

Barriers and Opportunities for the Transition to a Circular Economy. A Case Study of Chilean Cooperatives

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Abstract

The linear use–consumption–waste production model does not make allowances for resource limitation or loss, or the associated pollution. The concept of the circular economy (CE) emerged as an alternative to this model. In recent times, the CE has awoken considerable interest and discussion among academics, enterprises, and governments given its connection with sustainable development and its potential impact on the economic, social, and environmental levels. At present there is no precise and established definition of the CE as a concept, and though this new paradigm could proffer a host of benefits for the organizations who integrate it into their business model, it might also bring about difficulties or challenges.

The main aim of this study is to identify barriers and opportunities for the transition to the CE based on a case study of cooperatives in Chile. The study employs the qualitative methodology of social discourse analysis, complemented by a literature review and interviews with CE experts. Five categories were constructed to guide the interviews and subsequent analysis: (i) knowledge, (ii) technological, (iii) structural, (iv) operational, and (v) financial. A total of ten interviews were conducted across the three specific cases selected. The data analysis was conducted using Atlas TI8 software. The results obtained for each case study point to gaps and opportunities in the five categories, and, more generally, in the legal and cultural spheres.

Resumen

El modelo lineal de uso-consumo-producción de desechos no toma en cuenta la limitación o pérdida de recursos, ni la contaminación asociada. El concepto de economía circular (EC) surgió como una alternativa a este modelo. En los últimos años, la CE ha despertado considerable interés y discusión entre académicos, empresas y gobiernos dada su vinculación con el desarrollo sostenible y su posible impacto a nivel económico, social y ambiental. En la actualidad no hay una definición precisa y establecida de la EC como concepto, y si bien este nuevo paradigma podría ofrecer abundantes beneficios para las organizaciones que lo integran en su modelo de negocio, también podría traer dificultades y desafíos.

El objetivo principal de este estudio es identificar las barreras y oportunidades para la transición a la CE a partir de un estudio de caso de cooperativas en Chile. El estudio emplea la metodología cualitativa de análisis de discurso social, complementado con una revisión de la literatura y entrevistas con expertos de EC. Se construyeron cinco categorías para guiar las entrevistas y el análisis posterior: (i) conocimiento, (ii) tecnológico, (iii) estructural, (iv) operacional, y (v) financiero. Se realizó un total de diez entrevistas en los tres casos específicos seleccionados. El análisis de los datos se realizó utilizando el software Atlas TI8. Los resultados obtenidos para cada caso de estudio apuntan a brechas y oportunidades en las cinco categorías y, de manera más general, en el ámbito legal y cultural.

Keywords:

Circular economy; cooperatives; social economy; barriers; opportunities.

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Research problems

The present socioeconomic system is a linear construct, with enterprises that manufacture products and consumers that use and dispose of them. This linear production model can be studied and analyzed based on final products or their components—that is, the materials used in their fabrication. From this perspective, only virgin material can enter the value chain at the beginning. This incurs needless resource loss in various ways: inefficiencies in the production chain, waste at the end of the life cycle, excessive energy use, and ecosystem erosion (Ellen MacArthur Foundation, 2016). With this apparent proliferation of resource depletion, calls for a new economic model are growing increasingly loud (Micheline, Moraes, Cunha, Costa, & Ometto, 2017).

According to the World Bank report *What a Waste 2.0: Global Snapshot of Solid Waste Management to 2050* (World Bank Group, 2018), global waste generation will increase by 70% between 2016 and 2050, from 2.01 to 3.40 billion tons per year. The report *Maldito Plástico: Reciclar no es Suficiente*, published by Greenpeace España (2019), notes that each year the seas and oceans receive up to 12 tons of garbage, predominantly plastic, whose production will approach 350 million tons in 2020 (an 900% increase from 1980). Although there have been major advances in improving resource efficiency, all systems based on consumption rather than restorative resource usage mean significant losses along the value chain (Ellen MacArthur Foundation, 2016).

These and other associated challenges have prompted countries and cities to open a dialogue with industry and establish common goals associated with sustainability and ecological equilibrium. In this context, the circular economy (CE) paradigm emerges as an alternative to the linear economic system. As testament to the behavioral change toward CE initiatives, cities throughout the world are launching campaigns to raise awareness and incentivize companies and individuals. They are also redesigning their hiring policies and their public institutions according to the principles of circularity (Plastrik & Cleveland, 2018).

Although this new paradigm implies clear benefits for companies that adopt circular business models, in practice there can be various barriers, including difficulties determining future benefits versus current costs; needs related to knowledge; and market push and pull factors, such as availability of technology and consumer demand for green products (Rizos, Behrens, Kafyeke, Hirschnitz-Garbers, & Ioannou, 2015).

In Chile, the government has started making efforts to establish and promote the CE; for instance, the Ministry of the Environment created, in 2018, a Circular Economy Office, while the Production Development Corporation is now formulating projects. Moreover, various organizations have implemented business models founded in the CE. These include cooperatives—organizations whose governance system is based on values and principles and whose purpose is to produce, buy, or sell for the benefit of all members (Chaves & Monzón, 2018).

The main aim of this qualitative study is to identify the barriers and opportunities related to the transition to the CE through a case study of cooperatives, in order to add to our

knowledge and understanding of the social economy organizations that implement such models, as well as the factors involved in the transition.

This will entail a characterization and analysis of cooperative organizations and their governance model, basic structure, and forms of organization in order to shed light on their internal functioning and the CE implementation process, while also identifying the main gaps and opportunities by categories drawn from the literature. In so doing, the study contributes to the body of information available to cooperatives and other social economy organizations, thereby serving as a guide for their CE incorporation processes.

Theoretical Framework

The concept of sustainable development first emerged in 1987 when the World Commission on Environment and Development (WCED) published its report *Our Common Future* (also known as the Brundtland Report), in which it warned of the environmental consequences of economic development and globalization. The Brundtland Report defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN, 1987).

Sustainable development has become one of the key challenges of the 21st century. Presented as a solution to many of the problems posed to mankind, sustainable development poses something of a conundrum: How is it possible to increase the wellbeing of the world population, tackle social inequalities, and safeguard the dynamics of the biosphere all at the same time? (Urteaga, 2009). To achieve sustainable development it is necessary to harmonize three basic elements: economic development, social inclusion, and environmental protection. These elements are interrelated and are all essential to the wellbeing of people and societies (ONU, 2017).

Earth Overshoot Day is an indicator that denotes the calendar date on which humanity's resource usage exceeds the capacity of the planet's ecosystems to generate these resources for a given year. The date has moved back from late September in 1997 to July 29 in 2019, the earliest since the world began to surpass its limits in the 1970s (in 2020, World Overshoot Day fell on August 1). That is, at present humanity exploits nature 1.75 times more quickly than the capacity of Earth's resources to regenerate. This is tantamount to “using” 1.75 Earths (Overshootday, 2019).

Thus far, the literature has not reached consensus on a definition of the CE (Schroeder, Anggraeni, & Weber, 2018). Kirchherr, Reike and Hekker (2017) conduct an analysis of 114 definitions of the CE in the literature in order to gauge current understanding of the topic. They conclude that the CE is described most frequently in the literature as a combination of reduction, reusage, and recycling activities, without underlining the need for systemic change. Moreover, the concept of the CE tends not to be linked explicitly with sustainable development. The general objective of the CE is related to economic prosperity and environmental quality, while the impact on social equity and on future generations are mentioned with less frequency.

According to the Ellen MacArthur Foundation (2012) the circular economy is restorative and regenerative by design, and seeks to redefine what growth means with emphasis on the benefits for all of society. This implies, by design, a disassociation of economic activity from the consumption of finite resources and an elimination of waste from the system. Based on a transition to renewable energy sources, the circular economy creates economic, natural, and social capital and is based on three principles: 1) Design out waste and pollution; 2) Keeping products and materials in use; and 3) Regenerating natural systems.

The CE tends to be disaggregated into two component cycles: the biological cycle and the technical cycle (Ellen MacArthur Foundation, 2012). The biological cycle is characterized by the use of materials that, after one or two cycles of use, reenter the natural world where they biodegrade over time, returning the incorporated nutrients to the environment. These materials are foodstuffs or other bio-based materials such as cotton or wood, which can be restored to nature through processes such as composting and anaerobic digestion. Agroecological processes can be understood as part of these cycles, as this agricultural approach takes advantage of natural interactions that occur in production in order to reduce usage of external inputs and improve the biological efficiency of cultivation systems.

In turn, the technical cycle is composed of materials such as metals, plastics, and synthetic chemical products that cannot go back into the environment and must continue to pass through the system so that their value can be captured and recovered. Thus, for technical cycles to be able to restore or recover products and materials, it is necessary to reuse, repair, or remanufacture.

CE implementation has potential repercussions for the economic, social, and environmental spheres. Referencing the academic literature, gray literature, and relevant reports, and looking beyond the focus on technical solutions, Schroeder et al. (2018) note that CE approaches could yield significant benefits in terms of cost savings, job creation, innovation, productivity, and resource efficiency in developed and developing countries alike.

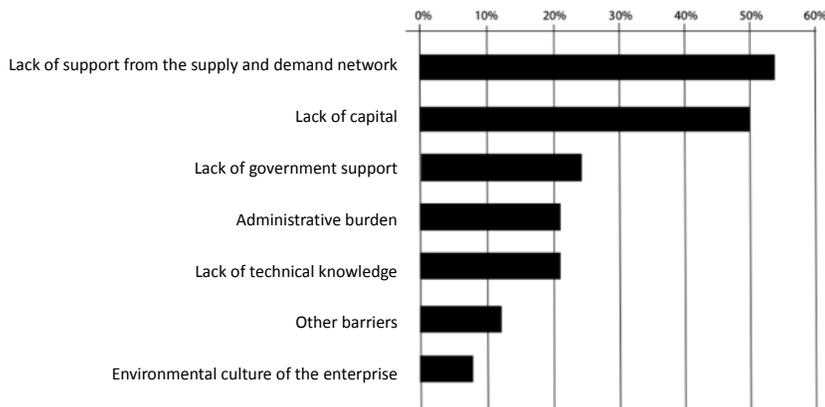
According to Rizos et al. (2016), a circular model helps to prevent emissions, reduce resource loss, and ease the burden on global ecosystems. A report published by the UN Economic Commission for Latin America and the Caribbean (ECLAC) and the International Labor Organization (ILO) predicts that CE implementation in Latin America and the Caribbean could create 4.8 million net jobs by 2030, in the sectors of waste management, recycling, and services—specifically, repairs and leasing (Comisión Económica para América Latina y el Caribe; Organización Internacional del Trabajo, 2018).

Which new business models could enable the transition to a more circular economy? How could innovation create value for companies, customers, society, and the environment? According to the Ellen MacArthur Foundation (2016), the various circular business models can be grouped into three categories: those engaged in design, use, and recovery. For a circular economy to work, businesses in these different categories need to interact and work together. This, in turn, gives rise to the notions of circular design, circular use, and circular recovery.

According to Vermunt et al. (2019), the barriers related to the implementation of circular business models differ from one model to the next. Ignoring the possibility of this difference could result in ill-founded generalizations about the barriers to implementing circular business models. Such models include the following: 1) product as a service; 2) product life extension; 3) resource recovery; and 4) circular supplies.

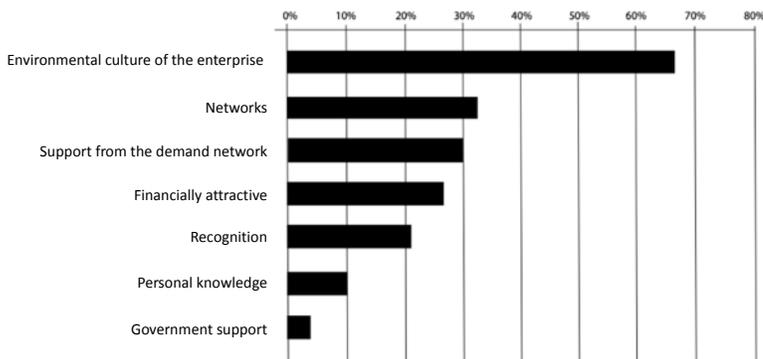
In a case study of SMEs that have successfully embraced the CE, Rizos et al. (2016) identify the barriers and opportunities faced by these transitioning enterprises, as shown in Illustration 2:

Illustration 1: Barriers to CE transition



Source: compiled by authors based on Rizos et al., 2019)

Illustration 2: Barriers to CE transition



Source: compiled by authors based on Rizos et al., 2019

Having explored the concept of the CE, defined as an alternative to the predominant linear economic model, the following question can be posed: Which organizations can implement the CE? To address this question, it is first necessary to identify the barriers and opportunities that different types of organizations face during implementation.

Meanwhile, Ritzén and Sandström (2017) also identify barriers to CE transition, grouping them into the following categories: financial, structural, operational, attitudinal, and

technological. This set of observations and taxonomies facilitates the construction of the categories selected for this study.

The term “social economy” was introduced to the economic world in the 19th century. Chile’s Ministry of the Economy defined it as a “a form of business organization that by definition has a clear imprint of solidarity and inclusive development” (translation ours). (Ministerio de Economía, Fomento y Turismo, 2015)

The social economy is an economic space composed of private organizational structures established in response to prevailing social demands, substantive issues, and social aspirations. Its social orientation sets it apart in economic and decision-making terms from traditional private firms based on the logic of capital. That is, the social economy in its various forms constitutes a response by organized civil society to demands and issues that have not been dealt with satisfactorily by the state and its agencies, or by the traditional corporate sector (Chaves & Mozón, 2018).

The concept of cooperativism originated in the late 19th century, referring to a form of organization that has a presence across most branches of economic activity. Cooperatives first emerged, amid the Industrial Revolution, as voluntary associations with the aim of achieving benefits for all their members and the community, in response to new economic, social, and cultural processes (Decoop, 2016).

The International Co-operative Alliance has entered the second phase of its Blueprint for the Co-operative Decade, a global strategy for this business model to become, by 2020, the leader in economic, social, and environmental sustainability, people's preferred model, and the fastest-growing form of enterprise. Given the synergies between the visions of the United Nations and the cooperative movement for a sustainable future, it is evident that cooperatives can contribute to attainment of the sustainable development goals (SDGs). To this end, cooperatives need to align their work with the SDGs, and with the targets and indicators that will monitor incremental attainment through to 2030 (Coops for 2030, s.f.).

At present, Chile has 1,096 active, registered cooperatives with a total of 1,810,789 members. These organizations represent 1.5% of Chilean GDP (El Mercurio, 2018). In 2018, 306 new cooperatives were created in the country, the highest figure of the past 15 years. Moreover, 75 percent of all cooperatives are located in the regions, thus bolstering decentralization in the country (Diario Financiero, 2019).

It is this confluence of factors that gives rise to the present research opportunity: to observe the ways in which cooperative organizations are part of the social economy, engaged in CE projects in Chile, motivated by questions about sustainable development, and working to overcome barriers.

Methodology

This is a qualitative descriptive study, framed as a social discourse analysis (Canales, 2006). Semi-structured interviews are used as a data collection technique, applied to

three cooperative organizations that have implemented business models linked to the CE. Within each organization, in-depth interviews were conducted in order to characterize the incorporation of the CE based on their different themes and perspectives. The categories used to guide the interviews, and the subsequent presentation and analysis, are as follows: (i) *knowledge*; (ii) *technological*; (iii) *structural*; (iv) *operational*; and (v) *financial*. These categories were constructed and determined based on the theoretical framework underpinning this study. To refine the categories and the framework, interviews with CE experts were also conducted.

The primary sources of information used in this study are the interviewees' discourses and comments about their meaningful experiences of cooperativism and the circular economy. The analysis was complemented with the use of Atlas TI8 software, which was used to construct the analysis of categories, representative quotes, and semantic networks.

The study sample is non-probabilistic. The selection of the sample was intentional, in that the case studies were chosen directly. The selection criteria for the three cases was that they be cooperative organizations whose business models are linked to the biological cycle, engaged in recycling, waste management and recovery, or agroecology. Moreover, the three cooperatives were considered to represent an interest in working on matters related to the CE, while also elucidating the role of the social economy in this endeavor.

The interviews constructed with the organizations were between 45 and 60 minutes in duration. For reasons of contingency and the world health crisis, all interviews were carried out remotely. For the interviews, a framework of open questions, organized into the aforementioned categories, was prepared. The conclusions to this study are presented as a contribution to the cooperative social economy system, with a view to supporting the emergence of new CE initiatives and ventures and to reflecting on sustainable economic development. A total of ten interviews were conducted across the three organizations.

As to the limits of this study, it is worth noting that this is a descriptive approach to a complex phenomenon. Thus, the study does not claim to be universalist or normative. The central observations in this study relate to the discourses and communications revealed through the interview process, whose limitations as a data-gathering tool, as well as those of the research question, could be subject to critical analysis. The construction of the sample of cooperative organizations is subject to the availability of the actors in the context of the global coronavirus pandemic. This study does not seek to constitute a general framework for cooperativism but to present specific cases about the practices of organizations based in Chile. The findings could be enriched by the observation of non-verbal communications and other practices at in-person meetings. This is another limitation of the proposed methodological tool and design. Finally, the authors of this article, as researchers (and thus observers), propose distinctions when it comes to analyzing the appreciations and observations of the organizations about the topic of study (Luhmann, 2007). These distinctions are part of the research/observation exercise and can be read implicitly and explicitly based on the configuration of this study,

the preceding theoretical framework, and the research design. This must be taken into account.

Next, the categories and subcategories will be described in more detail.

Category	Subcategory	Purpose
1) Knowledge	1.1) CE knowledge	The purpose of this category is to analyze the level of knowledge about the circular economy.
2) Technology	2.1) Project 2.2) Technical knowledge and new technologies	The aim of this category is to identify the CE project or action implemented within an organization, as well as the level of technical and/or technological knowledge required to develop it.
3) Structural	3.1) Cooperative identity and the CE 3.2) Sustainability in the organization	The purpose of this category is to analyze how cooperativism and its management structure influence the connection with the CE.
4) Operational	4.1) Link with customers 4.2) Link with suppliers 4.3) Influence of cooperativism	This category is intended to analyze the supply chain management to determine how the organization operates and communicates.
5) Financial	5.1) Access to financing 5.2) Profitability	This category seeks to establish, as factors, how capital, level of risk, profitability, and measurement of financial benefits influence CE practices.

Source: Own elaboration

Analysis and Results

This section presents the results and discusses the interviews conducted. The results are set out in line with the categories used for the interviews. Moreover, each category is accompanied by a representative quote, research observations, and a semantic network to aid analysis. In turn, three of the five categories are composed of subcategories, each of which are also presented alongside a representative quote. Next, an overview will be provided of the three organizations studied.

This section begins with a brief approach and observation on the 3 organizations considered in this article.

Characterization of Organizations

The three organizations are small cooperatives staffed by young teams of members and employees. They are referred to as cooperatives A, B, and C. Cooperative A, a worker cooperative, was founded in 2014 and is engaged in waste prevention and recovery. The cooperative's customer base is made up primarily of its members and the companies that use the material collected and processed. At present, Cooperative A provides services related to the management and recovery of used cooking oil for biofuel production; management and recovery of organic waste for vermicompost production; management of recoverable inorganic household waste; and environmental education projects; Cooperative B, another worker cooperative, was founded in 2016 and is engaged in agroecology. This cooperative has set up a house as a sustainable demonstration center—featuring solar panels and recycled water providing drip irrigation to an orchard—which it also uses as a base for its agroecology services and its advisory on cooperative formation.

Finally, Cooperative C is an agricultural cooperative, set up in 2016 with the aim of reducing the negative impact of agricultural activity. Its main customers are its members and agricultural producers. The cooperative provides sustainable agricultural waste management services, specialized advisory on microbiological compost, and workshops.

Results by Category

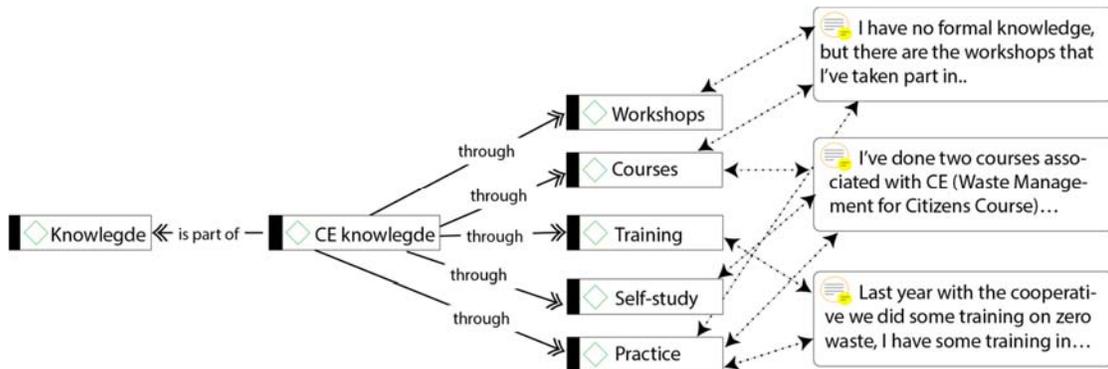
Next, an outline is provided of the results and observations by category. For each category, a table presents a description of the observation by category and subcategory, as well as a representative quote. In addition, a semantic network is constructed using AtlasTi8 software based on the responses to the questions in each thematic category.

Knowledge Category

Illustration 3: Semantic Network 1 - Knowledge Category

Subcategory	Description	Representative quote
CE knowledge	Generated based on self-education and personal research. Description of the CE based on closed processes and material management. Value in recovery actions.	<i>“The knowledge about the CE I have is very basic, let's say it's to do with closing the cycles, and to close these production cycles all waste and refuse that a production system generates, you transform or reuse it or look into or</i>

try not to generate that waste that you don't know what do with, so when you go to produce something, you study that process, and it could mean that waste that can't be transformed or revalued is not generated."



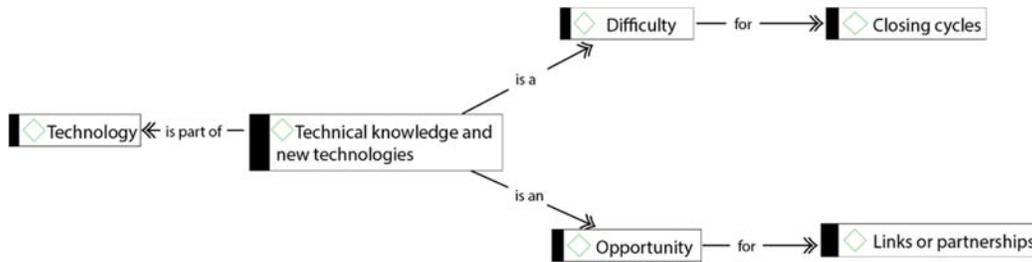
Source: Own elaboration

The interviewees' responses provide evidence of basic knowledge of the CE, represented through a semantic network. The interviewees said that they had acquired their knowledge about the CE through workshops, courses, training, self-educating, and practice. The conversations and accounts about knowledge are steered toward training activities such as workshops and courses. There is recognition of low-level or basic knowledge across the three organizations, but an acknowledgment that there is a lot still to learn.

Technological Category

Illustration 4: Semantic Network 2 - Technological Category

Subcategory	Description	Representative quote
2.2) Technical knowledge and new technologies	Technical knowledge for application to a new action or process. Factors for which the need for studies is recognized. Addressed through partnerships and cooperation.	<p><i>"In particular the facilities for producing biodiesel meant a technical challenge, which was tackled along with a professor from the Universidad Austral de Chile."</i></p> <p><i>"Indeed, for what we're doing, which is compost, there was a technical tour to Europe for example, to countries that are working with huge tons uses and reused tomato plants that have ended their season."</i></p>



Source: Own elaboration

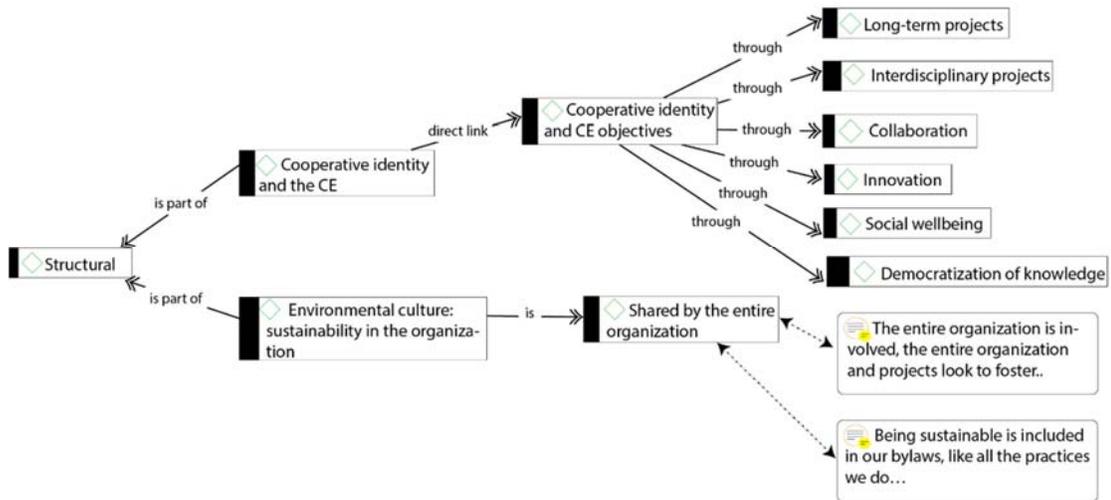
In this category, the conversations were directed toward the topic of the tools used in the work of the corporations, and their inclusion in the production process. Here, the interviewees cited wide-ranging difficulties with learning the processes and approaches for material treatment and recovery. In the face of these challenges—caused by lack of industry knowledge of these procedures—support, connections, and partnerships are crucial. These emerge as an opportunity. Cooperation as a principle and a capacity comes to the fore, as does the desire to realize these possibilities. The cooperatives do not pursue these aims for their own benefit, but to assist the training or support they provide to individuals and organizations.

Structural Category

Illustration 5: Semantic Network 3 - Structural Category

Subcategory	Description	Representative quote
Cooperative identity and the CE.	Necessary connection between the principles of cooperation and responsibility for developing successful CE projects. Conceptualization of common goods related to waste.	<p><i>“It is difficult to understand the CE. It is understood in a collaborative, cooperative, and above all horizontal way. For the CE to work there has to be loads of factors in harmony and this is difficult to achieve without collaborative thinking.</i></p> <p><i>“If we focus on waste management, I think it [the CE] is hugely important and it should be a requirement to apply the cooperative model, as garbage is a resource generated by the entire population, and so it could be classed as a common good [or a common ill in the present context] that should benefit everyone.”</i></p>
Sustainability in the organization	The vision of sustainability is shared by all members and	<i>“It is a vision shared by all cooperative members and the CE and sustainability in our production systems is part of our</i>

represented across all vision, mission and a policy of our structures of the organization. cooperative.”



Source: Own elaboration

In the Structural category, similarities between the responses of the three cooperatives were identified in the subcategories of cooperative identity and the CE, and sustainability in the organization. It was found that cooperative identity influences and has relevance for CE practices. The interviewees are aware that the cooperative structure and principles hasten the transition to the CE. They note that the cooperative model takes into account factors such as long-term projects, interdisciplinary processes, collaboration, innovation, knowledge democracy, and community awareness, all of which are necessary factors for CE implementation.

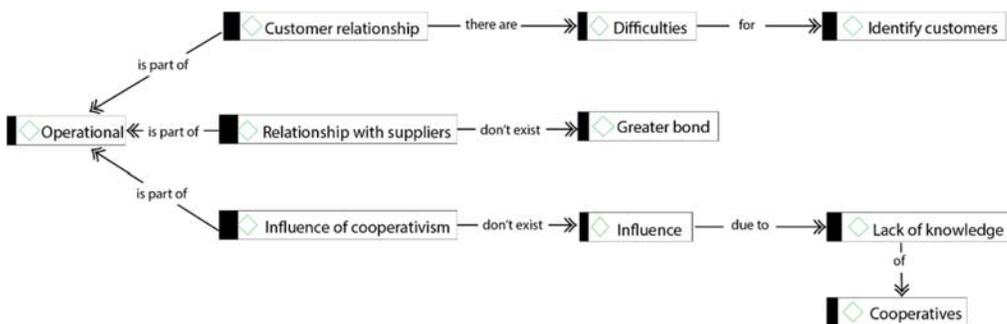
The vision of sustainability is shared by all members and represented across all structures of the organization. This may be due to the size of the organization—an observation that applies to the case studies, but which may also correspond to ventures.

Operational Category

Illustration 6: Semantic Network 4 - Operational Category

Subcategory	Description	Representative quote
Customer relationship	Customer relationship and close contact Strength of the organizations.	<i>“Right now we have a better idea about who our audience are and so our customers, we haven't had major difficulties with our customers, complaints or service that's been poor, so far it hasn't happened and relations have been good in the sense of plenty conversation,</i>

		<i>reaching agreements, things like that.”</i>
Relationship with suppliers.	Suppliers in the value chain are producers in other fields. Purchase of waste engenders more distant relationships.	<p><i>“We have suppliers, in terms of materials and supplies for the courses, we have some nurseries close to here in Limache and Quillota. [...] there's a kind of relationship with those people.”</i></p> <p><i>“Our raw material suppliers are the tomato farmers themselves [...]”</i></p>
Influence of cooperativism	Limited general knowledge about cooperativism. But with the greater visibility of their principles and governance, spaces of trust emerge that can be attributed to this.	<p><i>With customers, I think that perhaps we can alert a segment of the population that has an interest in this issue of cooperatives; many are outside this area and don't know about it. I don't think people have much knowledge or education about cooperativism, in general.”</i></p> <p><i>“If we were a company perhaps they wouldn't be giving us those donations, I believe.”</i></p>



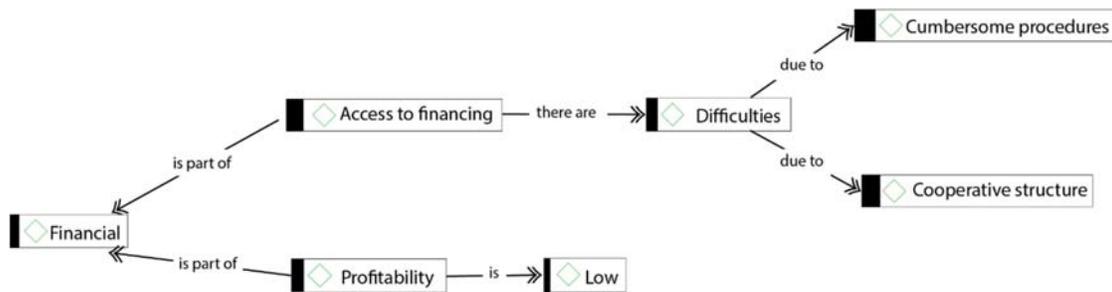
Source: Own elaboration

Financial Category

Illustration 7: Semantic Network 5 - Financial Category

Subcategory	Description	Representative quote
Access to financing	The cooperative structure presupposes complexities in processes for accessing financing, as well as lack of knowledge of the	<i>“In Chile because there is the option of being a for-profit or a non-profit cooperative, there is always some</i>

	type of organizations and administrative processes involved.	<i>competitive fund for not-for-profit legal entities where we have to write to them to see if we can apply as a cooperative, and then they ask you to send the bylaws, where it is clear that if you're not profit-making then you can take part, so it's a bit tricky.</i>
Profitability	The question about economic performance of the projects reveals major challenges.	<i>"Yes, it has demonstrated profitability, profits, and there has been no carryover because we have been investing our profits and carryover. In this period, what we have done is invest in machinery, some studies, we have been doing everything possible over this time to make ourselves sustainable."</i>



Source: Own elaboration

On the financial front, the interviewees describe cumbersome procedures and bureaucratic difficulties associated with the cooperative structure in their dealings with financial institutions and the state. Finally, economic profitability has been low, which is one of the factors analyzed in their operations.

Conclusions

The study of phenomena as complex as cooperativism and sustainability sheds light and lends new perspective, as well as paving the way for future research. The discourses of the interviewees provide insight into their experiences with the selected organizations, which must be taken into consideration in this conclusion. This study has identified a lack of technical or technological knowledge as a barrier to CE implementation in the organizations studied. This is consistent with the *Consultoría para Construir una Hoja de Ruta de Economía Circular en Chile* (2020); that is, waste separation and recycling processes and technologies, remanufacturing, and repairs, among other developments, are necessary.

In the cases reviewed, knowledge barriers were evident with regard to the processes for implementing biodiesel production infrastructure. However, through the assistance of well-trained external groups or individuals, the cooperatives have been able to deal with this barrier. Links or partnerships with professionals, universities, R+D+i centers and others can present opportunities for organizations to create a positive impact or

contribute to the community. A lack of linkage between companies and academia limits the ability to bolster training and R+D+i, an observation that is consistent with the literature (Rubik Sustentabilidad, 2019).

When it comes to technology, the three organizations point toward difficulties in developing their projects due to a lack of technical knowledge and new technologies. In the case of these organizations, knowledge refers to the biological cycle of the CE, and to specific technical aspects related to agroecology. To acquire this knowledge, the individuals interviewed had to undergo training; they did so on their own initiative, and based on their own interest, through courses, workshops, self-study, and practice within the organization and in their own time.

It was found that cooperative identity influences and has relevance for CE practices. The notion that the cooperative governance model might catalyze the transition to the CE was reaffirmed in the responses of the interviewees from the different cooperatives, who noted that the model includes factors such as long-term projects, interdisciplinary processes, collaboration, innovation, knowledge democracy, and community awareness, all of which are necessary for the transition. The interviewees remarked on the importance of CE knowledge accessibility, dissemination, promotion, and education, and that scope must be given to implement that knowledge and overcome the information asymmetry gaps identified in the theoretical framework. According to Rizos et al. (2016), successful transition to the CE can only be achieved through collective effort, which requires exchange and dissemination of knowledge and innovation between the different stakeholders in the value chain.

For future research, it is recommended that the methodology of this study be extended to other organizations in the social economy that are engaged in CE implementation. Future studies could also focus on the connection between cooperatives and other suppliers and customers in the circular economy.

For cooperatives that wish to implement the CE, and taking into account the conversations from the case studies, training for members and workers is recommended. According to the interviewees, the projects associated with environmental issues are not yet profitable, for various reasons, and dependence on external funding creates instability; as such, alternative income models are recommended.

A major difficulty noted by the interviewees concerns customer identification; cooperatives should take into account their target market in order to prevent unnecessary efforts and use of resources. Finally, they should enter into partnerships with professionals, universities, and R+D+i centers that are interested in implementing the CE.

The literature, and particularly this study, is driven by an intuition: that in certain discourses lurk communications belonging to broader social systems (Canales, 2006).

In other words, the descriptions and observations of particular social actors are part of a broader network of meanings that are contingent on the tasks they undertake and the historical time in which we live.

The results analyzed in this study are consistent with other findings in the literature. The methodology, based on interviews, was affected by the contingency of the coronavirus pandemic in the country, with containment measures initiated on the same date that contact with the cooperatives began.

For this reason, all interviews were conducted remotely, using teleconferencing technology platforms or, in one case, by telephone. Although this streamlined the coordination of the conversations, it was also a new form of interaction in which it was necessary to adapt the way in which the questions were posed and the conversation guided.

In the academic sphere, it should be recalled that the CE is a concept that is still undergoing development—particularly in Chile. A Circular Economy Office was only created in Chile in 2018, and this year, 2020, the government published a report analyzing the transition to the circular economy. It is hoped that this study can help to motivate new research.

One concept that goes alongside those of collaboration and waste recovery in the CE is interdependence. This means recognizing the existence of reciprocal dependence between individuals in social relations and acting economically and organizationally on this basis. Ensuring interdependence means balancing the value of diversity and the contribution of organizations within society. There remain opportunities for the investigation and systematization of practices and for observation based on experience—especially with regard to other actors in the technical and biological life cycles of material and waste—to ensure clarity about the afore-mentioned policies and practices.

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