Master's Thesis – master Sustainable Business and Innovation

Enablers for economically viable agricultural cooperatives: *a case study on Chile*

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PREFACE

Chile is a leading exporter and well known for its high-quality fruits, wine, and aquaculture products. What is less known is that almost 90% of the farmers in Chile are smallholder farmers, without any economic power and access to the international market, resulting in high inequality rates in this country. In order to improve the competitiveness of farmers in Chile through associativity, the Chilean Ministry of Agriculture has come up with a masterplan: *"Más Unidos, Plan Nacional de Asociatividad Chile"*. The idea behind the program is that business-like cooperatives will strengthen farmers' position in the supply chain and will contribute to the growing food demand in the world.

To assist the Chilean government in realising their national masterplan, Rabo Partnerships - a department of Rabobank with the overall objective to broaden access to financial services in Latin America, Africa, and Asia - was requested to assist them with advice as they have extended knowledge on agribusiness and cooperative development. Rabo Partnerships subsequently consulted me to contribute with knowledge about the enabling environment for cooperatives in Chile by means of my Master's thesis. The insights of this research can be used by Rabo Partnerships, as a theoretical underpinning for their advice to the Chilean Ministry of Agriculture.

SUMMARY

The food system in its current form is increasingly creating negative environmental and social outcomes. Agricultural cooperatives can play an important role in rethinking the system, by increasing farmers' economic power and producing sustainably. However, many smallholder cooperatives have shown to not be able to survive without support. Therefore, this thesis aims to provide an answer to the question "*what are the prerequisites for economically viable agricultural cooperatives and how can these be enabled?*" As a starting point, a theoretical framework was composed that combines a widespread variety of literature that is or could be related to the prerequisites for economic viability of agricultural cooperatives. The prerequisites range from organisational characteristics to financials, supply chain integration, and market adaptation. Also, the structural components of the Technological Innovation Systems approach were added to the framework with the intention to structure the enablers accordingly. Subsequently, members and managers of *eighteen agricultural cooperatives in Chile* – varying in size, location, and purpose – were consulted through semi-structured interviews to collect the data. These data were afterwards analysed using two different approaches: a *deductive approach* to test the relevance of earlier-identified prerequisites, and an *inductive approach* to newly discover enablers for those prerequisites. It was found that the prerequisites can be divided into four categories according to their relevance for economically viable cooperatives. The prerequisites belonging to the fourth category were found to clearly distinguish economically viable cooperatives from the unviable ones and include: *experience in the field*; *member commitment*; *access to finance*; *supply chain integration*; and *market adaptation*. When afterwards analysing the enablers, specific attention was paid to how these prerequisites can be facilitated. From the interviews it became clear that different existing initiatives are already being useful for cooperatives in meeting the prerequisites. Examples are government support programs, youth council meetings, and implementation of sustainability certifications. However, existing initiatives have proven not to be sufficient in turning cooperatives into vertically integrated, economically viable organisations that contribute to a sustainable food system. To reach that, this thesis concludes that *a less incremental and more dramatic shift is needed* in which science and technology such as Food Traceability Systems can lead to competitive advantage. *Multi-Stakeholder Partnerships* can make this possible – even for small cooperatives – by bringing together many different actors such as governmental organisations, businesses, innovative product holders, and cooperatives.

EXECUTIVE SUMMARY

PURPOSE AND APPROACH OF THIS RESEARCH

The globalising food system is increasingly creating negative environmental and social outcomes. This is also the case in Chile, where almost 90% of the farmers are smallholder farmers. These smallholder farmers have little economic power and inadequate access to the international market, resulting in high inequality rates in the country. Agricultural cooperatives can play an important role in rethinking the system, by increasing farmers' economic power and producing sustainably. However, many smallholder cooperatives have shown to not be able to survive without support ranging from flexibilisation of cooperative legislation to technical assistance and financial incentives. Therefore, the Chilean Ministry of Agriculture has come up with a masterplan called "Más Unidos", aiming to improve the competitiveness of farmers in Chile through associativity. The idea behind this is that business-like, modern cooperatives will strengthen farmers' position in the supply chain and will contribute to the growing food demand in the world. Rabo Partnerships was consulted by the Chilean Ministry of Agriculture to contribute to the program with knowledge and advise. This thesis in turn aims to assist Rabo Partnerships with knowledge and insights about the enabling environment for cooperatives in Chile, providing an answer to the question "*what are the prerequisites for economically viable agricultural cooperatives and how can these be enabled?*". Overall, the objectives of this thesis are:

1. to find out what the prerequisites for economically viable cooperatives are;
2. to find out which enablers contribute to meeting these prerequisites, and how these are interrelated.

This Executive Summary provides the main findings and recommendations that resulted from this thesis. But before presenting these results, a brief description will be given of the approach of the research.

To start, relevant concepts such as *cooperatives*, *the food systems approach*, and *economic viability* are defined. Afterwards, a theoretical framework is composed, combining a widespread variety of (both cooperative- related and unrelated) literature. This theoretical framework was tested and adjusted according to the findings, as shown in figure A and explained in more detail shortly.

To collect data, members and managers of *eighteen agricultural cooperatives in Chile* were interviewed, greatly varying in size, location, and purpose. When analysing these data, two different approaches were used: a *deductive approach* to test the relevance of the earlier-identified prerequisites and enablers, and an *inductive approach* to newly discover enablers. This resulted in the findings as described below.

MAIN FINDINGS AND RECOMMENDATIONS

Regarding the prerequisites, it was concluded that all prerequisites of the initial theoretical framework are somehow related to a cooperative's economic viability. However, the way in which they are related differs and can be divided into *four categories* as listed below, including the prerequisites that belong to that category (letters and numbers correspond with the prerequisites in figure A):

1. Currently not necessary for economic viability but expected to be in the long term (1.2b).
2. Important but absolutely not sufficient for economic viability (1.4a; 1.4b).
3. First steps in the process towards becoming economically viable (1.1a; 1.1c; 1.3a; 1.3b).

4. Clearly distinguishing economically viable cooperatives from the unviable ones (1.1b; 1.2a; 2.1; 3.1a; 3.1b; 3.2a; 4.1a; 4.1b; 4.2a; 4.3a).

When afterwards analysing enablers, specific attention was paid to how prerequisites of the fourth category can be facilitated, as this fits the scope of the research best.

The main findings and recommendations for each enabler (as depicted in figure A) are:

- **Government support programs** are already doing a good job in contributing to the development of cooperatives. However, many different programs with different goals are existing. They can be organised more efficiently by creating an overarching "master plan" that focuses on a balance between both the economic and organisational objectives of Más Unidos.
- **Certifications** are increasingly being adopted by cooperatives. This is recommended for cooperatives that wish to make a move towards sustainability and therewith generate a base of regular customers.
- No **Multi-Stakeholder Partnerships (MSPs)** were encountered during the research. It is strongly suggested for cooperatives to initiate MSPs together with other cooperatives and the different actors of the food system, as possible links between MSPs and other enablers were found as well. MSPs can thus be seen as an enabler for both prerequisites and enablers.
- Organising **youth council meetings** can be useful for any cooperative that struggles with member succession.
- **Food Traceability Systems (FTSs)** can be an effective way for cooperatives to reach competitiveness and sustainability. To implement FTSs requires a rather dramatic shift. It is therefore recommended to utilise MSPs to realise this.
- An **online tracking and connecting tool** can be adopted to transform the concept of agriculture and make data an important part of the process, automatically forming a possible solution to the succession problem.
- **Diversification and waste management** can be an innovative way of creating new products and increasing sustainability through a reduction of waste.

The results are represented in the adjusted theoretical framework in figure A, with the coloured lines corresponding with the component of prerequisites that is facilitated by the concerning enabler. The marked prerequisites belong to category 4 and thus are found to be the most distinguishing for the economic viability of cooperatives.

It can be concluded that different enablers are deployed already. Even though these enablers are useful and contribute to meeting the prerequisites, they have proven to not be sufficient in turning cooperatives into vertically integrated, economically viable organisations that contribute to a sustainable food system. To reach that, *a less incremental and more dramatic shift is needed* in which science and technology can lead to competitive advantage. However, considering the variation in size and resource capabilities of cooperatives in Chile, it is not realistic to expect that they will implement complex innovations by themselves. *MSPs could form a comprehensive solution to this*. By bringing together many different actors such as governmental organisations, businesses, innovative product holders, and cooperatives, they exchange and enable different forms of knowledge, skills, and capacities. With the increased knowledge that flows from this, along with mobilised resources and capabilities, it is even for small cooperatives feasible to implement complex innovations.

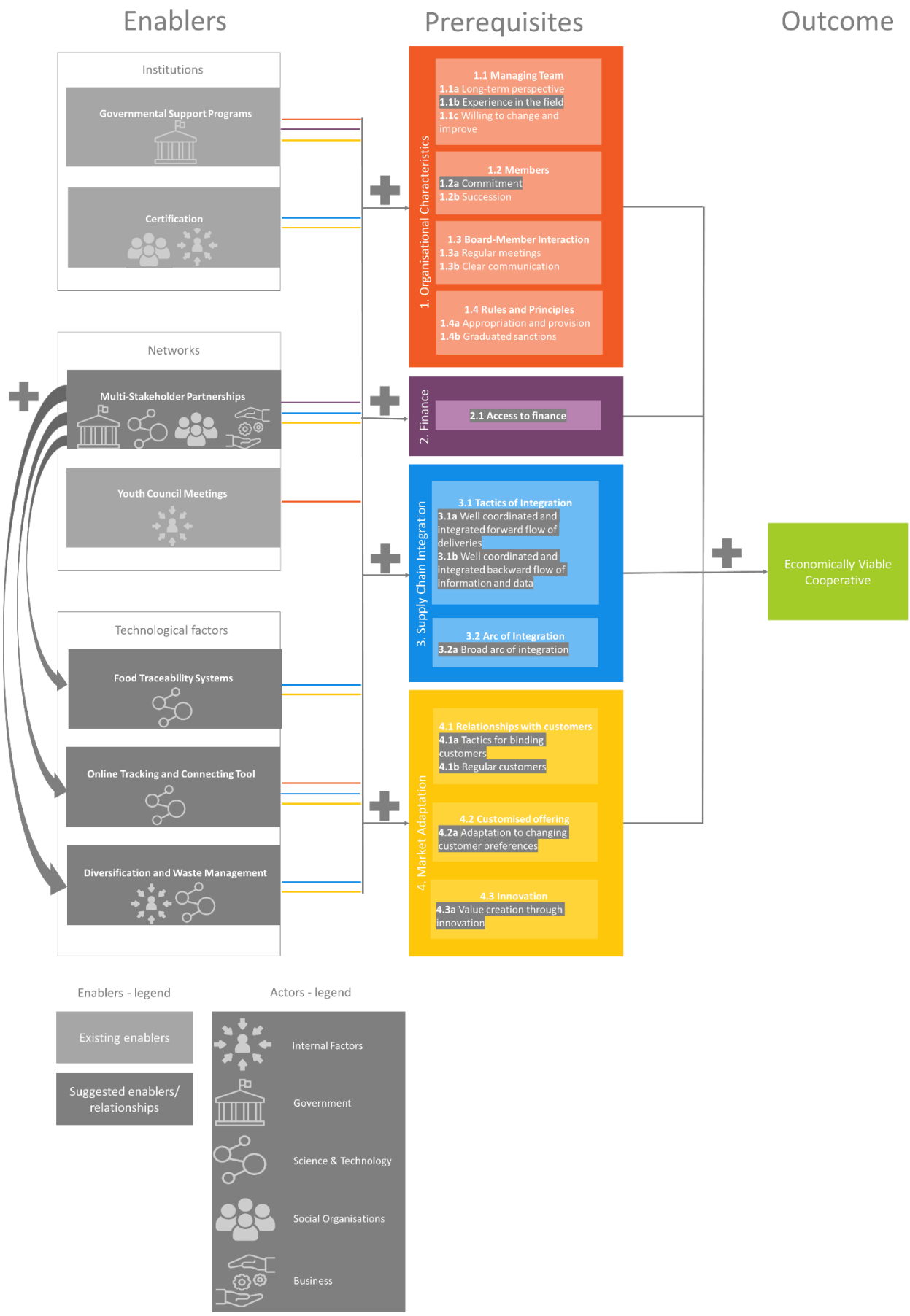

Figure A: Representation of main findings - adjusted theoretical framework.

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LIST OF ABBREVIATIONS

AC	Agricultural cooperative
CORFO	Corporación de Fomento de la Producción (Corporation for Production Promotion)
FAO	Food and Agriculture Organization
FIA	Fundación para la Innovación Agraria (Foundation for Agricultural Innovation)
FTS	Food Traceability System
GHG	Greenhouse gas
ICA	International Co-operative Alliance
INDAP	Instituto Desarrollo Agropecuario (Agricultural Development Institute)
MSP	Multi-Stakeholder Partnership
SCI	Supply Chain Integration
SERCOTEC	Servicio de Cooperación Técnica (Service for Technical Cooperation)
SFS	Sustainable food system
TIS	Technological Innovation Systems
WWF	World Wildlife Fund

1. INTRODUCTION

The world is estimated to count close to 10 billion people by 2050. In order to meet the needs that come with this growing population, food production has to increase by an estimated 50% compared to current levels (FAO, 2017). However, the food system in its current form is already causing negative system outcomes. As Kennedy et al. (2004) state: "The phenomenon of globalisation is having a major impact on food systems around the world". Environmentally speaking, food production accounts for 20-30 per cent of all anthropogenic greenhouse gas (GHG) emissions (Garnett, 2014), and for 70 per cent of potable water use while at the same time also being a major source of water pollution (WWF, 2013). Also, it was estimated by FAO (1995) that during the twentieth century, 75 per cent of the genetic diversity of domestic agricultural crops inherited from the nineteenth century was lost. On the socio-economic side, the intensification of agriculture is accompanied by a trend to larger farm sizes with hired labour globally. Smallholder farmers do not have any economic power and are losing their voice: low prices are a huge concern for them, as the profitability of farming activities has been progressively declining for decades in favour of the processing and retail sectors, therewith squeezing smallholder farmers out of the market and increasing inequality rates. (Ericksen, 2007; Gonzalez, 2018; Kennedy, Nantel & Shetty, 2004).

It is widely acknowledged: the future of food and agriculture is a big challenge and we need to rethink the system in order to overcome it. Cooperatives, defined as *autonomous associations of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise* (ICA, 1995), can play an important role in this as they make up a big part of our economy and society. Roughly half of all agricultural products is traded through cooperatives (Bijman et al., 2012); approximately half of all British farmers and 85 per cent of Spanish farmers are members of at least one agricultural cooperative (AC), and across the world, three-quarters of Fairtrade goods are produced by ACs (Gonzalez, 2018). Towards farmers, ACs are organisational mechanisms that can increase their lobby power (Fairtrade Foundation, 2011). A clear benefit of ACs is that they help farmers concentrate demand to buy cheaper inputs in bulk, but also allow them to negotiate better prices when selling produce to large buyers (Gonzalez, 2018).

The activities and purpose of ACs have been evolving over time to provide a useful means of both vertical and horizontal collaboration, enabling consolidation and simplification of supply chain activities (Baranchenko & Oglethorpe, 2011). In Europe, an overall trend of increased concentration can be observed, resulting in fewer but bigger cooperatives with members in more than one country (Gonzalez, 2018). Smallholder cooperatives, however, are facing challenges in their competition with multi-national agricultural firms and struggle to be economically viable (Meador et al., 2016; Bijman et al., 2012). As a consequence, different initiatives have been set up to support these cooperatives. Support measures range from flexibilisation of cooperative legislation to technical assistance and financial incentives (Bijman et al., 2012). However, to be able to contribute to a sustainable food system (SFS), cooperatives cannot infinitely be dependent of support. Thus, the question arises: what do these smallholder cooperatives need to be independent of support, yet economically viable? In other words:

What are the prerequisites for economically viable agricultural cooperatives and how can these be enabled?

Research is increasingly being conducted on the prerequisites of success for ACs. The organisational characteristics of successful cooperatives have been elaborately studied, as well as the enabling legal environment, financial aspects, and value chain coordination (Bijman, Muradian & Cechin, 2011; Carr,

Kariyawasam & Casile, 2008; Garnevska, Liu & Shadbolt, 2011; Sexton & Iskow, 1988; Ünal, Güclüsoy & Franquesa, 2009).

Next to that, van Berkum & Dengerik (2019) argue how crucial it is to look at the food system in its totality, instead of only considering individual aspects such as the producer (cooperative) or consumer. But it is still unclear how exactly this approach can be translated into a set of prerequisites, combining different topics of interest and relating those to cooperatives. Therefore, the first sub-question reads:

Sub-question 1: What are the prerequisites for economically viable cooperatives?

Taking it one step back, and enabling the full utilisation of support programs' potential, it is important to know how these prerequisites can be facilitated and by which enablers exactly. With this, the second sub-question arises:

Sub-question 2: Which enablers contribute to meeting these prerequisites, and how are these interrelated?

The final outcome of this research is aimed to be a framework showing how all enablers and prerequisites are interrelated and therewith enable a transition towards independent, economically viable cooperatives.

Chile offers the perfect case to answer this research question. 90% of all farms in Chile are small farms. These small farms are sub-commercial and domestically oriented, producing a relatively small share of agricultural output (INDAP, 2014). For that reason, Rabo Partnerships – a department of Rabobank with the overall objective to broaden access to financial services in Latin America, Africa, and Asia – has started a program to assist the Chilean government with their masterplan called "Más Unidos", aiming for a transition towards cooperatives being business-like organisations that are part of an integrated value chain and contribute to an SFS. In order to optimally assist the Chilean government with this, it is helpful for Rabobank to have more knowledge about the enabling environment for cooperatives in Chile.

In order to ultimately answer the posed research question, this thesis is structured as follows. First, relevant theoretical concepts are introduced. For the remainder of this research, it is crucial that you, the reader, and me are on the same page about what exactly cooperatives are, the food systems approach, its sustainability challenges and the role of cooperatives in this. It is also important to have a clear interpretation of the concept of economic viability. The literature section furthermore contains a literature review of possible prerequisites for economically viable cooperatives and the enablers thereof, structured according to the Technological Innovation Systems (TIS) theory, resulting in an initial theoretical framework. Second, the methodology is explained, including methods of data collection and methods of analysis. After that, the results for both research questions are presented, and the initial theoretical framework is adapted accordingly. This is followed by a discussion in which the results are linked with the theory section, and limitations of the research are highlighted. To conclude, the research question is answered after a short recap of the research.

RELEVANCE

All in all, the main focus of this research is to combine a widespread variety of theories and relate them to the economic viability of agricultural cooperatives. That is what makes this research unique in comparison to existing literature about this topic: much research has already been conducted on success factors for cooperatives, but the systemic way in which prerequisites and enablers are combined, connected, and adjusted according to findings, makes this thesis scientifically relevant. Another interesting characteristic is that this research approaches cooperatives rather as business-like

organisations, therefore also considers literature that was not directly intended for cooperatives in the first place, and explores and explains the possible link between that literature and cooperatives. The concept of market adaptation for example, is not the main focus in most cooperative-related researches, but its importance in relation to cooperatives is recognised in this thesis.

Answering the research question also fills a research gap that was mentioned by Gonzalez (2018, p. 226), who states that "if any, the most pressing issue, which requires further academic and empirical contributions, concerns researching strategies able to protect the alterity of transformative food and farming initiatives that can realise sustainable food systems".

I previously introduced how cooperatives can play an important role in the transformation towards sustainable food systems. By means of this research, I aim to socially contribute by providing recommendations that can help cooperatives become economically viable. When economically viable, cooperatives have a higher potential to improve smallholder farmers' lives. As farmers have increased economic power and access to the market through well-functioning cooperatives, they are better equipped to organise themselves and participate in the market, improving the livelihoods of these farmers and ultimately reducing inequality.

With these recommendations, Rabobank is also supported in their search for more knowledge about the enabling environment for cooperatives in Chile. Looking at it from a broader perspective, the findings of this research can contribute to the practices of more business organisations than just Rabobank. As this research explains the needs and incentives of cooperatives, organisations that wish to support or work with cooperatives can use it as a supporting document in creating a fruitful climate for ethical and/or sustainable business. This can eventually be applied in countries with a similar context outside of Chile, on which I further elaborate in chapter 5.

2. THEORY

2.1 COOPERATIVE DEFINITION

As touched upon in the introduction, the internationally accepted definition of cooperatives is "A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise" (ICA, 1995). In order for cooperatives to put these values into practice, seven internationally recognised cooperative principles have been put into place by ICA (1995):

1. voluntary and open membership;
2. democratic member control;
3. member economic participation;
4. autonomy and independence;
5. education, training and information for both members and the general public;
6. cooperation among cooperatives to strengthen the cooperative movement;
7. concern for the sustainable development of their communities.

Over the course of the years, these principles were simplified and reduced, therewith allowing ACs to attract large farmers and become more competitive. More emphasis was put on highlighting the differences between cooperatives and private companies, and less so on the ethical and educational aspects. As I consider exactly these aspects important for the transition of smallholder cooperatives, I chose to follow the seven principles as mentioned above.

"Cooperatives exist in many different sectors of the economy. From housing to banking, they have appeared over the decades to cover the very diverse needs of changing societies" (Gonzalez, 2018, p. 11). Since it is beyond the scope of this research to introduce every type of cooperative, the figure below summarises cooperatives based on the role of their members.

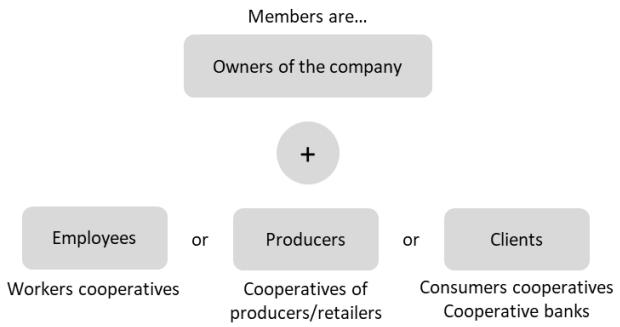

Figure 1: Typology of cooperatives across sectors based on members' role. Source: Gonzalez (2018).

As became clear in the introduction, this research focuses on ACs, existing in many different kinds and types (Bijman et al., 2012). Bijman et al. (2012) have selected seven classifications that can distinguish ACs from one another. The list is repeated below and used in the methodology section of this research to provide an overview of the characteristics of this research' sample. A cooperative can be classified on the basis of:

1. the sector(s) in which it operates or the main product it is handling;
2. the main functions it performs;
3. the diversity of functions and products it covers;

4. the position it has in the food chain;
5. the type of members it has;
6. the geographical scope of the membership;
7. the financial/ownership structure (Bijman et al., 2012).

2.2 The Food Systems Approach

The food systems approach depicts the different elements of our food systems and the relationships between those elements. This approach focuses on all activities related to the producing, processing and distributing of food, and looks at the drivers and outcomes of these activities, both in terms of food security, socio-economic aspects and the environment, also to be seen in the figure below (Berkhout et al., 2018).

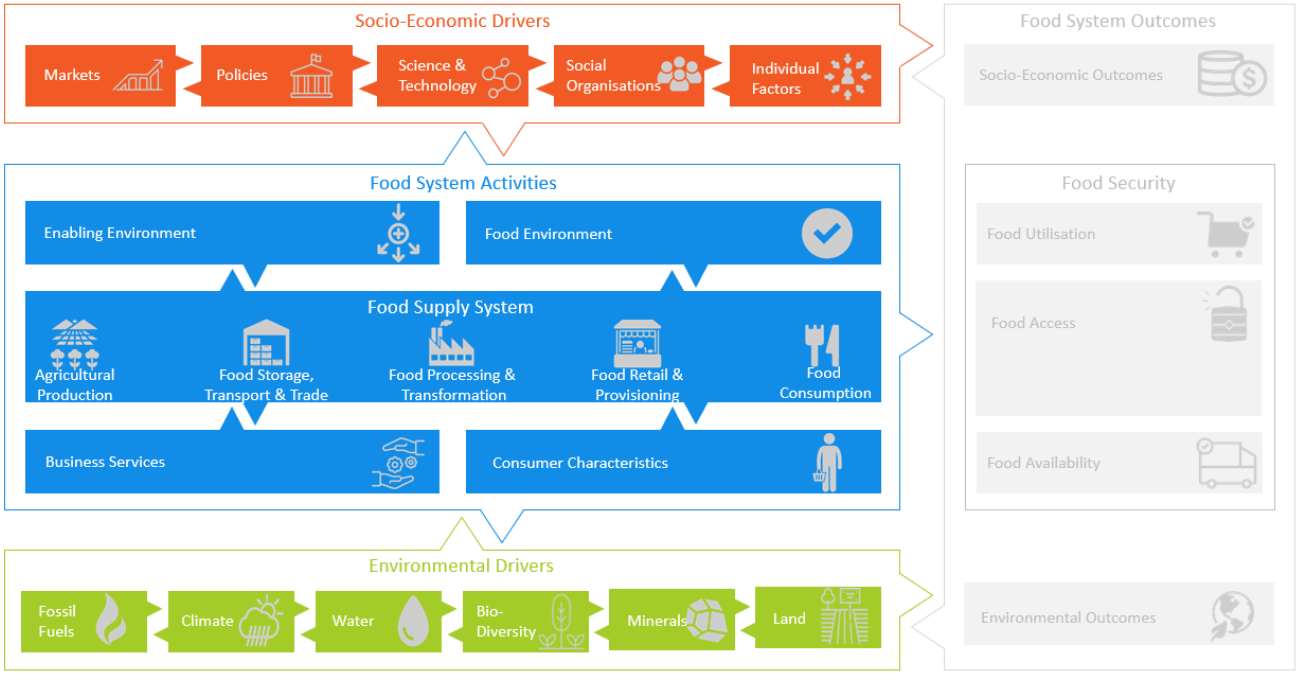

Figure 2: The relationships of food system activities to its drivers and outcomes. Source: Berkhout et al. (2018).

"A defining feature of systems thinking is that it views the behaviour of a system as an interplay of interacting subsystems, in which feedback plays a key role, rather than as a simple chain of cause-effect relationships" (van Berkum & Dengerink, 2019, p. 14). This also distinguishes food systems thinking from approaches as farming systems, sector or chain approaches. Even though these approaches also show market and environmental impacts of interventions, they do not tend to pay sufficient attention to feedback from the socio-economic system and/or ecosystem to the farm, sector or chain. As mentioned earlier, the wider perspective the food system approach offers is the value of the approach (van Berkum & Dengerink, 2019).

Throughout this research, cooperatives are considered as part of a food system: unavoidably influencing and influenced by socio-economic and environmental drivers; consumer characteristics; and business services. More on that is explained in the next two sections (2.2.1 and 2.2.2).

2.2.1 Sustainable Food Systems

The food system has increasingly been facing challenges over the past few decades. Gonzalez (2018) has listed these challenges, showing that almost all environmental drivers from the food system as depicted in figure 2 are currently forming a negative influence. This leads to negative environmental

outcomes, and thus causes a negative feedback loop between environmental drivers, food system activities, and environmental outcomes. Some of the challenges as listed by Gonzalez (2018) were mentioned in the introduction and are repeated below.

- **Energy:** This especially refers to the reliance on non-renewable fossil fuels and increasing demand for production of agrochemical inputs, operating machinery and transport to cover growing distances between different actors of the supply chain (UNEP, 2009).
- **Climate change:** The agricultural sector is a perpetrator as well as a victim of climate change. Food production accounts for 20-30 per cent of anthropogenic GHG emissions (Garnett, 2014), fuelling climate change which in turn creates more extreme weather events that affect global yields (IPCC, 2014).
- **Water:** Agriculture accounts for 70 per cent of potable water use while at the same time also being a major source of water pollution (Gonzalez, 2018).
- **Loss of agricultural biodiversity:** It is estimated that during the twentieth century, 75 per cent of the genetic diversity of domestic agricultural crops inherited from the nineteenth century was lost (FAO, 1995).
- **Land:** Tensions around land are becoming more serious, for example between food and biofuels production, but also in cases of land grabs which are increasing food security concerns (UNEP, 2009).

Because of all challenges and negative outcomes faced/caused by the food system, and at the same time considering the fact that world's food production has to increase with 50% towards 2050 to meet the needs of the growing population, Gonzalez (2018) argues that it is high time for a transformation to an SFS. This leads to the question how exactly an SFS can be defined. The DuPont Corporation (1991) defines an SFS as "ecologically sound, economically viable, socially acceptable". But Kloppenburg et al. (2000, p. 179) highlight that "what is socially acceptable is not necessarily just". This emphasises the importance of using food democracy as a key guiding principle of SFSs. In other words, producers and other actors should be integrated into the definition process, as they are the key agents of change (Gonzalez, 2018).

2.2.2 Sustainable Food Systems and Cooperatives

Being responsible for food production and able to influence farmers' lives, ACs can thus be seen as one of the potential key agents of change. Gonzalez (2018) conducted research in which she acknowledges and appreciates the important role ACs play in supporting individual farmer members, while still exploring difficult issues around co-optation that reveal a somehow uncomfortable, but potentially fruitful analysis to help ACs move towards a fairer and more sustainable future. According to Gonzalez (2018), there is a need for this from different perspectives, one of them being a state/policymaker perspective. From this perspective, "there is a need to inform the best approach to foster cooperation among farmers in order to design effective subsidy policies that do not direct public funds to farmers' organisations that might be reproducing the wrong kind of unequal cooperation" (Gonzalez, 2018, p. 40), perfectly relating to the objective of this research to assist in providing advice to the Chilean Ministry of Agriculture.

Furthermore, Gonzalez (2018, p. 40) mentions that "from an AC perspective, the ruthlessness of the market and agri-food industry forces ACs face also need to be considered, since these shape the room for manoeuvre ACs have in their practices and business models. How can farmers be supported to survive these market and industry forces without losing their voice as members, and without risking the environmental sustainability and viability of their farms?"

As introduced in the introduction, this thesis zooms in to the concern of economic viability by researching prerequisites for economically viable cooperatives, and enablers for those prerequisites. When exploring enablers, I mainly focused on the socio-economic drivers from the food system in figure 2, since these fit the objective of the research best: I consider it as more logical to advise a governmental program on influencing/optimising these drivers instead of the environmental ones.

2.3 Economic Viability

According to Webster (1956), viability is "the state or quality of being viable (i.e. able to live) and the state of being able to survive under conditions of wide geographical distribution, as species of animals and plants". This definition is also used to characterise the viability of artificial systems, entities and ideas, which have to maintain themselves in the long term to survive (Schuhbauer & Sumaila, 2016). Aubin, Bayen & Saint-Pierre (2011) state that the strength of the viability theory is that it involves interdisciplinary investigations, meaning it spans across fields which have traditionally developed in isolation.

One of these fields is economics, leading to the term 'economic viability' when combining it with viability. The focus here is on how an economic entity (e.g. a cooperative) can survive in the long term (Shuhbauer & Sumaila, 2016). A widely used option to measure economic viability is to purely focus on financial indicators such as net cash flow and returns on investments (Lery, Prado & Tietze, 1999; Adeogun, Abohweyere, Ogunbadejo, Tanko & Jim-Saiki, 2009). However, Tisdell (1996) argues that economic viability should not only address the momentary economic performance of an entity but also consider its future performance: an economic entity needs to be profitable not only today but also in the future. This approach was taken as a basis when operationalising the economic viability of cooperatives in section 3.2.1.

2.4 Prerequisites for Economically Viable Cooperatives

The exploration of a wide variety of literature resulted in several indicators (in this research called prerequisites) that are probable to correlate with the economic viability of cooperatives. In the search for literature, farmers' motives to cooperate, as presented in the table below, were taken as a starting point.

Motives	Examples
Countervailing power	Bargaining association
Economies of scale	Processing cooperative (including second-tier cooperatives)
Sharing of risk	Marketing cooperative with pool
Reduction of transaction costs	Cooperative auction
Access to resources	Credit cooperative
Access to markets	Marketing cooperative (including second-tier cooperatives)
Product innovation/quality control	Niche cooperative

Table 1: Motives for farmers to cooperate. Source: Bijman et al. (2012).

A so-called snowball approach was applied, being able to elaborate on the motives as described in the table, and to find additional ones. As mentioned in the introduction, this research approaches cooperatives as business-like organisations. That is why also business-focused topics are consulted instead of only literature that relates to cooperatives directly.

The next four sub-sections further explain the prerequisites that resulted from the literature search along with an exploration of the secondary data as later introduced in section 3.3.2, leading to the final theoretical framework that is presented in section 2.6.

2.4.1 Organisational Characteristics

For assessing the organisational structure of a cooperative, different studies were consulted. In the study by Carr et al. (2008), it becomes clear that having experienced managers with a long-term (beyond 1 to 5 years) perspective is a necessary factor for successful cooperatives. Besides that, it is important that the Board of Directors and members should be willing to meet regularly and plan strategically about the future of the cooperatives. Further, a good management team that is experienced in the appropriate field, can communicate well with the members, and is willing to change and improve, is crucial as well (Carr et al., 2008). Especially when considering the cooperative as part of a food system, it is necessary for the management team to be able to change and improve along with the other factors and actors in the system.

Crucial to a cooperative are its members. Thus, a member component cannot be missing from the organisational characteristics. Bijman & Verhees (2011, p. 3) state that "commitment is important for the viability of cooperatives". Member commitment to their cooperative might help in overcoming the free-rider problem – which is at the core of the cooperative's collective action dilemma – as it can be seen as an antecedent attitude of loyal behaviour (Cechin, Bijman, Pascucci & Omta, 2013). Other arguments for why member commitment is important for cooperatives are efficient operations, efficient decision-making, low cost of capital, and low transaction costs (Spiller & Wocken, 2006; Österberg, Hakelius & Nilsson, 2009; Bijman & Verhees, 2011). Another topic when it comes to members is their succession. Succession is important for the continuity of any type of business or organisation (Reynolds, 2009; Comini, Paolino & Feitosa, 2013), and thus also (or especially) for cooperatives as they are owned by their members.

For the rules and principles, the design principles developed by Ostrom (1990) are taken as a basis. These originally aim to provide a framework for analysing community-based natural resource management, but previous researches (e.g. Morrow & Hull, 1996) have applied it to cases of cooperatives as well. Cox et al. (2010) conducted a review of the relevant principles and thereafter re-evaluated them. The outcome of this was the framework as can be found in appendix 1. Please note that the word "user" is for the sake of this research changed into "member", making it more applicable to cooperatives. Of these principles, I decided to select "appropriation and provision" and "graduated sanctions", as I consider them as relevant for the functioning of cooperatives. Besides, these prerequisites are not covered in any of the other components, and I expected that they would allow for a clear and non-arbitrary assessment. Also, to maintain the balance of the organisational characteristics in comparison to the other components, I did not add more than two of Ostrom's design principles.

Taking all of the above into account, the component for assessing organisational characteristics looks as depicted below.

Figure 3: Component for assessing organisational characteristics.

2.4.2 Access to Finance

Table 1 reveals that one of famers' motives to cooperate, is access to resources. Considering the cooperative as a whole and its economic viability, an important resource (to obtain other resources) is finance. This statement is supported by Rey & Tirole (2007) and also by the outcomes of interviews that were conducted by Rabobank colleagues – after which mostly could be concluded that access to finance forms a challenge for many of the interviewed cooperatives. Therefore, a component related to finance is added to the framework in order to verify its relatedness to the economic viability of cooperatives.

Figure 4: Component for assessing finance.

2.4.3 Supply Chain Integration

Supply Chain Integration (SCI) can be defined as the degree to which a producer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organisation processes. The goal is to achieve effective and efficient flows of products and services, information, money and decisions, leading to maximum value for both customer and producer at low cost and high speed (Flynn, Huo & Zhao, 2009).

Multiple studies - e.g. (Fabbe-Costes & Jahre, 2008; Leuschner, Rogers & Charvet, 2013; Stank, Keller & Closs, 2001) - have shown that SCI indeed appears to have a positive effect on an organisation's performance. Thus, in order to strengthen cooperatives in Chile, SCI may be something to strive for.

Building on the work of Frolich & Westbrook (2001), it becomes clear that when assessing the degree of integration with the supply chain, they suggest to consider two aspects: SCI tactics, and the arc of integration. Frolich & Westbrook (2001) conceptualise the tactics with which manufacturers employ forms of integration as follows: the first type of integration involves coordinating and integrating the forward physical flow of deliveries between suppliers, manufacturers and customers. The other type of integration involves backward coordination of information technologies and the flow of data from customers to suppliers (Frolich & Westbrook, 2001).

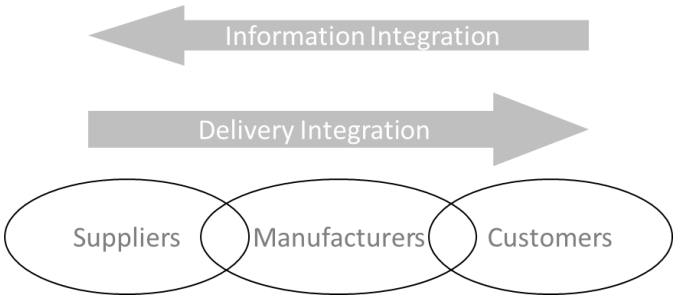

Figure 5: Integration in the supply chain. Source: Frolich & Westbrook (2001).

Considering the arc of integration, all manufacturers (in this research: ACs) make strategic decisions concerning the extent of upstream and downstream integration that they want to undertake (figure 6). Some ACs decide to engage in relatively little integration with suppliers or customers and thus have a relatively narrow arc of integration. Other cooperatives extensively integrate their organisations with upstream suppliers and downstream customers by pursuing a strategy with a broad arc of integration.

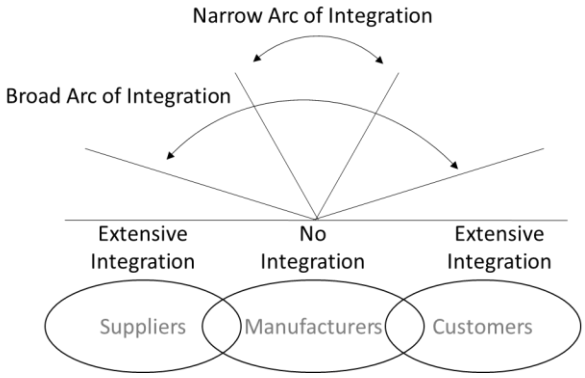

Figure 6: Arcs of integration. Source: Frolich & Westbrook (2001).

As stated by Frolich & Westbrook (2001, p. 187), "growing evidence suggests that the higher the level of integration with suppliers and customers in the supply chain the greater the potential benefits". Therefore, and taking the information of this section into account too, the proposed component for assessing integration with the supply chain looks as follows:

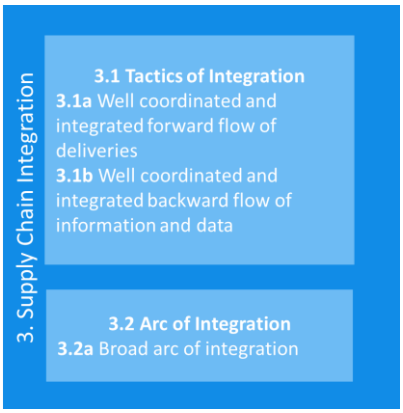

Figure 7: Component for assessing supply chain integration.

2.4.4 Market Adaptation

Another motive presented in table 1 is "access to markets". When exploring factors that lead to market access, a topic arose that has not been discussed in full detail yet: competitive advantage through customer responsiveness (Daugherty, Sabath & Rogers, 1992). Since customers also form a crucial part of the food system (see section 2.2), more attention to them is paid now.

The previous section already emphasised the importance of a well-coordinated and integrated backward flow of information and data. Mukerjee (2016, p. 5) also writes that "the knowledge of customers and the potential customer applications of a resource are crucial in determining how resources can potentially create value for customers and thereby enable the firm to create more value than the competitors". However, just managing the data is not enough, Mukerjee (2016) adds. It is important here to practice customer orientation in a proactive way, for it to turn into customer responsiveness and lead to a gain in competitive advantage (Mukerjee, 2016). According to Pehrsson (2012), customer responsiveness consists of different aspects. One of them is building relationships with customers through special tactics such as subscriptions, discounts, and personalised advertisements. In an ideal case, this would lead to a solid base of regular customers, of whom the cooperative is sure that they would always be interested in buying the produce when offered. Another aspect is customising the offering to changing customer preferences. This does not mean to fully switch from one product to another, but rather to make incremental changes and improvements to the product in order for it to remain competitive.

In order to fully optimise value by adapting to customers' preferences, Bocken et al. (2013), designed a model for value innovation opportunities for a firm and its stakeholders (figure 8). This also relates to the motive "product innovation/quality control" from table 1.

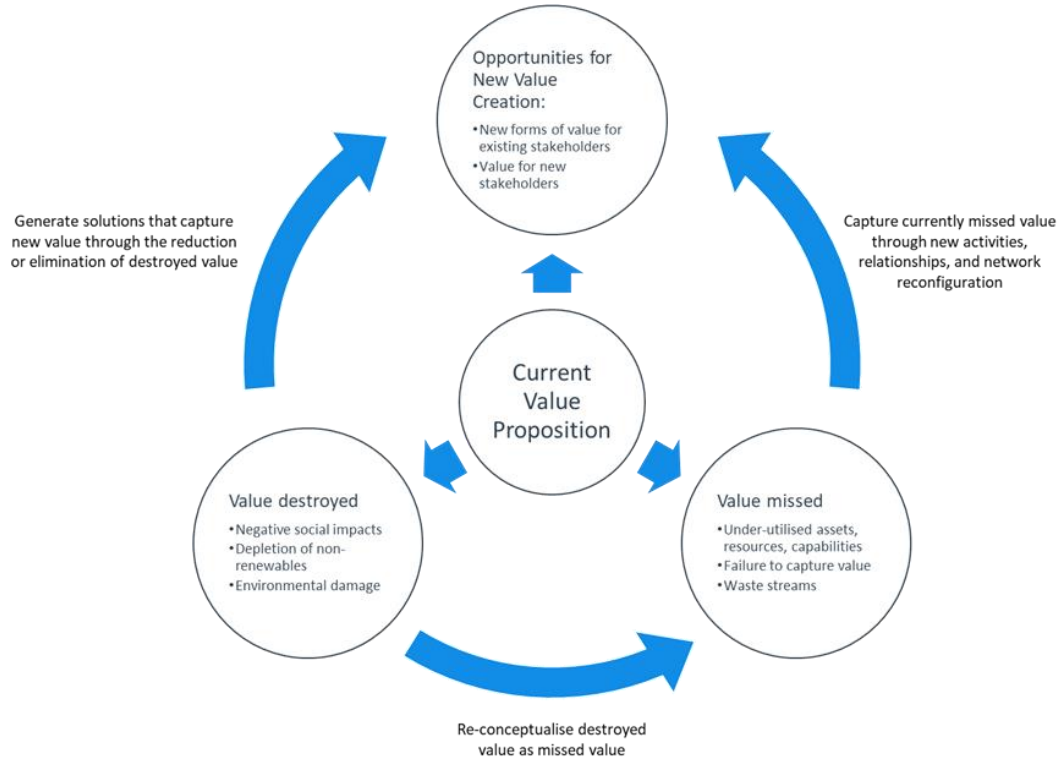

Figure 8: Model for value creation. Source: Bocken et al. (2013).

The value proposition is at the core of this model, representing the benefits delivered to stakeholders for which payment or another value exchange takes place (Bocken et al., 2013). Considering that it is focused on ACs as part of a food system, the stakeholders as mentioned by Bocken et al. (2013), are defined as customers in this research. In delivering the value proposition, the firm (in this research: cooperative) may destroy value. Value destroyed can take various forms, but in the sustainability context it mostly concerns the damaging environmental and social impacts of business activities. In the literature, these impacts are often referred to as negative externalities (Bocken et al., 2013). Missed value opportunities represent situations where cooperatives fail to capitalise on existing assets, resources and capabilities, are operating below industry best practice, or fail to receive the benefits

they seek from the network – or in this research: food system. This might be because of poorly designed value creation or capture systems, failure to acknowledge value, or inability to show customers why the benefit is worth paying for (Bocken et al., 2013). New value opportunities help expand the cooperative into new markets and introduce new products and services that offer enhanced benefits to customers. Figure 8 shows how these four aforementioned value concepts are interrelated and can therewith enhance value.

Taking all of the above into account, the following component proposed for assessing market adaptation was created:

Figure 9: Component for assessing market adaptation.

2.5 Enablers for prerequisites: Technological Innovation Systems

This research aims to assist Rabobank in their program of advising the Chilean Ministry of Agriculture on how to support cooperatives in their transition towards economically viable organisations that contribute to an SFS. Therefore, after finding out which prerequisites are important for being economically viable, it is relevant to study how these prerequisites can be enabled. As became clear in the beginning of this chapter, a globalising world and increasing interaction between different actors call for a systems approach. A widely used approach when studying the development and diffusion of new technologies, is the Technological Innovation Systems (TIS) approach. This approach "highlights the role of institutional structures and the importance of actors for the emergence of technological innovations" (Musiolik, Markard & Hekkert, 2012, pp. 1032-1033). As Hekkert, Negro, Heimeriks & Harmsen (2011) describe, it is made up of four main elements: actors, institutions, networks, and technological factors.

Hekkert et al. (2007) concluded that seven basic functions need to be served in a TIS, including:

1. entrepreneurial activities;
2. knowledge development;
3. knowledge diffusion through networks;
4. guidance of the search;
5. market formation;
6. resources mobilisation;
7. creation of legitimacy/counteract resistance to change.

Even though this research is not so much about new technologies (only one of the prerequisites involves innovation), I still consider the TIS approach useful to structure the enablers. When studying

the emergence of a new technology – which is the original purpose of TIS – one looks at the transition of the system before the new technology, towards the system during/after adopting the new technology, including the roles of institutional structures and actors during the process. With this research, I also aim to contribute to a transition, namely that of economically unviable cooperatives towards economically viable cooperatives. Because of this, and taking into account that I do not just consider internal characteristics of the cooperative but rather the whole food system it is operating in – including institutional structures and actors - the TIS theory is applied here.

Thus, the enablers are organised according to the structural components of TIS. Some concepts of possible enablers are already added to the theoretical framework in sections 2.5.3a and 2.5.4a so that their suitability for cooperatives could be assessed during the data collection process and adjusted accordingly. More enablers were discovered in the course of the research.

2.5.1 Actors

Hekkert et al. (2011, p. 5) state that "the potential variety of relevant actors is enormous, ranging from private actors to public actors, and from technology developers to technology adopters".

As was explained in section 2.2, this research views cooperatives as part of a food system. Therefore, the roles of the following actors of the food system (see figure 2) are considered when examining enablers, since these actors are expected to be easiest to influence/optimise through a governmental program:

Figure 10: Actors of the food system that can play a role in the enablers.

In order to classify as an enabler, actors must contribute to fulfilling at least one of the seven functions as stated by Hekkert et al. (2007). Later in this research, when results are discussed and enablers and the roles of actors are studied more in-depth, section 4.2 shows for each enabler which actors are contributing to it, and which functions of the TIS theory they fulfil.

2.5.2 Institutions

Hekkert et al. (2011, p. 5) state that "institutional structures are at the core of the innovation system concept". A distinction can be made between formal and informal institutions, with formal institutions being the rules that are codified and enforced by some authority, and informal institutions being more tacit and organically shaped by the collective interaction of actors. Even though informal institutions can be of great influence, they are impossible to map systematically (Hekkert et al., 2011).

I decided to not study the Chilean cooperative legislation, as I have too little expertise on this topic to have meaningful insights and/or recommendations on it. Besides that, this research focuses on topics

that could be rather easily influenced and adapted; I do not consider the law as one of those. Instead, I decided to focus on another activity which is exercised by the government, i.e. support programs for cooperatives.

According to Hekkert et al. (2011) it is important to determine the policy goal and geographical as well as technological scope of the project first, before being able to choose the right policy instruments (in this case: government support programs). The overarching objective of the "Más Unidos" program of the Chilean Ministry of Agriculture – around which this research is focused - is to improve the competitiveness of farmers through associativity (Ministerio de Agricultura, n.d.). This objective can be split up into two dimensions:

1. Economic goal: improving farmers' competitiveness and bargaining power along the value chain.
2. Organisational goal: improving associativity and organisation among farmers in the form of a well-organised cooperative. A well-organised cooperative should fulfil the cooperative principles. Hence, this goal can be split up into seven "sub-goals" based on the earlier-introduced cooperative principles:
    a. voluntary and open membership;
    b. democratic member control;
    c. member economic participation;
    d. autonomy and independence;
    e. education, training and information for both members and the general public;
    f. cooperation among cooperatives to strengthen the cooperative movement;
    g. concern for the sustainable development of their communities (ICA, 1995).

When analysing government support programs for cooperatives and their suitability within the overarching "Más Unidos" program, the (sub-)goals as listed above are taken as a starting point for assessment and recommendations.

2.5.3 Networks

The central idea of the innovation system framework is that the actors as introduced in section 2.5.1 function in networks (Hekkert et al., 2011). The theory below suggests a concept that could be used for the implementation of a network approach.

2.5.3a Multi-Stakeholder Partnerships

Building on the research by Sanginga et al. (2007) and the introduction of this research, it can be stated that ACs are increasingly facing complex problems. Hence, it is suggested by a wide variety of researchers (Ashby, 2003; Brouwer, Woodhill, Hemmati, Verhoosel & van Vugt, 2015; Chambers, 2005; Sanginga et al., 2007) that there is a profound need for cooperation and sharing of resources. An example that flows from this, is the concept of Multi-Stakeholder Partnerships (MSPs). This concept is defined by the Centre for Development Innovation as "A process of interactive learning, empowerment and participatory governance that enables stakeholders with interconnected problems and ambitions, but often differing interests, to be collectively innovative and resilient when faced with the emerging risks, crises and opportunities of a complex and changing environment" (Brouwer et al., 2015, p. 14). Brouwer et al. (2015) list civil society, government, business and science as collaborators for MSPs, which are also all actors of the food system as defined in section 2.2.

2.5.4 Technological Factors

The technological factors consist of artefacts and the technological infrastructures in which they are integrated (Hekkert et al., 2011). The concept of Food Traceability Systems (FTSs) as explained below

could be used as a technological infrastructure that enables the transition towards economically viable cooperatives.

2.5.4a Food Traceability Systems

According to Kalfagianni (2006, p. 13), "two major transformations have taken place in the food system which led to requirements for more transparency in the food chain". First, the increasing awareness and stronger demands for sustainability. And second, the increasing complexity of complex food chains with corresponding diffusion of responsibility among a variety of actors (Kalfagianni, 2006). Different means exist to achieve food transparency. Policies and politics for example, as researched by Kalfagianni (2006), but also food traceability in the form of technologies.

Bosona & Gebresenbet (2013, p. 35) define food traceability as "part of logistics management that capture, store, and transmit adequate information about food-producing at all stages in the food supply chain so that the product can be checked for safety and quality control, traced upward, and tracked downward at any time required". The figure below visualises the different aspects of traceability.

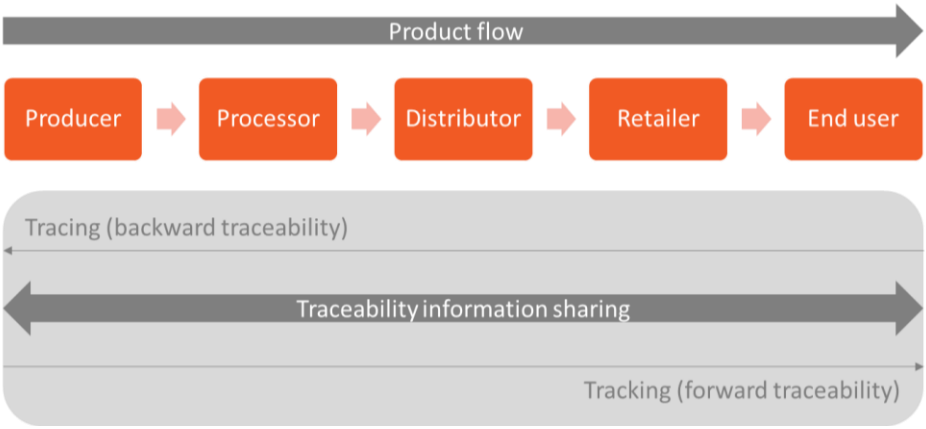

Figure 11: Conceptual representation of material and traceability information flow that best reflects the case of food supply chain. Source: Bosona & Gebresenbet (2013).

An increasing variety of technological innovations is available, each covering different product traceability purposes. A research by Tian (2017) introduces the concept of utilising Radio-Frequency Identification and blockchain technology for an FTS, which can realise the traceability with trusted information in the entire agri-food supply chain. However, since the technology behind FTSs is a completely different topic on its own that is beyond the scope of this research, I do not go into depth about this.

The concept of FTSs is introduced in this research to assess whether it could be an enabler for economically viable cooperatives. The drivers behind implementing FTSs are thus of more interest than the technology behind it. These can be divided into five categories, being regulatory, safety & quality, social, economic, and technological concerns. As a consequence of this, several benefits as listed below are expected to thrive from FTSs according to Bosona & Gebresenbet (2013).

- **Increase in customer satisfaction** which is reflected by the increase in consumer confidence in food available in the market and the availability of adequate information to make food choices.
- **Improvement in food crises management** arising from an increase in food recall activities performance, enhancing the level of security as well as reducing food recall costs.

- **Improvement in Food Supply Chain Management (FSCM)** and therewith enabling other actors in the chain to increase cooperation among them and develop their technical and economic competence.
- **Competence development** and forming a source of competitive advantages.
- **Technological and scientific contribution** because the new traceability devices used to capture, store, and transmit data significantly encourage the efforts to develop more advanced technologies and promote the future research regarding food traceability and FSCM.
- **Contribution to agricultural sustainability** as FTSs are very instrumental for transparency of food production and sourcing that in turn helps the implementation of sustainability initiatives, especially at the farm level.

Aside from the benefits, food producing organisations and companies face many barriers when implementing FTSs. These can be categorised into resource, information, standard, capacity and awareness limitations (Bosona & Gebresenbet, 2013). The barriers as well as the earlier-mentioned drivers and benefits of FTSs were investigated during the data collection process in order to ultimately find out if and how FTSs can optimally be made suitable for cooperatives.

2.6 Theoretical Framework

Combining all previous sections of this chapter leads to the complete theoretical framework as shown in figure 12. Please note that this framework was used as a starting point for interviewing cooperatives, expecting that during the research, when taking findings and results into account, this preliminary framework is modified into a final framework with more enablers and classification of prerequisites. The prerequisites are in this research treated differently from enablers and both undergo a different type of analysis. Section 3.4 further elaborates on this.

I am aware of the fact that the success of cooperatives is dependent on more - external - factors such as climate conditions. But since these factors are mostly predetermined and difficult to influence, they are not given an important role as they go beyond the scope of this research.

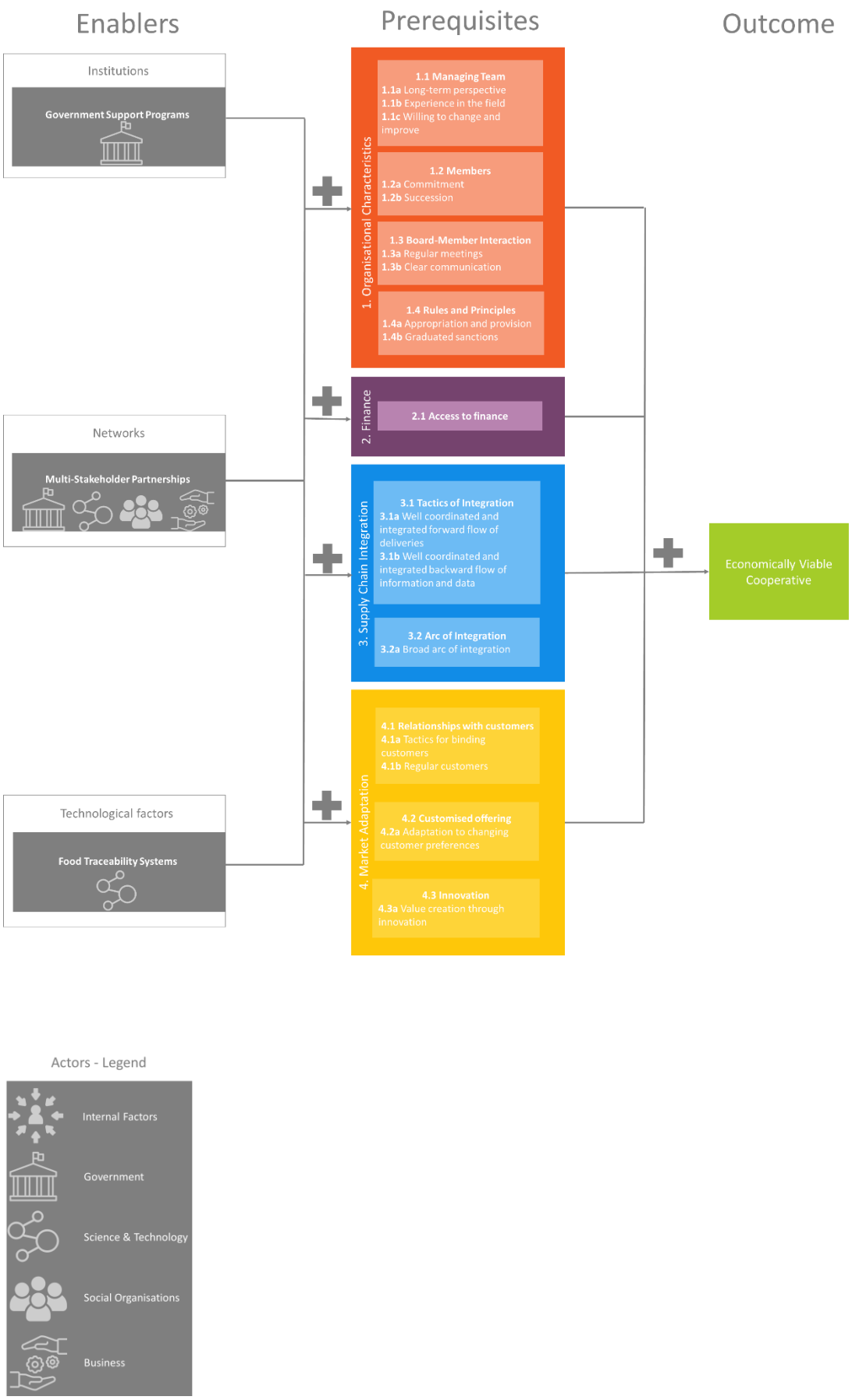

Figure 12: Complete theoretical framework.

3. METHODOLOGY

3.1 SAMPLE SELECTION STRATEGY

3.1.1 Cooperatives

For this research, cooperatives are the unit of analysis. The relevant population consists of ACs in Chile. ACs in Chile form a good case to find an answer to the research question. 90% of all farms in Chile are small farms, most of them economically unviable. Therefore, Rabo Partnerships started a program to assist the Chilean government with their "Más Unidos" initiative to facilitate the transition of cooperatives towards becoming more business-like organisations that are part of an integrated value chain and contribute to an SFS. This research is partly carried out to provide Rabo Partnerships with relevant knowledge about the enabling environment for cooperatives in Chile, giving me the opportunity to live and work in Chile for four months. Combining all the above reasons leads to ACs in Chile being the relevant population for this research. Both economically viable and economically unviable cooperatives were included in the sample, in order to be able to compare both cases with each other.

As a sample selection strategy, judgmental sampling - a type of non-probability sampling - was applied. Non- probability sampling allows researchers to choose sample elements by themselves instead of selecting them on a probability basis or by another means. Judgmental sampling specifically implies that researchers have the freedom to choose whoever they can find and seem to be relevant for the research. Even though this is not a very precise strategy, it is especially useful in early stages of exploratory research: to test or even gain ideas about a subject of interest (Blumberg et al., 2014). That is exactly what is done in this research: first the preliminary prerequisites for economic viability are tested along with some initial enablers, and afterwards more enablers are newly discovered. Besides that, the sample selection is also dependent on which cooperatives are willing to cooperate and be interviewed.

Even though non-probability sampling is applied, still certain conditions should be satisfied in the sample selection process. This research specifically focuses on for-profit ACs in the food & Agri sector, since this is also the group of interest of Rabo Partnerships. The locations of the selected cooperatives are spread all over the county as can be seen in Annex B, varying in size from 10 to 1000 members, and founded at least two years ago. This allows to compare and determine which prerequisites and enablers are depending on size and region, and which ones are applicable for all ACs. Of every selected cooperative, at least one board member and one regular member were chosen to be interviewed. This is to assure that different perspectives on the cooperatives and the system they are operating in, are considered.

A complete overview of the selected cooperatives' characteristics, structured according to the list of classifications by Bijman et al. (2012) as introduced in section 2.1, can be found in Annex C. The names of cooperatives have been left out here to guarantee the anonymity of respondents.

3.1.2 Additional Stakeholders

Next to cooperatives, I also spoke with representatives from other organisations at workshops and events. These organisations include stakeholders that play a role in working with or supporting cooperatives, such as governmental organisations, banks, and universities. Hearing things from their

perspective was useful to see things differently than during interviews with cooperatives, obtain additional information and check the feasibility of suggestions that came up during the interviews.

3.2 OPERATIONALISATION

3.2.1 Economic Viability

The dependent variable of this research is the economic viability of cooperatives. Before investigating the prerequisites and enablers, it is crucial to define what exactly economically viable cooperatives are. For this research, it is held that economically viable cooperatives satisfy the following conditions:

1. The cooperative does not depend on monetary support since at least one year.
2. The cooperative has shown to not make losses in the past year.
3. The cooperative expects to be profitable in the coming year.

These conditions are chosen since the aim of the program of which this research is part, is to assist cooperatives in their transition towards more self-relying, business-like organisations, away from monetary (governmental) support. The conditions are also based on the statement that an economic entity needs to be profitable not only today but also in the future, as introduced in section 2.3.

3.2.2 Prerequisites for Economic Viability

The framework in section 2.6 shows how the prerequisites for economically viable cooperatives can be split up into different components and concepts. The concepts are defined in more detail in this section (letters and numbers refer to the ones in the framework of figure 12). Please note that this is to provide an idea of what I aimed to find out about each concept. The complete set of posed interview questions is not limited to the questions below as I applied a semi-structured interview approach, which is further explained in section 3.3.1.

1.1a Does the cooperative's strategy take the long-term perspective (>3 years) into account?

1.1b Do the board members have experience in the field of management?

1.1c Are board members open to criticism, and willing to adapt and improve their way of working according to changes in the food system?

1.2a Are members committed to contribute to and participate in the cooperative?

1.2b With regards to the future of the cooperative: is succession available for the current members?

1.3a Does the board have scheduled meetings with members? If yes, how often?

1.3b Is it clear to the board and members how they can approach each other? Are members of the opinion that the board communicates its decisions clearly to them?

1.4a Are rules in place for how profit is distributed among members? If yes, are these proportionally consistent with inputs (e.g. time, money, materials)?

1.4b What are the consequences for not complying with the rules of the cooperative?

2.1 Does the cooperative have access to finance, in order to make the investments desired/required?

3.1a Does the product flow of the cooperative go through a coordinated process with actors further down in the value chain (e.g. food system actors responsible for transport, processing, retail, and the consumers, as depicted in figure 2)? Which agreements do they have with each other?

3.1b Does the cooperative receive a steady flow of information and data from actors further down in the value chain (e.g. food system actors responsible for transport, processing, retail, and the consumers, as depicted in figure 2)? Which agreements do they have with each other?

3.2a How far integrated is the cooperative within the value chain? With which food supply system actors of the food system as depicted in figure 2?

4.1a Does the cooperative have special advertising/subscription/offers in place to bind customers?

4.1b Does the cooperative have a solid base of regular customers; of whom they are sure they will always buy their products when available?

4.2a Is the cooperative flexible enough to adapt their offering according to customers' preferences and considering changes, barriers and opportunities in the food system?

4.3a Does the cooperative have innovative capacity to create/enhance value?

3.2.3 Enablers

My objective was to discover largest part of the enablers for prerequisites of economically viable cooperatives inductively during the research. Enablers are here seen as factors, actors, and activities that make it possible for cooperatives that at first do not satisfy the prerequisites, to make a transition after which they do satisfy the prerequisites and thus are economically viable.

Besides newly discovering enablers, the suitability of the concepts as introduced in section 2.5 is tested and adjusted during this research.

3.3 Data Collection

3.3.1 Primary Data: Semi-Structured Interviews

A very common method of primary data collection in qualitative research is the semi-structured interview. Semi-structured interviews usually start with specific questions but allow the interviewee to follow his or her own thoughts later on (Blumberg et al., 2014). Compared to structured interviews, semi-structured interviews are more suitable for exploratory research, as shown in the table below.

	Structured	Semi-structured or unstructured
Type of study	Explanatory or descriptive	Exploratory and explanatory (semi-structured)
Purpose	Providing valid and reliable measurements of theoretical concepts	Learning the respondent's viewpoint regarding situations relevant to the broader research problem
Instrument	Questionnaire (i.e. specified set of predefined questions)	Memory list interview guide
Format	Fixed to the initial questionnaire	Flexible depending on the course of the conversation, follow-up and new questions raised

Table 2: Structured and unstructured interviews. Source: Blumberg et al. (2014).

As stated by Blumberg et al. (2014), "exploring a topic needs at least a semi-structured approach that gives the respondent the option to turn the interview in different directions and to come up with new sub-topics that the researcher often has not thought about beforehand". This research has an exploratory character since it aims to test the prerequisites for economically viable cooperatives as shown in section 2.4, but also leaves room for coming up with different prerequisites. Besides that, most of the specific enablers for these prerequisites had to be completely newly discovered. Therefore, semi-structured interviews are most relevant.

The interviews were held with a selection of the sample as defined in section 3.1: board members and regular members of producer cooperatives in the food & Agri sector in Chile, plus members from organisations that work with or support cooperatives. The operationalisation from 3.2.2 was taken as a starting point for the interviews. Depending on the answers, follow-up questions were asked, aiming to:

- verify the answers by asking for elaboration and examples;
- test the suitability of enablers as introduced in section 2.5, by introducing their concepts and asking the interviewees opinion on them (which benefits/challenges do they foresee?);
- discover enablers by asking how cooperatives manage to satisfy certain prerequisites.

Interviews were held either in English or Spanish, whichever made the interviewee feel most comfortable and motivated to share thoughts and experiences. Since my own level of Spanish is sufficient to ask the questions in Spanish and interpret the answers afterwards, it was not needed to call in a translator.

3.3.1a Personal Interviews

Part of the semi-structured interviews were carried out through personal interviews. According to Blumberg et al. (2014), a personal interview is a two-way conversation initiated by an interviewer with the objective to obtain information from a participant. Reasons for choosing this as an approach for communication are that it usually results in good cooperation from respondents, and it is easy to ask follow-up questions and gather information by observation, making it applicable for semi-structured interviews in comparison to e.g. surveys.

This approach was preferred over the approach as explained in the next section (3.3.1b). So, all interviewees that were easily accessible by bus, train, or car were interviewed personally.

3.3.1b Telephone Interviews

Since Chile is a huge country, and not all cooperatives and organisations are easily accessible, part of

the interviews was held by telephone. This expanded the geographic coverage of the sample and has lower costs than personal interviews. Furthermore, telephone interviews provide better access to hard-to-reach respondents through repeated call-backs (Blumberg et al., 2014).

3.3.2 Secondary Data

Apart from primary data, relevant secondary data were collected in order to find an answer to the research question. Secondary data includes information or data that has already been collected and recorded by someone else, usually for other purposes. Using secondary data for research is an approach that allows to obtain high quality data while saving money and time (Blumberg, 2014).

So, in order to not spend much time on primary data collection about topics that have been widely researched already, desk research was done as well. For this research, country data and information published by the Chilean government appeared to be of great use. Since institutions like the government usually have better access to information providers, higher budgets for data collection and many experts were involved in the research and data-collection process, their data are of higher quality than what I would be able to gather by myself. Also interviews with cooperatives and additional stakeholders that were carried out by Rabobank colleagues were useful and studied in depth in order to prevent asking cooperatives the same questions twice. These interviews consist of eighteen semi-structured interviews with ACs, and eleven semi-structured interviews with additional stakeholder organisations, all widely spread over Chile.

Secondary data were of great use for the topics of:

- the current state of ACs in Chile;
- enabling conditions for cooperatives (both in General and in Chile);
- the specific cooperatives and organisations to be interviewed.

Secondary information in this research was useful for several components of the theoretical framework as depicted in section 2.6. When it comes to prerequisites, secondary data were used for the preparation of interviews with cooperatives. It allowed to already gain insights on whether cooperatives are satisfying some of the prerequisites or not. Figure 15 in the results section clearly shows which information was obtained through secondary data, and which through primary data. Furthermore, secondary data proved to be useful when investigating which enablers (e.g. programs and activities) already exist to support cooperatives with the transition towards becoming economically viable.

3.4 Methods of Analysis

3.4.1 Deductive Approach

To find an answer to sub-question 1 “What are the prerequisites for economically viable cooperatives?”, a deductive approach of analysis was applied. As stated by Burnard et al. (2008, p. 429), “deductive approaches involve using a structure or predetermined framework to analyse data. Essentially, the researcher imposes their own structure or theories on the data and then uses these to analyse the interview transcripts”. Since a theoretical framework with prerequisites for economically viable cooperatives has already been created in the theory section, applying a deductive approach for sub-question 1 is relevant here. To test the framework, it is for all cooperatives (both economically viable and economically unviable) determined for each prerequisite whether they comply with it or not. These results are presented in percentages and graphs, which makes it possible to compare them and draw conclusions from this.

A deductive approach is also applied to test the suitability of the concepts for enablers that were introduced in section 2.5. This was done by explaining and proposing the concepts during interviews and encouraging interviewees to share their opinion on these. In this way, I found out about the barriers and advantages to implementing these enablers, so that in the end fitting suggestions could be made.

3.4.2 Inductive Approach

For the rest of sub-question 2 "Which enablers contribute to meeting these prerequisites, and how are these interrelated?" it was relevant to apply an inductive approach of analysis. "This involves analysing data with little or no predetermined theory, structure or framework and uses the actual data itself to derive the structure of analysis" (Burnard et al., 2008, p. 429). Thomas (2006) lists three purposes underlying the development of the general inductive analysis approach, as listed below.

1. Condense extensive and varied raw text data into a brief, summary format.
2. Establish clear links between the research objectives and the summary findings derived from the raw data and ensure that these links are both transparent and defensible.
3. Develop a model or theory about the underlying structure of experiences or processes that are evident in the data.

For this research, purpose 1 and 2 are relevant. I fulfilled these by applying the coding process as depicted below. The last step "create a model incorporating most important categories" means in this case to add the enablers to the final framework with enablers and prerequisites. As a tool for this analysis, the computer program NVivo was used.

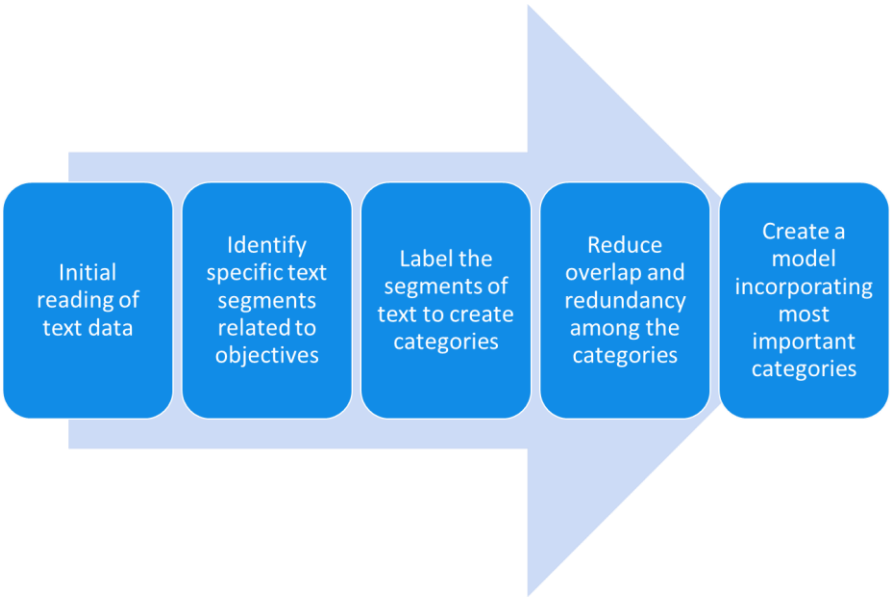

Figure 13: The coding process in inductive analysis. Source: Thomas (2006).

4. RESULTS

4.1 PREREQUISITES FOR ECONOMICALLY VIABLE COOPERATIVES

In order to complete the missing data – after consulting the secondary data - follow-ups were organised with all cooperatives according to the methods as described in section 3.3.1. These follow-ups ranged from drinking fruit juice in small on-the-farm offices to a phone call with the strategic development engineer of a cooperative whose brand can be spotted all over Chile. It thus became even more clear how greatly all different cooperatives vary from each other. The largest part of the follow-ups was held in Spanish, considering the level of English of most interviewees, and the fact that interviews in Spanish would make them feel more comfortable and able to share thoughts and opinions.

For some cooperatives, much about the prerequisites became clear when having natural conversations with interviewees about their cooperative and the way it functions. In other cases, more specific questions had to be asked such as “Does the cooperative have any objectives in mind about what should be achieved over the long-term, meaning in three years or more?” (for 1.1a of the theoretical framework). When these questions were answered with a “yes”, interviewees were always asked to provide an example or to elaborate more, which gave me the chance to verify the responses. When answered with a “no”, interviewees were asked whether they thought that satisfying that specific prerequisite would improve the (future of the) cooperative and on which aspects. They were also asked about ideas on how and what to change in order to comply. I also proposed the enablers from section 2.5 and earlier-heard ideas and opinions to check how widely applicable these would be.

4.1.1 Overall Findings

After the process as described above, it could be determined which cooperatives can be classified as economically viable, and which not (considering section 3.2.1). It also became clear which cooperatives satisfy which prerequisites of the theoretical framework. All these findings can be summarised as presented in the figure below.

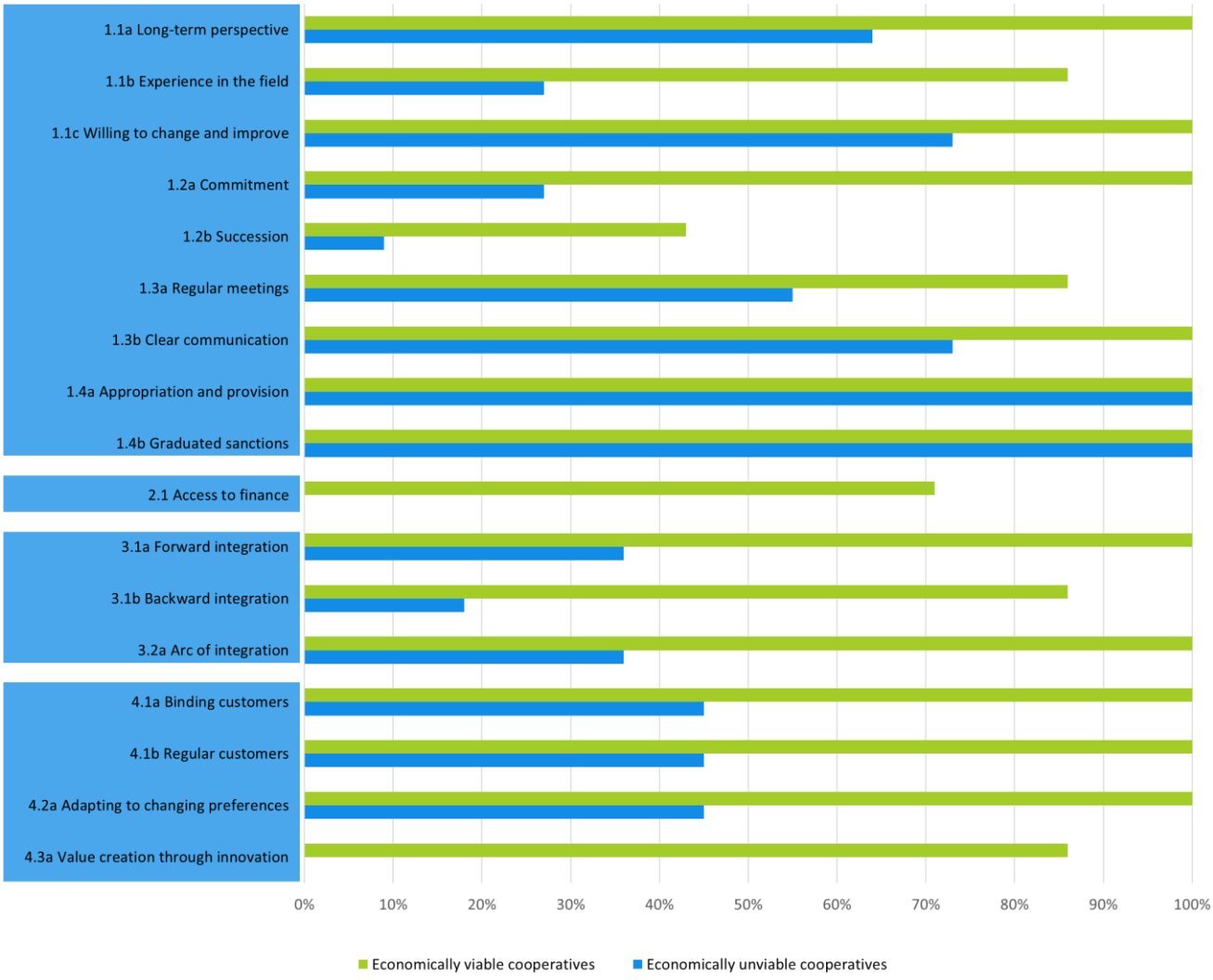

Figure 14: Comparison of prerequisite satisfaction.

At first sight, this chart shows that each prerequisite is satisfied by largest part of the economically viable cooperatives of the sample (except for succession, which is discussed in a bit). Based on the results of this research' sample, it could be concluded that all prerequisites of the framework are somehow related to being economically viable as a cooperative. However, the way in which they are related differs, which is why the following four categories are suggested to group the prerequisites.

1. Currently not necessary for economic viability but expected to be in the long term
2. Important but absolutely not sufficient for economic viability
3. First steps in the process towards becoming economically viable
4. Clearly distinguishing economically viable cooperatives from the unviable ones

4.1.1a Category 1

The only prerequisite that belongs to this category is 1.2b. This research has proven that it is possible to be economically viable as a cooperative while struggling with the challenges of succession. However, the interviews were focused on the state of a cooperative in a certain snapshot in time. It makes natural sense that without succession of (board)members, a cooperative is not able to exist for a very long time anymore. Succession is therefore maintained in the final framework – be it with a slightly lower emphasis - allowing to find enablers that could contribute to solving this challenge that many cooperatives are facing.

4.1.1b Category 2

Two prerequisites, 1.4a and 1.4b, were satisfied by 100% of both categories of cooperatives. This results in a conclusion arguing that on the one hand it is not possible to have an economically viable cooperative while not having a fair distribution of appropriation and provision and graduated sanctions in place. These design principles for collective action were already proven by Ostrom (1990) to be crucial for the functioning of groups, and according to this research also for the functioning of cooperatives. On the other hand, however, the fact that all economically unviable cooperatives have these prerequisites in place as well, means that it does not guarantee success: it is important, but definitely not sufficient.

4.1.1c Category 3

For this category, I consider the prerequisites for which there is less than a 50% difference of satisfaction between economically viable and unviable cooperatives. Thus, 1.1a, 1.1c, 1.3a, and 1.3b. Since largest part of the economically viable cooperatives complies with these prerequisites, they have shown to be important for the success of a cooperative. And considering the less than 50% difference of satisfaction between the two groups of cooperatives, it can be stated that these prerequisites are rather easy to adapt and thus show the first steps of a cooperative towards becoming economically viable. Interesting to note here is that all prerequisites belonging to category 3 are organisational characteristics. A logical order of the transformation process would therefore be to first have a strong internal organisation in place, before focusing on the interlinkages with external factors.

4.1.1d Category 4

All prerequisites that have not been mentioned yet, are part of this category: 1.1b, 1.2a, 2.1, 3.1a, 3.1b, 3.2a, 4.1a, 4.1b, 4.2a, and 4.3a. The level of satisfaction for these prerequisites differs with more than 50% between the two groups, and thus are seen as factors that are clearly distinguishing them from each other. Especially access to finance (71% vs. 0%) and value creation through innovation (86% vs. 0%) strike out here. Since the aim of this research is to advise Rabobank and the Chilean Ministry in their project of transforming cooperatives towards independent, business-like organisations, section 4.2 will put an extra emphasis on enablers for the prerequisites of this category.

4.1.2 Elaboration on Findings

The findings as presented in figure 14 are based on the dataset below, showing for each cooperative that is part of the sample whether or not it satisfies each prerequisite. The names of the cooperatives have been left out here, to guarantee anonymity.

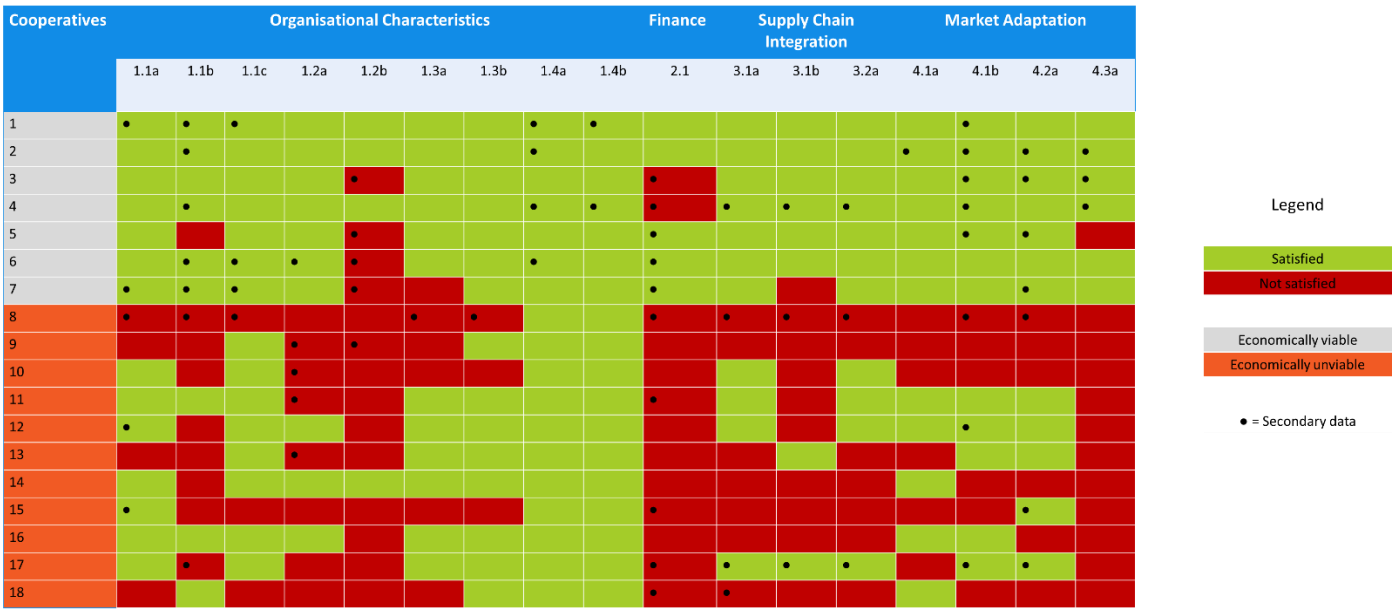

Figure 15: Final data collection for RQ1.

Elaborating on the dataset above, it is now discussed for each component of the theoretical framework what exactly it means to satisfy the prerequisites or not. To conclude this section – and therewith sub-question 1 – all data are further summarised and analysed, and conclusions are drawn from this.

4.1.2a Organisational Characteristics

I always started interviews with asking about the organisational characteristics, to get a feeling of the cooperative's internal organisation and therefore be able to adapt externally focused questions later in the interview process to this. As can be derived from figure 15, sometimes secondary data were already sufficient to draw conclusions about whether the cooperative is meeting certain prerequisites or not. In one call report of an interview held by Rabobank colleagues for example, it was mentioned that cooperative 7 plans on: purchasing a processing plant; attracting more members in order to increase from 35 million L produced by 35 members to 100 million L produced by 125 members; and exporting to Dubai and Russia. This brought me to the conclusion that cooperative 7 satisfies prerequisite 1.1a.

When data were gathered through primary information, interviewees would always be asked to elaborate after just answering "yes" or "no". This led to answers like:

"…Our management team has built up experience through leaning by doing, but it is still not sufficient at the moment" – Manager of cooperative 5.

This led to selecting "not satisfied" for cooperative 5, prerequisite 1.1b. Cooperatives that satisfy prerequisite 1.1c indicated examples that often included workshops, trainings or government support programs in which they are participating. A special note was made on this, so it could be included when answering sub-question 2. Member commitment was often demonstrated by members going the extra mile for the cooperative, thus participating in meetings and being community minded instead of just delivering products and earning money. More than once interviewees indicated that members want to see short-term benefits and results of being part of a cooperative. If this is not the case, they show no commitment and even quit the cooperative.

As presented in the dataset, succession appears to be a challenge for both economically viable and unviable cooperatives. Even more generally speaking, succession forms a huge challenge for the entire

agricultural sector in Chile. Cooperative members and farmers indicated that youth is less and less interested in agriculture, but rather in commercial jobs in the city. Even agronomy students prefer to go work in the lab afterwards, instead of for a cooperative or on a farm. However, the few cases in which succession is not a problem, presented potential solutions to this challenge. Section 4.2 further elaborates on this.

With regards to regular meetings and clear communication, interviewees were mainly asked about the frequency and forms of this. This led to quotes such as:

"We are few members in the cooperative and we do a lot of work in the production process as a team. We are in constant communication (two to three times a week) through WhatsApp, E-mail and phone, and have monthly meetings" – Member of cooperative 13.

Coming to the last two aspects of organisational characteristics, all cooperatives have shown to have clear rules in place for both 1.4a and 1.4b. Regarding appropriation and provision, cooperatives indicated to comply with the cooperative law and regulation, therewith fairly distributing profits according to the share of products that were delivered by members, and the inputs related to this. Consequences for not complying with the rules of the cooperative often depend on the seriousness of the case. The following quote clearly explains this:

"Depending on the lack that the members have had, the council may apply economic penalties, for example, in cases where the members do not deliver the grapes corresponding to their quotas and it is verified that they are selling the grapes outside the cooperative. Another punishment may be the reprimand in which it is punished by eliminating social benefits for a period. In more serious cases, the exclusion of the cooperative can be reached, which must be approved at the Annual Meeting of Members." – Strategic Development Engineer of cooperative 6

4.1.2b Finance

Access to finance was by largest part of the cooperatives indicated as a current challenge. Both economically viable and unviable cooperatives shared experiences in which banks are hesitant or even unwilling to provide loans to them. In the case of cooperative 7 it took seven years before the bank was willing to finance them. According to the interviewees, this is because cooperatives are too much of a risk for banks: members can usually come and leave the cooperative as they please, and if a cooperative is not able to pay off their loans as a consequence of this, there is no responsible person the bank can sue.

4.1.2c Supply Chain Integration

The prerequisite of forward integration is satisfied by those cooperatives who are involved in at least one value chain activity beyond producing. In most cases this meant that the cooperative had bought a processing plant and now also owns that part of the value chain process, leading to higher efficiency and quality. For a honey cooperative for example, it meant that they can directly process honey instead of having to wait in line, risking crystallisation of the honey.

Backward integration appeared to be slightly more complicated than forward integration, but definitely not less important. During the interviews it became clear that cooperatives with a strong backward integration, also know how to easily adapt to changing customer preferences. Examples of backward integration are cooperating with knowledge institutes such as universities, or in the case of larger cooperatives analysing their consumers' data, in order to keep up to date about the latest trends and preferences.

Broad integration is the case when a cooperative is integrated in more than one other value chain activity up and/or down. For a dairy cooperative for example, it meant being involved in both the processing and selling process:

"We are currently processing our products and selling directly. We started with producing products that are sold in large formats and serve as inputs for companies that transform them into products for the final consumer, but last week we started the first butter-making tests. This will be our first product that reaches the final consumer in the format of 250 grams with our brand. Within this year we expect to have three other products sold directly to the final consumer." – Manager of cooperative 7

4.1.2d Market Adaptation

Some of the cooperatives indicated to have a website and word of mouth marketing when asking them about special tactics for binding customers. However, I did not consider this as sufficient for satisfying prerequisite 4.1a, since it does not involve a specific tactic for binding customers. What I did see as sufficient, were examples such as advertisements (either online or offline), participating in fairs or events to establish the brand, and special offers.

Having a base of regular customers was mostly indicated by the fact that the cooperative did not experience any difficulties in selling all its produce, or at least could predict what part of the produce would definitely be sold to customers who are always interested in buying from them.

As touched upon in section 2.4.4, adapting to changing preferences means being up to date to customers' needs and preferences, and adapting the products accordingly. In many cases this means implementing sustainability and/or traceability, sometimes in the form of certificates such as Fairtrade. In other cases, for example for flower cooperatives, it means constantly testing and producing new and better crops.

Last but not least, value creation through innovation was only satisfied by economically viable cooperatives. As explained in section 2.4.4, this prerequisite is only satisfied when innovation is applied to truly add value to the products and/or cooperative. So, using solar energy to power a processing plant is not sufficient here, but an example of a cooperative that satisfies prerequisite 4.3a would be the following:

"We are working together with the University of Los Lagos to measure the carbon footprint of our farms. All our cows are fed mainly on grass that they gather freely in places where there are many trees and forests. Preliminary values already indicated that in our milk production system, we are carbon positive, which is highly valued by customers nowadays." – Manager of cooperative 7

The quote above also indicates that 4.3a promotes satisfying prerequisite 4.2a and also backward supply chain integration.

4.1.3 Conclusion for Sub-Question 1

The framework in figure 16 depicts the framework after data collection and analysis. The reasoning in this section (4.1) showed that all prerequisites from the initial theoretical framework are relevant for the economic viability of cooperatives. However, the importance of prerequisites and the way in which they contribute to cooperatives differs. The marked prerequisites belong to category 4, prerequisites that clearly distinguish economically viable cooperatives from the unviable ones, and thus require extra attention when looking for enablers.

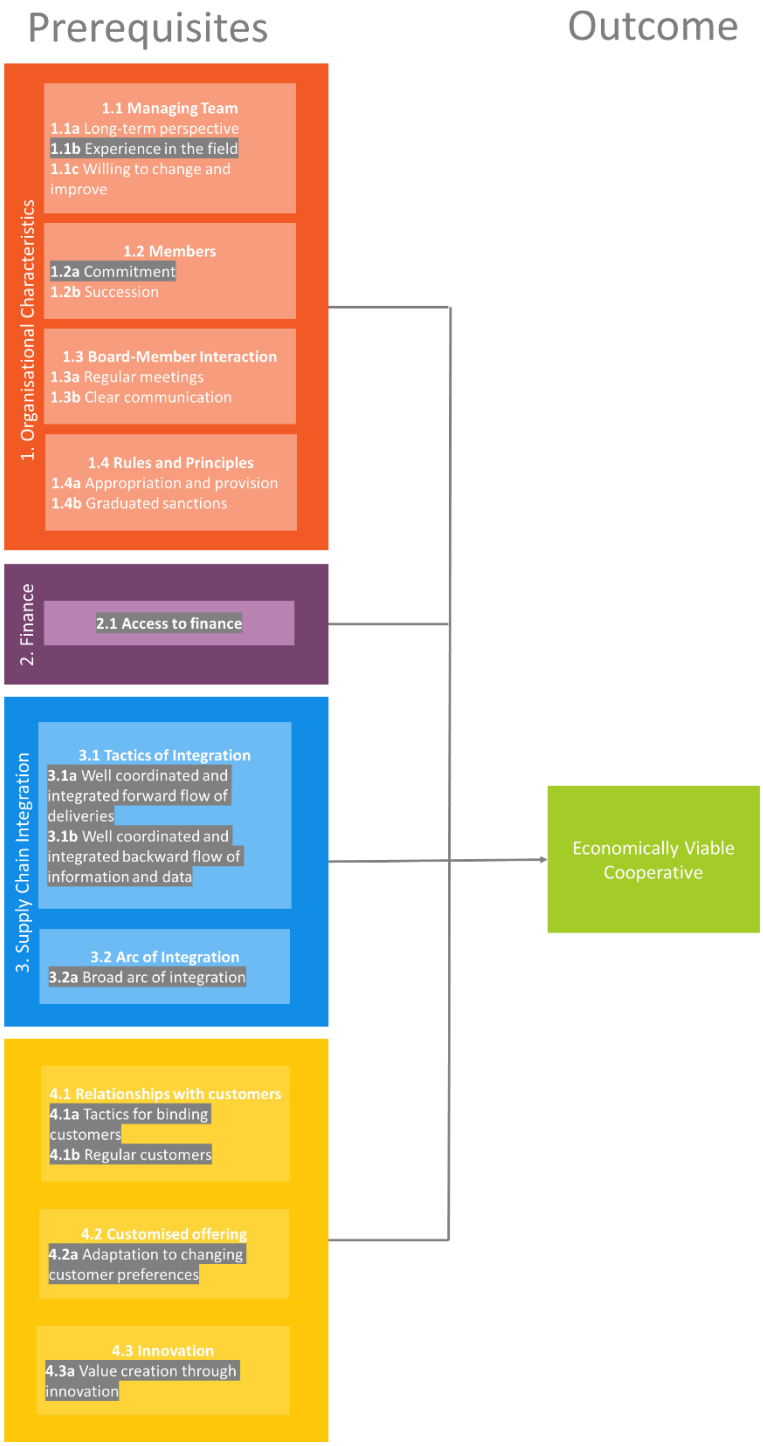

Figure 16: Adjusted theoretical framework after data collection for RQ 1.

4.2 Enablers for Meeting the Prerequisites

Having answered the first sub-question, it is now time to examine which enablers could contribute to meeting these prerequisites. As explained in the theory chapter, the environmental drivers of the food system are currently negatively influencing the food system's activities. This leads to negative environmental outcomes, and thus a negative feedback loop as depicted in figure 17 (dark-grey arrows). When answering the second sub-question, I look at how mostly socio-economic drivers can positively influence the food system's activities – especially the economic viability of cooperatives -

and contribute to the transformation towards an SFS (light-grey arrows). The roles of actors I consider when analysing and exploring enablers are highlighted in the figure below.

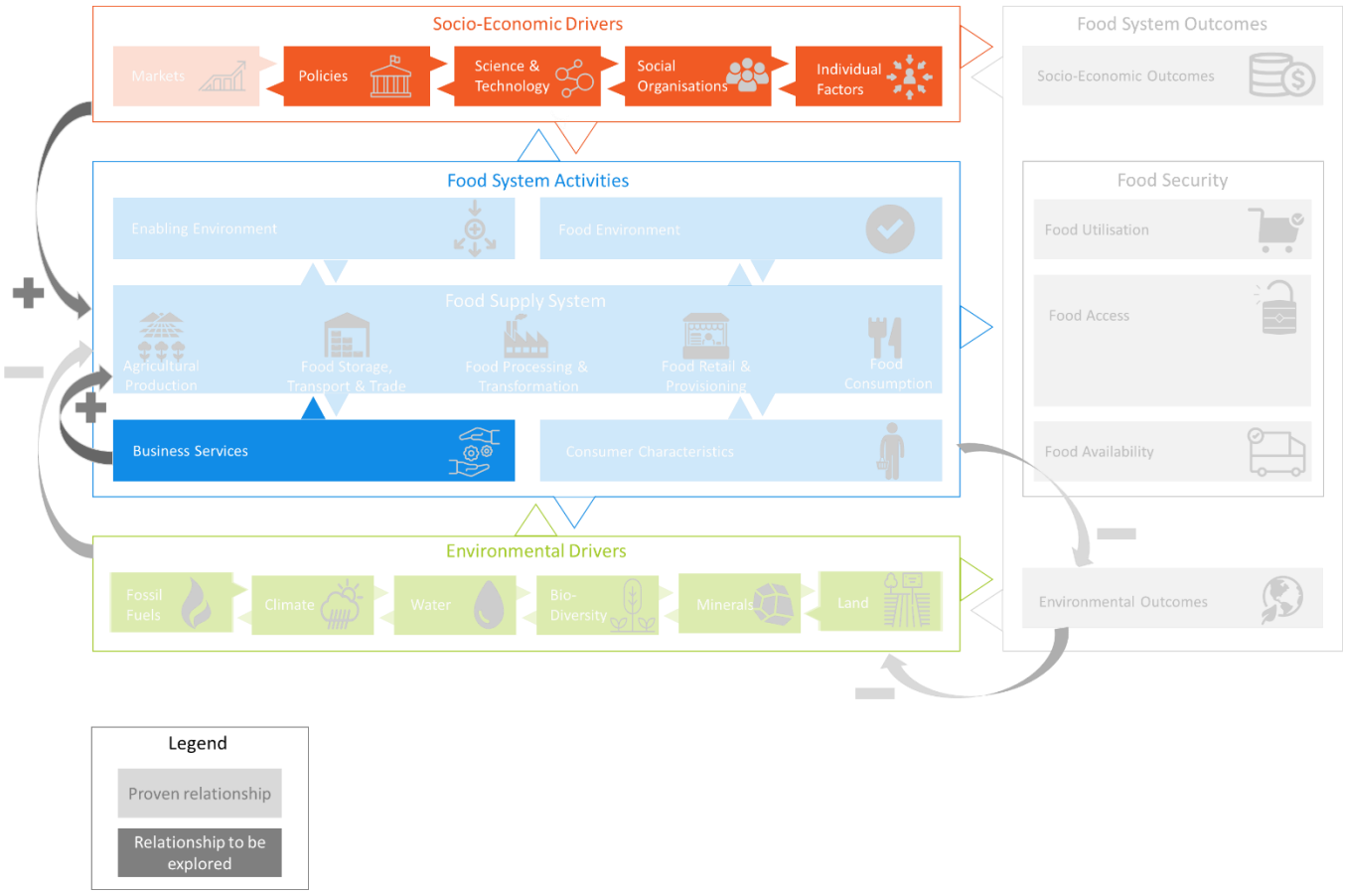

Figure 17: The food system and existing + suggested relationships. Adapted from source: van Berkhout et al. (2018).

To find an answer to sub-question 2, I consulted both secondary and primary data. First, the available secondary data as mentioned in section 3.3.2 were consulted.

The information that could be retrieved from this, was supplemented by primary data. During interviews with cooperatives about which prerequisites they are satisfying, additional questions were asked to learn what makes them succeed in satisfying these prerequisites. If an interviewee would indicate that the cooperative satisfies a certain prerequisite, follow-up questions such as *"Have you received any support that contributed to meeting this prerequisite, if yes, in what forms?"* and *"In your opinion, what makes the cooperative succeed in meeting these prerequisites?"* were asked. In this way, several support mechanisms and original ideas arose on which I collected more in-depth information afterwards.

Besides that, I participated in events organised by Transforma Alimentos and Fundación para la Innovación Agraria (FIA) where many relevant stakeholders of the food- and agriculture industry in Chile participated. During one of these events, innovations in the food industry were presented, which brought inspiration for new enablers. It was also a good occasion for networking. Another event aimed to map the challenges that cooperatives are facing and allowed me to speak with many cooperative (board)members. This gave me the chance to ask them how they are trying to solve their challenges and to propose enablers to find out how suitable these would be. During field trips I also visited farmers and companies related to agriculture, next to only cooperatives. This as well brought inspiration for not-yet-existing enablers that could be made applicable to cooperatives.

In the remainder of this section, first the earlier identified enablers from section 2.5 are assessed and adapted for suitability. Then, enablers that were newly discovered during the research are described , followed by a conclusion for sub-question 2. Please note that this section is meant as a suggestion for how the tested prerequisites *can* be enabled, based on interviews and observations during the research process. It does not examine to what extend the suggested enablers in reality relate to the prerequisites.

4.2.1 Enablers from the Theoretical Framework

For testing the suitability of the prerequisites from section 2.4, the same approach as for testing the prerequisites was applied, but with a more explorative character. When talking with interviewees about the prerequisites of supply chain integration and innovation for example, I would first explain the concepts of FTSs and MSPs, and ask questions such as *"Do you think that Food Traceability Systems could contribute to improving supply chain integration, if yes, how?"* , *"Which obstacles do you foresee in applying Food Traceability Systems to your cooperative?"*, and "*Would you be willing to cooperate with other cooperatives and stakeholders, in order to enhance the implementation of innovation? Please explain why (not)"*.

4.2.1a Food Traceability Systems

The concept of FTSs as introduced in section 2.5.4 can be applied to a wide variety of agricultural value chains. The "Servicio Agrícola y Ganadero" (SAG), part of the Chilean Ministry of Agriculture, has already implemented an official animal traceability program in which every movement of Chilean livestock gets tracked, but examples from other countries and industries have shown that FTSs are also applicable to agricultural value chains such as cocoa (Davis, 2019) and fruit (Ahold Delhaize, 2018).

As explained when introducing the theory, FTSs enable supply chain integration, customer satisfaction and thus create value through innovation. Relating that to this specific research, those are all prerequisites belonging to category 4. Interviewees generally indicated that they see how this innovation could be beneficial for their cooperative, especially cooperatives that are already focusing on sustainability. An interviewee of a dairy cooperative for example said:

"Our cooperative guarantees 100% traceability of all products. This has never been difficult, but now that we are growing in scale, technology would be very useful for keeping track of the increasing number of cows and products" – Manager of cooperative 7

It is, however, not realistic to expect from a small cooperative consisting of less than twenty members, to implement for instance blockchain technology in order to facilitate FTSs. Interviewees also indicated that even though they understand the usefulness of FTSs, they would lack the means to implement and maintain it. The suggestions made in the next section could therefore form a solution in making it more suitable for cooperatives to adapt FTSs.

The figure below shows which of the actors as introduced in section 2.5.1 play a role in the enabler of FTSs – in this case science & technology. By playing a role in enabling FTSs, science & technology can contribute to the development of entrepreneurial activities and new business opportunities as FTSs have currently not been adapted by cooperatives in Chile. With this, a market formation is caused of consumers that are interested in the origin and pathway of their products.

Figure 18: Actors and functions related to FTSs.

4.2.1b Multi-Stakeholder Partnerships

Section 2.5.3 already introduced the concept of MSPs. A regional MSP approach could be an enabler in making it more suitable for small cooperatives to implement innovations, meaning that per region, small cooperatives with the same purpose group together with relevant stakeholders from civil society, governmental, science, and business organisations – all identified as socio-economic drivers in the food system as identified in section 2.2. This could be either in the form of one big cooperative (formed out of multiple small ones), cooperating with different stakeholders, or a collaboration between small cooperatives and other stakeholders, enabling the sharing of knowledge, data, and innovations. Section 2.5.4 mentioned resource, information, and capacity limitations as barriers to implementing FTSs. These barriers could be (partly) solved by grouping together multiple stakeholders in a partnership.

The idea of MSPs was introduced to several cooperatives and stakeholder organisations. Even though the outcome of this concept appears to be appreciated by interviewees, one issue which is especially applicable to Chile arose, that is the lack of trust. It was mentioned several times that in Chile, it is culturally embedded to not trust each other. One interviewee even mentioned that a literal translation for “accountability” is non-existent in Chile. Hence, when establishing MSPs, it should be made clear from the beginning that there is something in it for everyone, and examples of successful MSPs (as mentioned by Brouwers et al. (2015)) could be used in clarifying this. Furthermore, it is crucial that the formation of MSPs is based on rules, and not on trust, in order to increase motivation and decrease risk for conflicts.

As shown in the figure below and being the main purpose of MSPs, many different actors contribute to the enabler of MSPs: governmental organisations, science & technology, social organisations, and businesses. By contributing to this enabler, all actors contribute to entrepreneurial activities (since MSPs make it easier for cooperatives to adopt technologies such as FTSs). Also, through their sharing of knowledge and resources, functions 3 and 6 are fulfilled.

Figure 19: Actors and functions related to MSPs.

4.2.2 Newly Discovered Enablers

When newly discovering enablers, the inductive approach as explained in section 3.4.2 was applied. Since most of the conversations (and thus notes) were in Spanish, I first translated everything to English, and coded in NVivo afterwards. The sub-categories resulted to be the titles of sections 4.2.2a up to 4.2.2e. The overarching concepts to which these sub-categories were related, are the components of the TIS model as explained in section 2.5: institutions, networks, and technological factors.

Institutions

4.2.2a Government Support Programs

Looking at governmental support, Chile has many different governmental organisations involved with supporting cooperatives and businesses in agriculture. Organisations with support programs that are relevant for the earlier found prerequisites are mentioned below.

- Corporación de Fomento de la Producción (CORFO) offers support aiming to contribute to the increase of the competitiveness, financing and/or co-financing projects that incorporate improvements in management, productivity, sustainability and/or innovation (Gobierno de Chile, n.d.). A relevant example of a CORFO instrument is Mipyme, where they guarantee cooperatives towards banks, based on which banks can provide financing to cooperatives. Another instrument is PROIFNB, which includes technical assistance and financing to cooperatives, who in turn can finance their members.
- Fundación para Innovación Agraria (FIA) aims to foster a culture of innovation in the agricultural, agri-food and forestry sector (FIA, 2020). One of their support instruments is "Proyectos de Gestión para la Innovación en Empresas Cooperativas" (Management Projects for Innovation in Cooperative Companies), to support the implementation of management projects for innovation in cooperatives.
- Instituto de Desarrollo Agropecuario (INDAP) aims to contribute to the sustainable economic development and valorisation of agriculture, through promoting the strengthening of human, social, productive, natural and cultural capital (INDAP, n.d.). An example of one of INDAP's programs would be their "Programa de Alianzas Productivas" (Productive Alliances Program), with which they generate access to commercial alternatives and new markets with greater added value for farmers.
- El Servicio de Cooperación Técnica (SERCOTEC) has programs to improve the capacities and opportunities of small businesses (Ministerio de Economía, Fomento y Turismo, n.d.). With "Redes de Oportunidades de Negocios" (Business opportunity Networks) for example, they generate networks for small businesses and cooperatives.

Together these programs enable the different prerequisites 1.1, 2.1, 4.1, and 4.3. In section 2.5.2 it was stated that the goals of the support programs should relate to the overarching objectives of the "Más Unidos" program, as repeated below:

1. Economic objective: improving farmers' competitiveness and bargaining power along the value chain.
2. Organisational objective: improving associativity and organisation among farmers in the form of a well-organised cooperative.

Analysing the government support programs as listed above, none is really out of scope of the Más Unidos program. However, I find that there is a disbalance in contribution to the two objectives: most

support is focused on the economic objective, and not so much on the organisational objective including the seven cooperative principles.

Furthermore, during the interviews it arose that cooperatives often are receiving support from multiple organisations at the same time, and that the objectives and forms of support regularly overlap with each other. Thus, even though the support programs already form a valuable enabler for meeting several prerequisites, it might be possible to make this more efficient by creating a "master plan" with all organisations together in which it becomes clear who contributes what exactly and to which cooperatives. This master plan could be created around the two main objectives as identified in section 2.5.2. For every form of support, organisations could ask themselves whether they are contributing to the economic and/or organisational goal including the cooperative principles. Ideally, a balance between the two goals can be formed and maintained in this way.

Quite logically, the government is the actor which contributes to the government support programs. Considering the objectives of government support programs as described above, functions 1, 3, and 6 are fulfilled.

Figure 20: Actors and functions related to government support programs.

4.2.2b Certification

A repeating enabler that was found for cooperatives that had no problems with satisfying prerequisites of components 3, 4.1, and 4.2, is certification. The Fairtrade and organic certifications were the ones most adopted by the sample of cooperatives. By applying certifications, cooperatives oblige themselves to be well-integrated with the supply chain, since they have to report precisely what happens at each stage. With this they automatically adapt to changing customer preferences and generate regular customers as sales of organic and Fairtrade products continue to rise due to an increasing demand for sustainability and traceability (Hatanaka, 2014).

In order for a cooperative to apply certification standards to its products, social organisations who develop the certifications play a role, as well as the internal factors of the cooperative that need to ensure that certification requirements are satisfied. As described above, certifications can generate a base (or market) of regular customers that care about the sustainability of the product.

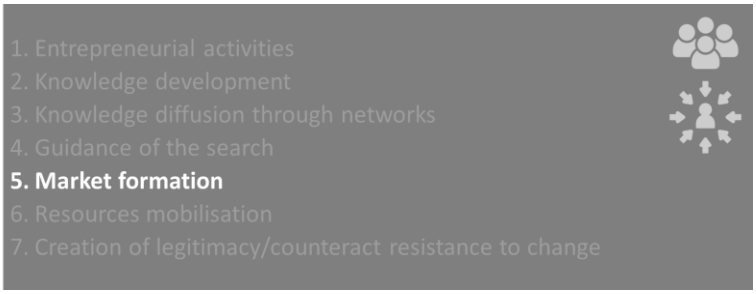

Figure 21: Actors and functions related to certification.

Networks

4.2.2c Youth Council Meetings

When interviewing cooperatives, it soon was shown that some of them have incorporated ideas and/or events internally that enable meeting the prerequisites.

As became clear when answering sub-question 1, succession remains a huge challenge in Chile's agricultural sector overall. According to INDAP (2018), the average age of farmers in Chile is currently 56.3 years, with only 6% of the farmers younger than 35. In order to systematically tackle this challenge, viticulture cooperative 6 taught me about their initiative of youth council meetings. These meetings are organised every month for (grand)children of the cooperative's members. The activities during these meetings range from learning about cooperative management to a barbecue or a trip to Mendoza, a city in Argentina famous for its vineyards. The youth council works with a points system: the more you participate, the more beneficiaries you receive. These initiatives aim to engage youth from the beginning onwards and also to get an idea of what motivates and interests them. All members of the youth council are students, and most of them indicated to be interested in joining the cooperative after graduating, however not as a farmer but rather in a management position.

The cooperative itself (internal factors) is the only actor related to this enabler. Through the youth council meetings, knowledge about cooperative development and management is developed among young people, who could at the same time be the future of the cooperative. Thus, they are also guided in their search for their future job, motivating them to become one of the successors for the cooperative.

Figure 22: Actors and functions related to youth council meetings.

Technological Factors

4.2.2d Online Tracking and Connecting Tool

Several examples of innovation implementation were found throughout the research. A successful dairy producing company showed how they use software and a mobile application accessible for all employees in order to be more efficient, and also more attractive for young people. They as it were transformed the concept of traditional agriculture: instead of only feeding and milking cows, the focus in this company lies on collecting and keeping track of data with regards to growth of grass, production, transportation and sick cows. Even though it was not a cooperative that implemented this example, it would be beneficial for cooperatives as well to enable the prerequisites of succession, commitment, supply chain integration, and innovation. As was the case for FTSs, here as well it is not realistic to expect from a single cooperative to design and implement a software and/or application by themselves. So, again the concept of MSPs might come in handy, involving stakeholders that have the capacity to design an online tool to which multiple cooperatives can connect. Another option would be that the government invests in designing an online tool for cooperatives to keep track of production,

the process, and sales, and to connect members with both each other and the board. This tool should be adaptable to different types of agricultural value chains and could be seen as a new form of government support.

The online tracking and connecting tool can be enabled through contribution of science & technology. Generating and analysing the latest data can lead to entrepreneurial activities such as the development/adjustment of (new) products after discovering a change in consumer needs. When analysing these data, new knowledge is developed and can easily be diffused through the online tool.

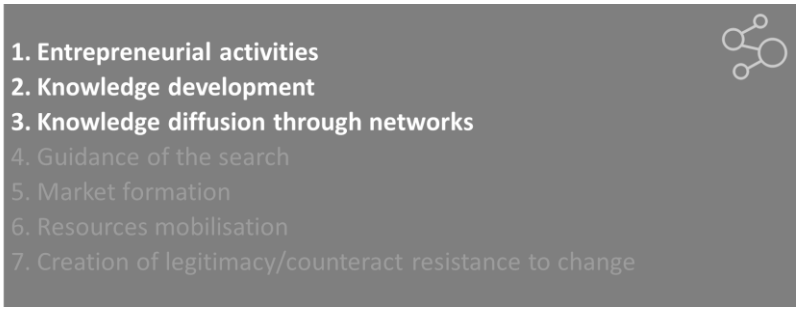

Figure 23: Actors and functions related to the online tracking and connecting tool.

4.2.2e Diversification and Waste Management

Another example of innovation is IFAN. This is a public-private program, supported by CORFO (mentioned in section 4.2.2a) which arose to develop new functional ingredients and natural additives based on Chilean raw materials in order to become a real contribution to the diversification and sophistication of the country's food industry offer. They have projects with which they produce hi-tech products based on dairy, algae, and cereal (IFAN, n.d.). Applying this to the cooperative landscape would include empowering them to diversify and make optimal use of their waste products, therewith increasing their sustainability but also enabling prerequisites of components 3 and 4. This again could be done through MSPs or governmental support, by involving stakeholders that have the scientific and innovative knowledge to enable such a process.

As depicted below, science & technology and internal factors can facilitate diversification and waste management of a cooperative's products. Through these innovative and entrepreneurial activities, new products can be developed, and thus new markets can be formed.

Figure 24: Actors and functions related to diversification and waste management.

4.2.3 Conclusion for Sub-Question 2

In the course of this section (4.2) it became clear that different enablers either could contribute or are already contributing to meeting multiple categories of prerequisites. Figure 25 provides an overview of all analysed and discovered enablers, including their interrelatedness with the prerequisites. The coloured lines correspond with the component of prerequisites the concerned enabler contributes to

(e.g. government support programs contribute to organisational characteristics, access to finance, and market adaptation). My findings and recommendations for each enabler are summarised and listed below.

- **Government support programs** are already doing a good job in contributing to the development of cooperatives. However, many different programs with different goals are existing. They can be organised more efficiently by creating an overarching "master plan" that focuses on a balance between both the economic and organisational objectives of Más Unidos.
- **Certifications** are increasingly being adopted by cooperatives. I recommend this for cooperatives that wish to make a move towards sustainability and therewith generate a base of regular customers.
- I have not encountered any **multi-stakeholder partnerships** during my research. I strongly suggest cooperatives to initiate MSPs together with other cooperatives and the different actors of the food system, as possible links between MSPs and other enablers were found as well. MSPs can thus be seen as an enabler for both prerequisites and enablers.
- Organising **youth council meetings** can be useful for any cooperative that struggles with member succession.
- **Food traceability systems** can be an effective way for cooperatives to reach competitiveness and sustainability. To implement FTSs requires a rather dramatic shift. I therefore recommend utilising MSPs to realise this.
- An **online tracking and connecting tool** can be adopted to transform the concept of agriculture and make data an important part of the process, automatically forming a possible solution to the succession problem.
- **Diversification and waste management** would be an innovative way of creating new products and increasing sustainability through a reduction of waste.

Since this research aims to look at cooperatives as part of a food system – as explained in section 2.2 – it is also for every enabler indicated which socio-economic drivers and actors of the food system are involved. In other words: I am looking at how different actors and drivers of the food system can contribute to meeting the prerequisites for economically viable cooperatives.

Relating the roles of the actors to the seven functions of TIS, I found that only the seventh function (creation of legitimacy/ counteract resistance to change) is not fulfilled. In my opinion, this makes sense since TIS is in this research applied to the enablers of prerequisites for economically viable cooperatives – not a disruptive innovation.

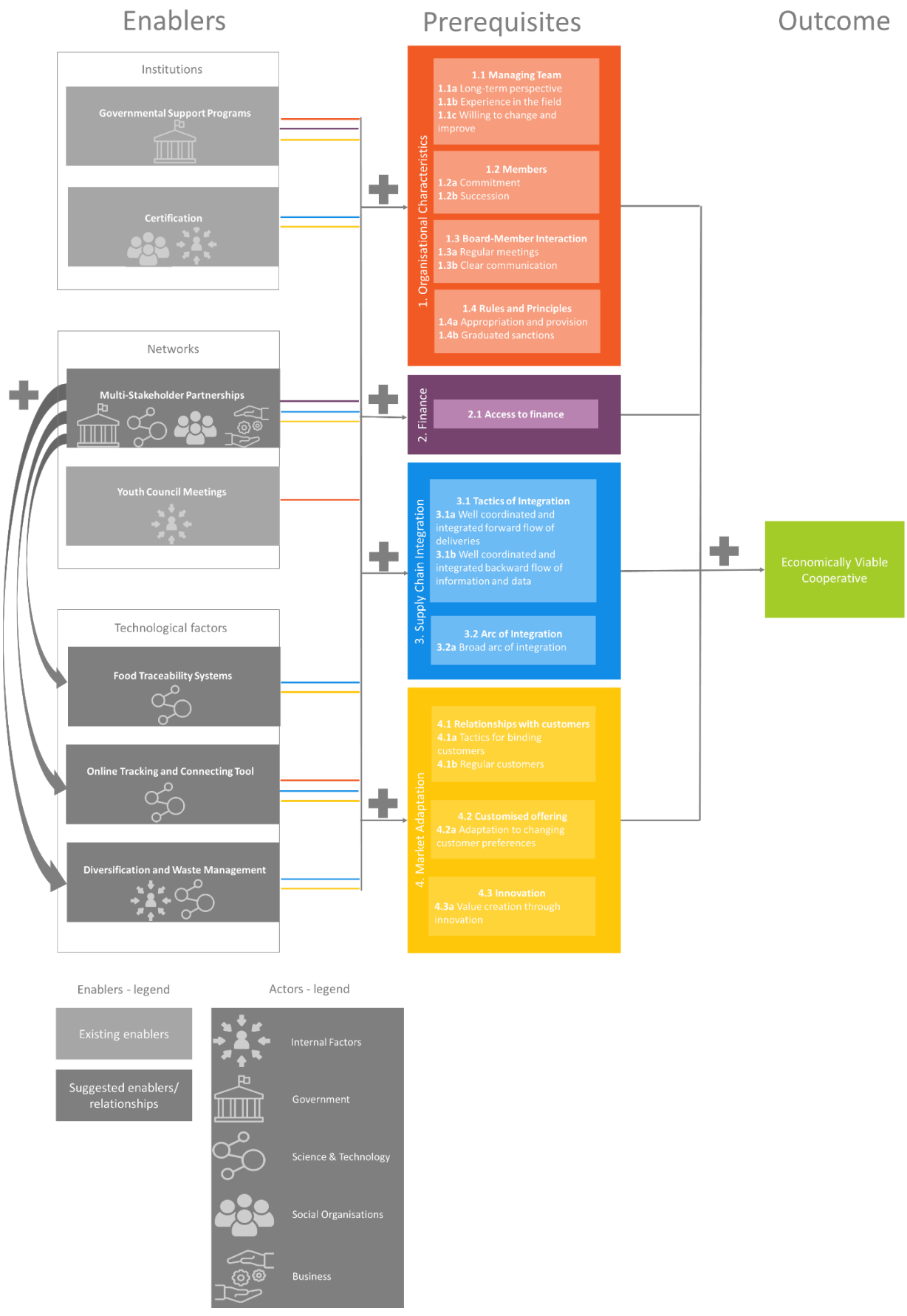

Figure 25: Enablers and their interrelatedness to the prerequisites.

5. DISCUSSION

5.1 THEORETICAL IMPLICATIONS

The data and analysis in section 4.1 showed that for the sample of this research, it can be argued that all prerequisites of the initial theoretical framework are in some way contributing to the economic viability of cooperatives. Thus, regarding the prerequisites, the final results are not divergent from my initial expectations based on literature research, and none of the prerequisites have to be removed from the initial theoretical framework. Still, their importance and way of contributing differs and can be split into four categories according to relevance for economically viable cooperatives. The prerequisites belonging to the fourth category were found to clearly distinguish economically viable cooperatives from the unviable ones, and include: *experience in the field*; *member commitment*; *access to finance*; *supply chain integration*; and *market adaptation*. This implies that cooperatives should comply with a whole set of prerequisites (also the ones belonging to category 1 to 3) in order to function. But to truly distinguish themselves and make the move towards being an economically viable, independent organisation that contributes to a sustainable food system, cooperatives should pay specific attention to the aforementioned prerequisites.

Most of the theory about prerequisites was initially not related to cooperatives specifically. The organisational characteristics were partly based on collective action theory by Ostrom (1990); the SCI theory was mainly based on Frolich & Westbrook (2001) who applied their research to business organisations; and the prerequisites related to market adaptation were all based on researches that considered the customers of a business – and not of a cooperative (Daugherty et al., 1992; Mukerjee, 2016; Bocken et al., 2013). Therefore, the findings of this research could be an addition to existing literature because the direct linkage to cooperatives is made and explained. Also, the final framework provides a clear overview of all prerequisites combined and categorised, something I have not encountered in other researches on this topic.

As for the enablers, section 4.2.1 showed that the theoretical concepts of both FTSs and MSPs have a great potential to contribute to meeting the prerequisites. Thus, again my initial expectations based on the theory, are conformed. The results section also interlinks the two concepts, arguing how MSPs can play a role in implementing FTSs – and other innovations and technologies as well - through sharing of knowledge and resources. This indicates that MSPs are the underlying enabler for other enablers: cooperatives (or organisations that support cooperatives) should initially focus on the implementation of MSPs. With this as a basis, other enablers can more easily flourish.

All other enablers that were newly discovered during the research, involved at least one socio-economic driver or actor from the food systems theory that was introduced at the beginning of this thesis, providing a suggestion for how the concerning actors can contribute to the transition towards economically viable ACs and ultimately an SFS. I also described for each enabler and corresponding actor(s) to which of the seven functions of TIS they contributed, therewith ensuring that the enabler was within the scope of this research. Considering these linkages between enablers, actors of the food system, and functions of TIS, it can be concluded that both the food systems approach and TIS theory can provide a good basis when studying and analysing the enabling environment for ACs.

Apart from the prerequisites and enablers that were studied and discovered, the food system consists of many more actors and factors. For further research, I would therefore suggest looking into prerequisites that relate to e.g. the production process in more detail and more specifically to the strategy of a cooperative. Regarding the enablers, this thesis focuses on the socio-economic drivers of

the food system as this fits within the scope of the assignment from Rabobank. Another suggestion would thus be to study how to turn the negative influence and outcomes of environmental drivers such as climate, land, and biodiversity into positive ones.

Also, positive feedback loops among prerequisites arose in some interviews. For example between components 3 and 4: an increase in supply chain integration leads to better customised offering and better relationships with customers. Innovation can increase the supply chain integration, which in turn positively influences component 4 again, and so on. I did not structurally research these effects, but it is an interesting case for further research, as it might represent that some prerequisites are enablers in themselves.

Lastly, when investigating prerequisites and enablers for economically viable ACs, I took the approach of conducting a case study on Chile. All research participants were located in Chile, and the Más Unidos program around which this thesis evolves, is initiated by the Chilean Ministry of Agriculture. However, I expect the findings of this thesis to be applicable to other countries as well, as none of the prerequisites and/or enablers is bound to specific country characteristics. I would therefore suggest testing the applicability of the final framework in figure 26 in other countries (preferably in different continents from South America) in order to verify this.

5.2 LIMITATIONS

Like most researches, this one does not come without limitations. First, not all relevant existing literature on the topic of this research has been considered. A wider exploration of theories and existing concepts could have made the theoretical framework more exhaustive and would therewith have increased the validity of this thesis.

Second, the fact that data were collected in different ways could lead to reliability issues. For some prerequisites, answers were partly generated through secondary data, and partly through primary data. Within the primary data collection, I even used two different methods, being personal interviews and telephone interviews. This has possible consequences for the robustness of my final claims as I was generally more critical during personal interviews by asking additional questions. Thus, if all data would have been collected through personal interviews (and not through secondary data and/or telephone interviews), the overall percentage of prerequisite satisfaction might have been lower, and differences between results for economically viable and unviable cooperatives – and thus the categorisation - could have looked different.

The third limitation is the sample size that is used in this research. Since the sample consisted of 18 cooperatives, it did not allow for a significant statistical analysis. A larger sample size and thus a quantitative instead of a qualitative analysis would have made the findings more reliable and robust – now they take on a rather speculative approach. However, this thesis is still able to provide a good starting point in studying the success of cooperatives from different angles, considering the influence of multiple internal as well as external factors and actors. Also considering the explorative character of this research, a qualitative analysis is suitable.

6. CONCLUSION

In this research, I aimed to find an answer to the research question *"what are the prerequisites for economically viable agricultural cooperatives and how can these be enabled?"*. For the sake of this, I first explored a wide variety of literature relating to the food systems approach, economic viability, and possible prerequisites and enablers, where enablers were structured according to the TIS approach. This resulted in a theoretical framework which was taken as a starting point for both primary and secondary data collection. I first explored the secondary data such as government documents and interviews that were conducted by Rabobank colleagues. Afterwards, I complemented these data with primary data collection for which I interviewed members and managers of eighteen ACs in Chile, greatly varying in location, size, and purpose (Annex B and C). The objective of these interviews was to collect data for analysing relevance and suitability of earlier-identified prerequisites and enablers in relation to the economic viability of cooperatives through a deductive approach, and also to newly discover enablers that could contribute or already are contributing to meeting the prerequisites by means of an inductive approach.

Based on data collection and analysis, I concluded that the prerequisites for economically viable cooperatives can be divided into four categories: *currently not necessary for economic viability but expected to be in the long term; important but absolutely not sufficient for economic viability; first steps in the process towards becoming economically viable;* and *clearly distinguishing economically viable cooperatives from the unviable ones*. Even though a combination of all prerequisites is important for economic viability, I paid most attention to the fourth category as that contributes most to a transition towards economically viable cooperatives and thus fitted the scope of this research best. Hence, when testing and exploring enablers I focused on the marked prerequisites of figure 26.

I found out that different enablers are deployed already: multiple types of government support programs are existing, along with other initiatives that are incorporated by cooperatives themselves such as certification and youth council meetings. These are the enablers in the light grey boxes in figure 26. These enablers are definitely useful and contribute to meeting the prerequisites, as can be derived from the coloured lines that correspond to the components of prerequisites the concerned enabler contributes to. However, these initiatives have proven to not be sufficient in turning cooperatives into vertically integrated, economically viable organisations that contribute to an SFS. To reach that, this research has shown that a less incremental and more dramatic shift is needed in which science and technology can lead to competitive advantage with FTSs, online tracking and connecting tools, and diversification and waste management – enablers in the dark grey boxes in figure 26. However, considering the variation in size and resource capabilities of cooperatives in Chile, it is not realistic to expect that they will implement complex innovations by themselves.

MSPs could form a comprehensive solution to this. By bringing together many different actors such as governmental organisations, businesses, innovative product holders, and cooperatives, they exchange and enable different forms of knowledge, skills, and capacities. With the increased knowledge that flows from this, along with mobilised resources and capabilities, it is even for small cooperatives feasible to implement complex innovations. Since 1995, the ICA is motivating cooperatives to strive for principles such as education, training, and information for both members and the general public, and concern for the sustainable development of their communities. After all these years, those principles are still relevant, but the system in which they are operated is changing rapidly. So why not look beyond the borders of the cooperative, and expand the scope of cooperation? Beyond cooperation amongst members, towards a collaboration in which many different actors of the food system are involved.

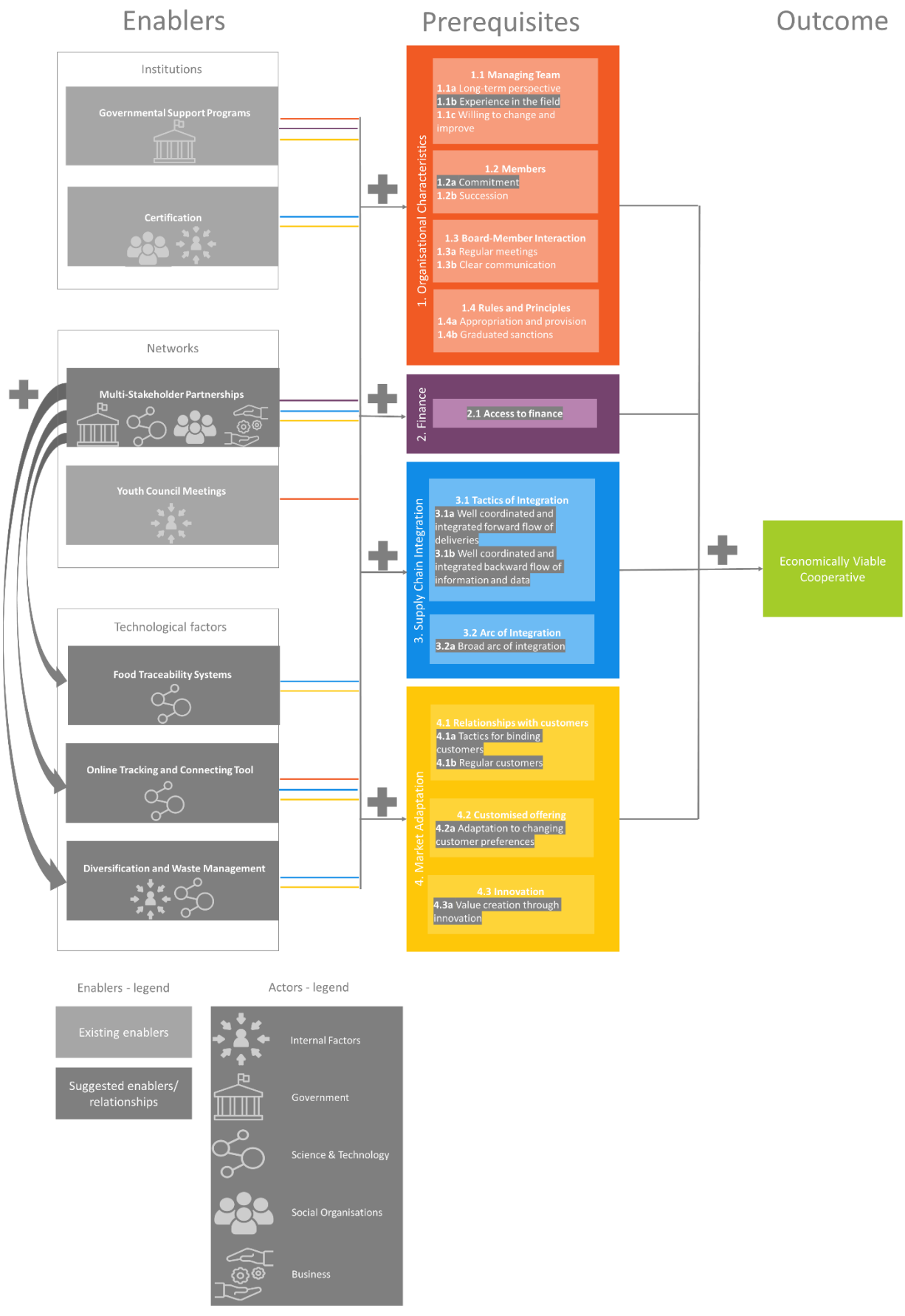

Figure 26: Summarised results of this research.

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I would like to express my deepest gratitude to Rabo Partnerships, and especially Corné de Louw, for giving me the chance to work in Chile, being able to easily access cooperatives and learn about the cooperative environment. De Louw's critical feedback and practical knowledge and experience in the field have been very useful in improving the societal relevance of this thesis. Also, his enthusiasm on the topic and loyalty towards me have been great motivators, not just for this thesis but for my professional career in general. In Chile, my colleagues at RaboFinance have done a great job in making me feel at home and assisting me on different aspects from day one. Without the local knowledge and useful contacts from Brenda de Swart, the whole process would have been much less smooth.

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APPENDIX

A. OSTROM'S DESIGN PRINCIPLES RE-EVALUATED BY COX ET AL.

Principle	*Description*
1A	**User boundaries:** Clear boundaries between legitimate users and nonusers must be clearly defined.
1B	**Resource boundaries:** Clear boundaries are present that define a resource system and separate it from the larger biophysical environment
2A	**Congruence with local conditions:** Appropriation and provision rules are congruent with local social and environmental conditions.
2B	**Appropriation and provision:** The benefits obtained by users from a common-pool resource (CPR), as determined by appropriation rules, are proportional to the amount of inputs required in the form of labour, material, or money, as determined by provision rules.
3	**Collective-choice arrangements:** Most individuals affected by the operational rules can participate in modifying the operational rules.
4A	**Monitoring users:** Monitors who are accountable to the users monitor the appropriation and provision levels of the users
4B	**Monitoring the resource:** Monitors who are accountable to the users monitor the condition of the resource.
5	**Graduated sanctions:** Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and the context of the offense) by other appropriators, by officials accountable to the appropriators, or by both.
6	**Conflict-resolution mechanisms:** Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.

Source: Cox et al. (2010).

B. LOCATIONS OF THE RESEARCH SAMPLE

C. Research Sample's Characteristics

Cooperative	# Members	1. Sector/ product	2. Main functions	3. Diversity of functions/ products	4. Position in the food chain	5. Type of members	6. Geographical scope of membership	7. Financial/ ownership structure
1	41	Dairy	Production; processing; marketing	Economic activities	Production to consumer	Primary	Regional	Member-investor
2	733	Dairy	Production; processing; marketing	Economic activities	Production to consumer	Primary	National	Member-investor
3	196	Honey	Production; processing	Economic and social activities	Production to processing	Primary	Regional	Traditional
4	350	Multi-purpose: maize; wheat; horticulture; fruits	Production	Economic activities	Production	Primary	Regional	Traditional
5	86	Walnuts	Production	Economic activities	Production	Primary	Regional	Traditional
6	1000	Pisco	Production, processing, marketing	Economic and social activities	Production to consumer	Primary; federal	National	Member-investor
7	34	Dairy	Production; processing; marketing	Economic activities	Production to consumer	Primary	Regional	Traditional
8	10	Raspberries; blueberries	Production	Economic activities	Production	Primary	Local	Traditional
9	39	Multi-purpose: horticulture; fruits; maize; flowers	Production	Economic activities	Production	Primary	Local	Traditional
10	23	Quinoa	Production; processing	Economic activities	Production to processing	Primary	Regional	Traditional
11	112	Wine	Production, processing; marketing	Economic activities	Production to consumer	Primary	Regional	Traditional
12	31	Honey	Production; processing	Economic activities	Production to processing	Primary	Regional	Traditional
13	10	Flowers	Production; marketing	Economic activities	Production to consumer	Primary	Local	Traditional
14	15	Multi-purpose: cucumber; pepper; beans; corn	Production	Economic activities	Production	Primary	Local	Traditional
15	17	Multi-purpose: quinoa, vegetables, sheep cheese	Production; marketing	Economic activities	Production	Primary	Local	Traditional
16	32	Quinoa	Production; processing; marketing	Economic activities	Production to consumption	Primary	Regional	Traditional
17	18	Multi-purpose: potatoes; garlic	Production; processing; marketing	Economic activities	Production to consumption	Primary	Regional	Traditional
18	150	Multi-purpose: fruits; dairy	Production; processing; marketing	Economic activities	Production to consumption	Primary	Regional	Traditional