

Article

Circular Economy and Cooperatives—An Exploratory Survey

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Abstract: Global sustainability assessments call for a rethinking of prevailing systems of production and consumption. We focus on the circular economy as an alternative system, and the role of cooperatives as transformative actors for sustainability. While cooperatives have been studied in relation to specific circularity strategies, notably recycling, we present the first study on cooperatives in relation to all circularity strategies. We ask how circular economy strategies and business models resonate with cooperatives. The research is based on an exploratory database and survey of 165 cooperatives in the Canadian province of Québec. Our research shows circularity to be anchored in the mutualisation at the heart of the cooperative model, which emphasizes a shared taking of responsibility in response to needs. The survey shows that cooperatives contribute comprehensively to the circular economy, not just to downstream categories of recycling and revalorization but also to upstream categories of rethinking production and consumption, sharing, and durable use. They can contribute to an embedding of circular economy in regional economies and circular societies. To advance this potential, further integration and improvement of circularity strategies and associated socio-technical questions, support with business model development and finance, as well as education and peer exchange are needed.

Keywords: cooperatives; circular economy; business models; circular society; Québec; social economy; reduction at the source; repair; recycling; transformation



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1. Introduction

Sustainability is well-established as a political goal on all political levels. The Sustainable Development Goals for 2030 offer a global framework to eliminate poverty and hunger, improve education for all, protect the climate and life on earth, along with further goals. However, multiple crises such as the COVID-19 pandemic and the war between Russia and Ukraine, make these goals difficult to achieve. Moreover, global sustainability assessments suggest that these crises are the result of underlying unsustainability tendencies and call for a transformation of the current systems of production and consumption [1]. The call creates space for alternative conceptions of the economy, as well as for more marginalized or invisible actors of the economy. At the level of conceptions of the economy, circular economy is gaining attention as a systemic approach for transformation towards sustainability [2]. Research on the conceptions of circular economy, in turn, points to alternative actors, including the cooperative movement in reformist and transformational approaches to circular economy [3]. The International Cooperatives Alliance defines a cooperative as 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” [4]. In effect, several recent articles study cooperatives as a vehicle for advancing sustainability goals [5–8]. Sustainability features both as the future of the

cooperative business model, as well as a value embedded in the tradition of cooperative practice and research [9]. However, empirical research centered on cooperatives and on circular economy as an operationalization of sustainability [2] remains limited, and mostly centered on case studies of recycling, waste management and waste-pickers in so-called developing countries [10–15]. Since circular economy includes not only recycling but also avoidance and reduction of waste, along with sharing and repairing—all upstream of recycling—there is a knowledge gap, which calls for a comprehensive exploration of cooperatives across all circularity strategies.

Our survey contributes towards filling this knowledge gap via a pioneering study of cooperatives in relation to all circularity strategies, upstream and downstream. The study provides insights into circularity strategies of cooperatives, their novelty, as well as the needs of cooperatives in relation to circular economy. The empirical focus of our survey is on Québec. The Canadian province is known for its long tradition of cooperatives [16], as well as for its pioneering role in creating a circular economy ecosystem [17]. The work draws on an exploratory database of 165 cooperatives, which we survey to understand how circular economy strategies and business models resonate with cooperatives. This research objective includes the following sub questions: which strategies and business models do cooperatives pursue; how do they view their advancement in relation to these strategies and business models; how are strategies and business models related to types of cooperatives and sectors; and what are the needs of cooperatives for advancing circularity?

Our research shows that circular strategies and business models resonate with cooperatives. They are anchored in the mutualisation at the heart of the cooperative model, which emphasizes a shared taking of responsibility in response to needs. Cooperatives contribute comprehensively to circular economy, not just to downstream categories but importantly also to upstream categories of rethinking production and consumption, sharing and durable use. Cooperatives can contribute to an embedding of circular economy in a strongly sustainable manner, not “just” dealing with waste, but embedding circular economy in a circular society anchored in regional economies and value chains of proximity. Specifically, the model of reduction at the source can move sectors such as agriculture, energy and mobility to regenerative uses of resource and land, and a preservation of natural capital.

The next two sections introduce our conceptual approach as well as our method. We then move to the portrait and analysis of our survey, followed by a discussion of results and our conclusion.

2. Conceptual Approach

Circular economy is gaining attention in both policy and scholarly circles as an approach for transformation towards sustainability [1,2]. Circular economy research identifies inter alia strategies and business model typologies [18,19], and explores the discourses and policies of circular economy [3,20,21]. In Québec, the discussion of circular economy advanced via the creation of a multi-stakeholder roundtable in 2015 [17]. It established a definition of circular economy as “production, exchange and consumption system aiming to optimize resource use in every stage in the life cycle of a product or service through a circular approach, reduce the environmental footprint and contribute to the well-being of individuals and communities” in 2016, and fostered the reputation of the province as having the most comprehensive approach in Canada so far [21]. The roundtable established the strategies of circular economy [22]. These are presented in four categories on the digital circular economy platform Québec Circulaire [23]:

1. *Rethinking*, comprising three strategies of (a) eco-design considering environmental impacts of products already at product design, (b) responsible consumption and procurement, and (c) process optimization making materials use more efficient and effective.
2. *Increasing the use of products*, comprising (a) the sharing or collaborative economy, which increases the use of goods via technological platforms and sharing practices, and (b) short-term renting.

3. *Extending the life of products and components*, comprising (a) maintenance and repair, (b) donating and reselling, (c) refurbishing or reconditioning of products after disassembly, and (d) the performance or functional economy focused on selling a service rather than a product (producer owners have responsibility also over the end-of-cycle stage of the product).
4. *Giving resources a new life*, comprising (a) industrial ecology or the idea that production sites can be organized in such a way that waste or by-products of one organization serve as an input for another, (b) recycling and composting, and (c) recovery or the making of new products or production of energy from residual materials.

Moving from these four categories of circularity strategies to policy and circular economy discourses, Québec is situated between technocentric and reformist circular economy policies and discourses [20]. *Technocentric* circular economy aims at sustainable human progress. It draws on capitalism and emphasizes technological innovation as a driver of decoupling the economy from environmental resources and sink requirements. *Reformist* circular society aims at economic prosperity and human well-being within planetary boundaries. It seeks to change capitalism and its organizations, and for this it aims at technological and social innovation [3].

The reformist discourse resonates with social economy, defined as organizations with a “social or public purpose, engaged in economic activities based on voluntary cooperation, democratic and participatory governance, autonomy and independence, the rules of which prohibit or limit the distribution of profit” [24]. In Québec, the social economy is well-established as a vector of a social change [25].

The research project *Économie sociale et économie circulaire* (“TIESS project” in the following) explored the synergies between circular economy and the social economy and its organizations, such as cooperatives, associations, mutual societies, foundations, social enterprises, and self-help groups [26]. It studied twenty-six, Québec social enterprises in relation to the circular economy strategies introduced above and with a view to covering enterprises from different regions of the province as well as from different sectors. The project identified eight business models of social enterprises in circular economy [27,28]:

1. *Ecodesigners* develop, produce, and sell products made from recuperated materials. For example, in our survey, the worker cooperative Euclid uses residual materials from local agriculture, for instance from cranberry cultivations to produce a gin with cranberry flavour.
2. *Mutualisers* coordinate the sharing of tools and products with a view to increasing their use within a community. For example, in our survey, the producer cooperative Monark shares machinery and knowledge to cultivate milkweed, a plant perceived as a ‘bad’ weed in conventional agriculture, yet essential for the monarch butterfly as well as having properties of interest for use in textiles and construction.
3. *Second-hand* shops sort and package clothes, furniture, and other goods for resale. For example, in our survey, the worker cooperative La Machine both designs new clothes from recycled materials and runs a second-hand shop [29].
4. *Logisticians* offer waste management (including coordination of partners) to make them available again via sale or gift. For example, in our survey, the solidarity cooperative Retournzy provides restaurants and their clients a service that allows take-home orders in reusable containers, which the cooperative provides and returns to the restaurants.
5. *Repairers* offer their services to mend clothes, fix bikes, etc. to extend the life of a product. For example, in our survey, the solidarity cooperative Bibliothèque d’outils La Remise provides citizens with tools and workshops to repair furniture, clothes, and bikes.
6. *Recoverers* offer a service in the collection, sorting, and preparation of ‘waste’ materials so that they become reusable again. For example, in our survey, the worker cooperative Boomerang recuperates a by-product of the beer brewing process, spent grain, and uses it for a new flour with spent grain as an ingredient.

7. *Transformers* offer industrial services by creating new products out of waste. For example, in our survey, the solidarity cooperative Tricentris sorts waste materials (such as glass) and transforms them into new products (such as glass mulch, filters, and glass abrasives).
8. *Craft hubs* offer citizens access to tools and training for repairing and making products in a workshop. For example, in our survey, the solidarity cooperative Atelier La Patente offers a hub along with educational workshops, a tool library, and a collection and sale centre for recycled materials. As these examples already indicate, some of these models overlap and we will return to this point below.

In the TIESS project, the business models were not specifically explored in relation to cooperatives and circular economy. The project sample of twenty-six organizations comprised twenty-two non-governmental organizations and only four cooperatives. However, a 2019 survey by the CQCM (Québec council of cooperatives and mutuals) of fifteen federations of cooperatives showed a latent interest among cooperatives [30]: Eighty-five percent of federations said that they intended to integrate information about circular economy and sustainable development in their future action plans. Sixty-three percent of federations reported a sustainability committee, and seventy-three percent said that they inform themselves regularly about circular economy. Forty percent said that they only recently started getting informed about circular economy, and forty-six percent had not yet discussed the topic with their members. The respondents viewed a lack of financial and human resources as the main obstacle to further advancing circular economy. They viewed the will of their members to have an improved environmental impact as a key leverage point for advancing circularity.

To explore the specific relation of cooperatives and circular economy, we revisited the TIESS project, of which two of our authors were participants in from the start. We created an exploratory database of cooperatives (introduced in the next section). The work on the database suggested that cooperatives might pursue more than one strategy and pursue more than one business model. Moreover, given the recent emergence of the circular economy discourses, as also put in evidence in the cooperative federation survey above, the advancement of strategies and business models among the cooperatives (preliminary, piloting, well-established) emerged as a further point. Furthermore, the preparation of the database suggested two further business models, which we presented to the members of the TIESS project in the preparation of the survey (see also Figure 1):

9. *Reduction at the source* offers a service based on the elimination of non-essential and harmful materials and value chains, such as zero-waste shops offering regional produce, or farmers using community-supported agriculture to offer seasonal and organic produce. For example, the producer cooperative CAPÉ (Coopérative pour l'Agriculture de Proximité Écologique) seeks to reduce food waste via a "bio local" offer of baskets that are local and biological only. The model complements the eco-designers above, who produce new products from recycled materials. Reduction at the source also includes the crucial substitution requirement for a transition to sustainability: e.g., moving out of fossil fuel-based models of energy provision towards renewables, as well as away from industrial agriculture and its reliance on industrially produced pesticides and fertilizers, and towards regenerative, sustainable agriculture. Thus, the model adds a component of sufficiency (doing less, attending to needs rather than wants) and regeneration (of natural capital) that expands the typology and its contribution to sustainability transformation (further discussed below).
10. *Consultants* offer advice and training for the development and implementation of circular economy strategies. For example, in our survey, the worker cooperative INCITA offers organizations an accompaniment to move towards zero waste.

These developments and observations at the intersection of circular economy and social economy provide the background of the current study and its questions: Do circular economy strategies and business models resonate with cooperatives? Which strategies and business models do they favour? How far advanced are they with the adoption of

these strategies and business models? How are strategies and business models related to types of cooperatives and sectors? What are the needs of cooperatives in relation to circular economy?

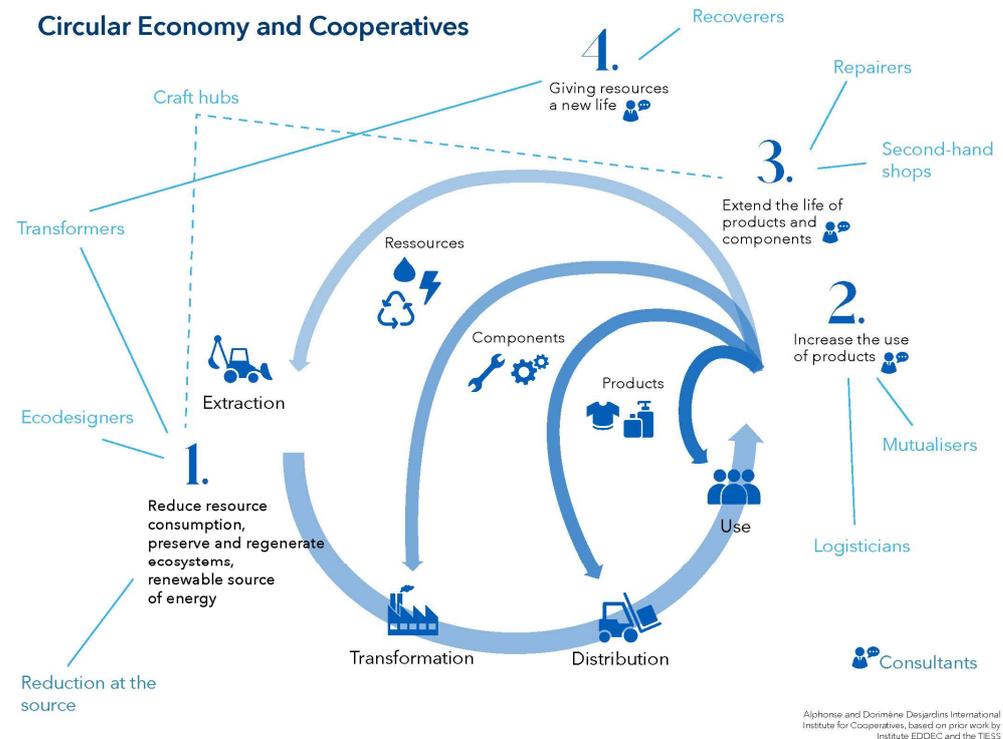


Figure 1. Circular Economy and business models of cooperatives.

3. Method

In Fall 2021, we created an exploratory database of Québec cooperatives based on the professional experience of two co-authors (and their teams) working in the cooperative milieu, as well as on prior research of the two academic co-authors on the circular economy–social economy intersection [31]. We used snowballing to identify further cooperatives. This resulted in a list of 165 cooperatives. We stress that this is an exploratory database. There is no established repository of cooperatives and circularity. Moreover, even the definition of circular economy remains contested (as in evidence in the circular economy discourses [3]). Accordingly, we interpret the results below without any claim to conclusive evidence, but rather as a contribution to the further development of the topic.

In Spring 2022, we developed a questionnaire based on the conceptual approach introduced in the prior section. The questionnaire was made up of eight parts. The first two parts asked participants to confirm or adjust the name and description of the cooperative. The third and fourth parts asked participants to validate their relation to circular economy strategies and business models (both strategies and models in the sense introduced above; the questionnaire was also accompanied by a document that explained the strategies and business models). Each cooperative was approached with our suggestion of what might be their strategies and business models based on our preliminary analysis. Participants were asked to confirm or make corrections, and they had to identify their level of advancement in relation to their chosen strategy/strategies and model(s). The options were (a) Yes, we are in the initial phase of operating this business model/strategy; (b) Yes, we are operating this business model (piloting)/strategy; (c) Yes, this business model/strategy is well established in our cooperative; (d) No, this business model/strategy does not apply to our cooperative; (e) No, this business model/strategy does not apply to our cooperative, but we would be interested in considering it in the future. The fifth part of the survey asked cooperatives to share documents of their work (such as annual reports, sustainability report, or theme

specific publications they produced). Part 6 asked participants about potential needs in relation to strategy and business model development. Part 7 was an open question to allow for unstructured comments and questions. Part 8 concluded with a question about the preferred mode of communication with the cooperative [31].

Each cooperative was contacted by email in summer 2022. If participants asked for it or something was unclear, we followed up with a phone call or by email to clarify questions. Responses were registered in an Excel spreadsheet, which was then used for the subsequent analysis and presentation of results.

Of the 165 cooperatives contacted, 48 cooperatives responded, with 32 complete answers and 16 partial responses, i.e., a twenty-nine percent response rate for partial answers and a nineteen percent response rate for full answers. Thirteen of the cooperatives had ceased to exist when we contacted them. Eight cooperatives were in a state of preparation (about to be created or created but not yet offering services).

4. Results

4.1. Portrait of Our Database in the Context of Québec

There are more than 3300 cooperatives in Québec with around 8.8 million producer, consumer, or worker members [32]. They employ an estimated 122,000 people, hold 427 billion Canadian dollars in assets, and represent 14.5 percent of the gross domestic product of Québec [32]. They include many not-for-profit cooperatives with no employees—in the province, just as in Canada as a whole—and many cooperatives with employees are small enterprises with less than 100 employees. We will return to this point in Section 4.4.

The cooperatives are active in 23 different sectors [33]. Our database covers 13 sectors [34]. Most cooperatives in our database are from agriculture and fisheries ($n = 83$), followed by professional and technical services ($n = 32$), and food ($n = 15$). The considerable number in agriculture and fisheries is largely due to there being 60 CUMAs (Coopérative d'utilisation de matériel agricole).

Québec is organized into 17 administrative regions, of which only the region of Nord-du-Québec is not included in our database. Most cooperatives are based in Montréal ($n = 25$), followed by Chaudière-Appalaches ($n = 23$), and Bas-Saint-Laurent ($n = 23$).

Québec distinguishes five types of cooperatives: consumer cooperatives, producer cooperatives, worker cooperatives, shareholding worker cooperatives, and solidarity cooperatives. In our database, the largest group is made up of 79 producer cooperatives (including the 60 CUMA producer cooperatives). Seventy-three producer cooperatives are from agriculture and fisheries. There are 56 solidarity cooperatives, working mostly in professional and technical services ($n = 22$), as well as food ($n = 11$) and agriculture ($n = 8$). There are 17 worker cooperatives, with the biggest subgroups in manufacturing ($n = 6$) and professional and technical services ($n = 5$). There are seven consumer cooperatives, with the biggest subgroup in food ($n = 3$). There is one shareholding worker cooperative in the database, working in professional and technical services. Figure 2 shows the distribution of responses by type of cooperative.

4.2. Identification with Strategies and Business Models

In this section, we report the results for the strategies and business models of the 48 cooperatives that responded to the survey. Respondents are in line with the portrait provided in the last subsection with respect to geographical distribution (14 regions present, with 11 participants from Montréal, 9 from Chaudière-Appalaches, and 5 from Bas-Saint-Laurent), 8 sectors (with 22 responses from agriculture and fisheries, 10 from professional and technical services, and 6 from food), and types of cooperatives (22 producer cooperatives, 17 solidarity cooperatives, 6 worker cooperatives, and 2 consumer cooperatives).

Fifty-five percent ($n = 26$) of respondents identify with the mutualiser model as their primary business model, followed by eight percent for reduction at the source and logisticians, respectively, and six percent for consultants in circular economy (see Figure 2). This result includes 14 CUMAs who identify with the mutualiser as their primary model.

The mutualisers include further producer cooperatives in agriculture, such as the CAPÉ. This cooperative brings together farmers committed to ecological agriculture. It supports them with the purchase of inputs as well as the sale of their produce in the local context (short circles), such as the bio local baskets mentioned in Section 2. It also offers educational workshops for its members, and the cooperative is politically active in support of ecological and local agriculture. The producer cooperatives also include two Fab labs. In addition, there are four solidarity cooperatives, two again from the agricultural and food sectors but also the Coopérative Bibliothèque d'outils La Remise, which offers the sharing of tools as well as access to workspaces. The mutualisers also include one worker cooperative (agriculture) and one consumer cooperative (woodworking).

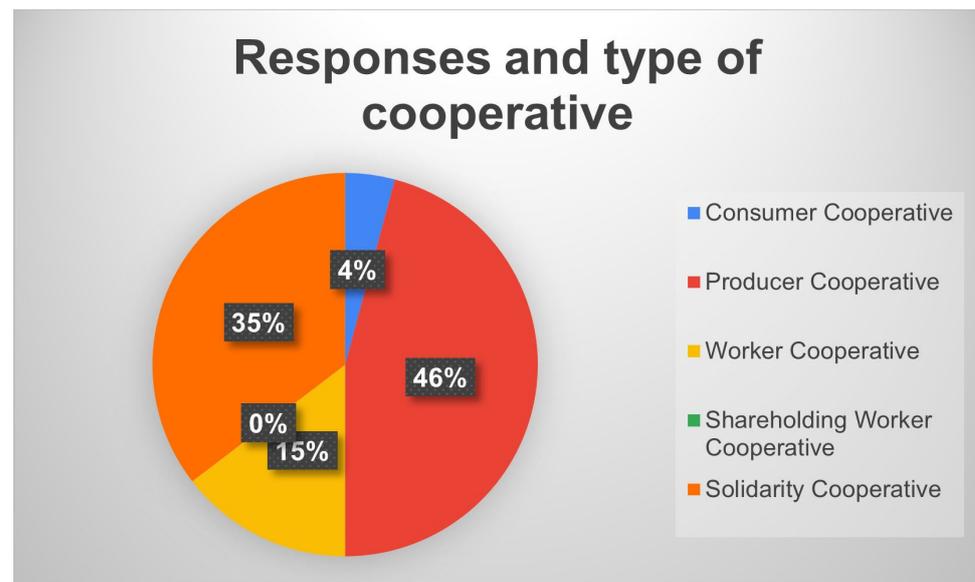


Figure 2. Distribution of Responses by Type of Cooperative (n = 48, 2 consumer cooperatives, 22 producer cooperatives, 7 worker cooperatives, 0 shareholding worker cooperatives, 17 solidarity cooperatives).

Eight percent (n = 4) of respondents identify with *reduction at the source* and *logisticians*, respectively, as their primary business model. *Reduction at the source* comprises a consumer cooperative and a solidarity cooperative both focused on bio products and the sale of products in bulk, a producer cooperative offering bike-powered delivery services, and a worker cooperative farm offering certified bio products. *Logisticians* comprise only solidarity cooperatives, three of them organizing the availability of locally and ecologically produced agricultural products as well as one cooperative focused on waste reduction (helping restaurants and their clients to avoid plastic waste when ordering food).

Forty-eight percent of the respondents also identify with a second business model, and fifteen percent with a third model. For the second model, *reduction at the source* prevails with thirty percent (n = 7), and even more so for the third model (71% percent, n = 5) (see also Figure 3). At the level of the second and third models, *reduction at the source* is validated by eight solidarity cooperatives, three producer cooperatives, and one worker cooperative. Agriculture and food-related cooperatives prevail (n = 9).

Eighty-eight percent of respondents, who identify their level of advancement (n = 32), say that the primary business model is well established (80% for the second as well as third business models). Cooperatives with a primary strategy at the level of piloting (9%) are new cooperatives founded in 2019 or after. With one exception, these are not the same cooperatives reporting piloting at the level of strategies.

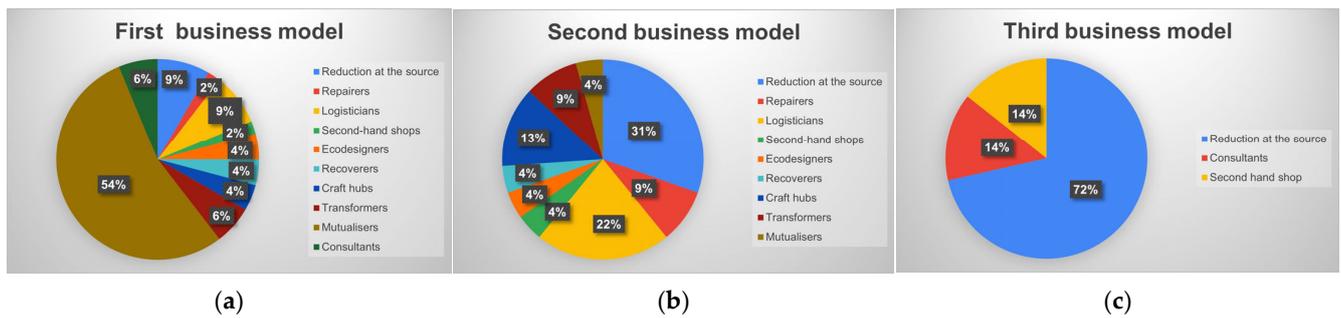


Figure 3. Cooperatives’ identification with business models: (a) first business model, (b) second business model, (c) third business model.

4.3. Circularity, Year of Foundation and Failure

Among the respondents for which we have the year of foundation (n = 47), thirty-two percent (n = 15) were founded within the last 5 years (2018–2022), fifty-one percent (n = 24) in the last 10 years, and ninety-six (n = 46) in the last 30 years (see also Figure 4). Taking out the block of CUMA agricultural producers, who were mostly founded in the 1990s, the numbers show forty-one percent of cooperatives founded within the last 5 years (2018–2022), sixty-six percent in the last 10 years, and ninety-six percent of cooperatives in the last 30 years. Thus, founding cooperatives with an explicit circularity strategy appears to be a relatively new but growing tendency, in line with the recent emergence of circular economy as a concept in policy and public discussions.

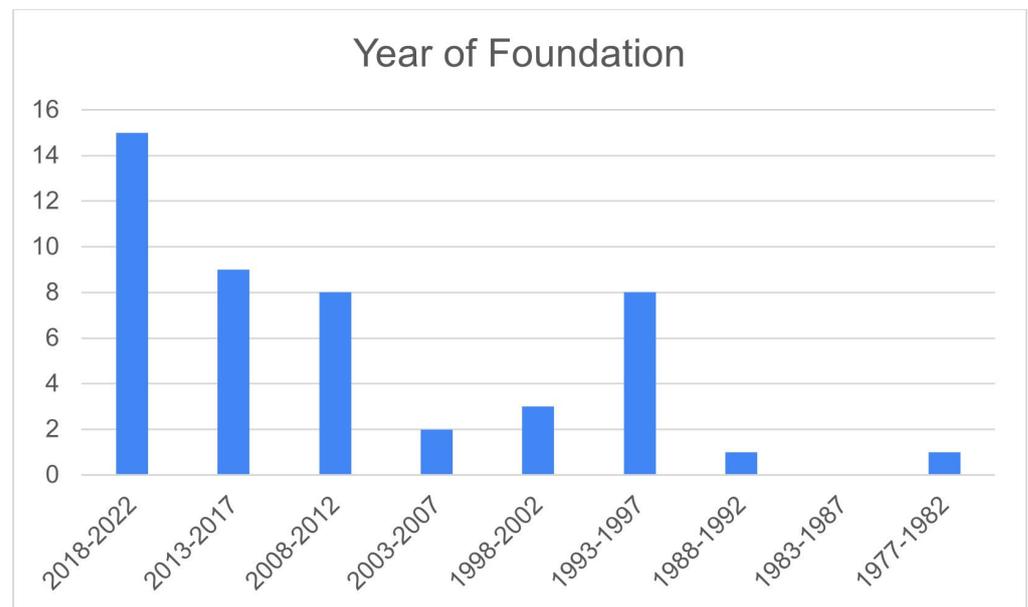


Figure 4. Histogram with years of foundation in 5-year interval.

Cooperatives have a better survival rate than private enterprise in Québec: Sixty-five percent survive the first five years, and forty-four percent the first ten years, whereas for private enterprises thirty-five percent survive the first five years [35]. Prima facie, the numbers suggest a better survival rate of cooperatives with circular strategies, as opposed to private circular enterprises.

In our survey, eight percent (n = 13) of cooperatives had ceased to exist when we contacted them. Reasons for closure include insufficient earned income to pay wages, two cases were also linked to the pandemic (one in the food sector, one in agriculture), conversion of the cooperative into an NGO, and inability to secure sufficient members in the early stage of the cooperative.

4.4. Documentation of Cooperative Impact

Twenty-two percent ($n = 11$) of respondents shared documents of their work: annual reports, as well as their documentation and research on topics pertaining to the circularity strategy and business models. No cooperative submitted a sustainability report or a circularity report.

Putting these numbers into the Canadian context, we note that according to the public statistics of 2018, 52.1% of co-operatives are non-employers (0 employees); 44.9% are small enterprises (1 to 99 employees); 2.5% are medium-sized enterprises (100 to 499 employees); and 0.4% are large enterprises (over 500 employees). Non-profits make up about 63.2% of all co-operatives [36]. In our survey responses, about forty-three percent have no employees, about fifty-two percent are small enterprises, about four percent are medium-sized enterprises, and there are no large enterprises (see also Figure 5).

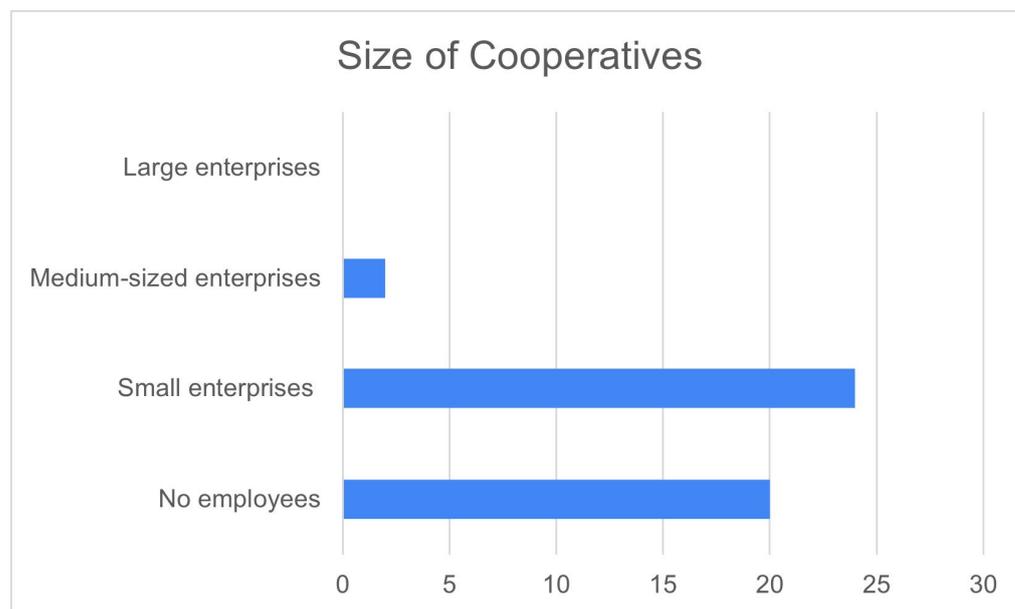


Figure 5. Cooperatives and employment (number of respondents on the x -axis).

Thus, these are in the majority small organizations, and only the exception in this group will have the resources for publishing reports. An example of a large Québec cooperative that documented circular economy activities (at the level of projects) as part of its reporting was Sollio—Cooperative Group, a large agricultural cooperative with about 123,000 members.

4.5. Needs of Cooperatives in Relation to Circularity

The responses of cooperatives regarding their needs are clustered in three topics: further integration and improvement of circularity strategies and associated socio-technical questions; business models and finance; as well as education and peer exchange.

The socio-technical questions refer to the challenge of integrating circularity in an integrated manner in the cooperatives, and this—for small cooperatives—in a context where time and resources for doing so might be missing. It also includes specific technical needs, such as for the installation of equipment or for the reduction of (packaging) waste in production and transformation, or for the optimization of a sharing service.

The business model and financial needs refer to an improved understanding of earned income possibilities from the models but also to information on finance opportunities specifically for cooperatives. Some respondents feel that it is easier to obtain finance either as a ‘normal’ enterprise or as an NGO, and that finance opportunities are fixated on the “new project” rather than on advancing and consolidating the mission of the cooperative and supporting it with expert coaching. Further needs are research on the market and

demand for products and services, as well as know-how for scaling an approach to the regional level.

The last cluster includes the call for workshops on circular economy for members and stakeholders, and for peer exchange among cooperatives pursuing similar strategies and models across different sectors.

5. Discussion

5.1. Resonance of Circularity Strategies and Business Models Indicates a Tool Box for Moving towards Strong Circularity

The analysis of the responses suggests that the circularity strategies and business models resonate with cooperatives across strategies and business models. Respondents affirm the strategies and indicate their level of advancement. Only one cooperative sees no “fit” between their work and the strategies, and this is not because of the types of strategies and models, but rather because this cooperative does not see itself as doing circular economy. Another cooperative views the craft hub as one of two business models in line with its approach but asked to specify it as “craft hub and fab lab”, with the reasoning that welcoming the public and making technologies available is not sufficiently conveyed by the craft hub label. We interpret this as a semantic issue, as the content point is captured by the craft hub model.

Forty-nine percent of respondents indicate more than one business model fitting their approach. Rather than being “the model” of an organization, it is more useful to think of a toolbox of models that cooperatives can adapt and recombine. For example, the solidarity cooperative *Centrale Agricole* brings together urban agricultural producers (including several cooperatives) to share material and immaterial resources on its site in Montréal. The cooperative also offers composting and recycling services. Its members have expertise across all four circular economy strategies. In addition, the cooperative actively fosters circular synergies between its members. For example, the ‘waste’ of a coffee roaster on its premises provides an input for the mushroom cultivation of another organization on its site. Thus, we suggest a toolbox interpretation for cooperatives to select and recombine according to context and purpose.

There is a justified worry that “circular economy as a green economy” discourse renders the economy more efficient but is insufficient to reduce overall pressure on ecosystems and society [3,37]. In this light, it is noteworthy that, in terms of second models chosen, “reduction at the source” is the most popular model (followed by logisticians and craft hubs). “Reduction at the source” is also the most popular third model. We interpret this result as an indicator of cooperatives being open to *strong* as opposed to *weak* circular economy. “Weak” circular economy refers to the idea of decoupling resource use and pollution from economic growth (the technocratic, “green economy” discourse mentioned above); “strong” circular economy refers to the idea that without an overall change and reduction in production, the pressure on ecosystems cannot be reduced (the “reformist” and “transformational” discourses [3,20]).

Our interpretation is supported by the distribution of circularity strategies. Recycling, which belongs to the category of “giving resources a new life” (along with industrial ecology and recovery of residual materials), is the strategy that most directly supports a “weak”, green economy discourse. Along with the other strategies of this category, it suggests that economies can continue with the economic growth paradigm, since all ‘waste’ is afterwards recycled and given a new life. However, in practice, recycling is only partly achieved; materials end up in landfills or as export to ‘developing’ countries (where, as we saw in the introduction, in part because of this dynamic, research focuses on waste-pickers and ways of using the cooperative model to better include and protect vulnerable groups in waste management [10–12]). In our conceptual approach (see also Figure 1), the category “giving resources a new life” is implemented by recuperators, transformers, and eco-designers. Only thirteen percent of cooperatives pursue one of those as their primary strategy. The large majority of eighty-seven percent of cooperatives pursue more upstream strategies,

including nine percent for reduction at the source as their first model, and thirty-four percent for reduction at the source as their first to third model.

Our research suggests that more work on the “reduction at the source” model can be expected to show overlaps between these cooperatives and other actors, calling for a reform or transformation of the economy. It would be important to explore whether there is a strategic divergence between such cooperatives and cooperatives pursuing the “weak” sustainability, economic growth model, which “fits” better with the prevailing, linear system of production. In the light of the results about cooperative size in Section 4.4., there might be a difference between small, niche organizations and larger, more established organizations. If this is correct, a circular economy strategy and business model discussion among cooperatives, small and large, would be relevant and indeed supported by principle 6 of the cooperative identity, which requires cooperation among cooperatives [4]).

We close our toolbox interpretation with two final observations. There is scope for refining strategies. For example, one solidarity cooperative places itself in the circularity strategy category “giving resources a new life” since it works in sorting of waste as well as transformation (of used glass into a glass abrasive). However, the cooperative also argues that a specific strategy for *recycling centers* is missing. Pars pro toto, the example shows space for further refinement and development of strategies. The example is also instructive for another reason. While the attention here is on circularity, a development relevant for social innovation happened at the same time. The organization became a cooperative in 2022 (it used to be a non-profit association). There is, therefore, also a further organizational dimension linked to the choice of organizational type and conversion towards cooperatives as social innovation [38].

5.2. Circular Economy and Cooperatives—Old Wine in New Bottles?

At the origin of the cooperative model is the civic idea of people organizing themselves together in response to a shared need [39]. Mutualisation of resources in response to the needs is central. As we saw above, the most widespread business model was the *mutualiser*. In fact, the deep link between the cooperative model and circular economy generated discussions with the participating cooperatives and cooperative coaches in the preparation and analysis of the survey. If mutualisation is in the “DNA” of cooperatives, are all cooperatives circular?

The question suggests a distinction between implicit and explicit circular economy [20]. “Explicit” circular economy refers to organizations, networks, and policies specifically referring to circular economy. For example, in our survey, the cooperative *Retournzy* lists circularity among its values: “we encourage a circular economy of sharing reusable containers as an alternative to single-use containers” (translated from the French original) [40]. “Implicit” circular economy refers to goals, structures, actions, or policies advancing circular economy and its strategies in all but name: reducing resources use, exiting from fossil fuel-based energy sources, using tools more frequently, repairing them, recycling ‘waste’, and transforming it into new products. Thus, a cooperative might not use, or not even have heard of circular economy but may implicitly advance the goals of a circular economy. We interpret the mutualisation at the core of the cooperative model as a deep, implicit support potential for circular economy.

However, cooperatives are subject to the isomorphic pressures of capitalist markets [41]. They are constrained by policies that support the linear economy (for example, with subsidies for the fossil fuel industry or absent penalties for producing externalities). The pressures imply a tendency to adapt ways of thinking and acting that emphasize the role of the individual and profit-maximization over community and mutualised ways of producing and consuming. Therefore, we argue that cooperatives need to move towards explicit goals and strategies to ensure and sustain social and ecological “circular” impact, and to avoid mission drift towards the linear model. This is supported by the cooperative identity and principle number 7, which requires cooperatives to work towards the sustainable development of communities. In line with our toolbox interpretation, we also

suggest that in such a process of making it explicit, cooperatives will expand, adapt, and correct circularity strategies and models. In short, it is a dynamic process supported by the cooperative identity.

For example, the CUMA, introduced in 1991 in Québec and currently covering about seven percent of the Québec agricultural producers, allows farmers to put their collective forces together for improved power when buying inputs, such as machines, and it enables the sharing, maintaining, and repairing of them. However, since agriculture is also a main driver of low de facto circularity in Québec, notably in relation to insufficient reuse of organic ‘waste’ in agriculture [42], agricultural producers and transformers must make additional, explicit efforts to tackle challenges in the current agricultural system of which they are part. It is noteworthy that already about nineteen percent of the CUMA have producer members with biological certification [43]. Other producer cooperatives, such as the large agriculture cooperative Sollio Cooperative Group, have started projects to better deal with organic ‘waste’. The Sollio team in Lévis has a partnership with an enterprise specializing in insect farming, which produces proteins and flour from insects fed by recuperated organic waste. This has allowed a fifty-six percent reduction of organic ‘waste’ sent to the landfill, and has reduced trucking trips, costs, and GHGs emissions [44]. Such numbers show the power of explicit circularity projects, and the potential transformative impact of moving towards explicit strategies for an organization or even a sector as a whole.

Since we saw in Section 4.4. that the work and impact of cooperatives are not very well documented (in the form of sustainability reports or similar), there is a link between becoming explicit and the call for further development of the cooperative reporting model for transformative impact [50]. Such reporting could not only help to better communicate the impact of cooperatives, but also serve internally as a learning mechanism.

In conclusion, while there is a structural link between the cooperative model and circular economy, this is not a matter of either/or (circular/no circular). It is rather a potential with degrees that need to be actualized, and made explicit, in the context of an economy that in agriculture, but also in other sectors, remains predominantly linear with all the resulting pressures on organizations within it. In this ambivalent context, cooperatives producing locally, according to biological standards, might have a special leverage to advance biological production. Seventy-six percent of Québec consumers say that they purchase local products to support the local economy; only six percent do so for ecological reasons [45]. Since cooperatives tend to be well-established as local producers, they might have a leverage point to convince consumers to add the bio in support of strengthening regions comprehensively.

5.3. Reduction at the Source

This survey added the model of “reduction at the source” to the extant literature [27,28]. Since circular economy is frequently associated with *recycling*—linguistically and metaphorically the circularity strategy that is most intuitively associated with circular economy—it is noteworthy that recycling is but one strategy downstream from “the source.” Before recycling, there are important prior strategies of repairing and improved use of products, and before these, the ecological conception of products and services is needed within the large category of “rethinking.” Crucially, this includes such principles as “designing out waste” and “relying on energy from renewable resources” [46], and with the latter, the global challenge of moving away from a fossil fuel-based energy towards a regenerative economy based on the sustainable use of natural capital. In addition to the emphasis on substitution (in particular of energy and of toxic materials in production), there is the complementary option of reduction of production and consumption, as in evidence with sufficiency as a principle in circular economy [47]. In short, this novel model makes a conceptual and practical contribution for advancing strong circularity.

Thus, it is noteworthy that among the respondents, “reduction at the source” came second (after mutualiser) as the first model, and first as the second and third model. A third of respondents subscribe to the model across the three levels. The biggest group

is from food and agriculture, where reduction at the source is aimed for via zero waste shops, vegan and vegetarian restaurants, and the offer of local and seasonal produce (as in the above example of local, bio baskets). “Reduction at the source” also resonates with cooperatives from professional services, who via logistical, repair, and maintenance services seek to reduce market consumption (for example via tool libraries), to strengthen a local, regenerative economy (bike delivery service, renewable community energy), and to offer educational workshops in support of this model.

The organizations in our survey tend to be small organizations. This is in line with sufficiency oriented circular economy business models and scenarios that emphasize decentralized, small-scale production for local needs [47]. This literature also emphasizes the role of citizens, not just as consumers but as active citizens [48]. In addition to organizational size, this underscores the key role of the primary stakeholders in cooperatives: citizens as members with an equal, democratic status, rather than as consumers with preferences and purchasing power. We therefore suggest that this business model warrants further research to understand its role and potential in different sectors, as well as in diverse cultural and geographical contexts.

5.4. Consultants

This survey also adds the “consultant” as a novel model to the extant literature on business models. In our database, we identify 11 cooperatives (or 6.8%) in relation to this model. These consultants offer services in forestry and agriculture, advice on how to better include principles of permaculture and arboriculture, and how to reduce emissions and garbage production. For example, one cooperative offers organizations accompaniment around all aspects of zero waste. We interpret the survey results as indicating the usefulness of this novel model for comprehensively understanding the circular economy and cooperative movement relation. We suggest two avenues for further developing this result.

First, given the emerging nature of “explicit” circular economy, a question for further research is to understand how the cooperative structure of these consultants changes their approach to consultancy in circular economy. Do they develop different tools, or use existing tools differently, in a way that links the work as a consultant back to the cooperative identity? These questions cannot be clarified within the limits of the present survey, but they are important in the light of the already mentioned isomorphic pressures facing cooperatives, and thus also cooperative consultancies.

Second, we propose that there is an important potential for such cooperative consultants in the light of the systemic nature of circular economy. This attribute calls for “thinking in systems: the ability to understand how parts influence one another within a whole, and the relationship of the whole to the parts, is crucial” [46]. Circularity requires organizations to work along value chains from “cradle to cradle,” and to recognize externalities and (potential) benefits for others. Since capitalist enterprises primarily aim at profit for owners in a competitive environment, the lack of a culture of collaboration and resulting lack of trust are a barrier to a wider uptake of circular practices [49]. Potentially, cooperatives have an edge in the light of the principle 6 of cooperation among cooperatives. However, even then, cooperatives no doubt also struggle to understand the systemic nature of value chains and circular, regional development. Thus, consultancy addressing this systemic aspect of circular economy and circular society for cooperatives would seem particularly fruitful.

5.5. Types of Cooperatives

Consumer, producer, worker, and solidarity cooperatives all participated in our survey. Potentially, the high number of solidarity cooperatives reflects their capacity to respond to complex challenges of multi-stakeholder issues. Notably, the business model of logisticians is exemplified by this type of cooperative. However, this requires further research, since among cooperative foundations in Québec in recent years, the solidarity type cooperative is most frequent [48].

Beyond the solidarity cooperative, further research could explore all types of cooperatives in relation to circularity strategies via in-depth qualitative research but also in a comparative perspective to analyze results in other countries and other cultural-geographical contexts.

5.6. Limitations

Our exploratory database underestimates the number of cooperatives with circular strategies in Québec. For example, we have since identified further cooperatives that could be included in future research. This would help to eventually create a consolidated database of cooperatives and circular economy, and to reach conclusive results. In the absence of such a database, we stress the interpretative nature of our exploratory study.

The analysis is based on publicly available materials on the cooperatives and their survey responses. No site visits or further qualitative research was carried out to validate responses independently. Follow-up research would enable such validation, for example via case studies or via action-research on the two novel models added in this survey (in continuity of the TIESS project). Thus, we emphasize again the exploratory nature of the present work and the need for further research, since our exploratory study does show that these models resonate with participating cooperatives. Moreover, the conceptual reasons discussed in the prior sections indicate their importance for a systemic approach.

A further critical issue is the relatively recent as well as complex character of circular economy. For many cooperatives, circular economy as a term is still new, and not something that has a tradition of discussion (as, for example, the cooperative identity does [50]). In response, we pre-attributed circular strategies and models as suggestions when contacting the cooperatives, allowing us to see if these suggestions resonate with participants who were invited to confirm or change these suggestions. Further research could test these results, drawing on qualitative interviews or focus groups.

A further limitation is the empirical focus on Québec. While the international research on international circular economy shows that circularity strategies, such as repairing and recycling, can be found across different geographical and cultural contexts on a vague level, there are no doubt differences in how strategies play out concretely in context. In addition, the importance of specific strategies is context dependent. Thus, our study suggests many avenues for further exploring and comparing results in and across contexts but it, again, cannot offer conclusive evidence prior to such research.

6. Conclusions

Circular strategies and business models resonate with cooperatives. They are anchored in the mutualisation at the heart of the cooperative model, which emphasizes a shared taking of responsibility in response to needs. Cooperatives contribute comprehensively to circular economy, not just to downstream categories but also to upstream categories of rethinking production and consumption, sharing, and durable use. Cooperatives thereby can contribute to an embedding of circular economy in circular society based on the priority of needs of members rather than profits of investors, and of their anchoring in regional economies and value chains of proximity. “Reduction at the source” highlights the potential to move to a circular and sustainable society that pushes sectors such as agriculture, energy, and mobility to regenerative uses of resources and land, and a preservation of natural capital.

The exploratory survey suggests recommendations for circular economy research and practice. For research, we recommend further analysis of the relation between implicit forms of mutualised circularity and explicit forms of circularity to better understand the contribution of the cooperative model in the light of unsustainable pressures from capitalist markets. This dynamic can be further studied, both in relation to types of cooperatives, and to circularity strategies and business models. In particular, the two novel models introduced in this survey, reduction at the source and consultants, appear to resonate with cooperatives and would allow for an improved understanding of strategies in the direction

of a strong and systemic circularity. Our results could be further explored via case studies of cooperatives, but also in a comparative perspective to review results in relation to other countries and cultural-geographical contexts.

The survey also suggests practical recommendations to advance a cooperative embedding of circular economy in the light of current needs: support for the integration and improvement of circularity strategies and associated socio-technical questions, support with business model development and finance, as well as promoting circular economy education and enabling peer exchange. Since cooperatives have greater longevity than private enterprises, advancing their circularity can be expected to have a more lasting effect. It would be interesting to advance both accompaniment and tools for cooperatives, but also for other circular economy actors to learn from cooperatives, their principles such as mutualisation and cooperation among cooperatives, and how cooperatives put those into place towards not just a circular economy but also a circular society based on principles of equality, democracy, solidarity, and sustainability.

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