	3.8	3-5	3.3	3-4	3.0	3-3	3.5

Table 7: Fairness perceptions of the respondents for the case of dairy in the Alpine region of Germany (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=11.

Examining the norms assessed during the workshop, farmers generally valued being paid according to effort and covering their costs (both 4.3) but differed in their opinion (ranges 3-5 and 2-5), see Table 8. Farmers supported income equality more than other workshop participants (4.5). However, their norms around procedural and interpersonal fairness were less pronounced (averaging 3.5–3.6), suggesting neutral moderating power. This points to a fairness culture where economic fairness is prioritized, while relational and procedural aspects are perceived as less guaranteed or important.

	Farmers (n=4)		Processors / traders (n=3)		Other stakeholders (n=3)		Unknwn (n=1)
	average	range	average	range	average	range	average
What are your norms?							
Distributional fairness:	4.3	2-5	4.6	3-5	3.8	1-5	4.7
That you are paid according to your efforts and investments	4.3	3-5	5.0	5-5	4.3	3-5	5.0
That you are paid the same as your supply chain partner	4.5	4-5	4.0	3-5	2.3	1-3	4.0
That you are paid at least enough to cover your costs	4.3	2-5	4.7	4-5	4.7	4-5	5.0
Procedural fairness:	3.6	1-5	3.8	3-5	3.6	1-5	4.2
That supply chain procedures are always followed in the same way	3.3	2-4	3.3	3-4	2.3	1-3	4.0
That supply chain procedures are applied to everyone in the same way	3.5	3-4	3.7	3-4	3.3	2-4	5.0
That the information that is provided to you for supply chain procedures is always correct	4.3	4-5	4.0	3-5	4.3	4-5	4.0
That mistakes in procedures can be challenged and corrected	4.0	3-5	4.0	4-4	4.3	4-5	4.0
That my specific interests and position is addressed in the procedures	3.0	1-4	3.7	3-5	3.3	3-4	4.0
That the procedures respect my rights	3.8	2-5	4.0	4-4	3.7	2-5	4.0
Informational fairness:	4.2	3-5	4.3	3-5	4.2	3-5	5.0
That the communication in the chain is honest	4.5	4-5	4.7	4-5	4.3	4-5	5.0
That your supply chain partner is giving you thorough, reasonable and timely explanation when something goes wrong	4.5	4-5	4.0	3-5	4.0	3-5	5.0
That the information that your supply chain partner gives is understandable	3.5	3-4	4.3	4-5	4.3	4-5	5.0
Interpersonal fairness:	3.5	3-4	4.7	4-5	4.3	3-5	5.0
That your supply chain partner treats you with respect, dignity and politeness	3.5	3-4	4.7	4-5	4.3	3-5	5.0

Table 8: Fairness norms of the respondents for the case of dairy in the Alpine region of Germany (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=11.

Also in this case, the workshop participants were asked to select on practices, which could make their climate-smart supply chain fair during a co-creation event, see Table 9. The workshop participants were asked to attribute 8 votes per workshop participant with a maximum of 1 per practice. The prioritization of earnings (10 votes) aligns well with the strong focus on distributional fairness seen in both perceptions and norms data, especially the norms of being paid fairly and covering costs. High votes for “Fair negotiating procedures,” “No unfair trading practices,” and “Risk division” also reflect workshop participants’ concerns with procedural fairness. Meanwhile, practices like “Politeness and respect”, “Contact channels”, and “Joint resource creation” score high as potential improvements, despite the relatively high ratings for interpersonal and informational fairness across all actors. The selected practices show a consistency with fairness concerns, with a clear desire to strengthen fairness through better contracts, transparency, and risk sharing in the chain.

Practices	Votes
Distributive	
Earnings	10
Investment and ownership division	1
Operational support	1
Product quality performance	3

Risk division	7
Procedural	
Adequate contract duration	3
Explicit contracting	4
Fair negotiating procedures	7
Formal monitoring and control	2
Informal monitoring and control	1
No unfair trading practices	7
Normative contracting	5
Informational	
Collaborative/honest communication	3
Contact channel	5
Information quality	1
Information sharing	4
Joint resource creation	6
Operational transparency	4
Interpersonal	
Cultural adaptation	1
Politeness and respect in interpersonal treatment	5
Responsiveness	4
Supply chain socialization	5

Table 9: Selected top-practices for making climate-smart supply chain fairer in the case of dairy in the Alpine region of Germany. 8 votes attributed per workshop participant with a maximum of 1 per practice.

Source: Workshop selection exercise, n=11.

4.5 Cereal sector in Lithuania

The Lithuanian cereals chain is characterized by several fairness-related challenges that affect the ability of farmers, especially smaller ones, to engage in sustainable and equitable production practices. Four core concerns emerge: price disparities, where farmers feel undercompensated for implementing CSA; market power imbalances, leading to unfair contract terms; unequal access to subsidies, particularly disadvantaging smaller farms; and knowledge gaps, where information sharing is limited.

Although some farmers are already adopting CSA practices, the actual freedom to choose for new practices is questionable, as switching is technically possible but rarely done. Decisions are often made under pressure, limiting meaningful choice. The sector is characterized as a bulk commodity sector and is driven by low-cost focus, with organic farming remaining marginal. While subsidies are available for organic certification, biodiversity, and renewable energy, uptake is limited. This is especially the case for renewable energy due to administrative complexity, which presents a significant barrier.

Contractual arrangements vary; large buyers typically use formal contracts based on global wheat prices and quality requirements, while smaller buyers rely more on informal agreements and seasonal arrangements. Buyers are mainly private traders and millers. In the eyes of farmers, buyers largely control pricing. Although farmers are typically organized into large cooperatives, these entities prioritize financial returns and have limited focus on CSA or broader sustainability goals. There is some technical support from buyers for sustainable investments, but this remains minimal. Certification schemes such as GlobalGAP are available but underutilized. Communication between farmers and buyers is largely restricted to harvest and delivery times,

with little attention to CSA in these interactions. While farmers provide data on crop forecasts and quality, pricing and quality expectations are communicated one-way from buyers.

A lack of mutual respect and sustained support in the supply chain have been identified as potential issues. Positive fairness practices include the existence of cooperatives, governmental subsidies, and certification options. However, these are overshadowed by unfair practices such as difficulty of accessing subsidies, and a lack of collaborative CSA implementation.

The interviewee stated that improving fairness would at least mean empowering cooperatives to negotiate higher prices by showcasing environmental benefits (aligned with Corporate Sustainability Reporting Directive (CSRD) obligations); improving access to subsidies; expanding certification use; and fostering stronger, trust-based relationships where buyers actively support farmers in implementing sustainable practices.

Workshop participants' fairness perception on different aspects of their business relation in the chain is displayed in the results of the workshop questionnaire, see Table 10. In the case of cereal sector in Lithuania, farmers' perceptions of fairness are generally positive but still show some issues to tackle. Remarkably farmers rated their own earnings at 4.2 (range: 4–5), indicating a strong sense of fair compensation. However, they rated the earnings of their supply chain partners at only 3.2 (Neutral) (range: 3–4), suggesting a perception that others may be overcompensated compared to farmers or that profit distribution is imbalanced. This contrasts with the more favourable assessments by input suppliers and other stakeholders, who both rated partner earnings at 4.0. Business procedures' fairness was rated by farmers at 3.8 (Fair) (range: 3–5), indicating moderate satisfaction but still lagging behind other stakeholders, who gave it a high 4.5. Fairness of communication and information exchange received a solid 4.0 (range: 3–5), though again slightly below the ratings from others. Interpersonal treatment was rated 3.8 (range: 3–5), which, while fairly positive, is significantly lower than the perfect score of 5.0 given by the input supplier and 4.3 from other stakeholders. These differences suggest that although farmers feel relatively well-off financially, they perceive relational and procedural aspects of fairness as less consistent or equitable. Overall, the findings point to a need for improving transparency, treatment, and perceived balance in supply chain relationships.

	Farmers (n=5)		Input suppliers (n=1)	Other stakeholders (n=6)	
	average	range	average	average	range
What is fair?					
Your earnings	4.2	4-5	4.0	3.3	2-5
The earnings of the supply chain partners	3.2	3-4	4.0	4.0	3-5
The business procedures in your supply chain	3.8	3-5	4.0	4.5	4-5
The communication and information exchange in your supply chain	4.0	3-5	4.0	4.3	4-5
The way you are treated by supply chain partners in interpersonal contact	3.8	3-5	5.0	4.3	3-5

Table 10: Fairness perceptions of the respondents for the cereal sector in Lithuania case (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=12.

Looking at the norms of workshop participants in this case, we see strong fairness norms across all dimensions expressed by farmers, especially in procedural (4.3) and interpersonal fairness (4.8), highlighting a clear expectation for respectful treatment and fair, consistent procedures (Table 11). Notably, they also highly valued income equality with supply chain partners (4.6), a stronger emphasis than seen in other cases, alongside being paid according to effort (4.4). These findings suggest that fairness is seen not only in economic terms but as a shared ethical standard, with farmers expecting equitable, transparent, and respectful treatment throughout the chain in this case.

	Farmers (n=5)		Input suppliers (n=1)	Other stakeholders (n=6)	
	average	range	average	average	range
What are your norms?					
Distributional fairness:	4,3	1-5	4,3	4,5	2-5
That you are paid according to your efforts and investments	4,4	4-5	5,0	4,2	2-5
That you are paid the same as your supply chain partner	4,6	3-5	5,0	4,5	4-5
That you are paid at least enough to cover your costs	4,0	1-5	3,0	5,0	5-5
Procedural fairness:	4,3	3-5	3,7	4,5	3-5
That supply chain procedures are always followed in the same way	4,0	3-5		4,2	3-5
That supply chain procedures are applied to everyone in the same way	4,8	4-5	3,0	4,3	3-5
That the information that is provided to you for supply chain procedures is always correct	4,2	3-5	3,0	4,8	4-5
That mistakes in procedures can be challenged and corrected	4,8	4-5	5,0	5,0	5-5
That my specific interests and position is addressed in the procedures	4,0	3-5		4,5	4-5
That the procedures respect my rights	4,2	4-5		4,3	3-5
Informational fairness:	4,5	3-5	4,3	4,7	3-5
That the communication in the chain is honest	4,2	3-5	4,0	4,7	3-5
That your supply chain partner is giving you thorough, reasonable and timely explanation when something goes wrong	4,6	4-5	4,0	4,7	4-5
That the information that your supply chain partner gives is understandable	4,6	4-5	5,0	4,8	4-5
Interpersonal fairness:	4,8	4-5	5,0	4,3	3-5
That your supply chain partner treats you with respect, dignity and politeness	4,8	4-5	5,0	4,3	3-5

Table 11: Fairness norms of the respondents for the case of cereal sector in Lithuania (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=12.

During a co-creation workshop as a part of the BEATLES project, the participants of this case were also asked to select on practices which could make their climate-smart supply chain fair, see Table 12. In this case, the workshop participants were asked to attribute 2 votes per workshop participant within each fair practices category with a maximum of 1 per practice. Workshop participants prioritized earnings and no unfair trading practices, aligning closely with high concerns for distributive and procedural fairness found in norms data. Strong support for information quality and supply chain socialization reflects the importance of transparent communication and interpersonal respect. The coherence between selected practices on one hand, and norms and fairness concerns on the other hand, suggests a clear direction for improving equity in the chain.

Practices	Votes
Distributive	
Earnings	9
Investment and ownership division	0
Operational support	0
Product quality performance	2
Risk division	1
Procedural	
Adequate contract duration	0
Explicit contracting	2
Fair negotiating procedures	1
Formal monitoring and control	1
Informal monitoring and control	2
No unfair trading practices	6
Normative contracting	0
Informational	
Collaborative/honest communication	3
Contact channel	0
Information quality	6
Information sharing	0
Joint resource creation	1
Operational transparency	2
Interpersonal	
Cultural adaptation	2
Politeness and respect in interpersonal treatment	3
Responsiveness	0
Supply chain socialization	7

Table 12: Selected top-practices for making climate-smart supply chain fairer in the case of cereal in Lithuania. 2 votes within each fair practices category attributed per workshop participant with a maximum of 1 per practice. Source: Workshop selection exercise, n=12.

4.6 Potato sector in the Netherlands

The Dutch potato sector is seen as a positive exception in comparison to other plant-based agricultural chains in the Netherlands, particularly in how it handles fairness and producer compensation. A well-organized cooperative structure and the availability of alternative markets, of which most notably the French fries processing industry, have provided potato growers with relatively strong negotiating power.

The interviewees stated that sustainability is becoming an increasingly important part of the fruit and vegetables supply chain in the Netherlands. SMK has reached agreements with supermarkets to pay sustainability premiums across the fresh produce sector, including potatoes (the premium is currently around €0.03 per kilogram for potatoes under “On the way to PlanetProof certification” with a strong climate-smart focus). These premiums are meant to be reviewed every one to two years. However, implementation remains complex. Farmers are concerned that as they face higher costs to meet new climate-smart standards, such as using mechanical weed control and robust, disease-resistant varieties, these costs may not be adequately covered by the buyers.

At the same time, according to the interviewees, there are concerns regarding transparency among the farmers. While climate-smart farmers are generally paid a premium, they often do not see this explicitly stated on their invoices, leading to uncertainty about what exactly they are being compensated for. E.g. in some cases, supermarkets argue that they already pay higher prices and deduct the sustainability premium from the base price, effectively neutralizing the intended benefit. It has been recommended that these premiums be clearly itemized to improve clarity and trust. A lack of a clear reference price further complicates matters, making it difficult for farmers to verify whether they are being fairly compensated. This ambiguity undermines trust and weakens farmers' ability to assess whether premiums truly reflect the added costs of sustainable practices.

The interviewees stated that stakeholders are exploring ways to address above-described challenges in the potato chains, and other fruit and vegetables chains, including joint monitoring of additional sustainability-related costs. However, establishing binding agreements with retailers on compensating these costs remains difficult. Improving fairness would at least mean clearly itemizing premiums on invoices, establishing a transparent reference pricing system, involving farmers in monitoring additional costs, and reaching enforceable agreements with retailers to cover these costs fairly.

Interestingly, the results from the workshop questionnaire among the participants in the case of potato sector in the Netherlands reveal a divide between traditional farmers and those involved in mixed farmer/trader activities. Traditional farmers reported low fairness scores for their own earnings (2.3 Unfair) and their partners' earnings (2.2 Unfair), indicating a strong dissatisfaction with financial equity (Table 13). In contrast, mixed farmers rated both at 5.0, suggesting a full satisfaction likely due to greater control in the supply chain. Traditional farmers also gave 'Unfair' to 'Neutral' scores for business procedures (2.3), communication (2.7), and interpersonal treatment (2.8), while mixed farmers rated these areas between 4.0 and 4.5. This contrast highlights how integration into trading improves perceived fairness. Processors and other stakeholders also rated fairness higher than traditional farmers, suggesting a systemic imbalance. Overall, traditional farmers seem to feel more marginalized, while the stakeholders with trading roles seem to experience greater fairness.

	Farmers (n=6)		Farmers/traders mixed activities (n=2)		Processors / traders (n=3)		Other stakeholders (n=2)	
	average	range	average	range	average	range	average	range
What is fair?								
Your earnings	2.3	2-3	5.0	5-5	4.3	4-5	3.5	2-5
The earnings of the supply chain partners	2.2	2-3	5.0	5-5	3.7	3-4	3.0	2-4
The business procedures in your supply chain	2.3	2-3	4.0	3-5	3.3	3-4	3.5	3-4
The communication and information exchange in your supply chain	2.7	1-4	4.5	4-5	4.0	4-4	3.5	3-4
The way you are treated by supply chain partners in interpersonal contact	2.8	2-4	4.0	3-5	4.0	4-4	3.5	2-5

Table 13: Fairness perceptions of the respondents for the case of potato sector in the Netherlands (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=13.

We expect that the above-described results are influenced by the importance individuals place on specific fairness aspects, represented by the norms. In the co-creation workshop, farmers strongly prioritized being paid fairly for their efforts (5.0) and covering their costs (5.0) but placed less emphasis on income equality with partners (3.4), suggesting a merit-based view of fairness (Table 14). Farmers/traders, who combine production and trading, share similar economic norms but scored higher on procedural and interpersonal fairness (both 5.0), reflecting their greater influence and expectations in the chain. Overall, the data reveals a clear contrast: while all workshop participants valued transparent procedures and respectful treatment, traditional farmers emphasized economic security, whereas integrated actors expect a more balanced, relationship-driven fairness across the chain.

	Farmers (n=6)		Farmers/traders mixed activities (n=2)		Processors / traders (n=3)		Other stakeholders (n=2)	
	average	range	average	range	average	range	average	range
What are your norms?								
Distributional fairness:	4.5	2-5	3.5	1-5	4.3	3-5	4.5	3-5
That you are paid according to your efforts and investments	5.0	5-5	5.0	5-5	4.7	4-5	5.0	5-5
That you are paid the same as your supply chain partner	3.4	2-5	2.5	1-4	3.3	3-4	3.5	3-4
That you are paid at least enough to cover your costs	5.0	5-5	3.0	1-5	5.0	5-5	5.0	5-5
Procedural fairness:	4.4	3-5	4.8	3-5	4.2	4-5	4.3	4-5
That supply chain procedures are always followed in the same way	4.5	4-5	4.0	3-5	4.0	4-4	4.0	4-4
That supply chain procedures are applied to everyone in the same way	4.0	3-5	5.0	5-5	4.0	4-4	4.5	4-5
That the information that is provided to you for supply chain procedures is always correct	4.5	4-5	5.0	5-5	4.3	4-5	4.0	4-4
That mistakes in procedures can be challenged and corrected	4.5	4-5	5.0	5-5	4.0	4-4	4.5	4-5
That my specific interests and position is addressed in the procedures	4.2	4-5	4.5	4-5	4.3	4-5	4.5	4-5
That the procedures respect my rights	4.7	4-5	5.0	5-5	4.7	4-5	4.5	4-5
Informational fairness:	4.5	3-5	4.7	4-5	4.2	4-5	4.8	4-5
That the communication in the chain is honest	4.3	3-5	5.0	5-5	4.3	4-5	5.0	5-5
That your supply chain partner is giving you thorough, reasonable and timely explanation when something goes wrong	4.6	4-5	4.5	4-5	4.0	4-4	4.5	4-5
That the information that your supply chain partner gives is understandable	4.5	4-5	4.5	4-5	4.3	4-5	5.0	5-5
Interpersonal fairness:	4.3	4-5	5.0	5-5	4.3	4-5	4.5	4-5
That your supply chain partner treats you with respect, dignity and politeness	4.3	4-5	5.0	5-5	4.3	4-5	4.5	4-5

Table 14: Fairness norms of the respondents for the case of potato sector in the Netherlands (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=13.

Also, regarding this case, the workshop participants were asked to select practices which could make their climate-smart supply chain fairer, see Table 15. For this exercise, the workshop participants were asked to attribute 2 votes per workshop participant within each fair practices category with a maximum of 1 per practice. In this case, workshop participants strongly

emphasized risk division, earnings, and supply chain socialization, signalling high concern for distributive and interpersonal fairness, which aligns with earlier perceptions of unfair earnings among non-integrated farmers. The high support for no unfair trading practices and fair negotiating procedures also reflects significant procedural fairness concerns. Additionally, selected practices like joint resource creation and collaborative communication show a drive toward more inclusive and transparent chain collaboration.

Practices	Votes
Distributive	
Earnings	12
Investment and ownership division	0
Operational support	2
Product quality performance	3
Risk division	13
Procedural	
Adequate contract duration	2
Explicit contracting	0
Fair negotiating procedures	9
Formal monitoring and control	6
Informal monitoring and control	1
No unfair trading practices	11
Normative contracting	3
Informational	
Collaborative/honest communication	7
Contact channel	5
Information quality	4
Information sharing	0
Joint resource creation	12
Operational transparency	4
Interpersonal	
Cultural adaptation	3
Politeness and respect in interpersonal treatment	7
Responsiveness	9
Supply chain socialization	13

Table 15: Selected top-practices for making climate-smart supply chain fairer in the case of potato sector in the Netherlands. 2 votes within each fair practices category attributed per workshop participant with a maximum of 1 per practice. Source: Workshop selection exercise, n=16.

4.7 Apple sector in Navarra province of Spain

In the Navarra's apple sector fairness concerns stem from a lack of price transparency, weak bargaining power, underutilized regional identity, and insufficient support for sustainable practices. A significant number of farmers has an organic certification. These fairness concerns are closely linked to pricing pressures, with small and large farmers frequently receiving prices below production costs, particularly in conventional systems. While some farmers attempt to counter this by selling directly to consumers or producing value-added products like cider and juice, most remain dependent on intermediaries or wholesalers. In the eyes of farmers, these intermediaries typically set prices, and only in direct sales do farmers have meaningful pricing power.

The interviewee highlighted that both organic and conventional farmers face challenges, but organic producers express stronger dissatisfaction, especially regarding the lack of subsidies to support CSA practices. Although organic apples generally fetch higher and more stable prices, transparency around production costs is limited. The Spanish government has expressed interest in mandating that buyers cover production costs, but actual implementation remains unclear. INTIA calculated average production costs, and these are approximately met by market prices, though this may not reflect the full reality for many producers.

The interviewee stated that certification systems play a role in the sector. Most apples are produced under integrated production certification, an older scheme that is somewhat outdated under current EU regulations but still ensures regional origin. Despite the strong identity of the Navarra region as a key value proposition, the apples do not have Protected Designation of Origin (PDO) status, and the regional label has limited value outside the area.

The interviewee highlighted that contracts are typically formal but lack specific dates and are arranged on a seasonal (campaign-by-campaign) basis. Price and volume are negotiated just before harvest, based on buyer estimates. While long-term relationships with buyers are common, farmers face a concentrated buyer market, limiting options and bargaining power. Auctions or competitive pricing mechanisms are not feasible due to the low number of buyers.

The local cooperative, which began as a farmer-led initiative, now operates more like a commercial service provider. Members receive agricultural input discounts or services depending on their membership level, but do not share in profits. This model prioritizes productivity and is not tailored to organic producers, who often sell outside the cooperative and are considering shared infrastructure, such as warehouses, to reduce investment costs.

Communication across the chain is minimal, typically limited to brief, one-time interactions regarding volume, variety, and quality. Training opportunities exist but are not frequent. Farmers report a poor understanding of buyer expectations or market logic, while buyers rarely engage in meaningful dialogue or support for CSA practices. Technical assistance is available for conventional producers through the cooperative, but support for CSA remains limited. Farmers often implement cover crops for soil health on their own initiative, without incentives.

According to the interviewee, working towards a fairer climate-smart apple supply chain would include improving transparency around price formation and production costs, emphasizing regional value more effectively in marketing, supporting the formation of organic producer cooperatives, fostering local consumer co-ops to strengthen direct sales, and developing financial incentives for CSA practices, particularly those that offer long-term environmental benefits but currently receive no recognition or support.

As seen in the results of the workshop questionnaire for the Apples in Navarra case, farmers reported consistently low fairness perceptions across all dimensions, see Table 16. They rated their own earnings and those of their supply chain partners at just 2.3 (Unfair) (range: 1–3), indicating strong dissatisfaction with income distribution. Business procedures were viewed even more negatively at 2.1, suggesting frustration with how the supply chain operates. Communication (2.7) and interpersonal treatment (2.7) also fall below fair, highlighting strained relationships and limited information flow. In contrast, other workshop participants, and especially processors/traders and retailers, reported significantly higher fairness scores in all areas, often above 3.5. The gap is most notable in interpersonal treatment, where farmers scored 2.7 and others rated 4.5. These discrepancies suggest a systemic power imbalance, where farmers feel sidelined both economically and relationally within the supply chain.

	Farmers(n=8)		Processors / traders (n=2)		Retailers (n=2)		Other stakeholders (n=2)	
	average	range	average	range	average	range	average	range
What is fair?								
Your earnings	2.3	1-3	4.0	4-4	2.5	2-3	3.5	3-4
The earnings of the supply chain partners	2.3	1-3	3.5	3-4	3.0	2-4	3.5	3-4
The business procedures in your supply chain	2.1	1-3	3.5	3-4	3.5	3-4	4.0	4-4
The communication and information exchange in your supply chain	2.7	2-4	3.5	3-4	4.0	4-4	4.0	4-4
The way you are treated by supply chain partners in interpersonal contact	2.7	1-4	4.5	4-5	3.5	3-4	4.5	4-5

Table 16: Fairness perceptions of the respondents for the case of apples in Navarra (1: Very unfair, 2: Unfair, 3: Neutral, 4: Fair, 5: Very fair). Source: workshop questionnaire, n=14.

Furthermore, all workshop participant groups in this case unanimously rated interpersonal treatment as extremely important for evaluating fairness (5.0), emphasizing the central role of mutual respect and dignity in their relationships, see Table 17. Farmers also valued being paid fairly for effort (4.6) and covering costs (4.5) but showed less emphasis on income equality (3.3), aligning with a performance-based fairness norm. While procedural norms were generally found important, farmers reported weaker importance of consistent rule application (3.0).

	Farmers(n=8)		Processors / traders (n=2)		Retailers (n=2)		Other stakeholders (n=2)	
	average	range	average	range	average	range	average	range
What are your norms?								
Distributional fairness:								
That you are paid according to your efforts and investments	4.2	2-5	4.0	3-5	4.7	3-5	4.3	4-5
That you are paid the same as your supply chain partner	4.6	4-5	4.5	4-5	5.0	5-5	4.5	4-5
That you are paid at least enough to cover your costs	3.3	2-4	3.0	3-3	4.0	3-5	4.0	4-4
Procedural fairness:								
That supply chain procedures are always followed in the same way	4.5	3-5	4.5	4-5	5.0	5-5	4.5	4-5
That supply chain procedures are applied to everyone in the same way	4.1	2-5	4.6	4-5	4.2	3-5	4.2	3-5
That the information that is provided to you for supply chain procedures is always correct	3.0	2-5	4.0	4-4	4.0	3-5	3.5	3-4
That mistakes in procedures can be challenged and corrected	4.0	3-5	4.0	4-4	4.5	4-5	4.5	4-5
That my specific interests and position is addressed in the procedures	4.0	2-5	4.5	4-5	3.5	3-4	4.0	4-4
That the procedures respect my rights	4.1	2-5	5.0	5-5	4.0	4-4	4.0	4-4
Informational fairness:								
That the communication in the chain is honest	4.3	4-5	4.5	4-5	4.0	4-4	4.0	4-4
That your supply chain partner is giving you thorough, reasonable	4.9	4-5	5.0	5-5	5.0	5-5	5.0	5-5
That the communication in the chain is honest	4.5	3-5	4.5	4-5	4.3	3-5	4.0	3-5
That your supply chain partner is giving you thorough, reasonable	4.4	3-5	4.0	4-4	5.0	5-5	4.5	4-5
That your supply chain partner is giving you thorough, reasonable	4.4	3-5	4.5	4-5	4.5	4-5	4.0	4-4

and timely explanation when something goes wrong									
That the information that your supply chain partner gives is understandable	4.5	3-5	5.0	5-5	3.5	3-4	3.5	3-4	
Interpersonal fairness:	5.0	5-5	5.0	5-5	5.0	5-5	5.0	5-5	
That your supply chain partner treats you with respect, dignity and politeness	5.0	5-5	5.0	5-5	5.0	5-5	5.0	5-5	

Table 17: Fairness norms of the respondents for the case of apples in the Navarra region of Spain (1: Very unimportant, 2: Unfair, 3: Neutral, 4: Fair, 5: Very important). Source: workshop questionnaire, n=14.

In the case of the apple sector in Navarra province of Spain, the workshop participants assessed all suggested fair practices and chose the ones they think are relevant. The workshop participants prioritized earnings, product quality performance, and fair negotiating procedures, highlighting concerns with distributive and procedural fairness, which mirrors earlier dissatisfaction among farmers regarding earnings and procedures (Table 18). Support for no unfair trading practices, collaborative communication, and information sharing indicates a desire for more transparency and balanced power in the chain. Interpersonal practices like politeness and supply chain socialization also received strong backing, reinforcing the importance of respectful relationships.

Practices	Number of votes
Distributive	
Earnings	12
Investment and ownership division	3
Operational support	6
Product quality performance	11
Risk division	6
Procedural	
Adequate contract duration	3
Explicit contracting	4
Fair negotiating procedures	10
Formal monitoring and control	6
Informal monitoring and control	1
No unfair trading practices	10
Normative contracting	5
Informational	
Collaborative/honest communication	8
Contact channel	4
Information quality	5
Information sharing	8
Joint resource creation	5
Operational transparency	7
Interpersonal	
Cultural adaptation	5
Politeness and respect in interpersonal treatment	7
Responsiveness	4
Supply chain socialization	7

Table 18: Selected practices for making climate-smart supply chain fairer in the case of apples in the region of Navarra, Spain. Source: Workshop selection exercise, n=14.

4.8 Conclusions

The application of fairness framework for climate-smart agri-food supply chain, included an assessment of the fairness perceptions, norms, and fair practices in five case studies of the BEATLES case studies i.e. pig sector in Denmark, dairy in the Alpine region of Germany, cereal sector in Lithuania, potato sector in the Netherlands, and apples in Navarra region of Spain with different chain dynamics. A cross-case analysis of fairness perceptions highlights some disparities in how fairness is perceived, particularly by farmers. In three cases, i.e. the pig sector in Denmark, the potato sector in the Netherlands and the apple sector in Navarra province of Spain, farmers reported lower fairness scores than other workshop participants, especially concerning economic fairness. Earnings were viewed as less fair, or less fairly distributed, especially in the apples case in Spain and the potato sector case in the Netherlands (scores as low as 2.1–2.3). In two cases however, the farmers perceived their earnings as fairer than the other actors did. In the cereal sector case in Lithuania, this may have to do with the relatively high cereals prices of the past four years, although prices have been falling since a peak in 2022. In the case of the dairy sector in the Alpine region of Germany, this observation is somewhat remarkable since the prices of organic milk for dairy farmers have been low.

In contrast, workshop participants with more control or vertical integration, such as traders or farmer-traders, expressed much higher satisfaction, underlining how power and access to markets strongly shape fairness perceptions. This confirms findings by e.g. Brito and Miguel (2017) and Bonatto et al. (2022).

The results of the assessment of procedural and interpersonal fairness varied. The same applies to assessed business practices in communication, and interpersonal treatment. While dairy and cereal farmers reported relatively balanced experiences, farmers in the apple and potato chains expressed exclusion from decision-making, poor communication, and limited respect from other actors. These fairness gaps not only reflect systemic imbalances, but also pose challenges to the transition toward CSA and sustainable agriculture.

With respect to the governance of the supply chain, we can conclude that the case studies reflect various situations. Three case studies, i.e. in Denmark, Germany and Lithuania, primarily rely on cooperative selling of the agricultural products. In the Netherlands and Spain, the agricultural products are predominantly sold individually through markets. Although our methods only provided only a qualitative indication of fairness concerns due to a lower number of participants and various implementation of the workshops, we observe that the case studies under cooperative selling generally have higher fairness evaluations, which is in line with findings of Hoang et al (2021).

The analysis of prioritized fair practices across the cases confirms that workshop participants consistently emphasize fair earnings, transparency, and respectful interactions as central to improving fairness in climate-smart agri-food chains. These findings support the relevance of the fairness framework's dimensions.

Although the insights we gained are valuable for improving fairness, they disclose some limitations of applying the fairness framework as described in Chapter 3.1 in real-world agri-food chains. One issue is the subjectivity and variability of fairness perceptions among supply chain actors. Farmers, traders, and processors often interpret fairness differently based on their roles, experiences, and expectations. The framework assumes some alignment on fairness norms, but these may diverge significantly across actors and contexts. Power imbalances and unequal access to information further complicate collaborative practices, which are often informal or opaque. These issues complicate standardized assessments. Therefore, while useful conceptually, the application of the framework must be adapted to local realities and complemented with strategies that address underlying systemic inequities.

5. Fair value propositions

5.1 Introduction

BEATLES project aims to find suitable value propositions for CSA. These value propositions must emphasize the value of CSA as well as the fairness of the business models. Fairness is interpreted as both referring to the transaction between the farmers and the other chain actors, as well as the consumers.

A value proposition is a representation or description of the product value delivered to a customer. It highlights the most valuable elements, differentiates products from competing ones (see Chapter 2.7). In the context of CSA, a value proposition emphasizes the benefits of CSA practices like improved soil health, efficient water use, or resilience to climate change (see D1.1). Those factors become increasingly important to farmers, environmentally conscious consumers, and other stakeholders. A value proposition is one of the critical components of a business model. Without a clear understanding of the value that a product delivers, such as supporting farmers in adapting climate change while increasing productivity, a business model is likely to underperform. By embedding CSA principles into the value proposition, businesses can address customer needs and contribute to broader sustainability goals, at the same time strengthening their social impact.

Fairness plays a pivotal role in crafting effective value propositions for CSA. Fairness ensures that the benefits of CSA practices are equitably distributed among all stakeholders, especially with respect to small and medium-sized farms in the EU and smallholder farmers in the global South who are often the most vulnerable to climate change.

Following our definition of fairness in Chapter 3, a fair value proposition for CSA can be defined as a description of the product value that emphasises one or more fairness dimensions, i.e. distributive, procedural, informational and interpersonal, as well as the value of CSA.

It is yet unknown what value propositions are relevant for CSA practices and technologies, and how these propositions are related to fairness. This chapter provides an overview of existing fair value propositions for CSA and discusses the relation to fairness. This answers the second research question of this deliverable: which value propositions are currently used in EU retail supply chains and how do they relate to fairness?

5.2 Data and method

To identify existing fair value propositions for CSA, we have studied the claims on food products in the EU, using the Innova database². Innova database provides information on new or changed products introduced to the EU food and beverages retail market. A wide array of information about the products is available in the database, including a description of the claims and features as given on the product packaging. These claims, translated into English, are in most cases a factual transcription of the text on the packaging and in some cases a summary of that information. Although not all claims have complete information, the database provides sufficient information to construct a list of fair value propositions that are used in practice.

In the database, we have selected all food products in the 24 EU countries presented, for the period of January 2023 – May 2024.³ Furthermore, we filtered the products that were categorized as having (1) an ethical claim with regard to human well-being (ethical – human in sub positioning)

² <https://www.innovamarketinsights.com/databases/>

³ No data is available for Cyprus, Luxembourg and Malta.

and (2) an ethical claim with regard to the environment (ethical – environment). This yielded 6,450 products with both an environmental and a social ethical claim. Note that this means that we only selected about 10% of the total of about 130 thousand new products introduced in the period. Next, we have selected the text of the claims and analysed all 2,851 unique sentences to explore the relation with fairness and CSA. Then, we have categorized the claims into different values based on the keywords.

Note that the data includes value propositions exclusively on packaged products found in supermarkets. Value propositions communicated to consumers through other channels, such as websites, social media, in-store signage, or directly at the farm, are not necessarily included in the data. However, the identified value propositions were described in general terms and supplemented with examples of products from non-supermarket channels as well.

Following, we analysed the correlations between these value propositions and, conducted principal component analysis (PCA) to identify the most common combinations of values that occur in conjunction with particular CSA values. The resulting factors have been named and described in terms of typical and illustrative fair value propositions for CSA.

The CSA related value categories were obtained by classifying the product claims into broad groups that are related to the CSA practices described in D1.1. Next to the CSA or environmental practices used in the product claims, our study focuses on the fairness of the value propositions in general. A value proposition is regarded as fair, if it addresses dimensions of fairness, regarding the relationship of the chain actors, or the society in general. The product is fair if buying it does no excessive harm to either the producers, processors or retailers involved, or to other stakeholders in society. Although fairness is a subjective concept, in most cases it has a recognizable element of reciprocity to it: the consumer pays a price to obtain the value of the product, and it is fair if each actor and stakeholder is compensated for their effort or loss in a fair way.

5.3 Descriptive results of claims

The data counts 6,450 products in total. Many products have multiple claims, often combined with the claims referring to the environment or the planet. According to the results, large number of product introductions are in the chocolate and sugar confectionary categories. Although these products may not be related to the BEATLES case studies, we kept them in the dataset as they may be instrumental for fair value propositions in the EU context as well. Chocolate confectionary is a product category in which many fairness related labels and claims have emerged. Cocoa production typically involves countries for which climate and income problems for smallholders are important, equally relevant to European smallholders. Remarkably, packaging related claims, for instance FSC certified, are not included in the categorization.

We have identified 16 categories of proposed values related to environmental issues (Table 19).

	Proposed CSA related fair values	Number of products in the sample
1	Protect forest, reforestation	3,607
2	Organic	1,424
3	Good for environment (general)	553
4	Palm oil free or certified	485
5	Climate, greenhouse gas emissions, circular, waste	299
6	Good for animals	194
7	Grazing	141
8	Free (less use) of pesticides	92
9	Biodiversity, regenerative	88
10	GMO free	87
11	Good farming practices	67
12	Soil management	58
13	Soy free or certified	58
14	Protection of water	28
15	Free (less use) of chemical fertilizers	25
16	Without antibiotics	6

Table 19: CSA related values on new product introductions in the EU that have both an environmental and a social claim, Jan 2023 - May 2024. Source: WR based on data from Innova database.

According to Table 19, between 2023 and 2024 new product introduction in the EU with environmental claims most frequently emphasize forests protection and reforestation (56% or 3,607 products), often in combination with the Rainforest Alliance certification label. “Organic” (1,424 products) and general environmental benefits (553 products) are also found relatively frequent. Other values, such as being palm oil free or certified (485 products), addressing climate and waste issues (299 products), and animal welfare (194 products) are also among the most found environmental and animal welfare related claims. Whereas values like “good farming practices”, “protection of water”, “absence or less use of chemical fertilisers” and “no antibiotics” appeared on significantly fewer products.

Unfortunately, not all the CSA practices described in D4.1 are present in the value propositions that manufacturers of packaged products communicate to consumers. For example, the use of digital technologies, drones or precision agriculture are absent from the database. Moreover, only one product is found with description to improve farm productivity, i.e. “high-yielding plants”. However, “good to farmers” or “fair”, “farmer education”, and “partnerships with farmers” to improve their livelihoods are made more frequently. Apparently, these agronomical technicalities of CSA are difficult to convey in an easy message to consumers.

Fairness related values proposed in the new products are not specifically related to the CSA listed in D4.1. Although these values are not directly related to the CSA, they indirectly contribute to the CSA, especially in terms of fairness. We have categorised these values into 17 groups (Table 20).

	Proposed fair values	Number of products in the sample
1	Good for people	3,652
2	Local (from a region, nearby)	569
3	Partnerships, direct trade, local smallholders	268
4	Artisanal	217
5	Good for farmer income, fair price	198
6	Donations to charity	178
7	Chain transparency	178
8	Slave free, no child labour	122
9	For future generations	84
10	Good for workers	58
11	Co-ownership	50
12	Good for consumer, for a better life	50
13	Support local communities	49
14	Family farm or business	46
15	Farmer education/training	17
16	Visibility of farmer	12
17	Gender equality	11

Table 20: Fairness related values on new product introductions in the EU that have both an environmental and a social claim, Jan 2023 - May 2024. Source: WR based on data from Innova database.

Table 20 shows that among new EU product introductions feature environmental and social claims, the most common fairness related value was “good for people” (57% or 3,652 products), often stated in combination with “good for nature or for environment”, followed by local sourcing (569 products). The product origin relates to fairness as it communicates respect for or connectedness with the producers in the country or region. Under this category there are also a limited number of products that stress the short distance between production and processing or sales: e.g., sourced from just 30km around the factory. Whereas values like gender equality (11 products) and farmer visibility (12 products) appeared much less frequent.

Finally, we also categorized the values based on the certified labels and company sustainability programs. In this categorization we made a distinction between independently audited sustainability certification schemes and sustainability company logos. These values serve as means of communicating the trustfulness of fairness claims (Table 21).

	Proposed fair values	Number of products in the sample
1	Sustainability certification schemes (independent audit)	5,807
2	Sustainability company logo	1,266
3	Organic	1,424
4	Rainforest Alliance, Utz	3,577
5	Fairtrade, Fair for Life	845

Table 21: Certifications and company labels on new product introductions in the EU that have both an environmental and a social claim, Jan 2023 - May 2024. Source: WR based on data from Innova database.

As Table 21 shows, the most frequently observed certification are independently audited sustainability certification schemes, accounting for 5,807 products. This category includes third party verified labels that validate sustainable production practices. The second most common label is Rainforest Alliance or Utz certifications (3,577 products). Organic certifications, encompassing EU Organic and various national certification programmes, are found on 1,424 products. If a product has ‘organic’ as claim, organic certification is mandatory in the EU (EU organic). In addition to the mandatory labelling of organic products, many organic products do also carry additional (national or company) organic labels. These are all grouped under the category “organic” (Table 21). Whereas the sustainability company logo that indicates the internal corporate sustainability programmes rather than third party standards, are identified in 1266 products. Lastly, products with Fairtrade, Fair for Life state that product is certified by Fairtrade, Fair for Life or other fair trade related scheme, such as Agri-Éthique in France, are found in 845 products.

Note that products may carry various labels at the same time, such as EU organic, Rainforest Alliance, and a company program label. Almost all products in our sample have one or more sustainability labels.

We have conducted Pearson phi correlation analysis among the identified values (Figure 4). This analysis provided an initial understanding of the co-occurrence of the different values. Figure 4 presents the results of Pearson phi correlation analysis and highlights significant relationships ($p < 0.05$). Insignificant results are not shown in the figure (white cells). Positive relations are shown in green, negative ones in red, with the intensity of colour reflecting the strength of the correlation.

However, correlation does not provide insights into their combined prevalence within existing value propositions.

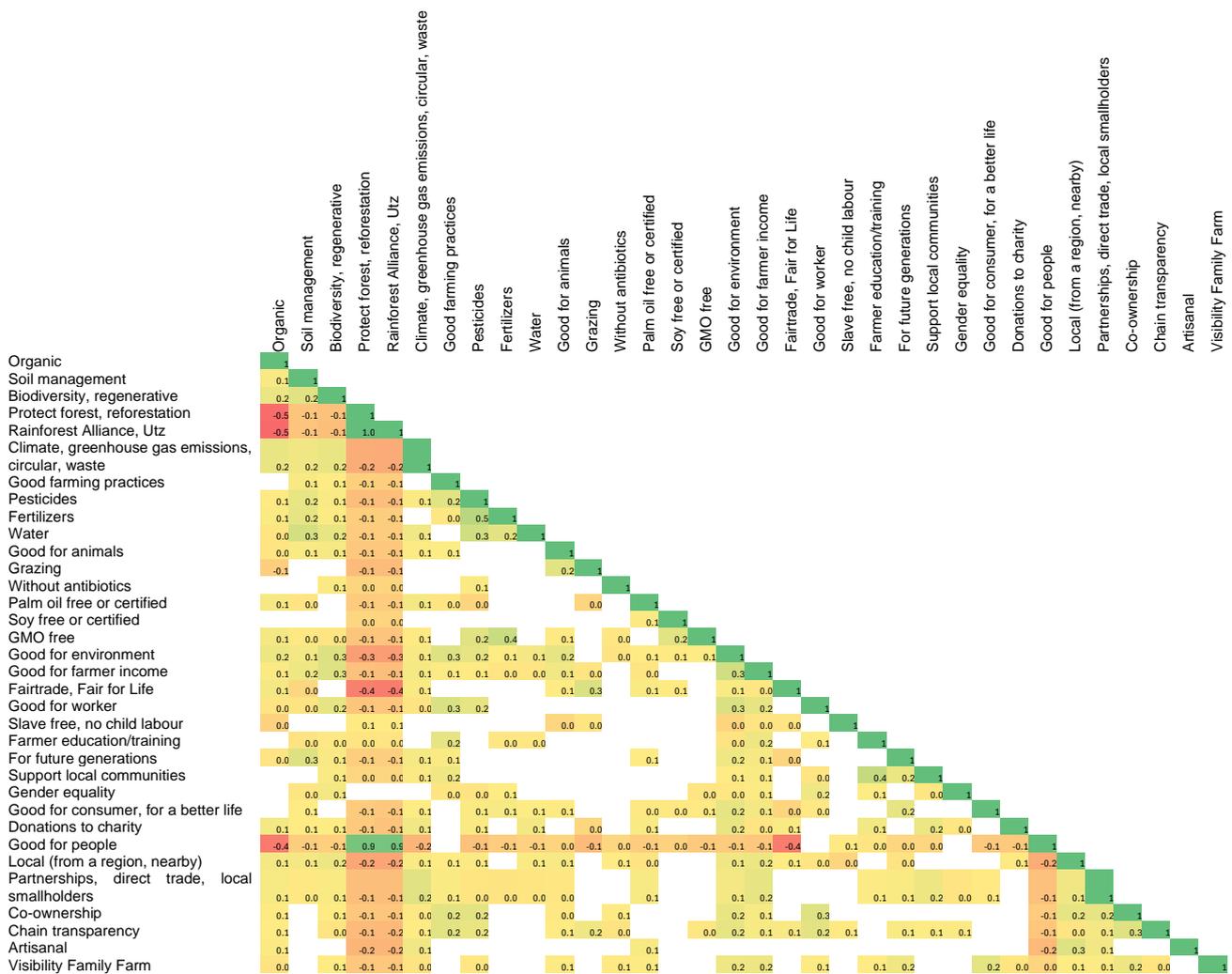


Figure 4: Pearson phi correlation matrix, all cases, only significant correlation with $p < 0.05$ shown

5.4 Fair value propositions for CSA

Following, we conducted PCA analysis to reduce the number of variables and group variables that are overfitting (Table 22). To test the suitability of the PCA and factor analysis, we used the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, which was found reasonable with 0.713 for all records. We tested various versions of the model to come to generally robust results. The resulting factors have been named and described based on typical and illustrative fair value propositions for CSA.

As Table 22 shows, the results of the PCA reveal 10 distinct components represented in 10 columns that structure the claims. The components limited to 10 simplify the interpretation of the results. Interpretation was based also on additional qualitative assessment of the data. Some high factor correlation has been allowed, such as between Rainforest Alliance certification and claims about protecting of the rainforest, because these coincide on the packaging and the results were not affected negatively.

The first component is strongly associated with rainforest protection and human well-being, supported by high loadings for “Protect forest, reforestation,” “Rainforest Alliance, Utz,” and “Good for people”. This suggests a strong link between the nature conservation and social benefits. The second component emphasizes good farming practices and supply chain transparency, as seen in high loadings for “Good farming practices,” “Co-ownership”, and “Chain transparency”, whereas the third component focuses on the Climate-smart farming, strongly linked to “soil management” and loaded by factors such as pesticide and fertilizer reduction. In general, all the components highlight sustainability and fairness messaging in products labelling that tend to cluster around wither environmental or human-centered narratives.

Following, due to the relevance of “Organic” value proposition to many BEATLES use cases, and the high frequency of organic as value proposition in the data, we decided to conduct two more PCA analysis: (1) PCA focusing on “organic” value proposition and (2) PCA focusing on non-organic products. By extracting the organic from all, we attempted to extract a number of additional value propositions that are specific to organic products (Table 23). PCA for only non-organic products yielded the same factors as the analysis for all records as shown in Table 22. Therefore, we did not progress with the analysis of “non-organic”. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy for the PCA with only the organic products was 0.595 indicating a reasonable suitability of the data.

	Rainforest and human well-being	Good farming practices, transparency	Climate-smart farming	Good for biodiversity, nature, farmer (and animal)	For future generations and better life	Good for environment, local & partnership	Farmer education & local communities	Natural, organic and low-input farming	Animal welfare & Fairtrade	Climate change & donation
Organic	-0.593	-0.092	0.019	0.16	-0.027	0.076	-0.019	0.067	-0.256	0.102
Soil management	0.024	-0.124	0.677	0.145	0.174	0.013	-0.037	-0.1	0.056	0.004
Biodiversity, regenerative	0.006	-0.121	0.289	0.696	-0.09	0.09	0.015	-0.058	0.027	-0.058
Protect forest, reforestation	0.951	-0.027	0.019	-0.008	-0.06	-0.048	0.015	0.007	-0.013	0.05
Rainforest Alliance, Utz	0.952	-0.027	0.016	-0.022	-0.058	-0.044	0.008	-0.001	-0.018	0.036
Climate, greenhouse gas emissions, circular, waste	-0.047	-0.057	0.288	0.008	-0.006	0.359	0.033	-0.036	0.039	0.378
Good farming practices	0.044	0.644	0.011	-0.018	-0.006	0.021	0.24	-0.052	-0.043	-0.011
Free (less use) of pesticides	-0.019	0.418	0.498	-0.077	-0.045	-0.028	-0.067	0.302	-0.055	-0.034
Free (less use) of fertilizers	-0.024	-0.01	0.438	-0.079	0.012	-0.022	0.065	0.56	0.003	-0.133
Protect water resources	0.05	-0.051	0.765	0.061	-0.078	-0.043	-0.101	-0.054	0.003	0.148
Good for animals	0.132	-0.055	0.036	0.302	0.031	0.105	-0.066	0.09	0.624	-0.085
Grazing (animals graze outside)	-0.057	0.038	0.024	-0.068	-0.079	-0.083	0.035	-0.015	0.797	-0.104
Without antibiotics	0.003	-0.014	-0.059	0.178	-0.04	0.168	-0.03	0.106	0.021	-0.201
Palm oil free or certified	0.057	0.046	-0.037	-0.2	0.104	0.136	-0.103	0.088	-0.067	0.702
Soy free or certified	0.051	-0.12	-0.298	0.089	0.064	-0.014	-0.032	0.588	0.014	0.316
GMO free	-0.046	-0.085	-0.038	0.034	-0.014	0.038	0.08	0.836	0.041	-0.025
Good for environment	-0.065	0.288	0.089	0.419	0.235	-0.094	-0.062	0.039	0.07	0.17
Good for farmer income	0.04	0.025	-0.043	0.542	0.205	0.123	0.134	0.033	0.163	-0.062
Fairtrade, Fair for Life	-0.45	0.026	-0.06	-0.071	-0.142	-0.159	-0.003	-0.022	0.417	0.208
Good for worker	-0.026	0.565	-0.085	0.382	-0.045	-0.182	-0.052	-0.081	-0.122	-0.03
Slave free, no child labour	0.185	0.076	0.026	-0.12	-0.075	0.014	-0.037	0.062	0.228	0.208
Farmer education/training	0.038	0.032	-0.093	0.167	-0.064	-0.001	0.779	0.117	-0.004	-0.018
For future generations	-0.03	-0.048	0.156	-0.115	0.688	-0.027	0.163	-0.162	-0.05	0.003
Support local communities	-0.024	0.03	-0.078	0.038	0.045	0.069	0.824	-0.003	-0.011	0.01
Gender equality	-0.03	0.004	-0.085	0.445	-0.15	-0.153	0.144	0.091	-0.074	-0.092
Good for consumer, for a better life	-0.064	-0.064	0.045	-0.071	0.735	-0.16	-0.068	0.132	-0.029	-0.02
Donations to charity	-0.051	-0.032	0.236	0.16	-0.176	-0.167	0.167	-0.066	-0.082	0.574
Good for people	0.935	0.028	0.035	0.087	-0.024	-0.054	-0.021	-0.016	-0.014	0.062
Local (from a region, nearby)	-0.116	0.047	0.046	0.211	-0.119	0.573	-0.115	-0.013	0.037	-0.113
Partnerships, direct trade, local smallholders	0.039	0.185	-0.042	-0.059	0.069	0.595	0.225	0	0.005	0.101
Co-ownership	0.04	0.688	-0.1	0.001	-0.039	0.247	-0.148	-0.061	-0.055	0.001
Chain transparency	-0.034	0.653	-0.037	-0.139	0.024	0.002	0.036	-0.058	0.209	0.051
Artisanal	-0.096	-0.025	-0.081	-0.108	-0.159	0.668	-0.001	0.039	-0.079	0.031
Visibility Family Farm	-0.017	0.075	-0.13	0.111	0.553	-0.044	-0.089	0.01	-0.064	0.02

Table 22: Pattern matrix, PCA with promax rotation, limited to 10 components, for all records (A)

This PCA of claims that are combined with organic identifies 7 components represented in 7 columns underlying CSA related fair value propositions of food products that are labelled as Organic (Table 23). Not surprisingly, the first component, "Rainforest & human well-being", is strongly associated with forest protection, reforestation, Rainforest Alliance certification scheme, and general human well-being, represented as "good for people" value.

The second component, "Natural and low-input farming," clearly highlights reduced chemical inputs, such as less or no pesticide, fertilizer, and GMO use. The third component, "Soil and water for future generations," is loaded by soil management, biodiversity, and responsibility for future generations. The fourth factor, "Farmer and worker empowerment," emphasizes farmer training and education, good working conditions, gender equality, and good farming practices. The fifth, "Collaboration," is loaded by factors co-ownership, partnerships, and local/regional sourcing, pointing to more collaboration in short supply chains. The sixth component, "Ethical trade and climate responsibility," is strongly associated with artisanal food production, which is often related to slave free production, palm oil certification, and partnership, direct trade with local smallholders. Finally, "Community support and good for environment" relates to donations and charities, support to local communities and contributions, and good for environment values. In summary, the PCA reveals that organic products are often combined with value propositions that are clustered in environmental and human well-being values, in particular with strong loadings for rainforest protection, natural production, and intergenerational responsibility and care for communities that need support.

	Rainforest & human well-being	Natural, organic and low-input farming	Soil and water, for future generations	Farmers & worker empowerment	Collaboration	Ethical trade and climate responsible	Community support and good environment
Soil management	-0.028	0.073	0.811	-0.012	-0.185	0.031	-0.09
Biodiversity, regenerative	-0.022	0.041	0.554	0.104	0.139	-0.047	0.18
Protect forest, reforestation	0.901	-0.005	-0.083	0.003	-0.01	0.031	-0.055
Rainforest Alliance, Utz	0.932	-0.014	-0.07	-0.024	-0.017	0.03	-0.104
Climate, greenhouse gas emissions, circular, waste	-0.017	-0.001	0.365	-0.186	0.075	0.525	0.032
Good farming practices	0.057	-0.037	0.197	0.461	-0.19	0.015	0.139
Free (less use) of pesticides	-0.01	0.86	0.031	-0.039	0.018	-0.013	0.082
Free (less use) of fertilizers	-0.02	0.864	0.048	0.053	-0.057	0.004	-0.063
Protect water resources	0.002	0.277	0.364	0.041	-0.065	0.013	0.013
Good for animals	0.135	0.061	0.224	-0.224	0.191	-0.071	0.3
Grazing (animals graze outside)	0.052	-0.02	0.063	-0.119	0.159	-0.097	-0.029
Without antibiotics	0	0.116	0.002	-0.092	0.088	-0.072	0.092
Palm oil free or certified	-0.025	-0.062	-0.052	0.045	-0.192	0.684	0.191
Soy free or certified	-0.111	-0.059	0.007	0.073	-0.183	0.061	0.108
GMO free	-0.026	0.714	-0.106	0.029	-0.017	0.012	-0.041
Good for environment	0.038	0.05	0.043	0.204	0.219	-0.023	0.626
Good for farmer income	-0.05	-0.077	0.398	0.354	0.287	0.023	-0.164
Fairtrade, Fair for Life	-0.226	-0.056	-0.293	0.134	-0.027	0.004	0.405
Good for worker	0.012	-0.096	0.023	0.653	0.029	-0.084	-0.027
Slave free, no child labour	0.145	0.104	-0.051	-0.006	-0.074	0.346	0.047
Farmer education/training	0.053	0.09	-0.032	0.625	-0.059	0.031	0
For future generations	-0.018	-0.18	0.681	0.01	-0.148	-0.037	-0.065
Support local communities	0.012	-0.028	0.032	-0.056	-0.114	0.085	0.512
Gender equality	-0.051	0.072	0.018	0.608	-0.078	-0.007	-0.182
Good for consumer, for a better life	-0.027	0.166	-0.057	0.049	0.149	0.036	-0.138
Donations to charity	-0.039	-0.01	-0.095	-0.137	-0.085	0.073	0.707
Good for people	0.842	-0.047	0.107	0.092	0.04	-0.009	0.14
Local (from a region, nearby)	-0.13	-0.047	0.168	-0.165	0.57	-0.168	-0.005
Partnerships, direct trade, local smallholders	-0.024	0.004	-0.037	0.037	0.49	0.562	-0.092
Co-ownership	0.025	-0.005	-0.252	-0.063	0.848	-0.015	-0.068
Chain transparency	0.04	0.051	-0.142	0.322	0.31	0.042	0.003
Artisanal	-0.001	-0.016	-0.028	-0.006	-0.099	0.758	-0.03
Visibility Family Farm	0.048	-0.035	-0.096	0.139	0.342	-0.056	0.082

Table 23: Pattern matrix, PCA with promax rotation, limited to 7 components, for organic products (B)

The results of the two PCA analyses presented in the Table 22 and Table 23 show that certain components are notably similar, such as rainforest and human well-being, natural and low-input farming. The remaining components have distinct features that can be interpreted as a separate

value proposition. The extracted components have been integrated and described as value propositions with related examples in Table 24. It is important to acknowledge the substantial variation within each group. Therefore, examples of value propositions are illustrative and have been supplemented with additional information from literature. Nevertheless, the identified value propositions give a comprehensive overview of the current fair value propositions for CSA in EU retail and the core elements that underpin them (Table 24).

Components		Examples of fair value proposition	Main types of fairness communicated to consumers
1	Rainforest and human well-being	<ul style="list-style-type: none"> Our farmers protect the forest to preserve the climate. We improve the livelihood of the farmers and communities. Our products are Rainforest Alliance certified and/or organic certified. 	Distributive Informational Interpersonal
2	Good farming practices, transparency	<ul style="list-style-type: none"> Our farmers apply good farming practices for the environment. We make these practices and impact transparent and reward farmers for good practices. 	Distributive Procedural Informational (when combined with certification) Interpersonal
3	Climate-smart farming	<ul style="list-style-type: none"> Climate-smart agriculture uses less pesticides and chemical fertilizers, to preserve soil and water quality, and reduce the climate impact of agriculture for future generations. 	Distributive Procedural Informational (when combined with certification)
4	Good for biodiversity, nature, farmer (and animal)	<ul style="list-style-type: none"> We are committed to the preserving nature and the livelihood of the farmers and communities. We pay fair prices to farmers. 	Distributive Procedural Informational (when combined with certification)
5	Future generations and better life	<ul style="list-style-type: none"> Family farms make healthy food in a sustainable way to preserve nature. We care about future generations. Our product is good for consumers and is meant for a better life. 	Distributive Interpersonal
6	Good for environment, local & partnership	<ul style="list-style-type: none"> The local supply chain has a lower climate impact. We support local farmers who make the best products. 	Distributive Interpersonal
7	Farmer education and local communities	<ul style="list-style-type: none"> Our farmers apply good farming practices to preserve nature. We support farmers and their communities with education and training and offer good trade conditions so they can apply good farming practices and improve their livelihoods. 	Distributive Procedural Interpersonal
8	Natural, organic and low-input farming	<ul style="list-style-type: none"> Our products use less pesticides, chemical fertilizers, and antibiotics, they are GMO free and soy free. Our organic products use no pesticides, no chemical fertilizers, and antibiotics, they are GMO -free and soy free. This makes the products sustainable and natural which is good for you and the environment 	Distributive Informational (when combined with certification)
9	Animal welfare & Fairtrade	<ul style="list-style-type: none"> The cows graze a minimum of 120 days in the meadows, which lowers the climate impact. This maintains the beloved farming landscapes. Our farmers are rewarded with a price premium. 	Distributive Procedural Informational (when combined with certification)
10	Climate change & donation	<ul style="list-style-type: none"> We care about climate. We donate 1% to the planet. We produce palm oil free. 	Distributive Procedural
11	Soil and water, for future generations	<ul style="list-style-type: none"> CSA uses no pesticides and chemical fertilizers, to preserve soil and water quality, and reduce the climate impact of agriculture. This is especially important for the future generations. 	Distributive Informational (when combined with certification)
12	Farmers & worker empowerment	<ul style="list-style-type: none"> Our respected farmers apply good farming practices to lower the environmental impact. 	Distributive Interpersonal

Components		Examples of fair value proposition	Main types of fairness communicated to consumers
		<ul style="list-style-type: none"> We support men and women in agriculture with training so they can apply good farming practices and improve their livelihoods. 	
13	Collaboration	<ul style="list-style-type: none"> Our products come from local farmers. We have partnership with local smallholders. We work directly with the farmers. 	Procedural Interpersonal
14	Ethical trade and climate responsible	<ul style="list-style-type: none"> Our artisanal products are slave- and child labour free, palm-oil free. We care about the climate. 	Informational (when combined with certification) Interpersonal
15	Community support and good for environment	<ul style="list-style-type: none"> We donate 1% to the planet. We produce certified organic. We are fair trade certified. 	Distributive Procedural Informational

Table 24: Components and examples of fair value propositions in use

The integration of the two PCA analyses harvested 15 distinct components in total. These components along the illustrative examples are presented in Table 24. Although the examples of fair value propositions do not capture the full diversity of practices, they offer a comprehensive overview of the core values underpinning the fairness in CSA. In relation to the fairness framework (Figure 2), the results can be interpreted and labelled accordingly. As Table 24 illustrates, most of the components are labelled under distributive and procedural fairness. Distributive fairness is mentioned in the table if the value proposition highlights a specific element of distribution of benefits, including e.g. supporting farmers through education or taking care of future generations. Procedural fairness is highlighting the ways in which such a distribution is reached, e.g. through paying a premium for certain achievements, through cooperations or through donations to charity. Informational fairness is, in this table, related to the quality of information and transparency, e.g. by certification schemes. Finally, interpersonal fairness is mentioned if the value position highlights respect for farmers or local communities e.g. through emphasizing the special efforts that “our farmers” make.

5.5 Conclusions

In this chapter we aim to explore value propositions that are currently used when introducing new food products to the EU food retail market and analyse how these value propositions are related to the fair business practices. Through extracting data from the Innova database covering 24 EU countries, we analysed the claims that have been used when introducing 6,450 new food products to the market. To reduce the number of separate environmental and human ethical claims to a reasonable number of value propositions, we have conducted PCA analysis. The found components are suggested as fair value propositions (Table 24).

The results clearly indicate a high frequency of rainforest, protecting forest, and human well-being related claims. The reasons for such high frequency can be explained by recognition due to global campaigns, such as Rainforest Alliance and United Nations sustainability goals, making such values easy to recognize and trust. Another reason could be the strong emotional appeal, which makes human well-being related values feel empathic and give a feeling of urgency and relevance. In addition, a high frequency of sustainability certified schemes, often verified by independent agencies, indicates manufacturers effort to increase the credibility of the value proposition. Therefore, to gain trust by the consumer, it can be recommended to develop and improve validation and certification mechanisms. However, the administrative burdens related to officially certified values need not become a hurdle for the fair value proposition.

Regarding the components we have found while analysing all value propositions and the value propositions in combination with organic products, we can conclude that the developed 15 components are the major groups found (Table 24). These components reflect a diverse set of values ranging from environmental stewardship (e.g., forest protection, climate responsibility, and biodiversity) to social equity (e.g. farmer and worker empowerment, community support, fair trade). The frequently mentioned claims or value propositions suggest a strong impact of global sustainability campaigns and consumer-related narratives. While the examples provided do not fully cover the large spectrum of possible practices, they provide insights on how fairness can be communicated to the consumers and can be operationalized when adapting CSA technologies and practices. The proposed fair values in this study can be used as a foundational framework by the stakeholders, and specifically by those who are engaged in CSA. Those value propositions are used in the market and indicate a successful communication towards the end consumer. However, stakeholders are recommended to tailor these specific components and fairness aspects to their specific CSA related context.

6. Summary of conclusions and discussion

Main conclusions

The overall aim of this deliverable is to explore which value propositions can make CSA successful. The deliverable has explored the conceptualization, operationalization, and empirical assessment of fairness in climate-smart agri-food supply chains, with the aim of informing the development of fair value propositions. By integrating theoretical insights with empirical validation and application across real-world case studies, the research contributes to a growing body of literature concerned with embedding fairness into sustainable food system transformations.

The findings from the literature study show that fairness in agri-food chains is a multidimensional, context-sensitive, and actor-dependent construct. Drawing on the inter-organisational fairness and organizational justice literature, four central dimensions, i.e. distributive, procedural, informational, and interpersonal fairness, were identified as foundational to understanding how actors perceive fairness in supply chain interactions. These dimensions are not merely abstract categories; they reflect deeply embedded experiences and expectations about outcomes, processes, relationships, all of which are controlled by norms, institutional settings and power dynamics. Fairness, as the analysis reveals, cannot be treated as a universal or objective principle. Fairness is subjective, negotiated, and often contested. To answer the first research question “What makes climate-smart agri-food supply chains fair?”, building on the literature, we define fairness in the context of climate-smart agri-food chains as:

“a perception of the farmers and the buyers of their products that the business relationship produces fair outcomes for all actors, applying fair procedures to reach the outcome, on the basis of fair information exchange, and with fair interpersonal treatment.”

In response to this complexity, a conceptual framework was developed that integrates collaborative practices, fairness norms, institutional context, and actors’ fairness perceptions. This framework was designed to provide both analytical clarity and practical relevance for assessing fairness in climate-smart agri-food supply chains. Validation through expert interviews confirmed the core logic and dimensions of the framework, while also suggesting important areas for refinement. These included the inclusion of ESG performance and intergenerational equity within distributive fairness, the need for more explicit recognition of voice and representation under procedural fairness, and the growing importance of data governance and adaptive, context-sensitive decision-making mechanisms. These refinements reflect an expanded understanding of fairness that incorporates social, environmental, and temporal considerations alongside economic ones.

Empirical testing of the framework in five BEATLES case studies from Denmark, Germany, Lithuania, the Netherlands, and Spain provided insights into how fairness is perceived and what practices would improve fairness in different climate-smart agri-food contexts. The results underscored that fairness perceptions vary significantly across actors, particularly between farmers and other chain actors in more powerful market positions. In several cases, farmers reported lower levels of economic fairness, particularly where market-driven governance dominated, and cooperative structures were less adopted. By contrast, actors with greater control over sales or integration in the supply chain expressed higher satisfaction, pointing to the influence of power and market access on perceived fairness. These patterns align with broader findings in fairness literature that highlight systemic imbalances in value distribution and decision-making authority.

To understand how fairness is currently operationalized in the marketplace, the report also examined value propositions derived from over 6,540 new food product introductions across the

EU retail in 2023-2024. Through principal component analysis, a set of 15 distinct value propositions was identified, encompassing themes such as environmental stewardship, social equity, and trust-based certification. Hence, to answer the second research question “Which value propositions are currently used in EU retail supply chains and how do they relate to fairness?”, we compiled a list of 15 distinct value propositions (See Table 24).

The analysis showed that fairness-related claims, particularly those tied to rainforest protection, human well-being, and third-party certifications, are prominent and often strategically employed to resonate with consumer values. However, while these claims may enhance market legitimacy, their effectiveness relies heavily on credible validation and transparency. Moreover, it must be ensured that the institutionalization of fairness through certification schemes does not create undue burdens for producers, particularly smallholders operating in complex and fragmented markets.

Taken together, the findings of this report underscore the importance of embedding fairness into climate-smart agri-food supply chains as both an ethical imperative and a strategic priority for sustainability transitions. Fairness cannot be understood or enacted through economic metrics alone. It requires ongoing negotiation, inclusive governance, and responsiveness to changing social, environmental, and institutional conditions. The conceptual framework developed here offers a foundation for such work but must be further refined through participatory engagement and empirical application.

Discussion

The application of the framework also revealed challenges in standardizing fairness assessments. Actor perceptions are influenced by roles, experiences, and local expectations, which complicates direct comparisons and points to the necessity of situating fairness frameworks within specific institutional and cultural contexts. Informal governance structures, asymmetries in information access, and divergent norms make it difficult to apply uniform assessment tools across cases. As such, while the framework proves conceptually robust, its use in practice must be flexible, iterative, and attuned to the lived realities of supply chain actors.

Future research should aim to explore the evolution of fairness perceptions over time and across governance structures, examine the implications of fairness for policy development towards CSA, and develop participatory methodologies that can more fully capture the perspectives of marginalized actors. By further grounding fairness in empirical practice and inclusive dialogue, researchers and practitioners alike can contribute to the design of food systems that are not only climate-resilient but also socially just.

7. Literature and websites

Alghababsheh, M., Butt, A. S., & Ali, S. M. (2023). The role of buyers justice in achieving socially sustainable global supply chains: A perspective of apparel suppliers and their workers [Article]. *Journal of Purchasing and Supply Management*, 29(2), Article 100820. <https://doi.org/10.1016/j.pursup.2023.100820>

Alghababsheh, M., Gallear, D., & Rahman, M. (2020). Balancing the Scales of Justice: Do Perceptions of Buyers' Justice Drive Suppliers' Social Performance? [Article]. *Journal of Business Ethics*, 163(1), 125-150. <https://doi.org/10.1007/s10551-018-3993-0>

Alghababsheh, M., Gallear, D., & Saikouk, T. (2023). Justice in supply chain relationships: A comprehensive review and future research directions [Article]. *European Management Review*, 20(3), 367-397. <https://doi.org/10.1111/emre.12541>

Ando, N., & Kee Rhee, D. (2009). Antecedents of Interorganizational Trust: Joint Decision-Making, Cultural Adaptation, and Bargaining Power [Review]. *Journal of Asia Business Studies*, 3(2), 16-28. <https://doi.org/10.1108/15587890980001513>

Barry, J. M., & Graca, S. S. (2019). Moderating effects of institutional factors on relationship quality: a comparative analysis of the US, Brazil, and China [Article]. *Journal of Business and Industrial Marketing*, 34(6), 1339-1359. <https://doi.org/10.1108/JBIM-02-2018-0062>

Benmehaia, A. M., Samoggia, A., Benharrat, O., Benziouche, S. E., & Ayfantopoulou, G. (2024). Fairness and Contractual Performance in Vertical Linkages Within an Uncertain Environment: A Case of a Tomato Value Chain [Article]. *Foods*, 13(23), Article 3819. <https://doi.org/10.3390/foods13233819>

Beugré, C. D., & Acar, W. (2008). Offshoring and cross-border interorganizational relationships: A justice model [Article]. *Decision Sciences*, 39(3), 445-468. <https://doi.org/10.1111/j.1540-5915.2008.00199.x>

Blader, S. L. (2007). *What leads organizational members to collectivize? Injustice and identification as precursors of union certification* [doi:10.1287/orsc.1060.0217]. Institute for Operations Research & the Management Sciences (INFORMS).

Bonato, F., Resende, L. M. M., & Pontes, J. (2022). Supply chain governance: a conceptual model [Article]. *Journal of Business and Industrial Marketing*, 37(2), 309-325. <https://doi.org/10.1108/JBIM-09-2019-0418>

Bouazzaoui, M., Wu, H. J., Roehrich, J. K., Squire, B., & Roath, A. S. (2020). Justice in inter-organizational relationships: A literature review and future research agenda [Review]. *Industrial Marketing Management*, 87, 128-137. <https://doi.org/10.1016/j.indmarman.2020.02.003>

Boyd, D. E., Spekman, R. E., Kamauff, J. W., & Werhane, P. (2007). Corporate Social Responsibility in Global Supply Chains: A Procedural Justice Perspective [Article]. *Long Range Planning*, 40(3), 341-356. <https://doi.org/10.1016/j.lrp.2006.12.007>

Brito, R. P., & Miguel, P. L. S. (2017). Power, Governance, and Value in Collaboration: Differences between Buyer and Supplier Perspectives [Article]. *Journal of Supply Chain Management*, 53(2), 61-87. <https://doi.org/10.1111/jscm.12134>

Brown, J. R., Cobb, A. T., & Lusch, R. F. (2006). The roles played by interorganizational contracts and justice in marketing channel relationships [Article]. *Journal of Business Research*, 59(2), 166-175. <https://doi.org/10.1016/j.jbusres.2005.04.004>

Cassia, F., Haugland, S. A., & Magno, F. (2021). Fairness and behavioral intentions in discrete B2B transactions: a study of small business firms [Article]. *Journal of Business and Industrial Marketing*, 36(13), 129-141. <https://doi.org/10.1108/JBIM-12-2019-0538>

Chen, L., Lee, H. L., & Tang, C. S. (2022). Supply chain fairness [Article]. *Production and Operations Management*, 31(12), 4304-4318. <https://doi.org/10.1111/poms.13849>

Chiu, S. P., Chou, H. W., & Chiu, C. M. (2013). The antecedents of buyers' perceived justice in online markets [Article]. *Cyberpsychology, Behavior, and Social Networking*, 16(7), 536-542. <https://doi.org/10.1089/cyber.2012.0539>

Christensen, T., Pedersen, S.M., Tarekegn Erekaló, K., Denver, S. Gemtou, M., Kakkavou, K., Fountas, S., Isakhanyan, G., Kornelis, K., Galgo, C., Mahdad, M., Kriznik, N., Bevc, J., Pazos Vidal, S., Šalkauskienė, D., Bienzobas, J., Bos, S., Brinks, H., Dogterom Van Eck, M., Puggaard, L., Nertinger, M., Ekane, N., Rosemarin, A.. (2024). Co-Creating Behavioural Change Towards Climate-Smart Food Systems. D1.1 Integrated framework of decision-making factors. BEATLES Project, HORIZON Europe, Grant Agreement: No 101060645.

Colquitt, J. A. (2001). On the dimensionality of organizational justice: a construct validation of a measure. *Journal of applied psychology*, 86(3), 386.

Cousins, P. D., & Menguc, B. (2006). The implications of socialization and integration in supply chain management. *Journal of Operations Management*, 24(5), 604-620. <https://doi.org/https://doi.org/10.1016/j.jom.2005.09.001>

Diller, H. (2008). Price fairness [Article]. *Journal of Product and Brand Management*, 17(5), 353-355. <https://doi.org/10.1108/10610420810896103>

Duffy, R., Fearne, A., & Hornibrook, S. (2003). Measuring distributive and procedural justice: An exploratory investigation of the fairness of retailer-supplier relationships in the UK food industry [Article]. *British Food Journal*, 105(10), 682-694. <https://doi.org/10.1108/00070700310506236>

Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics*, 114(3), 817-868. <https://doi.org/Doi 10.1162/003355399556151>

Ferguson, J. L., Brown, B. P., & Johnston, W. J. (2017). Partitioned pricing, price fairness perceptions, and the moderating effects of brand relationships in SME business markets [Article]. *Journal of Business Research*, 72, 80-92. <https://doi.org/10.1016/j.jbusres.2016.11.001>

Gassenheimer, J. B., Houston, F. S., & Davis, J. C. (1998). The role of economic value, social value, and perceptions of fairness in interorganizational relationship retention decisions [Article]. *Journal of the Academy of Marketing Science*, 26(4), 322-337. <https://doi.org/10.1177/0092070398264005>

Grandori, A. (2015). Improving organization forms in the agri-food industry [Article]. *British Food Journal*, 117(10), 2418-2434. <https://doi.org/10.1108/BFJ-11-2014-0386>

Griffith, D. A., Harvey, M. G., & Lusch, R. F. (2006). Social exchange in supply chain relationships: The resulting benefits of procedural and distributive justice [Article]. *Journal of Operations Management*, 24(2), 85-98. <https://doi.org/10.1016/j.jom.2005.03.003>

Gudbrandsdottir, I. Y., Olafsdottir, G., Oddsson, G. V., Stefansson, H., & Bogason, S. G. (2021). Operationalization of interorganizational fairness in food systems: From a social construct to quantitative indicators [Article]. *Agriculture (Switzerland)*, 11(1), 1-24, Article 36. <https://doi.org/10.3390/agriculture11010036>

Ha, Y. K., & Lee, C. (2024). Enhancing firm information competencies: Impacts on information sharing and logistics performance [Article]. *Information Development*. <https://doi.org/10.1177/02666669241269681>

Hemmert, M., Kim, D., Kim, J., & Cho, B. (2016). Building the supplier's trust: Role of institutional forces and buyer firm practices [Article]. *International Journal of Production Economics*, 180, 25-37. <https://doi.org/10.1016/j.ijpe.2016.05.023>

Hoang, V., Nguyen, A., Hubbard, C., & Nguyen, K. D. (2021). Exploring the governance and fairness in the milk value chain: A case study in vietnam [Article]. *Agriculture (Switzerland)*, 11(9), Article 884. <https://doi.org/10.3390/agriculture11090884>

Hornibrook, S., Fearne, A., & Lazzarin, M. (2009). Exploring the association between fairness and organisational outcomes in supply chain relationships [Article]. *International Journal of Retail and Distribution Management*, 37(9), 790-803. <https://doi.org/10.1108/09590550910975826>

Ireland, R. D., & Webb, J. W. (2007). A multi-theoretic perspective on trust and power in strategic supply chains [Article]. *Journal of Operations Management*, 25(2), 482-497. <https://doi.org/10.1016/j.jom.2006.05.004>

Jack, L., Florez-Lopez, R., & Ramon-Jeronimo, J. M. (2018). Accounting, performance measurement and fairness in UK fresh produce supply networks [Article]. *Accounting, Organizations and Society*, 64, 17-30. <https://doi.org/10.1016/j.aos.2017.12.005>

Kadefors, A. (2005). Fairness in interorganizational project relations: norms and strategies. *Construction Management and Economics*, 23(8), 871-878. <https://doi.org/10.1080/01446190500184238>

Kahneman, D., Knetsch, J., & Thaler, R. (1986). Fairness and the Assumptions of Economics. *The Journal of Business*, 59(4), S285-300. <https://EconPapers.repec.org/RePEc:ucp:jnlbus:v:59:y:1986:i:4:p:s285-300>

Kashyap, V., Manolis, C., & Brashear, T. G. (2008). A measure of distributive justice in distribution channels: Scale development and validation [Article]. *Journal of Marketing Channels*, 15(4), 253-279. <https://doi.org/10.1080/10466690802063911>

Kim, M., & Chai, S. (2019). Impact of justice in the supply chain relationship on implementing supply chain integration [Article]. *International Journal of Supply Chain Management*, 8(6), 1199-1212. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85078045676&partnerID=40&md5=cde1e7100ab367eac179f1a4d2b8e077>

Kshetri, N. (2023). Blockchain's Role in Enhancing Quality and Safety and Promoting Sustainability in the Food and Beverage Industry [Article]. *Sustainability (Switzerland)*, 15(23), Article 16223. <https://doi.org/10.3390/su152316223>

Lee, C., & Ha, B. C. (2020). The impact of interactional justice and supply-chain collaboration on sustainable SCM performance: The case of multinational pharmaceutical firms [Article]. *Journal of Asian Finance, Economics and Business*, 7(2), 237-247. <https://doi.org/10.13106/jafeb.2020.vol7.no2.237>

Lee, C., & Ha, B. C. (2021). Interactional justice, informational quality, and sustainable supply chain management: A comparison of domestic and multinational pharmaceutical companies [Article]. *Sustainability (Switzerland)*, 13(2), 1-16, Article 998. <https://doi.org/10.3390/su13020998>

Lee, H. S., & Griffith, D. A. (2019). Social comparison in retailer-supplier relationships: Referent discrepancy effects [Article]. *Journal of Marketing*, 83(2), 120-137. <https://doi.org/10.1177/0022242918823542>

Leventhal, G. S. (1980). What should be done with equity theory? In *Social exchange* (pp. 27-55). Springer.

- Lim, J. J., Dai, J., & Paulraj, A. (2022). Collaboration as a structural aspect of proactive social sustainability: the differential moderating role of distributive and procedural justice [Article]. *International Journal of Operations and Production Management*, 42(11), 1817-1852. <https://doi.org/10.1108/IJOPM-06-2021-0402>
- Liu, Y., Huang, Y., Luo, Y., & Zhao, Y. (2012). How does justice matter in achieving buyer-supplier relationship performance? [Article]. *Journal of Operations Management*, 30(5), 355-367. <https://doi.org/10.1016/j.jom.2012.03.003>
- Lund, D. J., Scheer, L. K., & Kozlenkova, I. V. (2013). Culture's impact on the importance of fairness in interorganizational relationships [Article]. *Journal of International Marketing*, 21(4), 21-43. <https://doi.org/10.1509/jim.13.0020>
- Luo, Y. (2006). Toward the micro and macro-level consequences of interactional justice in cross-cultural joint ventures [Review]. *Human Relations*, 59(8), 1019-1047. <https://doi.org/10.1177/0018726706068769>
- Luo, Y. (2007). The Independent and Interactive Roles of Procedural, Distributive, and Interactional Justice in Strategic Alliances. *Academy of Management Journal*, 50(3), 644-664. <https://doi.org/10.5465/amj.2007.25526452>
- Maluf, R. S., Burlandy, L., Cintrão, R. P., Jomalinis, E., Santarelli, M., & Tribaldos, T. (2023). Global value chains, food and just transition: a multi-scale approach to Brazilian soy value chains [Article]. *Journal of Peasant Studies*, 50(7), 2642-2665. <https://doi.org/10.1080/03066150.2022.2105700>
- Matopoulos, A., Didonet, S., Tsanasidis, V., & Fearne, A. (2019). The role of perceived justice in buyer-supplier relationships in times of economic crisis [Article]. *Journal of Purchasing and Supply Management*, 25(4), Article 100554. <https://doi.org/10.1016/j.pursup.2019.100554>
- Matthews, L., Silva, M. E., Figueiredo, M. D., & Lai, J. Y. (2025). Towards environmentally just supply chains: from harm reduction to transformative sustainability actions [Article]. *International Journal of Operations and Production Management*, 45(3), 733-755. <https://doi.org/10.1108/IJOPM-09-2024-0736>
- Maxwell, S., & Comer, L. (2010). The two components of a fair price: Social and personal [Article]. *Journal of Product and Brand Management*, 19(5), 375-380. <https://doi.org/10.1108/10610421011068612>
- Mir, S., Blessley, M., Zacharia, Z., & Aloysius, J. (2022). Mending fences in a buyer-supplier relationship: The role of justice in relationship restoration [Article]. *Journal of Supply Chain Management*, 58(3), 23-46. <https://doi.org/10.1111/jscm.12272>
- Nguyen, A., & Meng, J. G. (2016). How source of funds affects buyer's judgments of price fairness and subsequent response [Article]. *Journal of Product and Brand Management*, 25(7), 710-720. <https://doi.org/10.1108/JPBPM-02-2016-1104>
- Oyedijo, A., Yang, Y., Koukpaki, A. S. F., & Mishra, N. (2023). The role of fairness in multi-tier sustainable supply chains [Article]. *International Journal of Production Research*, 61(14), 4893-4917. <https://doi.org/10.1080/00207543.2021.1928319>
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1994). Alternative scales for measuring service quality: A comparative assessment based on psychometric and diagnostic criteria. *Journal of Retailing*, 70(3), 201-230. [https://doi.org/https://doi.org/10.1016/0022-4359\(94\)90033-7](https://doi.org/https://doi.org/10.1016/0022-4359(94)90033-7)
- Park, J. Y., & Kim, C. (2023). Role of Justice Perception in Relationship Duration, Brand Equity, and Strategic Integration [Article]. *Journal of Business-to-Business Marketing*, 30(4), 371-394. <https://doi.org/10.1080/1051712X.2023.2272993>

Poppo, L., & Zhou, K. Z. (2014). Managing contracts for fairness in buyer-supplier exchanges [Article]. *Strategic Management Journal*, 35(10), 1508-1527. <https://doi.org/10.1002/smj.2175>

Price, J. L., & Mueller, C. W. (1986). Absenteeism and Turnover of Hospital Employees.

Rambim, D., & Awuor, F. M. (2020). Blockchain based Milk Delivery Platform for Stallholder Dairy Farmers in Kenya: Enforcing Transparency and Fair Payment. 2020 IST-Africa Conference, IST-Africa 2020,

Rawls, J. a. (1971). *A theory of justice*. Cambridge, Massachusetts : The Belknap Press of Harvard University Press, [1971] ©1971. <https://search.library.wisc.edu/catalog/999472448502121>

Robaey, Z., Asveld, L., Sinha, K. M., Wubben, E., & Osseweijer, P. (2022). Identifying practices of inclusive biobased value chains: Lessons from corn stover in Iowa, sugar cane in Jamaica, and sugar beet in the Netherlands [Article]. *Cleaner and Circular Bioeconomy*, 3, Article 100032. <https://doi.org/10.1016/j.clcb.2022.100032>

Ryan, M., & and Hoes, A.-C. Justice and Sustainability Tensions in Agriculture: Wicked Problems in the Case of Dutch Manure Policy. *Ethics, Policy & Environment*, 1-18. <https://doi.org/10.1080/21550085.2024.2360369>

Saeed, K. A., Malhotra, M. K., & Grover, V. (2005). Examining the Impact of Interorganizational Systems on Process Efficiency and Sourcing Leverage in Buyer–Supplier Dyads. *Decision Sciences*, 36(3), 365-396. <https://doi.org/https://doi.org/10.1111/j.1540-5414.2005.00077.x>

Samoggia, A., & Fantini, A. (2023). Revealing the Governance Dynamics of the Coffee Chain in Colombia: A State-of-the-Art Review [Review]. *Sustainability (Switzerland)*, 15(18), Article 13646. <https://doi.org/10.3390/su151813646>

Schlosberg, D. (2013). Theorising environmental justice: the expanding sphere of a discourse. *Environmental Politics*, 22(1), 37-55. <https://doi.org/10.1080/09644016.2013.755387>

Sen, A., Kumar, A., Dubey, V., & Gupta, A. (2023). Managing two-sided B2B electronic markets: Governance mechanisms, performance implications, and boundary conditions [Article]. *Journal of Business Research*, 169, Article 114257. <https://doi.org/10.1016/j.jbusres.2023.114257>

Shoniwa, B., & Terera, K. G. (2024). Enhancing the Public-Private-Community Partnerships in the Banana Value Chain in Mutasa District, Zimbabwe [Article]. *Research on World Agricultural Economy*, 5(4), 420-436. <https://doi.org/10.36956/rwae.v5i4.1252>

Siadou-Martin, B., Vidal, D., Poujol, J. F., & Tanner, J. F. (2017). Salespeople, Fairness, and Buyer Satisfaction: What about Emotions? [Article]. *Journal of Business-to-Business Marketing*, 24(3), 221-233. <https://doi.org/10.1080/1051712X.2017.1345261>

Simões, A. R. P., Bánkuti, F. I., Borges, J. A. R., Roschel, M. S., & Nicholson, C. F. (2025). Dairy farmers' satisfaction with the price paid by processors in competitive markets [Article]. *Journal of Dairy Science*, 108(3), 2315-2323. <https://doi.org/10.3168/jds.2024-25737>

Soundararajan, V., & Brammer, S. (2018). Developing country sub-supplier responses to social sustainability requirements of intermediaries: Exploring the influence of framing on fairness perceptions and reciprocity [Article]. *Journal of Operations Management*, 58-59, 42-58. <https://doi.org/10.1016/j.jom.2018.04.001>

Srinivasan, R., Narayanan, S., & Narasimhan, R. (2018). An Investigation of Justice, Conflict, and Moderating Effects of Supplier Autonomy and Cultural Distance in Buyer-Supplier Relationships [Article]. *IEEE Transactions on Engineering Management*, 65(1), 6-20, Article 8082742. <https://doi.org/10.1109/TEM.2017.2751039>

Stank, T. P., Keller, S. B., & Daugherty, P. J. (2001). SUPPLY CHAIN COLLABORATION AND LOGISTICAL SERVICE PERFORMANCE. *Journal of Business Logistics*, 22(1), 29-48. <https://doi.org/https://doi.org/10.1002/j.2158-1592.2001.tb00158.x>

Suh, S. (2004). Fairness and relationship quality perceived by local suppliers: In search of critical success factors for international retailers [Article]. *Journal of Global Marketing*, 18(1-2), 5-19. https://doi.org/10.1300/J042v18n01_02

Suh, S. M. (2014). Fairness and relationship quality perceived by local suppliers: In search of critical success factors for international retailers. In *International Retailing Plans and Strategies in Asia* (pp. 5-19). Taylor and Francis. https://doi.org/10.1300/J042v18n01_02

Sun, Y., Liu, Z., & Yang, H. (2018). How Does Suppliers' Fairness Affect the Relationship Quality of Agricultural Product Supply Chains? [Article]. *Journal of Food Quality*, 2018, Article 9313068. <https://doi.org/10.1155/2018/9313068>

Sun, Y., Zhu, Z., & Yang, H. (2021). Fairness Perception, Trust Perception, and Relationship Quality in Agricultural Supply Chains [Article]. *Journal of Food Quality*, 2021, Article 8817003. <https://doi.org/10.1155/2021/8817003>

Theodorakopoulos, N., Ram, M., & Kakabadse, N. (2015). Procedural justice in procurement management and inclusive interorganizational relations: An institutional perspective [Article]. *British Journal of Management*, 26(2), 237-254. <https://doi.org/10.1111/1467-8551.12071>

Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. John Wiley.

Thorpe, J. (2018). Procedural Justice in Value Chains Through Public-private Partnerships [Article]. *World Development*, 103, 162-175. <https://doi.org/10.1016/j.worlddev.2017.10.004>

Vaidyanathan, R., & Aggarwal, P. (2003). Who is the fairest of them all? An attributional approach to price fairness perceptions [Article]. *Journal of Business Research*, 56(6), 453-463. [https://doi.org/10.1016/S0148-2963\(01\)00231-4](https://doi.org/10.1016/S0148-2963(01)00231-4)

Wang, A., & Dyball, M. C. (2019). Management controls and their links with fairness and performance in inter-organisational relationships [Article]. *Accounting and Finance*, 59(3), 1841-1874. <https://doi.org/10.1111/acfi.12408>

Wang, M., Sheng, S., & Zhou, K. Z. (2022). Fairness asymmetry, changes in mutual trust, and supplier performance in buyer-supplier exchanges in China: A dyadic view [Article]. *Industrial Marketing Management*, 106, 14-30. <https://doi.org/10.1016/j.indmarman.2022.07.013>

Wang, Y., Liang, H., Sun, S., & Xue, Y. (2024). Contractual Governance, Fairness, and Extra-Role Altruistic Behavior in Chinese Buyer-Seller Relationships [Article]. *Journal of Business-to-Business Marketing*, 31(1), 115-140. <https://doi.org/10.1080/1051712X.2024.2315346>

Wei, S., Yin, J., & Chen, X. (2021). Paradox of Supply Chain Integration and Firm Performance: The Moderating Roles of Distributive and Procedural Justice* [Article]. *Decision Sciences*, 52(1), 78-108. <https://doi.org/10.1111/dec.12438>

Williamson, O. E. (1998). Transaction Cost Economics: How It Works; Where It is Headed. *De Economist*, 146(1), 23-58. <https://doi.org/10.1023/A:1003263908567>

Wong, C. Y., Boon-itt, S., & Wong, C. W. Y. (2011). The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance. *Journal of Operations Management*, 29(6), 604-615. <https://doi.org/https://doi.org/10.1016/j.jom.2011.01.003>

Xia, L., Monroe, K. B., & Cox, J. L. (2004). The price is unfair! A conceptual framework of price fairness perceptions [Review]. *Journal of Marketing*, 68(4), 1-15. <https://doi.org/10.1509/jmkg.68.4.1.42733>

Yang, Q., Wang, Q., & Zhao, X. (2019). Improving relationship performance on platforms: the role of platform technology usage in promoting justice [Article]. *Journal of Business and Industrial Marketing*, 34(5), 965-976. <https://doi.org/10.1108/JBIM-05-2018-0162>

Yilmaz, C., Sezen, B., & Tumer Kabadayi, E. (2004). Supplier fairness as a mediating factor in the supplier performance-reseller satisfaction relationship [Article]. *Journal of Business Research*, 57(8), 854-863. [https://doi.org/10.1016/S0148-2963\(02\)00485-X](https://doi.org/10.1016/S0148-2963(02)00485-X)

Zhou, M., Govindan, K., & Xie, X. (2020). How fairness perceptions, embeddedness, and knowledge sharing drive green innovation in sustainable supply chains: An equity theory and network perspective to achieve sustainable development goals [Article]. *Journal of Cleaner production*, 260, Article 120950. <https://doi.org/10.1016/j.jclepro.2020.120950>

8. Appendix

8.1 Questions and interviewees for framework validation

8.1.1 Questions

Fairness

Based on the literature we define fairness in the context of climate-smart agri-food chains as: a perception of the farmers and the buyers of their products that the business relationship produces fair outcomes for all actors, applying fair procedures to reach the outcome, on the basis of fair information exchange, and with fair interpersonal treatment.

Q1. Do you agree with this definition? Why, or why not?

Q2. How would you define fairness in the context of climate-smart agri-food chains?

Q3. Which of the four aspects is the most critical to make climate-smart agri-food chains fair; distribution of outcomes, procedures, information exchange, or interpersonal treatment? Why?

Norms

Based on the literature we define *fairness norms* in the context of climate-smart agri-food chains as: personal or shared expectations of the farmers and the buyers of their products that serve as a benchmark for determining what is considered fair or unfair in a business relationship.

We discern four groups of norms consistent with the four fairness dimensions: distributive, procedural, informational, and interpersonal as listed in Figure 3 [provided to interviewees].

Q4. Which of these aspects do you think are most important for farmers to make climate-smart agri-food chains fair? Why? Examples from CSA?

Fair practices

Based on the literature we define *fair practices* in the context of climate-smart agri-food chains as: practices related to the business relationship that improve fairness perceptions of the farmers and the buyers of their products.

We discern four groups of fair practices consistent with the four fairness dimensions: distributive, procedural, informational, and interpersonal. The practices as listed as listed in Figure 3 are given for the review.

Q5. Which practices can enhance the fairness of the business models behind climate-smart agriculture?

Q6. Can you give some practical examples of climate-smart agricultural chains that are (relatively) fair?

Q7. Do the practices apply in all agricultural chains or are they more relevant in a certain context? (eg small farms versus large processors, regional products, highly digitalized agricultural processes, high production risks).

Wrap-up and follow-up

Thank you for your cooperation. We do not intent to attribute any specific remarks to individuals in the report. But do you mind if we list your name under the interviewees? [Yes / No]

We will draft a short summary of the interview and send that to you for your review and approval.

8.1.2 The list of the interviewees from academics

	Name	Organisation
1	Ingunn Guðbrandsdóttir	University of Reykjavik
2	Anne Charlotte Hoes	Wageningen University & Research
3	Anton Riera	UC Louvain
4	Mark Ryan	Wageningen University & Research
5	Antonella Samoggia	University of Bologna

8.2 Questions and interviewees for application to the BEATLES Case Studies

8.2.1 In-depth interview open questions to the case leads

1. Short analysis of the case is provided. What are most important fairness issues in the chain with respect to implementing CSA according to you?
2. What are the main 'value attributes' that the chain is currently exploiting in the market (i.e. organic, local, good taste, good quality, low price etc)?
3. Are there any premiums paid to farmers for CSA practices, or differentiated prices (e.g. for organic), and/or subsidies? How does that work? How high are they and what costs do they cover?
4. How is the chain organised in terms of negotiations and contracts? What is the normal term of the contracts (day trading, monthly forward contracts, annual contracts etc.)? Are farmers actually negotiating prices or do the buyers dictate prices? Is there a reference price (e.g. world market price)? Are CSA practices part of negotiating and contracts?
5. How are contracts monitored and enforced? (formal versus informal contracting and monitoring)?
6. Do buyers (or input suppliers) provide other (technical) assistance or investment support for CSA to farmers?
7. What roles do quality control and sustainability certification play?
8. How is the communication between farmers and buyers? How do farmers and buyers communicate/interact? How often do they interact? What is being discussed?
9. How is the information sharing between the actors? Which information is being shared by farmers with buyers? Which information is being shared by buyers with farmers? Is that useful, important for CSA or fairness?
10. Do the actors understand each other's position and needs, and is there mutual respect between the actors in the chain?
11. What other practices are in place to make the chain fair? What other practices make the chain unfair?

8.2.2 The list of the interviewees from case studies

	Name	Organisation	Country
1	Liselotte Puggaard	Food & Bio Cluster Denmark	Denmark
2	Magdalena Nertinger	Naturland	Germany
3	Matas Budriūnas	AgriFood Lithuania	Lithuania
4	Natasja Doelman	Delphy	Netherlands
5	Stefanie de Kool	SMK	Netherlands
6	Jon Bienzobas Adrián	INTIA	Spain

8.3 Questions about fairness and norms for the questionnaires during the co-creation workshops for the BEATLES Case Studies

1. Which actor do you represent?

Farmers	<input type="checkbox"/>
Input suppliers	<input type="checkbox"/>
Processors / traders	<input type="checkbox"/>
Retailers	<input type="checkbox"/>
Other stakeholders	<input type="checkbox"/>

2. How important are the following norms to you?

	Not important	Slightly important	Moderately important	Important	Very important	I don't know / n.a.
Distributional fairness:						
That you are paid according to your efforts and investments	<input type="checkbox"/>					
That you are paid the same as your supply chain partner	<input type="checkbox"/>					
That you are paid at least enough to cover your costs	<input type="checkbox"/>					
Procedural fairness:						

	Not important	Slightly important	Moderately important	Important	Very important	I don't know / n.a.
That supply chain procedures are always followed in the same way	<input type="checkbox"/>					
That supply chain procedures are applied to everyone in the same way	<input type="checkbox"/>					
That the information that is provided to you for supply chain procedures is always correct	<input type="checkbox"/>					
That mistakes in procedures can be challenged and corrected	<input type="checkbox"/>					
That my specific interests and position is addressed in the procedures	<input type="checkbox"/>					
That the procedures respect my rights	<input type="checkbox"/>					
Informational fairness:						
That the communication in the chain is honest	<input type="checkbox"/>					
That your supply chain partner is giving you thorough, reasonable and timely explanation when something goes wrong	<input type="checkbox"/>					
That the information that your supply chain partner gives is understandable	<input type="checkbox"/>					
Interpersonal fairness:						
That your supply chain partner treats you with respect, dignity and politeness	<input type="checkbox"/>					

3. To what extent do you regard the following aspects as fair?

	Very unfair	Unfair	Neutral	Fair	Very fair	I don't know / n.a.
Your earnings	<input type="checkbox"/>					
The earnings of the supply chain partners	<input type="checkbox"/>					
The business procedures in your supply chain	<input type="checkbox"/>					
The communication and information exchange in your supply chain	<input type="checkbox"/>					
The way you are treated by supply chain partners in interpersonal contact	<input type="checkbox"/>					

8.4 List of practices for selection during the co-creation workshops for the BEATLES Case Studies

1. Which fair practices are the most important ones to fulfil your vision of a fair CSA chain?

Fair practices	Description	Place your vote sticker here!
Distributive		
Earnings	Dividing the earnings fairly in the chain	
Product quality performance	Providing adequate quality products	
Risk division	Dividing risks fairly	
Investment and ownership division	Sharing investments and ownership	
Operational support	Giving adequate operational support	
Procedural		
Fair negotiating procedures	Allowing everybody in the business relationship to express their demands and enter in balanced negotiations	
Adequate contract duration	Making sure that the duration of the contract is appropriate, and fair given the situation	
No unfair trading practices	Not engaging in unfair trading practices, such as late payments, one-sided contract changes, or short notice of cancellations of orders	
Explicit contracting	Business relations are guided by written contract terms, conditions and obligations	
Normative contracting	Business relations are based on shared expectations, norms instead of difficult written contracts	
Formal monitoring and control	Agreements in the climate-smart agricultural chain are checked in a formal way with audits, checklists, and penalties etc.	
Informal monitoring and control	Agreements in the climate-smart agricultural chain are checked in an informal way based on trust	
Informational		
Information sharing	Sharing an adequate amount of information in the chain	
Contact channel	Having good ways of contacting each other in the chain	

Fair practices	Description	Place your vote sticker here!
Information quality	Making sure that the information shared in the climate-smart agricultural chain is of good quality	
Operational transparency	Openness about how things are done in the climate-smart agricultural chain	
Collaborative/honest communication	Fair, honest and open communication to solve problems collaboratively in the climate-smart agricultural chain	
Joint resource creation	Working together in the chain to create climate-smart solutions, with fair access to information and knowledge and joint decision-making	
Interpersonal		
Responsiveness	Questions and remarks are answered adequately and quickly	
Supply chain socialization	Organizing a good level of mutual understanding by getting to know the people you work with in the climate-smart agricultural chain	
Politeness and respect in interpersonal treatment	Treating others in the climate-smart agricultural chain with kindness and respect in personal contact	
Cultural adaptation	Understanding and respecting the different customs and practices of others in the climate-smart agricultural chain	