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## Article

# Social Cooperation as a Driver for a Social and Solidarity Focused Approach to the Circular Economy

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**Abstract:** The circular economy (CE) is currently a very widespread paradigm aimed at addressing the climate crisis. However, its notions seem often to be only focused on technical, industrial and economic growth-centric goals, without practically addressing social problems such as inequality and social exclusion. In this context, type B social cooperation (SC-B) emerges in the Italian context as a type of organisation explicitly aiming at addressing social issues. It has historically fulfilled this mandate by pioneering, among others, “circular” processes in the field of waste management. In doing so, it has consolidated a high level of organizational and management capacity, which has made it an exemplary model capable of innovating the CE discourse and including marginalized people while delivering high-quality environmental services. Through evidence gathered integrating different methods and sources (interviews with social cooperatives, literature review, case study research on filed actions), this paper aims to offer a reading of SC-B as a driver for promoting a social turn of CE and local development. Moving beyond waste management and towards waste reuse, SC-B could play an active role in creating local and regional waste transformation and upcycling chains, capable of creating new employment and inclusion opportunities as well as reducing environmental impacts by processing wastes directly in the territory, shortening their treatment chain.

**Keywords:** social-solidarity economy; social inclusion; circular economy; upcycling; reuse; appropriate technology; social cooperation



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## 1. Introduction

Today, the circular economy (CE) is promoted as a paradigm aimed, in equal measure, at all three dimensions of sustainability—environmental, economic and social [1]—in response to the current crisis in existing development models.

However, the great diffusion and success the CE concept is experiencing is not paired with a universal and univocal agreement on its definition and aims. In fact, as will be developed in the next sections, there is no consensus about CE definitions and guidelines. However, a mainstream thread with strong emphasis on industrial, productive and technical aspects can be identified.

While this technical focus is certainly important given the negative environmental impact of industrial activities, it is nevertheless partial and insufficient to tackle the broad spectrum of challenges our society is already facing, challenges that go beyond production processes and that concern social inclusion, wealth redistribution, decent and safe work for everyone and other social issues. Within the literature on the CE, little is discussed in relation to these aspects, as it does not address social issues in a systematic, project-oriented and prioritised manner but rather subordinates them to economic development aspects. Social development thus appears on the agendas of institutions, companies and think tanks as an element capable of resolving itself without investigating and hypothesising axes of action specifically aimed at it but only focusing on economic development processes [2].

In relation to that, trying to proceed beyond what seems to be a dominant narrative, it is possible to identify experiences that approach CE from a socially inclusive and fair

perspective. Many of these are linked to grassroots and voluntarist dimensions, in which the environmental and social dimensions are present, but the economic one emerges as particularly weak or subordinate.

In this context, a typology of organizations that our research group has come into contact with due to several experiences, and that seems particularly interesting for how it constructs a balance between all three dimensions of circular economy sustainability, is that of the type B social cooperative (SC-B). SC-B is an experience specifically linked to the Italian context, which can be located within the spectrum of social and solidarity economy (SSE) experiences. It has been able since the early 1990s to build up experiences that

- promoted a culture and practice of sustainability;
- became fundamental actors in promoting local economic development and employment;
- became central elements of local welfare systems by developing social inclusion processes, often precisely through circular economy activities.

The aim of the paper is to analyse the SC-B experience in the waste management sector, as a concrete practice related to the gap described above, in order to highlight the factors and characteristics that have made it, and still make it, a driver for the development of an inclusive circular economy that promotes local development and focuses on shortening waste treatment chains by preferring low-entropy- and product-cycling-based processes such as reuse, repair and repurpose [3]. Given the geographical specificity of SC-B, the re-reading activity is complemented by a work of re-contextualization of the interesting elements into the wider, more shared and diffused practical and theoretical framework of SSE.

Overall, the work aims to organise the information obtained through desk and field experiences in order to constitute a conceptual basis on which to build project hypotheses on various levels (systemic, process, product), to be shared with interested cooperatives, in order to consolidate and sustain the role of SC-B in promoting and realizing a much-needed CE “social turn”.

The paper is organized as follows: in Section 2, the methods of data gathering on which the research is based are outlined; in Section 3, results of the data gathering and literature review processes are illustrated; in Section 4, results are elaborated and discussed to shape possible design interventions axes; finally, Section 5 is dedicated to a summary of the work and the conclusions.

## 2. Materials and Methods

This work benefits from in-depth studies carried out using different methods on different scales, which have been subsequently incorporated into a comparative reading:

- A literature review of CE focused on its social dimension and aimed at systematizing knowledge on the theoretical framework and the state of the art of the ongoing debate. Specifically, the review focused on:
  - Systematic literature review papers investigating the concepts, definitions and narratives of the CE, to develop a general understanding of the discourses on this theme;
  - Papers investigating gaps in the main CE discourses, specifically about the social, local and technological aspects.
- A literature review on the social and solidarity economy (SSE) discourse, as a globally diffused and recognized framework, to contextualize and compare the SC-B model and experience outside Italian borders.
- Case study research [4], focused on the analysis and assessment of circular projects featuring one or multiple of the following aspects: explicit social aim; low–mid tech approach, with high accessibility; low–mid budget experiences. These parameters were chosen to build a knowledge base related to experiences that are currently trying to address the gaps highlighted in the paper.

- A cognitive survey carried out on a sample of 13 type B social cooperatives—with a total of 1478 employees—operating in Piedmont in waste recovery and management as well as waste reuse and experimental transformation activities. The aim of the interviews was to build a first database to explore the scope of SC-Bs active in the environmental sector. The interviewed cooperatives were identified through different methods. Some of them were identified through direct contact resulting from previous collaborations. Others were identified through the “Albo Nazionale Gestori Ambientali” (National Register of Environmental Managers), which gathers all the organizations officially authorized to deal with waste. The research in the register was carried out inserting as search filters the region Piedmont (the geographical region where the authors operate) and the term “cooperativa sociale” (social cooperative) in the field identifying the company typology. The search (retrievable through the link included in the Data Availability Statement) produced 78 results, from which an initial selection was made through the web and telephone contact to verify which cooperatives were still effectively active, which were still active in the environmental sector and which were willing to participate in the research. Starting from this framework, the case selection strategy for the constitution of the sample was one of maximum variation [5]. Thus, cases were selected that could provide as wide a variety of circumstances and characterizations as possible, for example in relation to size and number of workers; type and variety of activities and services provided (waste collection/management, reconditioning, recycling, reuse, etc.); type of waste treated (general, electronic, bulky, textile, etc.). It was agreed with the organizations that participated in the research that their names would not be made public. This condition was set in order to guarantee serenity in expressing possible criticisms to the institutions with which they collaborate on a daily basis, thus safeguarding the completeness and complexity of the information obtained. Interviews followed a semi-structured approach, starting from a defined but open track with several questions investigating the work generated and turnover produced, roles undertaken and actions carried out in the circular economy supply chain, organizational specificities, visions and development prospects, as well as the nature of the constraints and limitations on operations. A second round of 4 interviews was afterwards carried out to investigate the historical origins and development processes of this kind of cooperative. For both interview rounds, the proposed tracks were original and specifically developed for the research here presented. The first track, which was broader and more general, presented 6 sections: general questions (history of the cooperative, number of workers, etc.); relations with the territory; communication (management and development of the communication aspects of the activities carried out by the cooperative); economic strategies; strategic perspectives; and recovery and reuse of material. The second track presented 8 questions, more focused on the historical origins of the link between social cooperation and the environmental sector: motivations, perspectives and difficulties. In both interview rounds, the interviewees were senior figures of the cooperatives (chairpersons or similar figures). Both tracks are attached, in a translated version from Italian to English, in Appendix A of the paper. The homogeneity of the results obtained from the interviews made it possible to set up initial project directions to be tested, which could be verified in the future through further rounds of interviews.
- Following the first round of interviews, the interviewed cooperatives were invited to participate in a focus group focused on the perspectives, obstacles and possibilities present in the circular economy for social cooperation and third sector realities, from a social, environmental, economic and technological point of view. The issues discussed were outlined from the outcomes of the interviews and research findings. In addition to cooperatives, the invitation was extended to other subjects with characters and interests consistent with the topics discussed in the focus group, who were identified through direct contacts developed thanks to previous collaborations with the research team. The focus group was therefore attended by a representative of an

association active in the re-use of garments; a representative of a network of type A cooperatives (which manages social, health, training and lifelong learning services; for an overview of the differences between type A and type B social cooperatives, see <https://italianonprofit.it/risorse/definizioni/cooperative-sociali/> access date 5 September 2021); a representative of the social services of the city of Turin; the president of a type B social cooperative active in the recovery and transformation of waste; the president of a type B social cooperative active in the recovery, reuse and reselling of waste; and a professor of the Polytechnic of Turin whose research focuses on appropriate and accessible technologies. The discussion that emerged helped to share and consolidate elements from the interviews.

- The results of the interviews were summarized in their salient features and integrated with a literature review on SC-B to gather further general information. The choice of presenting the data in a summarized form instead of an extended one was dictated by the desire to leave room for the design-related and propositional part, rather than dwelling solely on the descriptive and reflective part centred on the information gathered. This choice was dictated by its greater adherence to the authors' field of study, namely design, and in particular design for social inclusion and environmental sustainability.

The listed sources are also supported by ongoing activity of participant observation of CE-related strategies, procedures and processes of SC-B [6] resulting from an ongoing collaboration relationship with different realities of the cooperative world.

### 3. Results

#### 3.1. Literature Review

Analysing grey and scientific literature, the discussion about CE appears controversial and no less rich in contradictions between definitions, representations and demonstrations. This is a wide-ranging and complex issue that prompts us to describe CE as an “umbrella term” that includes a series of concepts related to the careful and efficient use of material resources in both production and consumption scenarios [7–9] (For an overview of cases that exemplify the spectrum of projects considered to be “circular”, see the “Case Studies” section of the website of the Ellen McArthur Foundation available at <https://www.ellenmacarthurfoundation.org/case-studies> access date 5 September 2021).

The same difficulty is encountered in trying to circumscribe the domain of the CE; often, particularly in the commercial literature, the term is used as an approximation and without providing the necessary bibliographic references that would help define the context of implementation and the cultural matrix.

Nevertheless, it is possible to identify within the CE a mainstream thread that can be traced back to the work of the Ellen McArthur Foundation (EMF), a British think tank which has been focusing an important part of its efforts on the dissemination and implementation of the culture and principles of the circular economy since 2012. In the documents associated with this thread, the CE is described mainly as a technical–economic model focused on the technological innovation of industry and consumption patterns; it seems to be a “green” review of the current production system, aiming at improving its efficiency and drawing on concepts such as industrial ecology, industrial symbiosis, cradle-to-cradle and reverse logistics, and in promoting consumption models with a rhetorical emphasis on the sharing economy [10].

This mainstream vision appears to be rooted in previous paradigms of reform of the productive system such as the green economy. Of these paradigms, this view of CE takes a strong reformist stance [11] that is largely compatible with the current economic-productive system and so has become an almost-obliged reference for various public and private institutions, primarily the European Commission and employers' organisations, to position themselves into the general environmental sustainability discourse.

However, within the models represented by this orientation, the development of the societal dimension appears marginal and essentially subordinate to an economic-

productive reorganisation [10,12–19], rather than the object of an intentional and radical rethinking of the systems. More specifically, there is no consensus nor specific literature focused on a circular development that is also genuinely inclusive, as well as local and respectful of the specificities and needs of the territories and the society that inhabits them.

Geographically, the circular processes within the mainstream thread appear to be largely oriented towards a global scale, not unlike the development of the “linear” economy [19]; in this scenario, we can glimpse some sort of “zoning” process which bring to the closure of flows of matter into a circular perspective, by assigning specific responsibilities to specific geographical areas. Some areas seem to be in charge of reconditioning activities, others deal with the resale of used products, and other areas are the hub of recycling operations for specific materials.

Moreover, while the mainstream CE discourse puts a heavy rhetoric emphasis on reuse and repair practices, the main economic and financing streams seem to be mainly directed towards recycling and material recovery processes, at least at the European level [20]. This policy raises an issue that adds to previously mentioned contradictions in the main CE discourse. In fact, circular activities that are more conservative and focused on whole-product recovery prove to have positive impacts both at environmental and societal levels, by preserving more embedded energy, shortening waste treatment supply chains and by generating more and more various occupational possibilities [3,20]. In this sense, a comprehensive and efficient policy on the circular economy should therefore integrate and promote both “particle-cycling” (focused on materials recovery) and “product-cycling” (focused on whole-product recovery) circular processes and infrastructure [3]. Furthermore, recycling processes very often rely on industrial, centralised and both capital- and energy-intensive methods, also based on the extraction of value from the territory [3]; these visions tend to consider the community as a workforce and use it as a consumer audience for products expelled from the more developed markets. Additionally, due to the capital-intensive nature of these processes, almost only big companies can afford such investments, threatening the possibility for micro to medium sized enterprises to build a local and resilient economic system based on the reuse and valorisation of waste materials.

Overall, it can therefore be said that the “current CE framework is not clear if it can promote the social well-being for this generation and generations to come” [2]. In this respect, one framework that has the potential to fill the identified gaps and redirect circular development is the social and solidarity economy (SSE).

As with the concept of EC, the concept of SSE lacks an unambiguous definition. In view of this, the definitions proposed here are the result of collective elaborations, thus potentially broader and more shared than definitions by individual authors or organisations. According to RIPESS (Réseau Intercontinental de Promotion de l’Économie Sociale Solidaire), the main organization that promotes SSE’s principles and experiences [21], SSE is “an alternative to capitalism and other authoritarian, state-dominated economic systems. In SSE ordinary people play an active role in shaping all of the dimensions of human life: economic, social, cultural, political, and environmental. SSE exists in all sectors of the economy production, finance, distribution, exchange, consumption and governance. It also aims to transform the social and economic system that includes public, private and third sectors. SSE is not only about the poor, but strives to overcome inequalities, which includes all classes of society. SSE has the ability to take the best practices that exist in our present system (such as efficiency, use of technology and knowledge) and transform them to serve the welfare of the community based on different values and goals.” [22]. A different definition is provided by the ILO (International Labour Association), one of the organs of the United Nations, which defines the SSE as a “concept designating enterprises and organizations, in particular cooperatives, mutual benefit societies, associations, foundations and social enterprises, which have the specific feature of producing goods, services and knowledge while pursuing both economic and social aims and fostering solidarity” [23].

It is immediately evident that the substantial difference between the two definitions lies in whether or not they conceive of an overcoming of the capitalist system (or planned



economy systems, although these are now a marginal component of global economic systems) through the growth of SSE systems. Despite the fact that the more radical view is shared by several authors and movements and is even adopted as a political direction by some nations [24,25], in many other cases, SSE is seen as a complementary but subordinate sector to the pure market economy, often overlapping with the so-called “third sector” [25].

It should be considered that the different meanings, more or less transformative and radical, have different diffusion in relation to the geographical area of interest. In the European context, which includes the Italian context involved in the research, the social and solidarity economy is more characterised by organisations belonging to the third sector and included in the current political and economic system. This leads to a greater diffusion of a reformist meaning of ESS experiences; an example specifically linked to the Italian context is the civil economy, a paradigm aiming at “civilising” the market economy, without necessarily wanting to overcome it [26,27].

On the environmental theme, evolving the generalist approach to sustainability inherent in the vision outlined by the ESS, theoretical discussion is beginning to develop positions that explicitly relate to the ESS and the EC or the main concepts associated with them. While having to take into account the risks inherent in different interpretations of the two paradigms [28], several authors and organizations emphasize their strong complementary characteristics across the board [28–35].

Furthermore, going beyond the theoretical debate, within the SSE framework it is possible to identify or place heterogeneous realities that through their activities develop economies that are equally social, solidarity-based and circular scattered through many countries, including Italy [30,31,33,36–38]. These experiences can be traced back to a more “transformationalist” vision of the circular economy [11]. On a theoretical level, the “transformationalist” thread includes all those conceptualisations of the CE that envisage substantial changes to the current economic order, a substantial reduction in the consumption of material resources used for production and, lastly, a specific effort to rebalance the three dimensions of sustainability [11,12]. This thread is populated by numerous grassroots experiences in which matter’s circularity processes are functional and instrumental to a rethinking of social, productive and economic relations within society, towards a greater equalisation of rights, back to this orientation. For the purposes of this reflection, they have been suggestive of new ways of implementing the circular economy within cooperatives.

These are experiences that are concentrated around practices of reuse, repair and appreciation of waste material; through these practices, these bodies carry out a wide spectrum of aims, whose common trait is the distance from capital accumulation and profit-led processes. Some of them pursue political-ideological aims, others educational and informative aims; some even seek the satisfaction of basic subsistence and self-determination needs. Some examples included in this repertoire are repair cafés (<https://repaircafe.org/en/> access date 5 September 2021); the Brazilian *catadores* cooperatives (<https://www.b-hop.it/laltrove/i-catadores-dalluminio-brasile-per-uscire-dalla-poverta/> access date 5 September 2021); experiences of responses to primary needs such as housing (<https://www.bbc.com/news/world-africa-14722179> access date 5 September 2021), heating (<https://www.designother90.org/solution/sugarcane-charcoal/> access date 5 September 2021) or access to electricity (<http://bicimaquinas.com/> access date 5 September 2021) developed around the use of waste material; production chains (<https://magazine.etableta.it/social-fashion-torino/> access date 5 September 2021) and laboratories (<https://it-it.facebook.com/costruirebellezza/> access date 5 September 2021) where manufacturing activities exploit waste and launch social inclusion processes.

Even knowing that many cooperatives may not share some of the more radical and transformative aspects, we believe that they could be included among these experiences and within the broader framework of the SSE with regards to the diversity and inclusiveness and the promotion of “a plural and solidarity-based economy” [39] that is “less interested in how the dominant economy works than how people live their lives as part of the economy” [40]. Another aspect that reinforces SC-B’s place in an SSE narrative is its attention to the

local dimension of development. As mentioned above, social cooperation originates from individuals with a deep knowledge of the territory they inhabit and its needs, for whom cooperative organisation becomes a useful tool to fill these gaps, socially, economically and environmentally. As emerged from the interviews detailed in the next section, focusing on the local dimension also becomes a practice of safeguarding against uncontrolled growth processes that can lead to competitive and predatory mechanisms that are antithetical to the founding principles of cooperation. Returning to ESS theory, as expressed by Coraggio [24] “The local, the everyday would make it possible to overcome the alienation implied by the concentration of power in the national state” (authors’ translation), but not only in the state, but also the local and the everyday constitute an anchor that helps to overcome the uncontrolled concentration of power in any form, public or private. Overall, even when not explicitly claiming these principles, our experience shows that SC-B displays a strongly transformative posture in this regard [41]. This potential can be a fundamental factor in the transition towards a social- and solidarity-focused approach to the circular economy, as will be discussed in the next sections.

### 3.2. Interview Results

Type B social cooperation (SC-B) was created to generate labour inclusion and fulfils its mission by promoting activities that respond to the specific needs of the local area, among other things [42]. Cooperatives underwent considerable development during the 1980s and 1990s when, thanks to the work of the political and social movements of the 1970s, the social rights of previously excluded and marginalised categories (the disabled and people with mental disorders) were recognised. However, this recognition was not immediately followed by practical measures to enforce these rights. Various organisations, already operating in the social welfare sector on an informal and voluntary basis, found the cooperative to be the most suitable legal and organisational form to pursue and formalise their action. These first cooperatives found themselves operating in areas that were still scarcely explored. They were driven by strong motivation and the desire to keep improving the services offered, identifying innovative ways to overcome the constraints and obstacles that emerged day by day [42]. More specifically, with regard to environmental issues, a significant part of SC-B is linked to separate waste collection, pioneering the first activities related to the “circularity of matter” and demonstrating extensive dynamism and capacity for experimentation. The 1997 Ronchi decree (the so-called “Ronchi decree”, named after the 1997 Italian Minister for the Environment Edo Ronchi, established the regulatory and legislative basis upon which the Italian waste sorting and recycling system has been developed [43]) on waste management, which was an important element in promoting the start of activities in this sector, and which was essential to the establishment of this link. Immediately after the launch of the decree, the waste collection sector required organisations that could manage and provide the necessary services. The cooperatives found space to employ many of the people they were responsible for. Moreover, the commitment in this sector was confirmed by sensitivity towards environmental protection issues, typical of many cooperatives and ahead of its time, also with respect to the decree.

Today, this societal potential is only partially expressed by Italian type B social cooperatives, or even in danger. Indeed, starting from the interviews held and data from desk research on the origins and developments of the cooperative model, we can state that these organisations are currently experiencing difficulties. Today, there are many private for-profit companies interested in the business of waste management; they have filled the technical–organisational gap that separated them from SC-B in this sector and imposed their highly competitive commercial dynamics. Those actions force cooperatives to comply with work rate and business scales that are incompatible with their inclusive nature and remit.

The interviews showed that a significant amount of type B cooperation has invested considerable economic and organisational resources in responding to calls for tenders which the public sector announced to outsource certain utilities, including waste management.



Most cooperatives in the sector have grown and developed in a scenario where the main, if not the only, economic interlocutor is represented by public institutions. Apart from cooperatives that decided to engage in the resale of second-hand goods, maintaining a relationship with the private sector, most of them neglected the direct relationship with the local population. It is precisely the combined provisions of these prevailing approaches that is now raising problems and concerns for prosperity and sustainability.

The form of calls for tenders changed considerably. They initially awarded the quality and cost of the service provided, but also the societal role played by the service provider and, even, the degree of innovation brought to the service and society. As public spending declined, calls for tender became simpler, increasingly focusing solely on the economic parameter. This has meant that organisations capable of developing economies of scale, extended over more densely populated and larger territories, through standardised and more efficient processes, are now favoured. Today, this tends to reward profit-making companies, which do not have to comply with remits other than those imposed by their budgets and profit targets and have a much more limited interest and legal obligation towards inclusion processes (by law, SC-B bodies must be composed by at least 30% of “disadvantaged workers”, while for other business this threshold is set at 7% [44,45]). The disadvantage is relative to various parameters ranging from the physical, cognitive and legal condition of the potential worker, up to the length of his/her unemployment period and citizenship status [46]).

This approach to tenders based on efficiency and economy has created a series of obstacles for cooperatives, forcing them to adopt organisational scales and postures that potentially contradict their social nature. Cooperatives are established in response to the needs of the territory of reference, assuming a medium–small scale that allows them to respect different needs. These include the need to take care of the socio-relational aspects of an inclusive remit and to guarantee access to work even for those who are severely weakened by material, physical and psychological fragility. Attention to all individuals and locally-focused development are particular characteristics of this type of entity, along with organisational agility and a propensity for experimentation and innovation, strongly defined during their historical process of development. Today, in order to adapt to market conditions, several cooperatives started to grow in scale, sometimes reaching over 500 employees. These dimensions risk weakening internal relational aspects, as mentioned earlier, and certainly stiffen the organisational structure, reducing the agility and adaptability to the societal changes that have enabled social innovation and experimentation.

These processes of scale make the cooperative much more like a profit-oriented company. “Corporatisation” is the word used by one of the interviewees to describe this trend, criticised as being a “betrayal of the social remit”. It is seen as strongly opposed to the flexibility and high tolerance of the inefficiency, errors and complexity of social phenomena in response to which the cooperative model was established. This openness to the individual, considered in their multidimensionality—flaws included—has enabled the pioneering exploration and courageous experimentation of processes and services that cannot be conceived in a rigidly economic perspective. In this sense, to shy away from flexibility and move towards efficient and productive models, while not being completely contestable, means denying the peculiar nature of each organisation to the benefit of standardised and rigid models.

Again, growth processes of this kind, as well as the need to identify new forms of economic sustainability, push cooperatives to respond to calls for tender to provide services in areas which are a long way from where they are based. This creates competition with local organisations. Additionally, this is contradictory and paradoxical within the cooperative sector, where different organisations find themselves forced to abandon traditional forms of systemic organisation, collaboration and integration, and move towards those based more on competition and market logic. On the contrary, many cooperatives which decide to remain faithful to their social remit and their involvement in the waste collection sector find themselves struggling in a now extremely competitive market. To summarize, it can be

said that none of the interviewed cooperatives are able to avoid the dynamics imposed by market isomorphism. However, while some of them assume its competitive and expansive dynamics almost automatically and unconsciously, others maintain a more critical vision and try to safeguard their original characteristics from the contradictions they face.

In addition to this, they highlight the lack of internal skills to structure research and development activities that allow them to identify new “niches” for action. At the same time, many cooperatives say that they lack the economic resources to set up collaborations with experts who can help them plan new experiments. This results in a heuristic—or intuitive—approach to experimentation and research without adequate methodological support in terms of verification, redesign, and consolidation of results.

Lastly, the investigation revealed that many cooperatives engaged in the reuse and management of waste share a weakness in terms of communication with stakeholders and end-users of the services. The continuous interaction with institutional players has resulted in many cooperatives failing to efficiently communicate and promote the importance of their action and its social effects on the territory, as well as the need to promote and support it with appropriate economic measures and policies. In many cases, cooperatives today are “invisible but load-bearing pillars” of the territories. They play a key role in territorial welfare and in the processes of promoting sustainable behaviour. Unfortunately, at the present time, this crucial role seems hard for the public, and often the institutions themselves, to recognise and to see.

## 4. Discussion

### 4.1. Actual Trends of SC-B in the Environmental Context

Despite the difficulties emerging from the interviews, cooperatives showed a willingness both to continue their activities in the waste management sector with renewed loyalty to the original remit and to fulfil their potential in terms of innovation and experimentation. This willingness is confirmed by the widespread conviction that the cooperative model is still valid today and that environmental issues in close connection with social issues will become increasingly central to society [47], as many cooperatives already guessed at the time of their constitution.

Starting from this willingness, the investigation enabled further exploration, with focus group activities with the cooperatives and other third sector players, about a renewed role of SC-B in the implementation of balanced environmental, social and economic development processes. Particular attention was devoted to understanding which types of activity could consolidate the social and economic role of cooperatives in environmental services and which manufacturing or service approaches seemed compatible with the needs of job placement and the limited economic resources available.

The investigation showed that some cooperatives have already launched activities that supplement the waste management services contracted out by public entities. It was possible to see which were the most interesting and consistent with the cooperative model. One of the most widespread activities to date is the resale of second-hand goods, collected via donations, waste reuse preparation activities [48] or house clearance activities. Although the investigation reveals how difficult it is to make this activity economically sustainable, some recent reflections on a reuse approach suggest that there is potential to be developed (the Politecnico di Torino research group carried out a participatory observation activity within the service of acceptance of discarded objects at an eco-centre in Turin; with the implementation of a curricular internship, the aim of this activity was to figure out how many second-hand goods, which are in a state of maintenance such as to be reused, are disposed as waste and what is the value produced by them in case they are resold). An expert selection of discarded goods recollected and an organisation of collecting flows aimed at intercepting materials of value before their disposal, makes it possible to increase the quality and quantity of the goods to resale. At the same time, a similarly expert and redesigned system of marketing of the offer can overcome the forms of stigma towards second-hand goods that still exist and can facilitate and strengthen new channels

of promotion and sale. These above could benefit from a more efficient—because designed for these purpose—system of communication with the public, aimed at promoting reuse as preferable to the disposal of goods as waste.

The repair and reconditioning of used goods are other additional activities, complementary to waste management services, undertaken by some cooperatives and that prove to produce job and income opportunities. However, the interviews described them as being strongly subject to competition from new goods in terms of lower costs and consumerist rhetoric.

#### 4.2. Possible Prospects of SC-B in the Environmental Context

A third activity, which has been less explored but is just as promising, uses whole dismissed products and/or their parts as resources to be reused, recombined and transformed for manufacturing new products (the research group has begun analysing some circular supply chains which have different aims, stakeholders, production approaches and levels of technological complexity. The analysis has been carried out as part of an agreement with the University of Ferrara on circular supply chains). This could be an interesting opportunity for type B cooperatives, for reasons that go also beyond economic factors, and a way of escaping the now difficult waste management market.

The first motivation is related to the reduction of environmental impact, an issue that many cooperatives are very sensitive to. Reusing waste, trying to maximise its value as much as possible in the condition and form in which it is collected and avoiding its recycling as a “second raw material” [49], makes it possible to maintain as much value as possible—“The use value of a product is higher than the sum of the value of the materials it is made of” [50]. It has to be noticed that, if preserving whole products and/or their single but recognizable parts, also the symbolic and communicative value is retained, and not only the material and energetical value. Transformation and valorisation processes aimed at the artisan creation of products would allow cooperatives to work within their own areas of competence, favouring their development and reducing the costs—also in environmental terms—of logistics and intensive waste treatment. On the contrary, in recycling processes, the material is often sent to large plants, often in other areas. Consequently, the environmental impacts of waste handling logistics are added to the treatment processes.

Furthermore, manufacturing activities focused on reuse are very labour-intensive [20]. The term originates from a work that could be described as seminal within the circular economy, namely the 1981 report by Walter Stahel and Geneviève Reday-Mulvey, “Jobs for tomorrow: the potential for substituting manpower for energy” ([51,52] more recently renewed by ref. [52]), and is the opposite of energy-intensive. This means that activities of this kind prioritise the use of human labour (which is an intrinsically renewable energy source) over mechanised and automated production chains which rely on great amounts of energy to operate, energy that even when renewable has consistent production, transport and management environmental impacts. The two researchers highlight how reuse activities—such as repair and reconditioning—work to extend the useful life of the product and invert the energy/work ratio in favour of the use of labour in place of energy, just as the creation of local workshops replaces “centralised factories, enabling local job creation and the reindustrialisation of regions.” [50]. Experimentation in these directions would make it possible to guarantee new job opportunities—some studies show that, where recycling activities create one job, reuse activities create up to eight [53]—thanks to the creation of new tasks, which can be potentially carried out by people excluded from the labour market [50]. In this sense, reuse requires greater attention to the recovered object, which is enhanced, maintaining its original characteristics, in order to minimise the dissipation of its embedded energy. This level of attention involves processes that are difficult to automate and mechanise, in which the human factor is essential [50]. This need is well in line with the nature of cooperatives, where there is a vision of “human labour as an opportunity for self-fulfilment and not only for the production of goods” [54].

Elaborating on the theme of production in relation to SC-B, a fundamental factor to consider is the limited economic and material resources that organizations such as the interviewed cooperatives have access to. The interviewed cooperatives highlighted how the creation of production chains based on complex, expensive and potentially automated plants might favour economic profit but would require development scales which, in terms of volumes of work, costs and territorial scales, are hard for a single cooperative to manage. An interesting conceptual framework with respect to the above constraints and opportunities is that of “appropriate technology”, a concept originally developed by economist Ernst Friedrich Schumacher and initially described as “intermediate technology” [55]. The concept of “appropriate technology” (AT) refers to the use of technologies that enable the development of energy efficient projects on a local scale, using local materials as much as possible and being accessible both economically and operationally to the populations directly involved. It should be stressed that there are not absolutely “appropriate” technologies. A technology is appropriate in relation to the following: the context in which it develops; the needs that emerge from said context; the materials it offers; and the characteristic cultural elements. This conceptual framework is consistent with a design of supply chains that aims to work with recovered material, closely linked to the territory and focused on promoting its development. From this perspective, the AT framework could represent a functional trace of the experiments of SC-B in line with its social remit. From a practical point of view, it is also interesting to note how these experiences are able to develop despite often extremely limited economic and material resources. In this sense, waste naturally takes on the role of “raw” material, being cheap and readily available. At the same time, processes for the transformation of this matter develop around the most accessible and available knowledge and technologies within the original context of the project. The search for suitable technologies and the decision to work within the strict limits imposed by a shortage of material and economic resources are evident in the narratives of the founding processes of the organisations interviewed.

Overall, the proposed perspective for type B cooperatives to establish themselves in the current circular economy discourse and to influence it towards a more local and societal development develops around the launch of circular production chains that explicitly

- Develop on a local, regional at most, geographical dimension;
- Involve technologies for working on dismissed products that are appropriate and accessible, both economically and operationally;
- Prioritise a labour-intensive dimension over an energy- and capital-intensive one.

#### *4.3. Design Strategies and Proposals for SC-B Innovation in the CE Framework*

Given the increased complexity of society and the market in which these organisations operate today, SC-B’s capacity for intuition of their origins and the wisdom of today’s leadership, coupled with the experience gained over the years, seem to be insufficient to support and promote innovative and effective projects. Especially considering the constant contraction of margins, both in terms of time and budget, of experimentation and of the procedures for assigning services. To this effect, “expert design”, defined by Manzini [56] as “people trained to operate professionally as designers, and who put themselves forward as design professionals”, can complement these organization’s capacities for intuition and experience in researching and developing effective innovation processes. As far as design is concerned, the perspective that presents itself is that of accompanying plans for cooperation, supporting them with a critical and multidimensional vision. The aim is to combine the widespread design expertise of third sector organisations, the insights that come from the territory and society, expert design knowledge, planning for wicked problems [57] and for interdependent design domains. It is a matter of promoting spaces and experiences of collaboration and joint design processes which, based on shared values, allow individual entities to draw specific, tangible, applicable and measurable benefits.

The prospect we are going to outline constitutes spaces for design action that, with reference to Jones and Van Patter’s design domain organization [58,59], can take different

planes of intervention: from the design of artefacts and communications (design 1.0) to product/service design (design 2.0), and up to organizational transformation design (design 3.0) and social transformation design (design 4.0).

The research process focused on appropriate transformation technologies and circular reuse products belongs to domain 2.0 product/service design [58,59].

This domain requires specific knowledge and experience on defining a synthesis between function, form, values and meaning and experimenting with materials and production processes to turn this synthesis [60] into an object. Furthermore, also technical capabilities such as the one needed for visualization and prototyping, are required. Referring to a transformative circular process where “form follows availability” [61,62] the role of expert design knowledge needs to be underlined. Being based on already-shaped matter, the complexity of transformative processes through reuse and repurpose [11] may appear and partially be inferior if compared to linear design and production processes. However, the absence of formal training and experience in the design process can lead to great variability in the overall formal, functional, symbolic and even environmental-related qualities of the final output product (a search with the keyword “upcycling” on the web or inside some social platforms can quickly give an overview of quality variability among unmonitored circular transformative processes). If SC-B intends to undertake a transition towards activities focused on reuse and possibly on a more business-to-consumer dimension than the current one, the issue of the perceived quality of the products it offers cannot be underestimated and managed accordingly through processes based solely on intuition and uneducated design experience.

Beyond transformation processes and product development, a further design space is that of systemic interaction with the territory’s various stakeholders in order to promote policies which, also by favouring SC-B action, contribute to a more socially and environmentally sustainable transformation of society. In this context, design plays an increasingly important role. Due to the wicked nature of complex problems [57], designing in a context of complexity requires processes that can be ordered and methodologically checked in order to make the most of feedback from experimental activities. This is true both in the event of success and, particularly, in the event of failure, because it makes it possible to combine intuitive elements with expert insights and consequently increase the chances of transforming them into design resources. This dimension can be placed in the domains 3.0 and 4.0, relating to the definition of new forms of organisation and society. On this level, the expertise accumulated by SC-B in recent years is certainly substantial, as are the networks of relations and collaboration, although these have nowadays strongly instrumental and short-term aims. In fact, these collaborations often develop around collaborative management of limited daily tasks, rather than around long-term innovation projects and perspectives. In this sense, systemic design approaches and methods for local territorial development could play a fundamental role in innovating relational and socially-sensitive productive systems by allowing stakeholders to develop shared sensitivities and establishing a common design ground [63,64]. Combining the material and immaterial resources available to SC-B with an expert and methodical capacity for analysis, visualisation and co-design for and in complex systems can in fact generate new, unexpected perspectives. At this level the role of the designer is the one of a mediator between different types of knowledge, a facilitator in the interaction between professional figures and stakeholders, and in the design of complex local systems.

## 5. Conclusions

The paper aims to solicit a reflexion on the role of SC-B as a driver for a social and solidarity-based CE. Beyond that, it also aims to highlight some design led approaches and stances to support cooperatives in contributing to this “social turn” of the circular economy. The reflection is rooted in an investigation carried out through a composite approach of literature review, semi-structured interviews with local cooperatives active in the waste



management sector, as well as participant observation of CE-related strategies, procedures and processes of SC-B [6].

The situation described by the investigation shows the cooperative sector experiencing organizational and economic difficulties resulting from a highly competitive market and weakened institutional support but animated by the willingness to react and regain their innovative and inclusive attitudes. They translated seminal and individual experiences into organisations which gradually developed into cornerstones of territorial welfare systems. This ability seems to have been partially lost but, according to the managers interviewed, could be key to launching a new phase for the cooperative social-economic model that has to be practised and, because of the today's complexity, also supported. Indeed, it is where the circular and solidarity-focused economies meet towards a society capable of offering everyone decent work while respecting the environment and eliminating inequalities and poverty [65–68] that the cooperative model still seems to be the best way of combining the three dimensions of sustainability to achieve sustainable and balanced development. Despite their current difficulties, B-type cooperatives maintain a common framework of values that culminates in their social mandate and a deep knowledge of institutions and territories. These two elements, if appropriately revalorised and innovated, can make SC-B a central driver in the implementation of EC and ESS practices, processes and policies on territories.

Accordingly, the current crisis may be an opportunity for SC-B to become more receptive to external stimuli and to promote innovations that can reassert the cooperative model, not only in its social function but also, and above all, in its civil function “to contribute significantly to the civilisation of the market economy” [54].

With this, we have contributed to develop the discourse about organisational models and experiences that can effectively influence the current CE discourse and practice towards a much-needed fair, social and solidarity turn.

In promoting this view, we acknowledge the limitations of the current work:

- Gathered data is geographically limited, being obtained from cooperatives active in the Piedmont region, Italy. The limitations are mostly related to regulatory aspects, which vary from region to region and consequently may produce slightly different situations. It is acknowledged that the past experiences of the research team with other similar organizations active in other territories make us confident enough that the reflection can be extended to most of the SC-Bs active in Italy.
- Envisioned perspectives are also based on previous and ongoing experiences of the research team, which however validate various aspects in a partial and unsystematic way. Experimental data capable of validating a transition and experimentation process in all its components as described in the paper are currently lacking.

Considering these limitations, currently the research team is working to address them and expand the body upon which the research is based, mainly working on two axes. The first goal is to widen the network of cooperatives or similar organizations with which the team has collaborative relationships in order to increase the available database and favour the creation of collaboration networks within organizations sharing social and environmental goals. The second is to consolidate and reinforce experimentation processes capable of simultaneously validating as many aspects as possible, so as to obtain validations (or refutations) at the system level and not only of individual processes [69].

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## Appendix A

A1—Round 1 interview track

Can be retrieved at the following link: <https://www.dropbox.com/s/s7ktgsiai7p5c1c/Interview%20track%20-%20Round%201.docx?dl=0> (access date 5 September 2021)

A2—Round 2 interview track

Can be retrieved at the following link: <https://www.dropbox.com/s/ia3dogekzpw4vw/Interview%20track%20-%20Round%202.docx?dl=0> (access date 5 September 2021)

## References

- World Commission on Environment and Development (Ed.) *Our common Future*; Oxford University Press: New York, NY, USA, 1987.
- Padilla-Rivera, A.; Russo-Garrido, S.; Merveille, N. Addressing the Social Aspects of a Circular Economy: A Systematic Literature Review. *Sustainability* **2020**, *12*, 7912. [[CrossRef](#)]
- Blomsma, F.; Tennant, M. Circular economy: Preserving materials or products? Introducing the Resource States framework. *Resour. Conserv. Recycl.* **2020**, *156*, 104698. [[CrossRef](#)]
- Baxter, P.; Jack, S. Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *Quant. Rep.* **2008**, *13*, 544–559.
- Flyvbjerg, B. Five Misunderstandings about Case-Study Research. *Qual. Inq.* **2006**, *12*, 219–245. [[CrossRef](#)]
- Ingold, T. *Making: Anthropology, Archaeology, Art and Architecture*; Routledge: London, UK, 2013.
- Geissdoerfer, M.; Savaget, P.; Bocken, N.M.P.; Hultink, E.J. The Circular Economy—A new sustainability paradigm? *J. Clean. Prod.* **2017**, *143*, 757–768. [[CrossRef](#)]
- Ghisellini, P.; Cialani, C.; Ulgiati, S. A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. *J. Clean. Prod.* **2016**, *114*, 11–32. [[CrossRef](#)]
- Homrich, A.S.; Galvão, G.; Abadia, L.G.; Carvalho, M.M. The circular economy umbrella: Trends and gaps on integrating pathways. *J. Clean. Prod.* **2018**, *175*, 525–543. [[CrossRef](#)]
- Korhonen, J.; Honkasalo, A.; Seppälä, J. Circular Economy: The Concept and its Limitations. *Ecol. Econ.* **2018**, *143*, 37–46. [[CrossRef](#)]
- Reike, D.; Vermeulen, W.J.V.; Witjes, S. The circular economy: New or Refurbished as CE 3.0?—Exploring Controversies in the Conceptualization of the Circular Economy through a Focus on History and Resource Value Retention Options. *Resour. Conserv. Recycl.* **2018**, *135*, 246–264. [[CrossRef](#)]
- Friant, M.C.; Vermeulen, W.J.V.; Salomone, R. A typology of circular economy discourses: Navigating the diverse visions of a contested paradigm. *Resour. Conserv. Recycl.* **2020**, *161*, 104917. [[CrossRef](#)]
- EASAC. *Circular Economy: A Commentary from the Perspectives of the Natural and Social Sciences*; EASAC: Brussels, Belgium, 2015.
- Hobson, K. Closing the loop or squaring the circle? Locating generative spaces for the circular economy. *Prog. Hum. Geogr.* **2016**, *40*, 88–104. [[CrossRef](#)]
- Hobson, K.; Lynch, N. Diversifying and de-growing the circular economy: Radical social transformation in a resource-scarce world. *Futures* **2016**, *82*, 15–25. [[CrossRef](#)]
- Koumparou, D. Circular economy and social sustainability. In Proceedings of the Solid Waste Management & its Contribution to Circular Economy, Athens, Greece, 14–15 December 2017.
- Lazarevic, D.; Valve, H. Narrating expectations for the circular economy: Towards a common and contested European transition. *Energy Res. Soc. Sci.* **2017**, *31*, 60–69. [[CrossRef](#)]
- Moreau, V.; Sahakian, M.; van Griethuysen, P.; Vuille, F. Coming Full Circle: Why Social and Institutional Dimensions Matter for the Circular Economy: Why Social and Institutional Dimensions Matter. *J. Ind. Ecol.* **2017**, *21*, 497–506. [[CrossRef](#)]
- Van den Berghe, K.; Dąbrowski, M.; Ersoy, A.; Wandl, A.; van Bueren, E. The Circular Economy: A Re-Emerging Industry? *SocArXiv* **2020**. [[CrossRef](#)]

20. Llorente-González, L.J.; Vence, X. How labour-intensive is the circular economy? A policy-orientated structural analysis of the repair, reuse and recycling activities in the European Union. *Resour. Conserv. Recycl.* **2020**, *162*, 105033. [CrossRef]
21. Poirier, Y. Social Solidarity Economy and related concepts. Origins and Definitions: An International Perspective. 2014. 23. Available online: [https://www.socioeco.org/bdf\\_fiche-document-3293\\_en.html](https://www.socioeco.org/bdf_fiche-document-3293_en.html) (accessed on 5 September 2021).
22. RIPESS. *Global Vision for a Social Solidarity Economy: Convergences and Differences in Concepts, Definitions and Frameworks*; RIPESS: Milano, Italy, 2015.
23. Plan of action for the promotion of social economy enterprises and organizations in Africa. In Proceedings of the ILO Regional Conference on Social Economy, Africa's Response to the Global Crisis, Johannesburg, South Africa, 19–21 October 2009.
24. Coraggio, J.L. *Economía Social y Solidaria: El Trabajo antes que el Capital*; Abya-Yala: Facultad Latinoamericana de Ciencias Sociales (FLACSO): Quito, Ecuador, 2011.
25. Utting, P.; van Dijk, N.; Mathei, M.-A. Social and Solidarity Economy. (n.d.) 71. Available online: <https://www.unrisd.org/80256B3C005BCCF9/search/AD29696D41CE69C3C1257D460033C267> (accessed on 5 September 2021).
26. Bruni, L.; Zamagni, S. *Dizionario di Economia Civile*; Città Nuova: Roma, Italy, 2009.
27. Bruni, L. *L'ethos del Mercato: Un'introduzione ai Fondamenti Antropologici e Relazionali Dell'economia*; Bruno Mondadori: Milano, Italy, 2010.
28. Malagón Vélez, L.E. Aportes conceptuales de la economía social y solidaria a la economía circular. *Cuadernos de Administración* **2021**, *37*, e5010824. [CrossRef]
29. UN Department of Economic and Social Affairs. *Accelerate Action to Revamp Production and Consumption Patterns: The Circular Economy, Cooperatives and the Social and Solidarity Economy*; UN Department of Economic and Social Affairs: New York, NY, USA, 2021. [CrossRef]
30. Stamm, I.; Matthies, A.-L.; Hirvilammi, T.; Närhi, K. Combining labour market and unemployment policies with environmental sustainability? A cross-national study on ecosocial innovations. *J. Int. Comp. Soc. Policy* **2020**, *36*, 42–56. [CrossRef]
31. Alikhan, S.; Stamm, I.; Hirvilammi, T.; Matthies, A.-L.; Närhi, K. *Ecosocial Innovations in Europe: How Social and Solidarity Economy Actors Can Promote the Sustainable Development Goals*; UN Inter-Agency Task Force on Social and Solidarity Economy: Geneva, Switzerland, 2019; p. 16.
32. Utting, P.; Wengler, J.C. *Social and Solidarity Economy: A New Path to Sustainable Development*; Beyond 2015 Briefs; UNIRISD: Geneva, 2014. Available online: [www.unrisd.org/b2015\\_5](http://www.unrisd.org/b2015_5) (accessed on 5 September 2021).
33. Herlevi, K. The Social Economy: A Means for Inclusive & Decent Work in the Circular Economy? Circle Economy. 2020, p. 16. Available online: <https://www.circle-economy.com/resources/the-social-economy-a-means-for-inclusive-decent-work-in-the-circular-economy> (accessed on 5 September 2021).
34. RREUSE. Social & Solidarity Economy. Available online: <https://www.rreuse.org/the-social-economy/> (accessed on 4 September 2021).
35. ESS France. Transition Écologique. Available online: <https://ess-france.org/fr/transition-ecologique> (accessed on 4 September 2021).
36. Robinson, S. *Social Circular Economy—Opportunities for People, Planet and Profit*; 2017. Available online: <https://circulareconomy.europa.eu/platform/en/knowledge/social-circular-economy-opportunities-people-planet-and-profit> (accessed on 5 September 2021).
37. Socioeco, SSE Solutions Map—Recycling and Managing Waste. Available online: [https://www.socioeco.org/solutions\\_en.html?hide\\_intro=1&zoom=3&lat=24.686952411999155&lon=10.371093750000002&categories=13&maxzoom=8&minzoom=0](https://www.socioeco.org/solutions_en.html?hide_intro=1&zoom=3&lat=24.686952411999155&lon=10.371093750000002&categories=13&maxzoom=8&minzoom=0) (accessed on 4 September 2021).
38. Carteco. Available online: <https://carteco-ess.org/annuaire#/carte/@44.84,10.63,5z?cat=all> (accessed on 4 September 2021).
39. RIPESS. *Charter of Ripess*; RIPESS: Milano, Italy, 2008.
40. Dash, A. Toward an Epistemological Foundation for Social and Solidarity Economy. *UNRISD Occas. Pap. Potential Limits Soc. Solidar. Econ.* **2014**, *3*, 29.
41. Campagnaro, C. Collaborare Per Una Società Coesa. Crisi Dei Modelli Sociali Capitalistici. In *microMACRO—Micro Relazioni Come Rete Vitale Del Sistema Economico e Produttivo*; Edizioni Ambiente: Milan, Italy, 2014; pp. 87–91. ISBN 978-88-6627-142-0.
42. Marzocchi, F. La storia tascabile della cooperazione sociale in Italia. *Quad. Dell'Economia Civ.* **2012**, *2*, 24.
43. Ronchi, E. Rifiuti Decreto Ronchi Decreto Legislativo 1997 n.22 Testo Coordinato ed Aggiornato Più Allegati D. L.vo n.152/2006. 1997. Available online: <https://www.ambientediritto.it/Legislazione/Rifiuti/2002/Decreto%20Ronchi%201997%20n.%2022.htm> (accessed on 28 July 2020).
44. Italia non Profit, Cooperative Sociali. Italia Non Profit. Available online: <https://italianonprofit.it/risorse/definizioni/cooperative-sociali/> (accessed on 8 April 2021).
45. Del Lavoro, M. Cliclavoro. Available online: <https://www.cliclavoro.gov.it:443/Aziende/Pagine/Collocamento-mirato.aspx> (accessed on 25 June 2021).
46. Riforma del Terzo Settore: Come Favorire L'occupazione Di Lavoratori Svantaggiati. Articolo. 2017. Available online: <https://welforum.it/riforma-del-terzo-settore-favorire-loccupazione-lavoratori-svantaggiati/> (accessed on 25 June 2021).
47. IPCC. AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability. IPCC. 2014. Available online: <https://www.ipcc.ch/report/ar5/wg2/> (accessed on 11 June 2020).
48. European Commission. Directive 2008/98/EC on Waste (Waste Framework Directive)—Environment—European Commission. European Commission. 2008. Available online: <https://ec.europa.eu/environment/waste/framework/> (accessed on 28 July 2020).

49. Giampietro, P. Dal Rifiuto alla “Materia Prima Secondaria” nell’art. 6, della Direttiva 2008/98/CE—(End of Waste Status e Problemi di Trasposizione Nell’ordinamento Italiano). *AmbienteDiritto*. 2010. Available online: [https://www.ambientediritto.it/dottrina/Dottrina\\_2010/end\\_of\\_waste\\_giampietro.htm](https://www.ambientediritto.it/dottrina/Dottrina_2010/end_of_waste_giampietro.htm) (accessed on 11 June 2020).
50. Stahel, W.R. *The Circular Economy: A User’s Guide*; Routledge: London, UK; Taylor & Francis: New York, NY, USA, 2019.
51. Stahel, W.R.; Reday-Mulvey, G.; Reday-Mulvey, G. *Jobs for Tomorrow: The Potential for Substituting Manpower for Energy*, 1st ed.; Vantage Press: New York, NY, USA, 1981.
52. Bompan, E.; Brambilla, I.N. *Che Cosa è L’economia Circolare*; Edizioni Ambiente: Milano, Italy, 2016.
53. RREUSE. *Briefing on Job Creation Potential in the Re-Use Sector*; RREUSE: Brussels, Belgium, 2015.
54. Zamagni, S. Cooperazione in “Il Contributo Italiano alla Storia del Pensiero—Economia”—Treccani. 2012. Available online: [http://www.treccani.it/enciclopedia/cooperazione\\_%28Il-Contributo-italiano-alla-storia-del-Pensiero:-Economia%29/](http://www.treccani.it/enciclopedia/cooperazione_%28Il-Contributo-italiano-alla-storia-del-Pensiero:-Economia%29/) (accessed on 11 June 2020).
55. Schumacher, E.F. *Small is Beautiful: Economics as if People Mattered*; Harper & Row: New York, NY, USA, 1973.
56. Manzini, E. *Design, When Everybody Designs: An Introduction to Design for Social Innovation*; The MIT Press: Cambridge, MA, USA, 2015.
57. Buchanan, R. Wicked Problems in Design Thinking. *Des. Issues* **1992**, *8*, 5. [[CrossRef](#)]
58. Jones, P.; van Patter, G. *Design 1.0, 2.0, 3.0, 4.0: The Rise of Visual Sensemaking*; Slidelegend: Rastenfeld, Austria, 2009.
59. Jones, P.H. Systemic Design Principles for Complex Social Systems. In *Social Systems and Design*; Metcalf, G.S., Ed.; Springer: Tokyo, Japan, 2014; pp. 91–128. [[CrossRef](#)]
60. Celaschi, F. Il design come mediatore tra saperi. L’integrazione delle conoscenze nella formazione del designer contemporaneo. In *Uomo al Centro del Progetto Design per un Nuovo Umanesimo—Man at the Centre of the Project Design for a New Humanism*; Germak, C., Ed.; Allemandi: Torino, Italy, 2008; pp. 19–31.
61. Brütting, J.; Senatore, G.; Fivet, C. Form Follows Availability—Designing Structures through Reuse. *J. Int. Assoc. Shell Spat. Struct.* **2019**, *60*, 257–265. [[CrossRef](#)]
62. Josefsson, T.A.; Thuvander, L. Form follows availability: The reuse revolution. *IOP Conf. Ser. Earth Environ. Sci.* **2020**, *588*, 042037. [[CrossRef](#)]
63. Pereno, A.; Barbero, S. Systemic design for territorial enhancement: An overview on design tools supporting socio-technical system innovation. *Strateg. Des. Res. J.* **2020**, *13*, 113–136. [[CrossRef](#)]
64. Sevaldson, B. Visualizing Complex Design: The Evolution of Gigamaps. In *Systemic Design*; Jones, P., Kijima, K., Eds.; Springer: Tokyo, Japan, 2018; pp. 243–269. [[CrossRef](#)]
65. Goal 1: No Poverty. 2020. Available online: <https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-1-no-poverty.html> (accessed on 11 June 2020).
66. Goal 8: Decent Work and Economic Growth. 2020. Available online: <https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-8-decent-work-and-economic-growth.html> (accessed on 11 June 2020).
67. Goal 10: Reduced Inequalities. 2020. Available online: <https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-10-reduced-inequalities.html> (accessed on 11 June 2020).
68. Goal 12: Responsible Consumption and Production. 2020. Available online: <https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-12-responsible-consumption-and-production.html> (accessed on 11 June 2020).
69. Binder, T.; Redström, J. Exemplary Design Research. In *Proceedings of the Wonderground—DRS International Conference 2006*, Lisbon, Portugal, 1–4 November 2006.