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Creating Territorial Value Through Circular Economy: Why Proximities Matter?

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ABSTRACT

The circular economy (CE) represents a strategic approach to improving business sustainability. Worldwide, many companies have been adopting or implementing circular initiatives. However, the contribution of these circular practices to territorial value creation remains insufficiently explored. This study examines how CE initiatives generate territorial value through the activation of different forms of proximity—geographical, relational and institutional. Based on 70 semistructured interviews with 51 stakeholders in the Kamouraska region (Canada) and in La Rochelle (France), this research discusses how businesses, policymakers and community actors collaborate to optimise resource flows, foster innovation and enhance environmental performance. The findings reveal that CE initiatives strengthen local socio-economic networks, facilitate knowledge cocreation and improve firms' adaptability to sustainability transitions. The use of proximity mechanisms enables companies to embed CE principles more effectively in their strategic models, which increases resilience and competitiveness. The results emphasise the importance of integrating CE beyond firm-level practices and recognising the role of territorial governance in supporting sustainable regional or territorial ecosystems.

1 | Introduction

In recent years, the circular economy (CE) has emerged as a strategic framework for production and consumption. Defined as an economic system that eliminates waste through resource efficiency and closed-loop processes (Kirchherr et al. 2023; Stahel 2019), its implementation reshapes business models and generates various economic, environmental and social benefits (D'Amato et al. 2017; Dong et al. 2021). CE initiatives, as referred to in this article, represent various business-driven practices, for example, reusing, recycling, repairing and sharing products and materials to extend their lifecycle and maximise value retention (Prieto-Sandoval et al. 2018). These initiatives limit resource consumption and minimise the environmental impact of producing goods and services (Haupt and Hellweg 2019). However, beyond environmental benefits, CE initiatives can strengthen economic resilience, improve supply chain security and foster innovation (Chen et al. 2020; Veyssière et al. 2022). They can also contribute to territorial anchoring of industrial and economic activities, particularly in local and regional contexts (Bourdin et al. 2022; Bourdin and Torre 2020, 2025; Chen et al. 2020).

CE initiatives can also generate intangible value beyond financial and environmental performance. Additional benefits, conceptualised as territorial value (Maillefert and Robert 2017, 2020), encompass strengthened business networks, enhanced stakeholder trust and increased knowledge spillover (Chembessi et al. 2021). As demonstrated by Bourdin et al. (2022), these dimensions of value play a central role in shaping sustainable business ecosystems. Strengthening relationships among stakeholders is necessary to realise the full potential of circular initiatives (Bourdin and Jacquet 2025; Bourdin and Torre 2025).

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However, *how* do CE initiatives contribute to intangible value creation? And at the territorial level, what role does proximity play in shaping territorial value and facilitating business transitions towards circularity? Studies have shown that different forms of proximity—geographical, relational and institutional—are strategic enablers of collaboration and resource optimisation in CE ecosystems (Torre and Gallaud 2022; Chembessi et al. 2024). Therefore, this paper analyses how leveraging these proximities within circular initiatives can enhance their impact, improve coordination among businesses and strengthen territorial resilience. It provides a multidimensional understanding of CE beyond firm-centric models by emphasising collective value creation at the territorial level. In addition, it explores the mechanisms that allow CE initiatives to drive systemic change and improve sustainability in territories.

To do so, we use data from 70 semistructured interviews with 51 stakeholders in CE initiatives in the Kamouraska region (Canada) and in La Rochelle (France). These initiatives engage a diverse range of actors, including businesses, public organisations and community associations, through circularity practices such as industrial symbiosis, resource pooling and material reuse agreements.

Our study offers insights that can help both business leaders and policymakers design more effective strategies to integrate CE principles into regional and territorial development. It explains the roles of geographical, relational and institutional proximities as key drivers of collaborative gains and sustainable value creation. Our results demonstrate that optimising proximities allows businesses and policymakers to create the conditions necessary to scale CE initiatives and foster long-term sustainability. The case studies show that embedding circular initiatives within territories can strengthen economic resilience, enhance innovation capabilities and support low-carbon business models.

The structure of the rest of the paper is as follows. First, we present a literature review (Section 2). We then describe our methodological approach (Section 3). Next, we present the results (Section 4). Finally, we discuss these results (Section 5) and conclude the paper (Section 6).

2 | Literature Review

2.1 | The CE Paradigm: A Territorial Dimension

Resource depletion, waste, pollution and other issues have revealed the need for an integrated and systematic approach in the economy's functioning (Boulding 1966), which gradually led to popularisation of the CE concept at the end of the 2000s (Chembessi et al. 2023; Hachaichi and Bourdin 2023). Seen as a sustainability paradigm (Kirchherr et al. 2023; Korhonen et al. 2018), its principles bear on individual and collective considerations of the planet's limited resources and physical limits (Coenen et al. 2020). These principles call for an ecological transformation of production and consumption patterns. They refer to various strategies to design products and systems so that materials and resources are retained in the economic cycle for as long as possible (Stahel 2019; Kirchherr et al. 2023). Thus, CE implementation requires waste reduction, reuse, recycling and closing the loops in production and consumption systems. It implies profound changes at the supply level (products, industrial processes and sectors) and in demand, consumer behaviour, territories and other areas (Bahers et al. 2017; Prieto-Sandoval et al. 2018. It means transforming the linear economic model (extract, produce, consume and dispose) by rationalising production, optimising energy and material consumption, minimising waste at the source and reusing waste as raw materials (Kirchherr et al. 2023; Korhonen et al. 2018).

The transition to a CE involves collaboration and joint effort between various actors, whether they are public, private, community, economic or social (Jambou et al. 2022). Territories therefore stand out as adequate scales for implementing CE initiatives (Bourdin et al. 2022) occurring near each other (Niang et al. 2022; Van Fan et al. 2021; Torre et al. 2025). However, the most competitive territories, especially industrial ones, have long been structured by a linear economic paradigm based on infinite growth (Bahers et al. 2019). Current sociotechnical regimes do not allow for the full development of circular loops (Buclet 2011; Bahers et al. 2017). Thus, CE initiatives help optimise territorial resource and infrastructure usage as well as reduce pollution and negative environmental impacts (Beaurain and Dermine-Brullot 2022; Jambou et al. 2022). They can also strengthen socio-economic potential within territories through positive spillovers (Bassi et al. 2021).

Assessing the CE's positive externalities and transformative impacts at a territorial level presents a considerable challenge (Moraga et al. 2019; Rajaonson et al. 2025). Indeed, extant research has more frequently measured CE initiative outcomes at the scale of productive entities (Vanhuyse et al. 2022), particularly in terms of a firm's resilience to raw material price volatility (Moraga et al. 2019) or through cost reductions and the creation of high-value-added jobs (Moreno-Mondejar et al. 2021; Rajaonson et al. 2025), neglecting the intangible or immaterial benefits of CE initiatives (Chembessi et al. 2021).

2.2 | Value Creation in CE Initiatives: Conceptual and Empirical Background

The concept of value, central in economics and business fields, refers to the importance, utility, benefit or relevance attributed to a resource, good or service (Porter 1985; Wilden et al. 2019). However, even in these fields, studies have found that value creation can be extended to extra-economic benefits (Yan and Wagner 2017) and relate to the creation or enhancement of knowledge, community, competence, attitude and intellectual agility (Lyons and Brennan 2019; Jeannerat and Crevoisier 2022).

In the context of CE, the value creation is most often considered economic or environmental (Rajaonson et al. 2025). CE initiatives are intended to reduce the environmental impacts of human activities (Ghisellini et al. 2016) and maintain or strengthen the productive and financial performance of economic systems (Ghisellini et al. 2018). This value creation, which is directly measurable and quantifiable, encompasses elements such as waste reduction, the optimisation of resource use, business relocation, the creation of green jobs, the reduction in

greenhouse gas emissions and sustainable and low-cost energy production (MacArthur 2013).

Nevertheless, CE initiatives are not limited to the creation of economic and environmental value (Rajaonson et al. 2025). They can also offer important opportunities to generate social value by promoting inclusion, learning and community development (Padilla-Rivera et al. 2020; Piao et al. 2023; Vanhuyse et al. 2022). Thus, various studies have proposed a framework for assessing social value in circular business models (Bianchini et al. 2022; Valencia et al. 2023; Vanhuyse et al. 2022; Rajaonson et al. 2025). The measurement of social value creation can both improve transparency and corporate social responsibility as well as guide decision-makers in implementing more sustainable and ethical practices (Beaurain et al. 2023; Clube and Tennant 2022).

Recently and to a lesser extent, the literature on CE has identified an additional form of value creation: territorial value. According to the work of Maillefert and Robert (2017), territorial value embraces the economic, environmental, social, technical, institutional and organisational benefits collectively generated at the local level through the adoption of sustainable business models. Beyond accumulating economic value or minimising environmental impacts, it has five key components: (i) the densification and diversification of local socio-economic networks; (ii) the strengthening of interorganisational trust and stakeholder cooperation; (iii) the anchoring of innovation dynamics in the local context; (iv) the promotion of shared identity and territorial cohesion; and (v) the improvement of collective well-being and environmental resilience (Beaurain and Chembessi 2019; Dermine-Brullot et al. 2017; Beaurain et al. 2023). Thus, territorial value creation in the CE goes beyond the traditional goal of decoupling economic growth from natural resource consumption (Chembessi et al. 2021; Maillefert and Robert 2017, 2020), and the understanding overcomes a strictly business-centric perspective on CE benefits (Beaurain and Chembessi 2019). Additionally, as a place-based logic of value creation, it compels synergistic interactions between actors, resources and governance mechanisms able to strengthen a territory's capacity to foster inclusive, resilient and sustainable development (Maillefert and Robert 2020; Chembessi et al. 2021). It entails active collaboration between stakeholders and the establishment of new forms of governance capable of fostering sustainable and responsible territorial development (Torre 2023). It emerges when local actors, resources and strategies synergistically interact to strengthen the resilience, sustainability and well-being of the area as a whole. In this sense, territorial value creation in CE initiatives is not an abstract ideal but a situated and observable process operationalised through a combination of measurable outputs (e.g., the number and type of material exchanges, employment effects and institutional innovations) and perceived outcomes (e.g., stakeholder narratives, shifts in collective practices and governance reconfigurations).

At the epistemological level, the territorial value at stake in the CE invites us to consider the primacy of a relational and pragmatic perspective on the behaviour of actors where this behaviour is not reducible to the search for a balance of purely individual interests but is motivated mainly by the construction of a collective action (Beaurain and Chembessi 2019). This, then, reflects the permanent evolution of the composition of the local community, the innovations brought about by these new entrants, the new associations and connections of actors brought about by this broadening of the public concerned and the new conflicts and power relations that they potentially generate given the initially divergent interests and values of the actors making up the collective resulting from this broadening of the public concerned.

The collective dynamic under construction is not based on the hypothesis of a value previously shared by all but rather on values to be brought out and stabilised collectively, within power relations and a desire to impose points of view (e.g., on environmental design or the role of technologies in the transformation of production). As such, at the centre of its analysis, in our opinion, are the effects of the different types of proximity existing between the actors. These proximities make it possible to grasp the role of distance, the structuring of organisations and cognitive and institutional dimensions in the process of constructing a collective action to be stabilised in the CE.

2.3 | Proximities as Resources: A Conceptual Framework

In CE initiatives, proximities are not a passive background condition but strategic resources that actors mobilise to generate territorial value. Defined as the collective and systemic benefits produced locally through the coordination of diverse stakeholders, territorial value stems from the capacity of a territory to densify socio-economic networks, foster interorganisational trust and innovation, strengthen territorial cohesion and enhance both well-being and environmental resilience.

Geographical proximity provides the spatial foundation that makes many CE exchanges operationally feasible. It reduces the friction of distance by improving the logistics of resource transfers, enhancing visibility between actors and supporting spontaneous coordination (Jambou et al. 2022). In territories with a dense economic landscape and functional transport infrastructures, geographical proximity fosters short-loop material reuse, such as the local recovery of industrial by-products such as construction or organic waste (Chembessi et al. 2024). This proximity lowers transaction costs and simplifies the management of inter-firm synergies. It supports the densification and diversification of local socio-economic networks, as actors can engage in multiple and flexible forms of collaboration. In addition, geographical proximity can play a symbolic role in strengthening territorial identity, as localised exchanges reinforce a sense of place-based interdependence (Veyssière et al. 2022; Bourdin et al. 2024).

Yet geographical proximity alone does not ensure cooperation (Torre and Rallet 2005). Colocation must be activated through trust and shared purpose. Here, relational proximity becomes decisive. Combining organisational proximity (network structure, organisational arrangements, network coordination, market and non-market interactions, formal and informal interactions), social proximity (based on interpersonal

trust, shared values and familiarity) and cognitive proximity (shared knowledge bases, complementary skills and interpretative frameworks), relational proximity enhances the quality and durability of cooperation between stakeholders (Arfaoui et al. 2024). It allows local actors from different sectors—such as agriculture, industry, civil society or research—to understand each other, align objectives and codesign innovative practices (Niang et al. 2022). Relational proximity thereby facilitates the diffusion of CE principles across heterogeneous networks (Torre et al. 2025) and helps anchor innovation in the territory. This anchoring is essential to ensure that solutions are adapted to local conditions rather than imported models with limited relevance (Bourdin and Torre 2025). Moreover, relational proximity enables circular projects to evolve from opportunistic exchange to stable partnership, which is a critical condition for building interorganisational trust, a pillar of territorial value (Chembessi et al. 2024).

Institutional proximity, finally, introduces a stabilising and legitimising layer. It refers to the degree of alignment between actors in terms of governance frameworks, policy tools and shared norms regarding sustainability (Beaurain and Dermine-Brullot 2022; Balland et al. 2022). Institutional proximity provides the scaffolding necessary for CE initiatives to scale up and endure beyond short-term initiatives (Henrysson and Nuur 2021). It supports regulatory coordination, facilitates access to public funding or incentives and encourages the integration of CE objectives into broader strategic planning. This proximity often materialises through shared planning instruments, formalised partnerships or governance platforms. When strong, institutional proximity helps reduce uncertainty, align stakeholder expectations and reinforce accountability mechanisms. It can contribute directly to territorial cohesion and governance innovation, two essential components of territorial value, by creating arenas where public, private and civic actors can negotiate, adjust and align their roles in the transition (Beaurain et al. 2023).

These three forms of proximity interact dynamically (Boschma et al. 2017; Klimas et al. 2023). They are not fixed but can be activated and combined by actors to develop collective projects and create value in various territorial contexts (Torre and Gallaud 2022). In this sense, the proximities should be understood as resources that stakeholders can strategically use to support development and value creation. Geographical proximity may spark initial exchanges, but without relational trust or institutional support, these exchanges remain fragile. Likewise, institutional frameworks may exist, but without cognitive alignment or shared values, they can produce top-down coordination without real local engagement. Territorial value is therefore not the additive result of each proximity in isolation but the emergent outcome of their interaction when actors activate and combine them strategically. This combinatory logic explains why some CE initiatives produce deep transformations, whereas others stall or remain marginal.

3 | Methodology

In this study, we employed a qualitative approach composed of four main steps: identification and selection of the case, data collection, data analysis and the interpretation of findings. In this section, we describe and justify the selection of the Kamouraska region (Canada) and La Rochelle (France) for our case studies. Subsequently, we detail the data we gathered and describe our data analysis method.

3.1 | Case Studies

3.1.1 | Justification of the Case Studies

The selection of Kamouraska and La Rochelle for comparative case studies was guided by a strategic intention to explore the diversity of territorial configurations through which CE initiatives emerge, evolve and generate territorial value. Rather than seeking to compare similar contexts, we opted for a large contrast in order to analyse how different forms of proximity operate and interact under distinct institutional, socio-economic and geographic conditions.

Kamouraska and La Rochelle differ markedly in terms of urbanisation level (rural vs. urban), economic base (agro-industrial vs. port-industrial) and institutional arrangements (informal coordination vs. formal governance structures). This contrast enabled us to examine how different proximity mechanisms—geographical, relational and institutional—are activated in dissimilar environments and how they contribute to territorial value creation in situated ways. Their diversity reflects the broader heterogeneity of CE trajectories observed across territories (Chembessi et al. 2024; Tapia et al. 2021) and responds to calls in the literature to account for place-based specificities in CE implementation (Rajaonson and Chembessi 2024).

Importantly, the regions present comparable levels of maturity in CE implementation. Begun in the early 2010s, their respective CE initiatives have moved beyond pilot projects to become embedded in territorial strategies. By 2020, each had successfully implemented over 40 circular practices, many of which involved interorganisational material exchanges and broader systemic transformations—pillars of industrial ecology. This common feature allows for a meaningful exploration of how different contexts shape CE dynamics, rather than attributing observed differences to variation in implementation stage.

Furthermore, both initiatives have been supported by strong local mobilisation. In Kamouraska, the CE project is deeply rooted in community networks and a tradition of mutual aid, whereas in La Rochelle, the transition has been guided by institutional actors such as the Port Atlantique and the local metropolitan authority. This contrast enabled us to examine the role of proximity in both bottom-up and top-down dynamics, thus enriching the conceptual understanding of territorial circular ecosystems (Bourdin and Torre 2025). Finally, both cases are exemplary of territories seeking to reconcile economic revitalisation with environmental sustainability—albeit through different paths. Kamouraska mobilises CE as a response to economic decline, demographic shrinkage and resource pressures, whereas La Rochelle uses CE to reinforce industrial performance and achieve ambitious carbon neutrality goals.

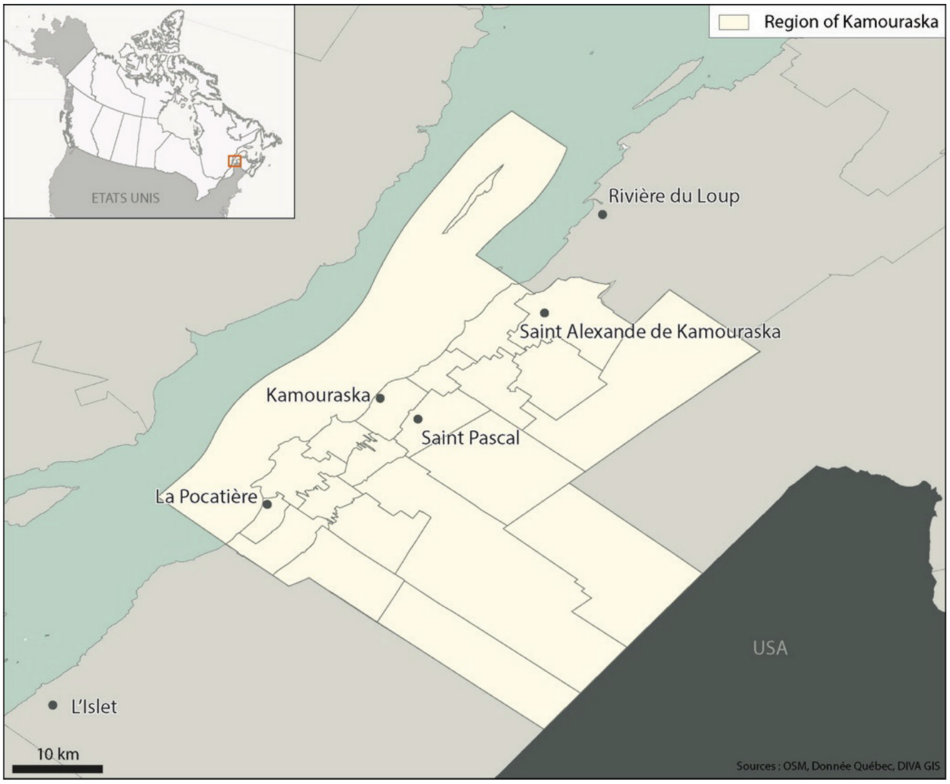

FIGURE 1 | Kamouraska regional county municipality.

3.1.2 | Circular Practices in the Region of Kamouraska (Canada)

Located approximately 120 km east of Quebec City, the Kamouraska region combines rural and urban attributes and can be viewed as a rurban centre[1] (Figure 1). The region has undergone major economic and demographic transformations. Like other rural communities in Quebec, its economic development has been based on agriculture and timber, but it has set itself apart with the establishment and development of major manufacturing activities in the transport sector. This industrial landscape, established in the early 1960s, helped transform the region profoundly, with the presence of various types of businesses and economic activity. However, the economic activity in the Kamouraska region is concentrated around the towns of Saint-Pascal and La Pocatière, resulting in devitalisation of the region's agricultural and forestry sectors.

In this area, there is a shortage of labour for local businesses and an ageing population. In addition, despite more recent development of the service and knowledge-based economy, the Kamouraska economy faces several ecological challenges related to the exploitation of natural resources. The area is home to mineral resources (comprising quarries, gravel pits and sand pits), forestry, agriculture (including fishing) and peat, and exploitation of these resources has led to pollution and damage to the road network. Furthermore, mining sites are very often abandoned after long periods of activity, making them difficult to clean up.

Therefore, with its 21,000 inhabitants, the region comprises economic, ecological and demographic opportunities and challenges. In this context, local stakeholders initiated a CE project with a vision of economic recovery and preservation of Kamouraska's natural resources. Launched in 2013 under the leadership of the *Société d'aide au développement des Collectivités* (SADC),[2] the project has mobilised numerous local actors. Altogether, 70 local socio-economic organisations (local businesses, research centres, municipalities, community organisations, public bodies, etc.) have been involved in the initiative.

With the support of other local stakeholders, they are focusing their efforts on developing resource exchanges. Between 2016 and 2020, 52 material exchanges (i.e., 337 tons) were developed between stakeholders. The main materials involved were wood waste, cardboard, ferrous alloys, glass, foam, ashes, fabrics and food waste, among others. For example, the city of La Pocatière implemented a system where mineral waste from three local companies is repurposed as road abrasives, preventing the waste from ending up in landfills and enhancing road safety during winter months. A student cooperative at a local high school has found an innovative way to reuse wood scraps from a nearby company, turning them into sports equipment for the school and community and thereby providing both an educational experience and practical, sustainable products.

Similarly, a local community organisation sorts and conditions wood and fabric residues from a furniture production company, giving these materials a second life and contributing to local sustainability efforts. Another noteworthy example involves the reuse of industrial fabric scraps by a local artisan, who transforms them into unique, handmade bags, thus creatively extending the lifespan of materials that would otherwise go to waste. Additionally, metal waste from another local company is

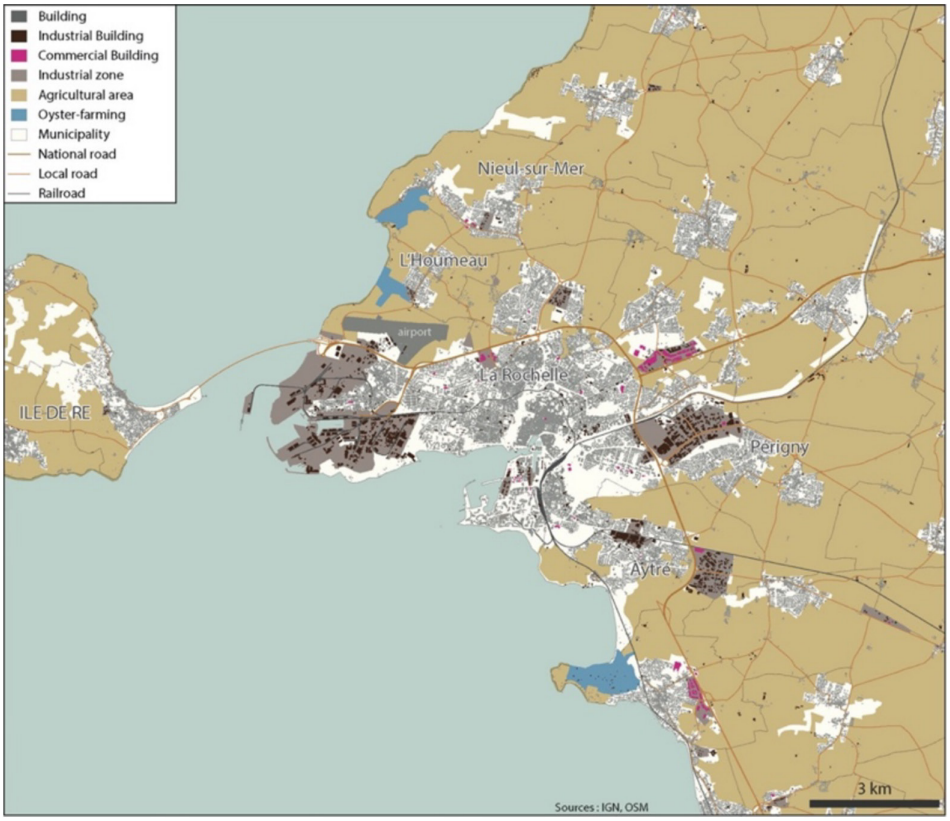

FIGURE 2 | Port Atlantique La Rochelle.

repurposed by a community organisation to create spare parts for sports equipment, which helps reduce costs and promotes resourcefulness.

In a practical agricultural context, a school farm uses plastic boilers from a local company to store and preserve agricultural products, ensuring the materials are reused effectively. The reuse of steel transport paper sheets by two companies as protective packaging for shipping is yet another example of how businesses in Kamouraska collaborate to reduce the need for new packaging materials. Wood shavings from a local cabinetmaker are collected by four local farmers to use as bedding for calves, and the same shavings are later turned into valuable fertiliser. This exchange promotes both animal welfare and sustainable agriculture.

A collaborative effort between an agricultural cooperative, a research centre and a hospital has led to the valorisation of residual ashes from biomass boilers, turning them into fertiliser for agricultural land and thus supporting sustainable farming. The exchange of cardboard boxes among three local companies for product shipping demonstrates a commitment to reducing packaging waste, whereas a joint effort between three companies to reuse wood residues for making small decorative furniture and custom transportation equipment, and even heating campsites, showcases the diverse possibilities for reusing materials and supporting a local CE.

In addition to these exchanges of resources, other initiatives have been implemented locally and have touched on various CE pillars, for example, sharing and hiring professional equipment, pooling staff, recycling unavoidable energy and optimising processes.

3.1.3 | Circular Initiatives at La Rochelle (France)

With its 28 municipalities spread over 327 km^2 and a population of 168,692 inhabitants, the agglomeration of La Rochelle is one of the most dynamic intermediate urban centres in France. More than 10,000 companies are located in the agglomeration, which also has a significant potential for innovation. These companies operate in the railway industry, the automobile industry, telecommunications, maritime trade and so forth. These companies take advantage of the natural attractions of La Rochelle, a city whose coastline remains strongly influenced by ports and maritime activities, particularly Port Atlantique La Rochelle (Figure 2).

Located on the Atlantic coast, Port Atlantique La Rochelle is a key logistics hub connected to major European and global ports. With its 133 industrial companies and 2000 direct jobs, it plays a central role in the economic and logistical operations of the surrounding regions. It is considered one of the major poles of economic development in the La Rochelle agglomeration. As the leading French port for forest products and paper pulp, Port Atlantique La Rochelle has incorporated environmental protection measures into its strategy. Since 2015, approximately 50 companies from sectors such as hydrocarbon storage, agricultural exports, food processing, forestry, paper manufacturing, logistics, ship repair, construction and fisheries have launched CE initiatives at the port. These companies

TABLE 1 | Summary of study participants.

Type of actor	Kamouraska region		La Rochelle	
	Number of participants	Number of interviews	Number of participants	Number of interviews
Project organizations	5	10	3	5
Partner organizations	2	4	4	4
Local authorities	3	6	5	5
Companies	13	16	11	12
Public agencies	2	4	4	4
Total	25	40	26	30

have implemented a variety of CE practices, including material exchanges (e.g., wood pallets, concrete and plaster residues and cereal by-products), joint waste collection systems and energy recovery processes.

In landscaping, six exchanges of construction waste engage 10 stakeholders in transforming discarded materials into valuable resources for green space development. Similarly, a collective disposal initiative leads to the exchange of used wood pallets where two stakeholders collaborate to recycle them for alternative uses, such as in furniture or packaging. Composting efforts are also present, with three exchanges of fertiliser residues involving six stakeholders enriching local compost and helping to reduce waste. Wood pallets are reused for shipping purposes in another exchange, where two stakeholders work together to prolong the life of these materials. Pulp waste is repurposed for papermaking in an exchange involving four stakeholders, which reduces the need for raw materials.

In the energy sector, methanisation is applied to handling waste, grain dust and cereal residues, with three exchanges and 14 stakeholders involved. The process converts organic materials into biogas, contributing to local renewable energy generation. Similarly, wood pallets are refurbished and reused by two stakeholders for a sustainable alternative to creating new pallets. The sharing of resources continues with water pooling in car washes, where two exchanges of water and equipment take place among six stakeholders.

A green natural gas station is shared by two stakeholders promoting cleaner energy use in the region and supporting sustainability goals. Renewable energy production through solar power is another key practice, with four exchanges involving solar equipment and five stakeholders working together to harness renewable energy. The pooling of a recruitment service also supports resource sharing, with three exchanges between two stakeholders to facilitate job hiring in the industrial zone. In terms of resource recovery, construction waste is reused for road sublayers through an exchange involving four stakeholders. Other processes include gypsum substitution in production and the processing of bauxite, clinker and baryte residues into rubble for pavement structure, with two stakeholders involved in each. Finally, several innovative initiatives are in place for energy recovery from wood residues, rainwater collection for substitution of mains drinking water and the use of construction waste in road construction, with a total of four exchanges involving five stakeholders.

In addition to the port initiatives, various CE initiatives are active in the city of La Rochelle. As a trailblazer in urban ecology in France, the city aims to become the first French coastal territory to have a zero-carbon footprint. In 2019, La Rochelle launched a project to reduce the environmental impact of its economic activities, involving over 130 partners, including citizen associations, local authorities, banks and businesses. Key actions include shortening energy circuits, transitioning industrial sectors to CE and financing carbon offset projects. The city also hosts associations like *Écho-Mer* and *La Matière*, which focus on the reuse of materials such as corks, oyster bags, neoprene, wood and textiles. These organisations promote awareness of plastic recycling and material reuse through workshops and local initiatives.

The Biotop network, based in the Périgny district, has over a hundred members dedicated to the collection, sorting and upcycling of materials. Initiatives include the refurbishment of mobile phones and the creation of bags and accessories from used boat sails. Additionally, La Rochelle is testing the first local loop for collective self-consumption of energy; the loop is powered by photovoltaic shades that provide electricity to electric vehicle charging stations, public lighting and other infrastructure.

3.2 | Data Collection

To reveal the territorial value generated in CE initiatives in Kamouraska and La Rochelle, we conducted 70 semistructured and iterative interviews with 51 actors involved in the project. The participants were selected depending on their active involvement in CE initiatives, their role in decision-making processes and their potential to provide diverse and comprehensive insights into the project's value creation dynamics. They included representatives from the organisation behind the project, partner organisations, local authorities, businesses and public agencies (Table 1).

We aimed to capture a synoptic view of the project by engaging with a variety of stakeholders to ensure that both project initiators' and recipients' perspectives were represented. Some participants were interviewed multiple times to corroborate certain

TABLE 2 | Coding of interviews using concept words.

Type of proximity	Coding category	Description
Geographical proximity	Local logistical accessibility	Reduction of physical and logistical distances facilitating material exchanges
	Reactivity and rapid coordination	Ability to collectively address problems quickly thanks to spatial closeness
	Proximity-based innovation	Emergence of ideas and solutions through local interactions
Relational proximity	Interpersonal trust	Stable, repeated interactions fostering personal familiarity, goodwill and reliability
	Collective learning	Knowledge cocreation, shared experiences, collaborative capacity-building
	Territorial cohesion	Local anchoring, place-based identity, commitment to community development
Institutional proximity	Shared reference framework	Alignment of actors around common rules, sustainability principles and local values and imaginaries
	Policy integration	Circular economy embedded in local charters, action plans or development strategies
	Multiactor mobilisation	Ability to bring firms, institutions and citizens together around shared goals

information, follow up on the progress of specific initiatives or gain a deeper understanding of any changes and developments that occurred after our first interview. This iterative approach allowed us to validate our findings and ensure the reliability of the information the stakeholders provided.

For each category of participant in the study, interview guides were developed around different themes. To grasp the role of the different forms of proximity in enabling stakeholders to create territorial value and to operationalise the notion of territorial value in empirical terms, our interview guides were structured around four thematic pillars: (i) the quality and evolution of relationships between actors (e.g., trust, cooperation and mutual learning); (ii) the internal environmental and organisational challenges faced by stakeholders; (iii) the motivations, expectations and perceived impacts of CE engagement; and (iv) the roles played by various forms of proximity (geographical, relational and institutional) in fostering new synergies and enabling value creation. All interviews were transcribed and anonymised in strict compliance with confidentiality agreements with the study's participants. The interviews were transcribed as the data were collected to ensure direct interaction and the possibility of reacting and reproducing information with the partners and the case study. The interview data were supplemented with a literature review.

Four categories of documents were analysed. The first pertained to documents related to the projects, including material flow analysis reports, material exchange summary sheets, material exchange management charts, meeting minutes, agreements and charters between stakeholders. Furthermore, we examined internal documents from specific stakeholders, including activity reports, sustainable development reports and social and environmental responsibility reports. We also reviewed public policy documents, for example, laws, ministerial decrees, briefing notes, local regulations, plans and sustainable development reports. The final category encompassed news media articles and all publications that served to popularise and promote the CE projects.

3.3 | Data Analysis

The collected data were analysed comprehensively using a word-concept approach, which means looking for logic in the (individual and collective) perceptions of those involved in the phenomenon under study. The approach emphasises the meanings that each stakeholder attributed to the phenomenon and to their actions. It implies identifying and understanding the meanings and perceptions that stakeholders ascribe to their actions, particularly the factors that determine their actions, of which they may be partly the creators (Fürst and Grin 2018). The approach helps researchers grasp the complexity of the phenomenon being studied; contextualise the results obtained; and construct, cross-reference, compare and interpret the discourses of the stakeholders involved in the study (Kabongo and Boiral 2017). It is based on concept words, often used in discourse analysis to translate or associate each key idea (answers to questions, in our case) with a concept, thereby leading to an understanding of stakeholder discourse in a study (Bowker and Star 2000).

Accordingly, we selected several conceptual terms from the framework of proximities (Torre and Rallet 2005; Boschma 2005; Carrincazeaux et al. 2008; Beaurain and Dermine-Brullot 2022) that are relevant to our research questions and the objective: Identify the resources of proximity used by stakeholders to develop their projects and generate territorial value (Table 2). These conceptual terms serve to categorise and interpret stakeholders' responses and to indicate underlying mechanisms that drive their behaviour, decisions and perceptions, as suggested by Wodak and Chilton (2005). By integrating these concept words

TABLE 3 | Geographical proximity and territorial value creation.

Coding category	Definition	Territorial value created
Local material exchange facilitation	Proximity enables reuse of local by-products and circular flows.	Reduced waste; optimised resource use; operational efficiency
Shared infrastructure and logistics	Spatial closeness allows SMEs to access collective resources.	Economies of scale; cost reduction; SME empowerment
Rapid coordination and responsiveness	Problems can be addressed faster due to geographical proximity.	Reactivity; local problem-solving capacity
Informal interaction and idea generation	Face-to-face interactions generate easier collaboration.	Innovation; cocreation; knowledge sharing
Uneven proximity dynamics	Geographical proximity does not guarantee durable collaboration.	Fragile cooperation; need for support mechanisms

into our analysis, following the methodological approach outlined by Gee (2014), we aimed to ensure that our interpretation was justified by the proximity economy's theoretical framework. This was essential to strengthening our results' robustness and relevance in that it allowed us to make the link between theoretical concepts and empirical realities.

We then manually coded each response from the interviews. This manual coding made it easier to understand each respondent's discourse and put their individual representations into perspective. We adopted a dual approach combining deductive coding, based on the conceptual categories presented in Table 3 and derived from the literature, with inductive coding, emerging directly from the empirical material (interviews, internal documents and policy texts). The qualitative approach also made it possible to characterise the discourse as a function of variables (the topic of each question) and/or modalities (categories of stakeholders). In the same vein, we also coded the documents collected from the various actors. To ensure the validity of our coding process, we conducted regular peer-debriefing sessions during which members of the research team would review and discuss the coded data, challenging and refining the application of concept words to ensure accuracy and consistency. Furthermore, following Turner et al.'s (2017) recommendations, we implemented a triangulation strategy in order to cross-reference findings from our interviews with documents collected from various stakeholders.

4 | Results

We structured our main results around three resources—geographical proximity, relational proximity and institutional proximity—each playing a key role in creating territorial value through the CE practices implemented by local businesses and stakeholders.

4.1 | Geographical Proximity and Territorial Value Creation

Our data revealed that the close geographical proximity of stakeholders in CE initiatives in the Kamouraska region (Canada) and La Rochelle (France) fostered the implementation of various practices that benefit local communities (Table 3).

In Kamouraska, a region covering 2242 km^2, local organisations leverage their geographical proximity to facilitate the exchange of materials, machinery and human resources. For instance, by-products from one manufacturer are repurposed as raw materials for another. This minimises waste and fosters a closed-loop system: 'In such a tight-knit community, it's easy to reach out and share resources. [...] We realise that we can improve our industrial practices, use byproducts, and refine our sorting methods with the company next door!' (Company—Kamouraska). At Port Atlantique La Rochelle, spatial closeness of businesses facilitates the collective use of infrastructure, the share of resource that would otherwise be out of reach, particularly for small- and medium-sized enterprises: 'We're a closed port. We're with people who are on the same industrial platform. That's crucial for understanding the opportunities we can offer one another. The ways of organising and sharing—it's easier' (Company—La Rochelle).

Hence, from the perspective of value creation, geographical proximity helps strengthen territorial collective problem-solving capabilities. In fact, because of this proximity, stakeholders experience frequent face-to-face interactions and are prompted to work together: 'I think that by default, because we're a small territory, there's a habit of working together—or at least not shutting the door on the business next door. People run into each other at the grocery store, their kids go to the same school, and we're in a small community, so that geographic proximity actually forces us to do things together' (Local Authority—Kamouraska). With that geographical closeness, when challenges arise, stakeholders in CE initiatives quickly convene, coordinate their efforts and implement solutions efficiently: 'When we face a challenge, we come together, discuss, and find solutions. The fact that we're all so close physically makes this possible' (Local Authority—La Rochelle). These face-to-face interactions accelerate decision-making, encourage collaborative initiatives and promote the exchange of ideas and knowledge: 'You'd be surprised how many great ideas come from our meetings or just bumping into someone around. We often make big breakthroughs—not just for the project but for the community as a whole' (Company—Kamouraska). Thus, whether through formal meetings or casual encounters, these interactions serve as catalysts for innovation. They inspire new ways to repurpose waste, optimise resource use and share professional equipment, further embedding CE principles within the community. Therefore, with geographical

proximity, CE initiatives can enhance industrial practices, generate new knowledge, build social capital, promote environmental responsibility and drive long-term community growth. The short distance-driven collaboration encourages open dialogue, reinforces community connections, enhances accessibility and facilitates efficient collective action: 'We've always had the tendency to be proactive and autonomous in doing everything we want. Given that we want to remain internally autonomous, the best way to stay that way within the circular economy project was to involve people close to us who could help us maintain that autonomy and also provide flexibility' (Company—Kamouraska).

However, in both cases, geographical proximity was not sufficient to ensure participation in CE initiatives. Despite being spatially close, some companies chose not to be involved in the project: 'At the beginning of the project, we approached 40 businesses to inform them about the circular economy initiative. We explained what it was and asked if they were willing to be assessed and take part. But ten declined. Why? Because some companies were not mature enough on sustainability issues, others were afraid of what would be done with the information about their waste, and some were simply too small—with two or three employees—and didn't have time to commit to the project' (Project Organisation—La Rochelle). Thus, when companies lack internal capacity, trust, awareness or maturity regarding sustainability issues, geographical closeness does not guarantee engagement. In the same sense, the top-down nature of the project, power dynamics and an imbalance in decision-making processes hindered the participation of some companies:

> I've often noticed in development organisations, actually here [in Kamouraska], that instead of asking people what their needs are, they think they already know what people need. They set up their thing [the CE project] and then they ask people to fit into it [the CE project]. But us—I looked at it and said 'Bye.' It does not meet my needs. (Company—Kamouraska)

> If it's just the port giving instructions, hoping we'll become a sustainable, civic port, all those slogans ... I think that without the companies, we will not achieve much. (Company—La Rochelle)

Additionally, innovation through geographical proximity remains uneven and context-dependent. Although spatial closeness often enables dynamic interactions and practical collaboration, sustaining such relationships over time can be challenging. Factors such as limited human resources, financial constraints, staff turnover and uncertainties about technical reliability can inhibit long-term cooperation: 'Our time is very limited. Profit margins are very tight. Prices are increasing at an almost frightening rate. So, for us, it was easy to exchange with [Company A]. We're in the same building. But if they move their production elsewhere in La Pocatière, even though we might continue the exchange, it would require reflection ... It becomes a cost. We'd need to ensure the routine stays the same, that the resource is reliable, and that we're not constantly calling to check if boxes are available' (Company—Kamouraska). In fact, even when companies express a clear willingness to engage in material exchanges, additional costs and a lack of appropriate infrastructure can be a major obstacle: 'We want to do [the] exchanges. But we'll need new equipment to valorise the materials. We're not really set up for that yet. I was thinking of recycling, where we might need to buy an internal shredder. For wood, we'd need a chipper, a grinder, and a biomass boiler. All of that is a big project—it involves a lot of money' (Company—Kamouraska). Tensions between private interests and collective goals or market competition also weakened participation in CE initiatives: 'First and foremost, issues of cost and the price to pay can influence participation. We're also dealing with conflicting interests to some extent, because the companies that produce materials have every interest in encouraging competition. But we see that the companies requesting those materials have no interest in playing that competition game. We'll see how that affects the project. But we've come to understand that *when the private sector takes over, it doesn't work because the company's interests prevail over the public interest*' (Partner Organisation—La Rochelle).

Therefore, geographical proximity alone is insufficient to ensure the implementation of CE initiatives and, in turn, the collective creation of territorial value.

4.2 | Relational Proximity and Territorial Value Creation

Our analysis shows that in Kamouraska and La Rochelle, relational proximity among CE stakeholders has been a catalyst for the enhancement of local socio-economic networks (Table 4).

By activating or developing strong relational links (trust, mutual understanding, social relations, the adoption of coordination mechanisms, etc.) in the context of their material exchanges and circular practices, stakeholders have created fertile ground for the community to develop or enhance their collaborations. They formed a local community dedicated to fostering mutual growth and sustainability: 'Thanks to our CE project, we've built relationships here that go beyond the typical business partnerships. We trust each other, and that opens up so many doors for innovation and further collaboration' (Company—Kamouraska).

At Port Atlantique La Rochelle, relational proximity has facilitated collaboration between local businesses. One notable example is the shift of a galvanisation contract from a company in Normandy to a local firm in La Rochelle, demonstrating how CE initiatives can relocalise economic activities and reinforce local supply chains: 'The project has allowed two of the Port's business leaders to get to know each other. One has decided that the galvanisation of his warehouse will no longer be done by a company from Normandy, but rather a company from La Rochelle' (Project Organisation—La Rochelle). Therefore, the close relationship at work in the implementation of CE practices helps stakeholders form a collaborative network instead of working in isolation. It deepens mutual understanding among stakeholders, ensuring that the solutions and practices implemented

TABLE 4 | Relational proximity and territorial value creation.

Coding category	Definition	Territorial value created
Interpersonal trust	Stakeholders develop reliable and trust-based relationships through repeated, direct interactions.	Stable collaboration channels; resilience of local partnerships
Social familiarity and cohesion	Informal ties and interpersonal relations among actors	Community engagement; strengthened socio-economic networks
Cognitive convergence	Alignment of actors around common frames of reference, including norms, knowledge and problem definitions	Efficient communication; cocreation of locally adapted solutions; effective coordination; reduced transaction and translation costs
Collective learning and feedback	Stakeholders learn from one another through experience and dialogue.	Capacity-building; innovation through shared practices
Coordinated governance mechanisms	Establishment of associations or working groups to manage CE collectively	Structured collaboration; strategic alignment beyond bilateral ties
Unequal engagement dynamics	Diverging interests, power asymmetries or discontinuity of actors	Coordination fatigue; fragile sustainability of joint efforts

are well-tailored to the local context and community needs. It also enhances collective learning among stakeholders. Our data show that stakeholders in CE initiatives want to learn from the flow exchanges. They are looking to pave the way for long-term collaborative projects: 'We're collectively really looking at how the circular economy can be a structuring tool for the territory' (Local Authority—Kamouraska). Thus, the interconnected ecosystem that has formed through the circular practices allows them to learn from one another and expands the possibilities of what can be achieved beyond for implementing circular initiatives.

Moreover, with their interactions in CE implementation, stakeholders have developed strategies and attitudes with regard to generating local commitment and involving the community in finding solutions for local issues. Their relational connections led to the formation of a community of actors and to the mobilisation of citizens, not only in support of the CE but also more broadly in addressing local challenges: 'We've learned to anticipate problems and make decisions despite the uncertainties. We're now able to reach out to certain actors in Kamouraska for specific objective, results, and problems. We've learned how to get people involved in [a] local project or to develop things for our region' (Project Organisation—Kamouraska). This newly emerging community (of businesses, local and public authorities, citizens, non-profit organisations, etc.) embraces the potential of CE practices to improve their environment and economic landscape: 'I've always wondered what to do with people here, but now I see with the people who have embraced the circular economy that there are things we can do with the people to enhance this place in which we live and operate' (Company—La Rochelle).

Enhancing interactions that allowed the development of CE initiatives may therefore have a significant impact on the community. In particular, the interactions in CE implementation are embedded in material exchanges with non-economic local actors, a territorial attractiveness project and a strengthening of investment in the community by all local actors. In Kamouraska, for example, the networking of local economic actors around the exchange of flows is strongly understood as a project for the development of the territory: 'Even if it's not the objective at the beginning, the project still has an effect on the territory. It supports our territorial marketing strategy' (Local Authority—Kamouraska). At Port Atlantique La Rochelle, the CE project serves as a commercial strategy to support local businesses and position the port as a key player in the international market: 'The project is part of a label to help port companies and promote the port. The aim is to make it a brand not only for La Rochelle but for the south-west of France' (Partner Organisation—La Rochelle).

However, relational proximity does not function seamlessly. In Kamouraska, the implementation of certain CE initiatives necessitated the establishment of coordination mechanisms to overcome administrative and organisational constraints. For example, one company faced internal accounting limitations that prevented it from processing low-value transactions, such as exchanges involving small quantities of materials. Its accounting system only allowed the opening of expense accounts above a certain threshold. Stakeholders have to be innovative to maintain relationships and exchanges with that company: 'They couldn't open an expense account for exchanges under a certain value. And not everyone is trading thousands of dollars' worth of materials. So, they couldn't participate in exchanges. The solution was for us, as the intermediary, to open an account with them in our name. We would receive one invoice covering all exchanges, and then we'd re-invoice each participant' (Project Organisation—Kamouraska).

At Port Atlantique La Rochelle, the establishment of an autonomous CE governance association, *Association Matières Énergies Rochellaises (MER)*, has played a key role in knowledge sharing, problem-solving and the promotion of best

practices. *Association MER* strengthens local collaboration. It serves as a space to expand discussions beyond material exchanges to include broader socio-economic and environmental challenges: 'Moving into the form of an association works. Companies play more collectively. This allows us to address questions of all kinds, not limiting ourselves to material exchanges alone. Any problem that may arise around the project, or if it concerns our city, the surrounding populations, can be addressed by the association, with practical consequences' (Partner Organisation—La Rochelle). Nonetheless, the creation of the association involved various challenges in aligning heterogeneous actors with different levels of power, priorities or time commitments. The association is not perceived as inclusive or balanced by some actors: 'We requested that the initiative no longer be too heavily led by the port authority, but rather become a tool in the hands of the businesses. Still, I notice that our cooperation is a bit difficult. It's true—we all have availability issues and personal commitments. I've adapted; I'm easygoing. If everyone wants to go in that direction, let's go. But some are a bit offended. Their opinion wasn't asked. No one asked them what they wanted. My hope is the association brings new energy and helps build more genuine cooperation in the project' (Company—La Rochelle).

Beyond these organisational constraints or new modalities, uneven engagement levels and the fragility of trust over time can hamper CE initiatives. Indeed, trust plays a central role in maintaining effective synergies, as was identified in many interviews. Moreover, recognition and return on investment—whether financial or symbolic—are essential conditions for companies' long-term involvement: 'At first, when I joined the project, it was so theoretical. There was nothing concrete. But things progressed fairly quickly. Today, we clearly see the concrete outcomes. We've made progress. We've invested time and money into this project. We helped launch it. However, I'm not sure we'll continue to be involved. That's why it's important to say: if I invest time and money into a project, I expect something in return—not necessarily financial, but in terms of visibility, contacts, whatever it may be. I think that's normal for an entrepreneur, because that's how we evaluate investment' (Company—La Rochelle).

Thus, even it plays a pivotal role in sustaining circular practices and, consequently, contributes to territorial value creation, relational proximity is fragile and demands effort to be maintained. Distrust, uneven engagement or poor coordination can quickly undermine collaboration—even when actors are physically close and know each other well.

4.3 | Institutional Proximity and Territorial Value Creation

Several studies have found that the benefits of place-based collective action rely on a shared framework of thoughts, knowledge and beliefs among stakeholders (Niang et al. 2022; Beaurain and Dermine-Brullot 2022). This shared framework is known as institutional proximity, which involves the actions, thoughts and values that stakeholders adhere to. In our cases, these shared institutional references have supported the development of CE practices by (i) stabilising or reinforcing cooperation, (ii) offering a symbolic framework and (iii) anchoring initiatives within existing territorial strategies (Table 5).

The analysis of social relations and collective dynamics in both case studies, through the prism of institutional proximity, reveals a certain similarity anchored or sought (created) in the norms and values of the stakeholders. The exchange of materials—made possible by the activation of the environmental or solidarity values and culture of certain stakeholders—led to the emergence (creation) of a common reference framework for stakeholders to address local issues, particularly environmental ones: 'At Port Atlantique La Rochelle, there are individuals who have convictions, and who really want to move things forward. With them in the circular economy project, we have some who joined the process saying "He does it, so I'm going to do it!"' (Project Organisation—La Rochelle).

In the case of Kamouraska, stakeholders share visions and aspirations of Kamouraska as an innovative region where economic development and environmental preservation are addressed sustainably. These expectations and aspirations played an important role in the commitment to and development of circular practices valorising local resources: 'Thanks to the circular economy, businesses in Kamouraska are changing their practices, choosing to utilise byproducts, improving their sorting methods, and becoming more aware of new ways of consuming and producing' (Project Organisation—Kamouraska). From this participant's perspective, the development of CE in Kamouraska is fostering business innovation, waste reduction and a cultural shift towards sustainable production and consumption.

More generally, the research participants pointed out that the CE initiatives are envisioned as a pathway for the long-term viability of local businesses. From their perspective, they contribute to the development of local expertise in eco-design, recycling and repair and cultivate local know-how. Therefore, in both cases, local expectations regarding CE implementation are a vital resource in creating a shared framework. They align actors and guide their interactions and collaborations to address territorial issues: 'We all understand that we're working towards and share a common vision for our region's future. The circular economy project has made collaboration much smoother for the future' (Local Authority—Kamouraska).

Additionally, in Kamouraska, local public policies on residual materials management, the regional development plan and the local investment fund, which explicitly promotes development of the CE, participate in the development of local know-how to position the territory and make it more attractive. At La Rochelle, various public policies and regulations on environmental issues and the adoption of Port Atlantique La Rochelle Sustainable Development Charter (which led to the implementation of circular practices) have mobilised local stakeholders to implement different environmental practices. Thereby, public policies contribute to the emergence of a common vision for the territory, the valorisation of local resources and the enrichment of social capital, among other things. 'All these circular economy projects are integrated into a territorial strategy in terms of attractiveness and competitiveness.

TABLE 5 | Institutional proximity and territorial value creation.

Revised coding category	Clarified definition	Territorial value created
Normative convergence	Presence of shared policy principles and environmental standards across institutions and stakeholder groups	Cultural coherence; legitimacy of CE discourses; support for behavioural change
Policy embedding	Formal integration of CE principles into local or regional policy frameworks and regulations	Operational coherence; programmatic clarity; alignment of institutional agendas
Territorial narrative construction	Strategic use of CE initiatives to craft a territorial vision and enhance symbolic capital	Identity-building; attractiveness; reputation leverage
Institutional adaptability	Ability of public institutions to evolve in response to CE challenges (e.g., through planning or reforms)	Policy innovation; dynamic governance; responsiveness to transitions
Public orchestration	Coordinating role of public authorities in structuring, funding or mediating CE initiatives	Collective capacity; facilitation of actor engagement; inclusive implementation
Dedicated governance bodies	Creation of CE-specific formal institutions (associations, platforms, agencies) with long-term mandates	Ecosystem durability; role clarity; institutional memory
Embedded cooperation legacy	Mobilisation of pre-existing institutionalised traditions of cooperation and solidarity	Reinforcement of trust; acceleration of joint action; continuity in transition
Asymmetric institutional capacity	Disparities between actors in authority, resources or engagement levels across the institutional spectrum	Fragile governance; bottlenecks; reliance on institutional champions

It's part of a territorial marketing' (Local Authority—La Rochelle).

In return, the CE initiatives in the Kamouraska region and in La Rochelle have prompted changes in the institutional practices of public agencies and local authorities in support of the socio-ecological transition at the local level. At La Rochelle, for example, the CE initiatives in the region have strengthened the commitment of local public authorities to the development of a global 'zero-carbon' strategy for the agglomeration: 'With the various projects in the region, a consortium has been created that's working on a plan to achieve the goal of becoming a zero-carbon territory by 2040. So, in partnership with the associations leading these projects, we respond to various calls for proposals. We want to commit to strong environmental initiatives. Several levers have been identified—we've talked about the circular economy, mobility, renewable energy, data management, and so on. And really, there's a comprehensive strategy for the territory. Our goal is to become zero carbon. So how do we get there? What are our courses of action? One of them, of course, is supporting the circular economy' (Local Authority—La Rochelle). The exchange of materials has enabled political authorities to structure a collective reflection on improving the quality of life and the environment and reducing the amount of waste to be disposed of.

In the Kamouraska region, CE initiatives have empowered local political authorities to define a public programme allowing the development of CE practices and (more generally) transition initiatives on larger territorial scales. They have gradually led to intangible and material interactions with various actors (public, businesses, community organisations, trade chambers, etc.) from at least three neighbouring regional municipalities. They contributed, with the active support of local public authorities, to the creation of a regional intervention organisation, namely, *Synergie Bas-Saint-Laurent*, for the development of CE throughout the Bas-Saint-Laurent administrative region of which Kamouraska is a part. *Synergie Bas-Saint-Laurent* aims to integrate more circularity into the economy of the Bas-Saint-Laurent region by supporting industries, businesses and institutions in the implementation of strategies for reducing, reusing, recycling and recovering their residual materials.

Shared norms, rules and standards have therefore helped structure CE initiatives in Kamouraska and La Rochelle. They converge on the emergence of a local network that aims to transition towards more sustainable and eco-responsible practices and can, in several cases, improve the ability of local actors to coordinate their efforts and respond to territorial challenges: 'With the circular economy project, we're creating an opportunity for citizens and entrepreneurs to meet and work together for the benefit of our beautiful region' (Local Authority—Kamouraska). In other words, CE initiatives are strengthening a pre-existing culture of local solidarity and collaboration, fostering a sense of accountability and

responsibility among stakeholders and mobilising the entire community of stakeholders around various projects that could have greater impact in the territory:

> With the circular economy project, we have to look for the capacity of the large company so that it gives it to the small ones. And we have to look for the creativity of the small company so that it stimulates the big company. (Partner Organisation—La Rochelle)

> Since 2013 in Kamouraska, we have been innovative. We're now mobilising a lot of people to launch a global network of businesses and citizens who are exchanging materials. We want to bring other players into the circular economy in Kamouraska. (Project Organisation—Kamouraska)

Hence, institutional norms operating in the territory and in the development of CE practices provide a framework incentivising collaboration among local stakeholders. Although these examples illustrate the institutional benefits and adaptation in CE implementation, our findings also expose several limitations. In both regions, public stakeholders acknowledged the fragility of long-term coordination efforts after pilot phases due to limited institutional capacity, budgetary constraints and an over-reliance on a few motivated individuals: 'We're currently in discussion with the region about the next steps. Our goal is to create a long-term project. We haven't discussed yet how. But we'll continue to provide technical expertise …' (Public Agency—La Rochelle). In fact, local CE public policies are limited. First, public funding is a temporary support for both CE initiatives: 'If we're talking about the long term, our strategy is not to financially support the project indefinitely. Our aim is for the project to become somewhat financially autonomous with company contributions and clear benefits' (Local Authority—La Rochelle). Thus, companies have to adjust to the short-term logic of public funding to sustain and ensure the continuity of circular practices:

> It's clear to us that we are not going to have subsidies for synergies. So, as companies, we need to ask ourselves what happens if the project organisation no longer has funding to support facilitation. (Company—Kamouraska)

> If we want to think about long-term sustainability, we'll need [...] private contributions tied to the savings and services created. At some point, we'll need to tell companies: If you want to keep having a facilitator, communication, support for your synergies, you'll need to open your wallets. (Project Organisation—La Rochelle)

Second is the constraining role of sectoral and environmental regulations, which may be well-intentioned but can unintentionally hinder innovation, flexibility and material reuse:

> On the environmental side, in terms of standards, it's quite difficult to create matches. There's a lot of willingness. But the regulations are so heavy that trying to change things is incredibly difficult. (Company—Kamouraska)

> We have a company here working with composites. A new regulation came in this year about styrene—alpha-type compounds that are carcinogenic. To reuse composite residues now, you need far more advanced ventilation systems and protective equipment. But of course, this represents a major cost for the industrial actor. It does not bring immediate profitability. It's a barrier like thermal regulations in buildings or solarisation rules for SEVESO-classified sites. It's complicated … (Company—La Rochelle)

Additionally, although organisations like *Synergie Bas-Saint-Laurent* or like *Association MER* at Port Atlantique La Rochelle were created to formalise and structure collaboration, they appear for some stakeholders as an over-institutionalisation or a bureaucratisation of CE initiatives that could hinder flexibility and bottom-up innovation:

> We realised we could lean on the association to encourage companies to do more. But some companies already feel like we are asking too much. Since then, it's been the same people coming to the meetings. Some businesses send different people now and then, but essentially, it's the same companies, same people, same contacts. (Project Organisation—La Rochelle)

> We have an economic development role that gives us legitimacy to support circular economy. We keep building connections, mobilising businesses, stimulating synergies that would otherwise take much longer. But when meetings consist only of civil servants and elected officials, I worry about the project's future. Politicians give the direction, but then it takes real exchanges between businesses. At the last meeting, out of eight people, there were two elected officials and directors from the municipalities. It worries me. I would've liked to see entrepreneurs from La Pocatière and Saint-Pascal together. (Local Authority—Kamouraska)

Furthermore, structural and economic constraints or territorial limitations encumber the practicality of integrating CE into all local stakeholders' processes and question the long-term viability of current efforts:

> We face local barriers. We do not have the equipment on our territory to properly valorise all materials.

> So, we have to export them elsewhere. An economic analysis is needed to see if it's even worth it, to know whether we can really avoid landfilling these materials. (Project Organisation—Kamouraska)

> In Québec, if we are talking about natural resources, it's wood and mining, and the cost of energy is low—it's going to be difficult to get everyone to integrate into a circular economy loop. (Public Agency—Kamouraska)

> Today, profit margins are extremely thin. The economic stakes are enormous for companies. Competition is fierce, and the push for efficiency is constant—so I think SMEs that are currently involved will quickly withdraw if nothing happens. (Partner Organisation—La Rochelle)

Finally, the inclusiveness and resilience of the local CE networks may vary over time and between actors. In Kamouraska, for instance, some stakeholders raised concerns about the difficulty of maintaining sustained engagement across all categories of actors, especially once external facilitation or funding declined. On the one hand, the vision of integrating CE into all aspects of the local economy is not equally shared or operationalised by stakeholders: 'There's the question of how to convince others [local actors]. Will we really manage to get more businesses on board? I think there's always that doubt. It's a slow-moving project, but with this networking between businesses and citizens, we want to integrate circular economy thinking into all the different local loops as much as possible' (Public Organisation—Kamouraska). On the other hand, the functioning and stability of local CE networks still depend heavily on the presence and continuity of key facilitators or intermediary organisations: 'Right now, I let the facilitators do their job, act as matchmakers. I don't really see the point of knowing the names of every company in the project. It wouldn't bring me much. The region is big, and the businesses aren't large either … So we need an organisation that leads the project and is really the local point of contact' (Company—Kamouraska). These individuals act as coordinators, trust-builders, connectors and catalysts. Their withdrawal or reallocation of priorities could endanger the continuity of CE projects, as the institutional routines are not yet fully embedded in all local structures:

> I speak regularly with businesses, and many tell me that if I were not here, none of this [the CE project] would be happening. Yes, I think if I left tomorrow … it's not very humble to say but the role of the facilitator is essential. (Project Organisation—La Rochelle)

> Am I worried if the facilitator leaves? Of course, when a facilitator leaves, it will shake things up. We need to hire someone new, and that person has to get to know the businesses and the territory—it's a big challenge. (Partner Organisation—Kamouraska)

> If the [Project Organisation] stopped leading the project—it would be surprising, but it could happen—it would disrupt a lot. That's our weakness. Some territories tried open databases—'here's the list, call each other.' But businesses do not have time. They will not call people they do not know. It takes a human to facilitate, to follow up, to encourage. Maybe we need more networking moments so people actually get to know each other. (Company—Kamouraska)

From this perspective, shared structures and routines—essential for CE implementation—can lead to disengagement among even the most committed stakeholders, especially when they are too rigid and not aligned with stakeholders' needs or availability. Even where local actors are engaged and innovative, they can lack regulatory flexibility and institutional support to adapt their norms to emerging circular practices. The local networks collide with institutional silos, divergent agendas and unequal resource capacities, which limit the systemic integration of CE principles. This emphasises the importance of activating the local culture of solidarity among stakeholders in implementing CE practices and, consequently, the formation of a community to address local issues: 'Solidarity in our region, among local people, is what defines Kamouraska. Here, we've always relied on that sense of solidarity. We have an ecosystem where people know and support each other a great deal' (Project Organisation—Kamouraska).

Consequently, institutional proximity—essential for supporting circular initiatives and, as a result, creating territorial value—can be activated solely to ensure the stable and inclusive framework decisive for long-term collaboration.

5 | Discussion

5.1 | Territorial Value Creation Through Proximity Mechanisms

The transition to a CE creates opportunities for territorial development (Chen et al. 2020; Veyssière et al. 2022; Torre 2023). Our study demonstrates that different forms of proximity, serving as strategic resources for implementing circular practices at the local level, contribute to territorial value creation. In this vein, it identifies the conditions necessary for CE initiatives to support regional economic resilience and foster local sustainability transitions. In this paper, we consider proximities as dynamic resources that can be strategically mobilised in CE ecosystems. Geographical, relational and institutional proximities do not merely describe static conditions—they generate territorial value by shaping coordination mechanisms, knowledge flows and political alignment. Table 6 below synthesises how each form of proximity contributes to circular transitions through specific pathways of territorial value creation and practical outcomes.

In Kamouraska (Canada) and La Rochelle (France), geographical proximity between stakeholders has facilitated resource exchanges and encouraged spontaneous interactions, both of which enable stakeholders to respond quickly to challenges

TABLE 6 | Proximities as resources and their contributions to territorial value creation.

Type of proximity (as a resource)	Territorial value created	Outcomes of the territorial value created
Geographical proximity • Spatial embeddedness and logistical accessibility • Metric and functional distance	Facilitation of exchange: Reduction of logistics costs and optimisation of resource use Spontaneous interactions: Generation of innovative ideas and collective solutions Reactivity and problem-solving: Rapid implementation of CE initiatives	Geographical proximity allows for more efficient exchanges and better use of local resources, which enhances innovation capacity and problem-solving at the local level.
Relational proximity • Network coordination and mutual understanding • Trust-based relationships • Cognitive alignment	Building trust: Open sharing of resources and information Interdependence and cooperation: Mutual support networks facilitating the adoption of circular practices Cocreation of knowledge: Collective learning and continuous improvement of local initiatives	Trust relationships and close cooperation between local actors promote sustainable collaboration and effective knowledge sharing, which are crucial for the long-term success of CE projects.
Institutional proximity • Micro: Shared values and imaginaries • Meso: Local governance instruments • Macro: Public policy and regulatory alignment	Alignment of objectives: Shared vision of sustainability and coordination of efforts Favourable political framework: Local regulations and incentives supporting CE Inclusion and community mobilisation: Citizen participation and integration of community perspectives in planning	A strong institutional framework and shared values facilitate the adoption and expansion of CE practices by creating a political and social environment conducive to their effective implementation.

Source: Authors.

and foster innovation. These conditions have reinforced collective learning and strengthened the ability to address sustainability issues at the local level. Relational proximity, based on cooperation and interdependence, has promoted continuous collaboration and trust, encouraged knowledge sharing and improved the coordination of circular initiatives. Institutional proximity, linked to shared norms and values in CE practices, has shaped common visions, policies, incentives and governance strategies to enhance territorial well-being. This proximity has strengthened solidarity and cooperation between stakeholders and the broader community and helped address regional challenges.

However, our results also point to critical tensions and constraints that temper these positive dynamics. Although geographical proximity can foster quick collaboration, it also reveals disparities in operational capacities, especially among small and medium-sized actors. Relational proximity is not always inclusive or stable, and actors reported coordination fatigue, power asymmetries and difficulties sustaining commitment over time. Institutional proximity, although central, remains fragile, particularly when it is overly dependent on short-term programmes or insufficiently embedded in territorial governance structures.

Beyond their individual contributions, our analysis identifies clear interactions between different forms of proximity. Geographical proximity can act as an initial enabler and establish the conditions that permit relational proximity to develop through repeated face-to-face interactions. Once relational proximity exists, it builds and consolidates cooperation and strengthens the effects of institutional proximity, as it promotes the collective internalisation of shared norms and values. Institutional proximity can contribute to the setting of new firms within the same local system, and thus to the establishment of geographical proximity, or facilitate the construction of relational proximity networks. These effects create virtuous cycles of learning, innovation and coordination and reinforce the territorial dynamics that support CE initiatives. However, our study also identified tensions. Strong relational ties can generate closure effects and reduce openness to new actors or alternative

practices. Reliance on institutional proximity without sufficient relational trust can lead to rigid, compliance-driven behaviour rather than genuine collaboration. Finally, excessive geographical proximity can contribute to exacerbated and spurious competition between neighbours. Thus, the combination of proximities often strengthens circular practices but also introduces constraints when misaligned.

Our results confirm and expand upon existing literature on the role of proximity in facilitating value creation in sustainable business ecosystems. First, the proximity framework emphasises the importance of geographical and relational proximities for fostering interaction and innovation (Torre and Gallaud 2022). Second, it underscores that these are not independent or substitutable but can be combined or added to each other (ibid.). Our study illustrates how proximities have influenced resource exchanges, business collaborations and innovative practices in Kamouraska and La Rochelle.

Additionally, our results confirm previous findings on the role of territorial embeddedness in value creation (Torre 2019) and the impact of socio-economic networks on sustainability transitions (Boschma 2015). Geographical proximity, relational ties and institutional frameworks have exercised a decisive influence on the development of the CE strategies observed in both case studies. These factors have enabled (or constrained) the evolution of territorial ecosystems.

5.2 | Proximity, Territorial Embeddedness and the Emergence of Sustainable Ecosystems

Our findings reinforce the idea that territorial value creation stimulates the emergence of new economic activities, as highlighted in Boschma's (2015) work on regional development. By strengthening relationships and improving connectivity between economic actors, proximities enhance the capacity of territories to support local economic transitions and promote sustainable business models (Torre 2014; 2022). However, our data also show that these transitions are never guaranteed. They depend on the robustness of networks, the ability to navigate institutional inertia and the flexibility of governance instruments to adapt to evolving territorial challenges. The long-term viability of ecosystems is often threatened by resource asymmetries, a reliance on a few motivated leaders and fragmented political will.

Our study suggests that territorial value creation aligns with the institutional dimensions of regional development (Boschma et al. 2017). In Kamouraska and La Rochelle, CE projects have played a catalytic role in accelerating ecological transition strategies at the local level. Stakeholders have worked together to develop a shared framework for CE development, implementing governance models that support long-term sustainability. Collective learning, business network expansion and increased citizen engagement have strengthened the alignment of regional strategies with sustainability goals.

Figge et al. (2022) reported that value creation is more impactful at the collective level than at the level of individual companies. This calls for a broader perspective on CE's benefits, one emphasising the collective impact of initiatives rather than focusing exclusively on firm-level outcomes. Strong networks and close collaboration increase the adaptability of territories to economic and environmental challenges; circular practices within local socio-economic ecosystems facilitate resource management and reduce the ecological footprint of economic activities.

5.3 | Institutional and Cultural Contexts: A Comparative Perspective

Beyond the mechanisms of proximity, differences in institutional and cultural contexts between Kamouraska (Canada) and La Rochelle (France) have significantly influenced the dynamics of CE initiatives and territorial value creation.

In Kamouraska, CE initiatives emerged within a rural, community-driven environment characterised by strong local solidarity, close-knit social ties and a shared tradition of collective action. Local stakeholders were mainly connected by a type of institutional proximity, based on informal rules, which later led to networks of relational proximity. The cultural heritage of mutual aid, historically rooted in agricultural and small-town life, has played a decisive role in shaping the dynamics of CE implementation. Local businesses, community organisations and educational institutions were naturally inclined to collaborate informally, without the need for heavy institutional scaffolding. Coordination often occurred through direct interpersonal relations, informal agreements and shared community goals rather than through formal contracts or regulations. This context enabled an organic ecosystem where knowledge sharing, resource pooling and circular practices were facilitated by trust, familiarity and a strong sense of belonging to the territory. Consequently, the success of CE initiatives in Kamouraska has largely depended on stakeholders' ability to mobilise endogenous resources, adapt collectively to new environmental challenges caused by mining and cocreate solutions that are well aligned with local socio-economic realities.

Conversely, in La Rochelle, the transition towards a CE has been more structured and embedded within formal public policies, territorial strategies and institutional frameworks. The presence of a diverse industrial landscape, the economic weight of Port Atlantique La Rochelle and the proactive stance of local authorities have shaped a more planned, top-down approach to CE development. Public institutions have played a central role by orchestrating partnerships, setting regulatory frameworks, providing financial incentives and embedding CE initiatives into broader urban and regional planning instruments such as the *Territoire Zéro Carbone* project. Thus, the foundational type of institutional proximity between stakeholders in La Rochelle is closely related to the actions and policies of formal institutions. Collaboration between businesses is encouraged but often mediated through formal governance structures like associations, charters or official agreements rather than relying solely on informal trust networks. This institutionalised model has ensured a high level of strategic coordination, resource mobilisation and policy alignment across various sectors. It has facilitated the integration of CE principles into industrial practices, energy management and urban development. It reflects a context where regulatory guidance, strategic planning and political leadership act as key drivers of the transition towards circularity.

Overall, these differences shaped the types of proximities mobilised: Institutional proximity based on informal rules and institutions is particularly critical in Kamouraska, whereas institutional proximity based on formal institutions anchored in regulatory and planning instruments has been more decisive in La Rochelle. Thus, the study's comparative approach highlights the importance of adapting CE strategies to local specificities, whether by reinforcing grassroots dynamics or structuring institutional support to foster territorial value creation.

5.4 | Managerial and Policy Implications

The perspective on territorial value developed in this paper has several implications for businesses transitioning towards CE. Companies should position themselves within broader ecosystems and prioritise collaboration, partnership and shared value creation. The territorial value perspective encourages firms to engage in collective action rather than focusing solely on individual gains. This shift might require changes in corporate culture and operational strategies, moving away from short-term financial objectives to long-term sustainability investments. Recognising territorial value motivates companies to invest in employee training, relationship building and knowledge exchange. This approach may also redefine success metrics and performance indicators by placing greater emphasis on sustainability and shared benefits. In this regard, recent research has discussed the necessity of adopting a spatially informed perspective to better align business strategies with territorial dynamics and to foster the development of 'territorial circular ecosystems' that enhance both economic and environmental outcomes (Bourdin and Torre 2025).

Despite these opportunities, uncertainties remain regarding the extent to which stakeholders recognise the strategic importance of territorial value creation. Although environmental awareness drives interest in CE, economic considerations often take precedence (Rovanto and Finne 2023; Bourdin and Jacquet 2025). Addressing this challenge requires a paradigm shift in how value creation is assessed and integrated into decision-making processes. Evaluating value creation beyond financial metrics necessitates incorporating social and environmental dimensions (Korhonen et al. 2018) while considering the broader implications for quality of life and community well-being.

6 | Conclusion

This paper has explored the potential benefits of CE initiatives beyond their tangible economic and environmental impacts. The analysis of the created value in CE initiatives in the Kamouraska region (Canada) and in La Rochelle (France) has identified various forms of territorial value, such as collective learning, the formation of a local socio-economic network, community and local population engagement and institutional change. These valuable outcomes required the mobilisation and activation of assorted forms of proximity, and they are critical in transitioning to a CE and addressing local sustainable development challenges.

Our study shows that proximity mechanisms can enable CE implementation. However, these mechanisms do not operate uniformly across actors or contexts. The creation of territorial value is often contingent upon pre-existing geographical realities, socio-institutional configurations, actor commitment and the stability of supporting frameworks. But our findings also suggest that CE initiatives, although promising, remain exposed to tensions such as coordination fatigue, institutional inertia, uneven actor engagement and the fragility of relational dynamics over time. In both case studies, stakeholders pointed to the risk of dependency on a small number of facilitators, the challenge of maintaining momentum once external support ends or the difficulty of reconciling divergent agendas in collaborative projects.

In terms of policy implications, our results suggest that policymakers should promote wider understanding and recognition of the territorial value generated by circular projects. This could involve developing guidelines or standards for reporting on territorial value, incentivising investments in territorial value creation (e.g., through tax breaks or grants) and supporting collaborations and partnerships that foster collective action. Moreover, policies that encourage corporate transparency and disclosure regarding CE efforts are needed to ensure that businesses are accountable to stakeholders other than shareholders, for example, employees, customers and the local community. Such policies could also promote education and training in CE principles and practices to facilitate knowledge sharing and collective learning.

Despite this study's valuable findings, some limitations must be acknowledged. Our findings are context-dependent. The characteristics of the Kamouraska region and La Rochelle and the specificities of the circular initiatives are important in our understanding of the creation of territorial value. Therefore, our findings might not be fully applicable to other regions or different CE projects. To address the issue of transferability, future research could compare different territorial contexts with varying institutional, economic and cultural configurations. Such comparative approaches would help assess which dimensions of territorial value creation are generalisable across CE initiatives and which are strongly place-bound. Furthermore, examining contexts with contrasting levels of maturity in CE implementation—such as urban versus rural settings or centralised versus decentralised governance models—could shed light on the contextual conditions under which the mechanisms identified in this study are likely to hold.

One research avenue could be to apply different theoretical frameworks to understand the dynamics of territorial value creation in a CE. For example, social capital theory or network theory could provide insights into how relationships and networks contribute to territorial value creation. Additionally, the role of digital technologies in facilitating the creation of territorial value in a CE could be a promising area of research. An approach could also involve identifying newly created territorial value and understanding how this value is captured by different stakeholders in CE initiatives. It would be worth investigating whether all actors involved can equally benefit from the value generated. This would require comprehensive analysis of the distribution of intangible benefits among various actors within the CE ecosystem—not only firms but also consumers, public actors and associations, considering factors such as their role,

influence and capacity to access and leverage these benefits. Similarly, analysing the extent to which the creation of value for one territory can result in the destruction of value for others could be interesting. Finally, this line of inquiry could examine the mechanisms and strategies that can be implemented to ensure a more equitable distribution of territorial value in order to foster inclusivity and maximise the overall impact of CE initiatives on local economic development.

Endnotes

[1] An area with a diffusion of urban and rural activities is termed *rurban*. Rurban centres are newly emerging towns that are governed by rural local bodies, but their activities are urban in nature (Kolhe and Dhote 2016).

[2] In Quebec, SADCs have been working for over 40 years on the economic development of the province's regions. Their mandate is to ensure the economic development of the communities they serve.

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