

Review

# Addressing the Social Aspects of a Circular Economy: A Systematic Literature Review

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**Abstract:** Circular Economy (CE) is a growing topic among scholars, industries, and governments, and is aimed at decoupling economic growth and development from the consumption of finite resources. CE incorporates different meanings, from reduce, reuse, and recycle activities, to environmental degradation or resource scarcity, and is supported by specific indicators to attain sustainable development. However, so far, there has been no agreement to measure how effective an industry/product is in making the transition from linear to circular approaches, particularly those that affect society. This research work aims to perform a systematic literature review ( $n = 60$ ) to analyze and discuss how social aspects have been considered and integrated in CE research so far. Moreover, this review provides an overview of the literature on social impact within the CE, which results in three main outputs: a knowledge map of the CE, an analysis of social aspects within CE, and the theories/frameworks used to evaluate social impact of CE. Finally, this study brings to light how CE implementation can affect society and highlights the importance of social dimension in the domains of CE and a policy-making community, which could help move CE towards a sustainable development.

**Keywords:** circular economy; social aspects; systematic review; sustainable development

## 1. Introduction

Circular Economy (CE) has emerged as a paradigm, highlighting multiple paths and targets to attain sustainable development, and to propose ways to create value for costumers, societies, and other stakeholders. Moreover, the understanding of CE has attracted increasing research interest, and it is currently mainstreamed in several stakeholders, from municipal to national governments, academia, and businesses around the world, and has become a policy tool to move forward sustainability [1].

CE puts forward the concept of developing new business models that transform traditional linear economies of “take, make, dispose” [2], into an alternative flow model, one that is circular, and looking for closed loops. It has been argued that circular materials reduce negative environmental impacts, by minimizing the consumption of virgin materials and energy, and stimulating new business opportunities [3]. However, CE views have privileged economic solutions as the driver for solving material and energy-related problems, rather than a sustainability paradigm [4], which should require a complete mapping of three sustainability dimensions. Indeed, although sustainability has, as a main goal, to benefit the environment, the economy, and society at large, the current main beneficiaries of the CE appear to be economic actors that implement the system [5].

Recently, a considerable number of reviews have taken the challenge of undertaking research focused on the relationship between CE and a sustainability concept, as well as the large amount of terms that are related to it. For instance, some studies have referred to the CE term as new sustainability

paradigm, which enables progress through the implementation of CE practices [5–7]. Other researchers have investigated the limitations and challenges of CE in terms of global sustainability [3,8]. Moreover, discussions and critics about the various CE conceptualizations have been made towards the coherence of CE [1,9]. Other authors, such as De Pádua Pieroni et al. [10], propose business models (based on business model innovation) as a strong foundation to transition to CE (with sustainability as a strong foundation).

In short, notwithstanding a few voices from authors advocating for the inclusion of social aspects in CE concepts, tools, and metrics, the concept of CE today clearly appears to prioritize the economic system with primary benefits for the environment, either resource efficiency or environmental efficiency, and only implicit gains for social aspects. For instance, some of these voices include Korhonen et al. [3], who emphasize the importance of including a social objective in CE, establishing the sharing economy, increased employment, and participative democratic decisions as main issues to be included. Additionally, Homrich et al. [11] point out the lack of more research approaches, applying a triple bottom line perspective, since the focus, until now, remains on economic-environment perspectives, while concern with social aspects are still missing. Other authors, such as [12], criticize CE for not explicitly targeting sustainable development goals, especially regarding the social dimension. Incorporating sustainable development goals (SDGs) into the CE agenda is promising and should not be underestimated. In all of these examples, authors agree and recognize the importance of bringing the social dimension into the CE agenda, attempting to help sustainability transition worldwide. Thus, transition towards CE must be perceived through a framework of socio-technological transition, where existing production structures, businesses, models, products, and consumption practices undergo a fundamental change [13].

Reviews on CE have pointed out weaknesses in the current concept, particularly because there is lack of social and institutional dimensions, issues that are considered important to the development of the CE concept [14]. As quoted by Geissdoerfer et al. [5], many conceptualizations of the term seem to ignore socioeconomic effects and only emphasize economic issues, while simplify the environmental dimension. Similarly, Murray et al. [8] support that circularity approaches benefit some aspects of sustainability, but lack the integration with social dimension. Besides, many researchers highlight that there is no evidence concerning the contribution of CE to sustainability, particularly to social wellbeing [5]. So far, insufficient consideration is given to how CE will interact with normality (habits, norms), and meaning in circularity approaches [15].

Although there are various benefits that CE could potentially give to society, the conceptual relationship between the CE concept, tools, and social impact is not clear. This has potential implications to outline how social impacts can be associated with CE implementation on the affected stakeholder groups. As far as we know, no research has systematically reviewed how social aspects are dealt and integrated in CE strategies and tools. Therefore, to fill this gap, this work aims to analyze and summarize, through a systematic literature review, the social dimension within CE. Hence, the research questions addressed in this paper are: (1) why social aspects are relevant in CE? (2) What are the socio-economic aspects related to CE and what are the most important in CE? (3) Which methodological tools and metrics are used for assessing the social dimension within CE? We defined social aspects as all parameters, indicators, or issues related to the social relations between individuals and society.

## 2. Research Methodology

This review was conducted in accordance with general systematic review principles [15], and is based on research articles published from 2009 to March 2019, and academic search databases (Springer, Cham, Switzerland; Science Direct, Elsevier, Amsterdam, The Netherlands; MDPI, Basel, Switzerland and Wiley, Hoboken, NJ, USA). The time span chosen is because the previous decade encompassed the most relevant part of literature in terms of trends, development, and research of CE.

First, search words were associated with the Boolean operators OR and AND, and defined using the following topics: “Circular economy” OR “circularity” AND “social aspects, OR “social indicators”,

OR “social issues”, OR “social implications”, OR social indicators, OR social impact, OR social value, OR social cohesion, OR social capital. Our first search generated 3647 potentially studies.

Following Becheikh et al. [16], we performed a two-step screening (practical screening, inclusion criteria). As a first step, a practical screening was applied to titles and abstracts (3647 studies) to eliminate duplicates. The practical screening was done by one author and repeated once after the coding of all papers to ensure all relevant works were included. The searching was limited to peer-review works and only published in the English language. We concentrated on English literature to make this review replicable for readers. After the application of practical-screening, 1580 relevant studies were identified.

As a second step screening, we defined the following criteria inclusion for the studies in order to be considered in the final systematic review:

- The articles must deal–evaluate–propose with, either separately or mixed, at least one social aspect/indicator/issue/parameter/implication; and
- The articles must consider, as a core, CE or its associated concepts (green economy, cradle-to-cradle, industrial ecology and bioeconomy).

The screening criteria were applied to abstract–introduction–conclusion sections. It was found that 1319 studies did not achieve the inclusion criteria; thus, 261 potentially studies were kept for analysis. Finally, a full-text analysis was launched to determine the final studies for the systematic review. After that, only 60 relevant studies, which included all inclusion criteria established above were considered for the systematic review process. Figure 1 shows the process adopted to carry out the literature review.

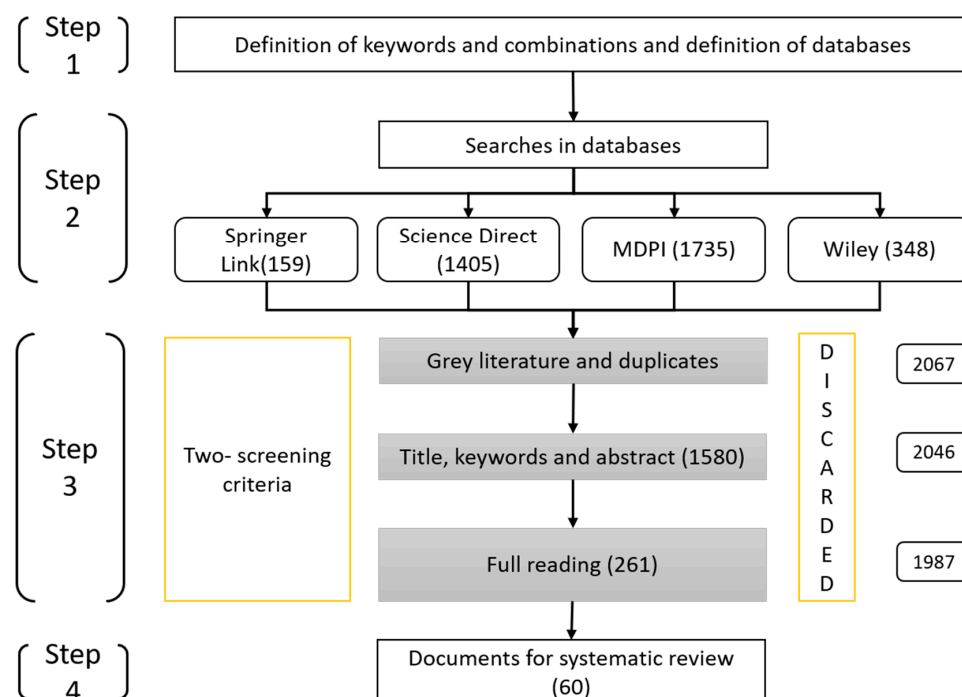


Figure 1. Research strategy implemented to undertake the systematic review.

### 3. Systematic Literature Review

#### 3.1. Characteristics of the Included Studies

From the 60 articles reviewed (Supplementary Material), it can be seen that interest on social dimension within CE academia grew from 2015 onward. This tendency can be explained due to

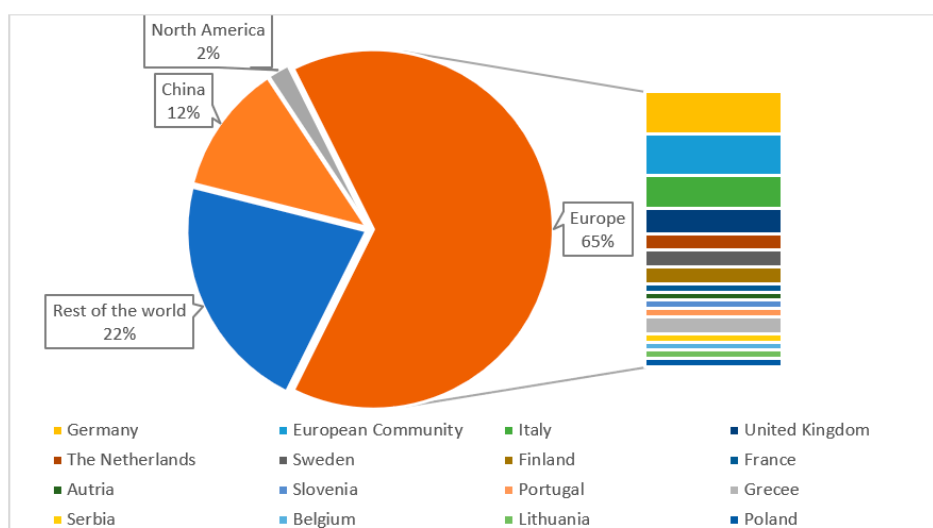
the increment of environmental international regulations, as highlighted by Sassanelli et al. [17]. Some of these regulations became more closed and important because of climate change, urbanization, and consumerism. Moreover, the Ellen MacArthur Foundation report, published in 2015 [18], emphasized the inclusion of social dimension within circular performance assessment.

Regarding the type of research, both articles published in international journals (59) and proceedings of international conferences (1) were considered. Three journals present a bigger contribution in terms of social implications within CE works, *Sustainability* (25%), *Journal of Cleaner Production* (25%), and *Resources, Conservation & Recycling* (9%), with almost 60% of papers reviewed.

Most of the papers selected (53%) gave relevance to the analytical assessment that is the approach most exploited; analytical assessment is used to break CE down into its respective constituents in order to drive the methodology (elements of CE), while theoretical approaches (22%) tend to describe various aspects of human behavior, providing models for investigating complexity of CE (whole object-CE), followed by case study (13%) and surveys (12%).

### 3.2. Geographical Context

In order to analyze the region where circular economy works are applied and implemented, the papers were allocated regarding the geographic context (Figure 2), wherever possible. Moreover, 85% of studies investigated have an exact geographic zone. Of these, 70% settle their investigations in Europe, 23% in Asia, while Africa, North America, and Latin America, together reach only 7%.



**Figure 2.** Geographical context found in Circular Economy (CE) documents.

For Europe, most of the studies focused on Germany (16%) and The European Community (EC) (16%) as a whole, followed by Sweden (10%), Italy (10%), the United Kingdom (10%), and other European countries (38%). It should be notice that in Europe, CE first emerged in Germany with the 1972 Waste Disposal Act, and was then supported by the Waste Directive 2008/98/EC [19], and the CE Package [20].

Regarding Asia, China (55%) is the country with the greatest number of works on the subject in this review. This could be attributed to the early adoption (year 2002) of CE as a nationwide development strategy. In the wake of this Chinese strategy, many other countries have promoted CE as a new development strategy. However, the current China policy framework stresses too much on the means and not enough on the ends of the CE.

In contrast, North America and Latin America have only a few works represented in this review. This could be attributed to the existence of few initiatives in the region [21]. The United States (U.S.)

is one of the few countries that present a relevant CE federal policy, based on previous regulations: the Resource Conservation and Recovery Act of 1976 [22], and the Pollution Prevention Act of 1990 [23].

### 3.3. Scale of Analysis

The implementation of CE is categorized according to three systematic levels [21]. The micro level, which emphasizes products, companies, or consumers. The meso level focuses on industrial parks and industrial symbiosis districts; the macro level includes activities within a city, region, nation, and beyond. In this review, the level of analysis presents that one-third of studies reviewed (32%) conducted studies oriented at a macro level: either society level (e.g., [24,25]), municipal (e.g., [26]), or regional level (e.g., [25,27]). The micro level of analysis portrays 30% of studies (e.g., company [28], consumers [29], products [30]), followed by not mentioned (17%) (e.g., [7,8,31]), and the meso level (17%) (e.g., industrial parks [32]). Finally only 3% of studies presented a combined (micro and macro) level of analysis (e.g., [33,34]); this could be attributed to concurrence of the CE implementation.

### 3.4. Industries

In this section, the papers reviewed were categorized in relation to the industry of implementation. In almost 50% of works analyzed, it was possible to distinguish a sector of activity. The most relevant sectors are waste management (14%) (e.g., [35]) and manufacture (7%) (e.g., [28]). This is supported by [36], who highlighted that most of the circular economy works focus on waste industry, since one the objectives of CE is to minimize waste and improve its use. With regards to the manufacture sector, the most investigated areas are metal [37], and paper production [38].

Concerning other industries, chemical (5%) (e.g., [39]) is the most investigated regarding the technological sphere, while the agri-food industry (5%) (e.g., [40]) and wood (5%) (e.g., [41]) are the most studied in the biological sphere. While in services, tourism and commodity accounted for 8%. The rest of the industries accounted for (12%), including cities (3%), high-tech (3%), energy generation (2%), textile (2%), and communication (2%).

## 4. Results and Discussions

### 4.1. Classification of Social Aspects

In order to help articulate the findings of this review, the social aspects were first classified, in order to analyze their meaning and relevance in the sustainability context. Typically, the meaning of sustainability has been interpreted differently according to the actors involved, the context, and the indicators used to measure it. Sustainability aspects are classified in three dimensions: environmental, economic, and social. While this three-dimension classification is being debated, no other categorization schemes have been proposed so far in the literature. However, while the concept of a social dimension to sustainability is generally accepted, its implementation in sustainability strategies has not been very clearly defined or agreed. Indeed, despite the variety of available social sustainability categories/aspects/indicators, Hutchins et al. [42] note the absence of commonly accepted indicators of social sustainability.

Therefore, in this review, we based our analysis on the sustainability categories identified by Dempsey et al. and the Ellen MacArthur Foundation [18,43]. The categories gave an overview of social dimension in terms of sustainable development and circularity, the categories were grouped into thematic areas and social aspects, according to Table 1. We used the social aspect classification following the principles previously established in the Social Life Cycle Assessment (SLCA) methodology, but using the thematic areas proposed in [18]. These categories and thematic areas were selected since there is no consensus for classifying social issues in CE.

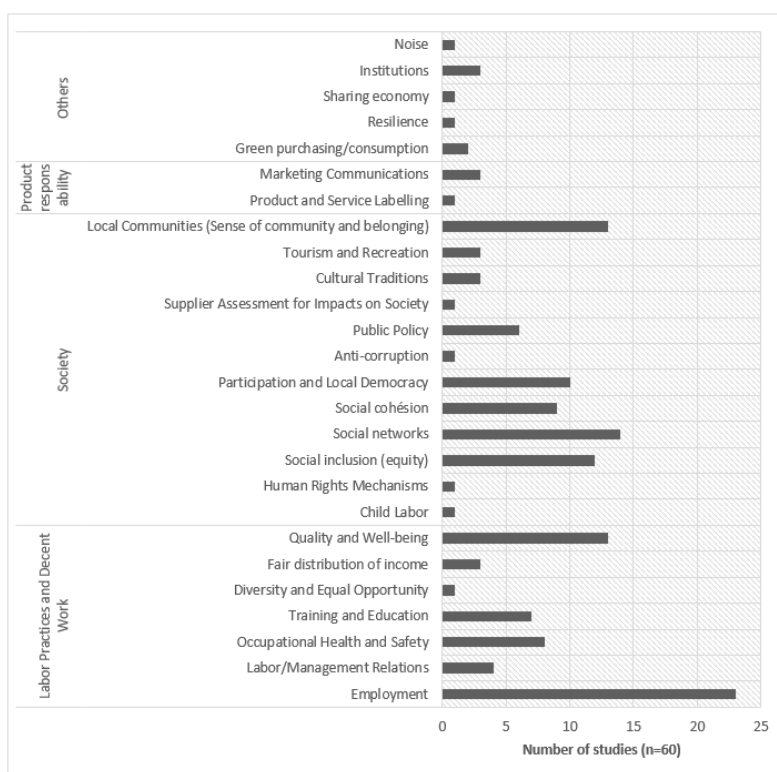
**Table 1.** Thematic areas and aspects for social dimension within CE.

Thematic Areas *	Labor Practices and Decent Work	Human Rights	Society	Product Responsibility
Social Aspects	1. Employment	8. Investment	15. Social inclusion (equity)	
	2. Labor/Management Relations	9. Non-discrimination	16. Social networks	
	3. Occupational Health and Safety	10. Freedom of Association and Collective Bargaining	17. Social cohesion	
	4. Training and Education	11. Child Labor	18. Participation and Local Democracy	26. Customer Health and Safety
	5. Diversity and Equal Opportunity	12. Forced or Compulsory Labor	19. Anti-corruption	27. Product and Service Labelling
	6. Fair distribution of income	13. Security Practices	20. Public Policy	28. Marketing Communications
	7. Quality and Well-being	14. Human Rights Mechanisms	21. Compliance	29. Customer Privacy
			22. Supplier Assessment for Impacts on Society	30. Compliance
			23. Cultural Traditions	31. Anti-competitive behavior
			24. Tourism and Recreation	
			25. Local Communities (Sense of community and belonging)	

\* A fifth thematic area, named as "Others", presents those indicators that cannot be classified in the thematic areas proposed.

#### 4.2. Thematic Areas and Social Aspects within CE

After determining the classification above, the thematic areas and the social aspects identified in this review are shown in Figure 3. The social aspects used in the papers reviewed addressed a wide spectrum of issues related to the social dimension of CE, within which numerous aspects aim to support CE assessment across the macro, meso, and micro levels. Society is the thematic area that has the highest percentage of indicators found in the literature (49%), followed by labor practices and decent work (41%), while others (6%), human rights (2%), and product responsibility (2%) presented the lowest level of occurrence.



**Figure 3.** Thematic areas and social aspects in the systematic review.

Concerning the single aspects, employment has the highest frequency (reported in 23 out of 60 studies) in the reviewed studies, tied at second level of occurrence are quality and wellbeing, social networks, and local community (reported in 13 out of 60 studies). Social equity has also a high frequency (reported in 12 out of 60 studies). From Figure 3, it also emerges that some indicators (such as participation and local democracy (10/60), social cohesion (9/60), and occupational and health and safety (8/60)) are increasingly used to assess the social dimension within CE. It should be noted that although sharing economy and green purchasing/consumption indicators do not represent a high frequency in reviewed studies (less than 3%), they have been recognized as a new vision for the consumption culture within CE for sustainable development [3]. The role of institutions/governance have (reported in 3 out of 60) gained an insight within CE practitioners because they provide the basic requirements for transitioning to CE, and they also stimulate the creation of new policies enhancing sustainability [13,44]. In the following section are analyzed in detail the most frequented social aspects (employment, social inclusion, participation and democracy, and health and safety) to provide a more compressive overview.

##### 4.2.1. Employment

As seen in Figure 3, employment was the social aspect most often cited in this review, since CE has the potential to create employment opportunities, which directly deals with regional unemployment

disparities and occupational mismatch. These studies highlight the importance of promoting circularity-based economies and show that it is necessary that governments are involved by proposing new policies and incentivize their developments in order to create more jobs. These policies should also help improve energy efficiency through greener technologies, smarter strategies to move forward better waste management systems, lower carbon emissions, increased renewable energy sources, etc. All of these new developments would require the development of new business models that incorporate greener jobs.

In this review, Pociovălișteanu et al. [45] studied the relationship between environment and jobs, by means of determining the jobs created derived from the environmental policies. Their findings suggest that measures to promote green jobs in the context of sustainability should be oriented towards the development of educational programs and training and encourage the adoption of greener technologies among different stakeholders. It was also found that investment in green infrastructure should promote a green economy at a social level. In this sense, employment in the CE plays an important role in overcoming socio-economic challenges, by which CE has the possibility to create new jobs, even if modest or transformational, and combat against unemployment and social inequity, for an exponentially growing population in a shifting economy.

Jobs in a circular economy can be newly created, created by substitution, or redefined. Moreover, green jobs on the road to contribute to decent work have to: (1) incentive jobs that meet conditions in terms of pollution (which have to be minimized), (2) commute traditional jobs to greener jobs, by employing non fossil sources, by retraining workers and by greening working methods, and (3) stop working in excessively contaminated areas. The CE can also contribute to offsetting the disappearance of low-level occupations. However, if the circular economy is aimed to be developed extensively, there would be, necessarily, some types of higher skilled employment. In this sense, education and training contribute to the development of these skills, increase labor productivity, and thus move forward sustainable development, but measuring skills and circular jobs remain too generic and difficult to adequately inform circular economy policy. For these reasons, approaches, such as [46], have developed a more granular framework to measure the amount of circular jobs. This framework distinguishes over 1400 economic sectors and differentiates between directly circular jobs in sectors that follow core strategies, enable circular economy strategies, and, indirectly, circular jobs in sectors that support directly circular jobs. Moreover, the approach takes economic interaction between these different sectors into account. As such, they were able to measure the circular labor force in a very detailed way. The method is a uniquely comprehensive way of measuring the circular labor force, providing cities with a tool to effectively invest in the jobs of the future.

It is important to highlight that technology related to CE implementation could reduce certain human jobs, referred to as technological unemployment. However, while that might be true, CE may also create new job opportunities elsewhere [47].

Thus, to promote employment in circular economies, attempts must be carried out both at the industry and government levels. Both must strengthen employment through strategies and incentives, either to close material loops or to use products more efficiently. However, this transition would also depend on how workers receive the necessary training and skills to fulfil the employment demanded in CE.

#### 4.2.2. Social Inclusion (Equity)

As noted in Section 4.2 and Figure 3, equity is one of the most frequent aspects. In this review, there are multiple references to social equity ranging from intra-generational equity and inter-generational equity [48], equitable distribution of system benefits [33], to improving social benefits for poverty alleviation [49]. The importance of equity resides, among other aspects, in improving human rights and social justice. It has its base in social justice, distributive justice, and equality condition [50]. This reflects the connectedness of the concept of social equity within interpretation of sustainable development aimed at satisfying the needs of present as well as future generations.



Moreover, there are some cases of inconclusive approaches found in the literature, on how the CE will promote social equity. For example, Xue et al. [51] propose that the CE can improve social welfare distribution, at the same time Gen and Dobertein [52] suggest that CE helps to further social justice. However, these approaches seem to be vague suggestions in terms of measuring CE as no quantitative studies have been proposed that support these statements. In addition, no suggestions are found on how CE improve aspects of this dimension. In this regard, some efforts have been made to measure social equity, for example, Gross Domestic Product (GDP) has been proposed as a relevant indicator of social equity. On the one hand, Zhijun and Nailing [53] suggest that the CE can incentive economic and social growth, and discussion about that the implementation of the CE in certain areas has been associated with an important raise in GDP. They advocate the idea that GDP increment can be employed as an indicator for social equity. On the other hand, Van Den Bergh [54] argues that GDP is not sufficient for improving social equity. Therefore, as indicated by Moreau et al. [55], it seems that there is no knowledge about how CE could support the promotion of social equity, there has been no detailed analysis, and it is necessary, explicitly, that CE empirically supports this fact.

As a consequence, if CE is seen as a tool to move forward sustainable development, it must firstly develop a framework to show how CE strategies can promote/incentive social equity, and it can be incorporated with other aspects. However, as supported by Moreau et al. [55], so far, there is no explicit evidence on how CE could support the encouragement of social equity. Thus, it is necessary to create the tools and mechanisms that can adequately and accurately integrate the concept of social equity within CE discourse to progress in different directions, in this regard, further work is necessary in this area.

#### 4.2.3. Sharing Economy/Collaborative Economy

Defining 'sharing economy' has been a challenge, particularly considering the widespread usage and its multiple definitions, including peer-to-peer economy, collaborative economy, fair trade, community currencies, on-demand, and collaborative consumption, to name but a few. However, these approaches agree that sharing economy aims to distribute the goods/services or other resources by multiple people. The sharing economy assumes the principle of maximizing the utility of benefits via lending, renting, exchanging, etc., issued by technology [56].

Moreover, practitioners of the theme suggest that this type of economy is conducted by three main assets: more efficient and resilient use of financial resources (economic), more efficient use of natural resources (environmental), and deeper social interactions among people (social) [57]. In parallel, the sharing economy also supports targets, such as community-building, economic empowerment, creative expression, but also resource management.

In the last years the concept has, perhaps, become progressively less transparent in a context where sharing and collaborative frameworks are together linked with a perception of start-ups and the promotion of small enterprises. All of these models are facilitating and extended by technology platforms, wherein the three main systems drive within the collaborative consumption and sharing economy: redistribution markets, product service systems, and collaborative lifestyles platforms. The principal examples of these business include sectors, such as office space, transportation, accommodation, tourism, retail products, and financial services. However, sharing models is only a little part of the large CE picture, and in-depth questions should be asked to have clearer implications for consumers/users and its shortage of acceptance. In this sense, it is imperative to adopt digital technologies to increase the use of (and optimize) resources and material flows, and promote the integration of user and consumption perspectives into design processes in order to integrate them into circular solutions [58].

#### 4.2.4. Participation and Local Democracy

Participation and local democracy are two ways in which society can express their own opinions, and in some cases, they can influence decisions makings, for instance, circularity decisions [59]. Both aspects can serve as local change mechanisms to educate people, and facilitate information

about a bureau's activities, and enable people to be part of conducting decisions. On this subject, the understandings and outcomes from society's participation can play an important role in tackling persistent societal problems in a reasonable, transparent, and multi-oriented way, along with enabling innovations for circularity. Thus, CE strategies should explicitly propose strategic and systematic approaches to bring all stakeholders, together, to attempt policy coherence. Therefore, all CE actors must be connected more closely with multi-perspective policy processes and intergovernmental discussions, and should be organized by a common perspective of a sustainable CE system.

In terms of participation related to environmental issues, there are three levels of participation recognized: participation in the planning process, participation via information, and participation in finance decisions. In studies reviewed, different goals and scopes are pursued from the decision making progress [60], stakeholders interest, and perceptions of bio economy [61], to consumer perspectives on CE strategies for reducing wastes [62]. These approaches have the power to give an insight base for short-term democratic and decision-making agendas (of incentives and measures to forward a potentially sustainable CE) as well as to actually put them into practice.

From a community perspective, greater participation within and by local communities develops the functional benefits, as mentioned by Korhonen et al. [63]. Thus, operation of CE should increase participative democratic decision-making through a community user. Moreover, it is important to pay attention, from a stakeholder perspective, since this approach can generate better decisions that are more likely to be implemented, raise legitimacy, and promote a wider understanding of the complexity of societal problems. Participation by local actors also plays an important role in a community-centered perspective that accentuates local empowerment.

Another area related to the community and involvement in decision-making is social acceptance, also referred to as community acceptance. Community acceptance involves specific acceptance of citing decisions within projects, in this case, projects related to CE, by local actors, particularly residents and local authorities. This is the place where the Not in My Backyard (NIMBY) concept spreads. NIMBY reflects a phenomenon defined as "public opposition to construction of certain public facilities in urban development" [64]. NIMBY conflict increases when residents have different perceptions of gains and losses resulting from the development of certain projects. This concept is basically an effect of community perceptions; particularly in the perception of the visual impact, noise, hygiene, safety, etc., requirements of such facilities, in which most habitants are against [65].

In addition, the NIMBY syndrome is commonly seen as a negative term, involving selfishness, ignorance, and irrationally, in favor of residents interested in conserving their own turf and putting their own interests ahead of societal assets [66]. Some scientists have criticized this concept since they argue that it lacks a robust theoretical framework and conceptual models for measuring it, and it is suggested that the language of NIMBY should be excluded [67]. Furthermore, public policy and researchers need to develop frameworks for understanding public perceptions involving CE strategies affecting local communities. In this regard, education and awareness raising campaigns could modify this opposition (NIMBY) and provide a better community cohesion when it comes to implementing strategies for decision making. However, there is no literature on the relationship between NIMBY phenomenon and CE initiatives and, therefore, further investigation is required to build on existing discourse. Implementing these strategies is a way to address citizens' environmental concerns and give them access to decision making information about transitioning to CE.

#### 4.2.5. Health and Safety (Occupational and Consumer)

The transition to a CE has implications for the stated priorities of human health in following years. These priorities include dealing with major disease concerns, strengthening people-centered health systems and public health capacity, and creating supportive environments and resilient communities, among others. The CE may affect the burden of disease, both positively, e.g., through reduction of air pollution due to transition to circular economy mobility and production modes [68,69], and negatively, e.g., if hazardous chemicals are not managed to minimize health risks (Garrido-Azevedo et al. [70]).

The CE can also contribute to improving the delivery of public health and health care services by providing a range of cost-saving and efficiency measures. In this regard, the transition to the circular economy could promote supportive environments and resilient communities to the extent that this translates into improved well-being and quality of life. Up to now, however, the coverage of the health link to transition to a circular economy has been nearly insufficient.

There have been a few specific and indirect CE actions that attempted to evaluate and improve health consequences. Direct actions include those case studies on chemicals of concern, e-waste, and food safety, while indirect actions would result in reduced global environmental pollution from production and consumption process. In the context of assessing the health implications of the transition to a CE, it is necessary to develop a framework to identify pathways through which implementation of circular economy models may affect human health and welfare. The framework should be designed to describe the health and welfare impacts identified according to their key characteristics, including the type of effects (positive/negative, direct/indirect) and the economic sectors and groups affected (distributional issues). To the extent possible, the framework should draw on and adapt existing frameworks and classifications from the environment and health literature, including from World Health Organization (WHO) initiatives. A key question in this context is: to what extent do circular economy alleviate or contribute to environmental health risks for the vulnerable stakeholders?

#### 4.3. Theoretical Approaches within CE

The multiple choices, in terms of social aspects within CE, are difficult decisions that usually entail the application/development of theories and frameworks/method/index/approach. In this review, the documents were classified according their level of empiricism by non-empirical (theoretical approaches) and empirical studies (analytical assessment, case study, and survey). Regarding non-empirical studies, they contribute to 22% of papers reviewed. From these studies, 13 articles use socio-economic theories, as follows: the social and solidarity economy [56,71,72], socio-technical transition theory [73], stakeholder theory [74], governance theory [60,75], historical analysis [50,76], grounded theory [77], social embeddedness and social capital [35], sustainable oriented theory of the firm [78], and Gidden's structuration theory [79]. Table 2 maps the use of some theories in the field to provide future researchers with an orientation and, thus, contributes to the advancement of the field.

**Table 2.** Principal theories used to develop social dimension within CE.

Theory	Overall Purpose of Theory in Terms of Social Performance Measurement
Stakeholder theory	Stakeholder theory can be seen as a tool to the implementation, scope, and quality of social performance measurement within CE context.
Socio-technical transition theory	This theory can enable a significant change in the socio-technical dimension within CE case studies.
Network theory	Network theory helps with understanding how the position in a network determines social performance measurement and interorganizational decision making.
Gidden's structuration theory	Understanding this interaction and the feedback between social structures and human action can improve physical resource management. Thus, making an explicit link between the institutional drivers of material change and material (stocks and flows) aspects would allow for increasing the effectiveness of the circular economy initiatives.
Social and solidarity economy theory	The social and solidarity economy is an instructive and constructive example for the CE, increasing labor-intensive activities, while raising the quality and diversity of human work involved in remanufacturing and recycling.
Social embeddedness and capital theory	Combination of both theories can be used to understanding and comparability of the role of the social characteristics in CE activities around the world by quantifying the presence of these factors and their correlation with CE.
Institutional theory	Institutional theory facilitates understanding how differing institutional settings determine the social performance measurement and how it helps organizations to assess their conformity to institutional rules.
Resource-based view of the firm	Resource-based view help analyze how firms can achieve sustainable competitive advantage through competencies and capabilities in social performance measurement.

#### 4.4. Methods and Tools

Methodologies for quantifying and valuing social aspects are not yet well established, however our results found that approximately 78% of the reviewed literature sample use quantitative related-social methodologies. The increment of quantitative studies, 44 studies, indicate a progression in social performance measurement, rising from a theoretical base to a quantitative framework. This is interesting because, normally, social impacts are often of a qualitative nature and not easily quantifiable [80]. The outlook of social indicators in performance measurement can be interrogated if significant qualitative indicators are overlooked in favor of more easily quantifiable effects.

The overall publication of frameworks for guiding the social dimension within CE are diverse, principally, four principal approaches are frequently mentioned (in 56% of empirical studies) by researchers, ranging from United Nations (UN) sustainable development goals (used as target indicators) (8 articles), forecasting and statistical methods (surveys and Delphi-method) [81], (18%), United Nations Environment Programme (UNEP) Social Life Cycle Assessment (SLCA) [82], (7%) and generic sustainable indicators (7%) [83]. The rest of the approaches (eco-innovative solutions, monitoring framework, dynamics systems, sustainable business model, Intergovernmental Panel on Climate Change (IPCC) guidelines and ecological footprint) account for 45% of empirical studies.

#### 4.5. International Reports on Circular Economy and Social Dimension

Throughout this review, scientific papers and proceedings have been analyzed, all of them from academia; however, it is necessary to mention initiatives from other stakeholders, in this case from international organizations that consider/include social dimension to pave the way to a more inclusive and sustainable global economy (Table 3).

**Table 3.** International reports focus on social aspect of circular economy.

Methodology/Approach	Description	Social Dimension	Weakness
Ellen Macarthur Foundation [18]	Approach developed to measure effectiveness of a company in achieving transition from linear to circular models.	Complementary social issues based on Global Reporting Initiative (GRI) guidelines are proposed.	It is not reported how to measure social issues and how to incorporate these issues into circularity indicators.
Towards a greener economy [84]	Initiative developed to understand labor implications in green economies.	This report focusses on employment generation by relocating resources from high carbon to lower carbon economies.	The principal lack of this initiative is that it only focuses on a single stakeholder and it is missing the community and consumers stakeholders.
Social circular economy opportunities [85]	A report to highlight the opportunities, insights, and themes to engage enterprises and society through the creation of social circular enterprises.	The term social circular economy, a holistic view in line with UN sustainable goals to accelerate progress to a circular economy is proposed.	The main criticism of this approach is the lack of indicators and ways to measure how implementation of a social circular economy has improved the society.
The Circular Economy and Benefits for Society [86]	A report focused on the social benefits from linear to circular economy.	The report aims to explore employment benefits and CO <sub>2</sub> reductions in Poland and Czech Republic by evaluating circular strategies.	It only measured employment in terms of economic indicators (jobs generated), it did not specify quality issues, such as skills and training, involved in circular economy strategies.
Handbook for product social impact assessment [87]	This report describes a methodology to assess social impacts of products and services with focus on life cycle approach.	Regarding CE, these metrics discuss how CE strategies can have potential social impacts on social actors along the product value chain.	The incorporation of CE seems to be ambiguous and no identification is made on how CE-strategy analysis could improve social well-being or equity.

## 5. Conclusions and Final Remarks

This systematic literature review has highlighted that, despite being advocated as a tool for sustainable development, current CE framework is not clear if it can promote the social well-being for this generation and generations to come. In addition, it is uncertain whether the CE can be a more sustainable model than a linear economy. Furthermore, social dimension is an important area in the domains of CE and sustainable development. As such, academia, governments, and firms are increasingly striving to achieve a comprehensive understanding and valid measurement of social dimension to influence the overall implementation of CE as a means to achieve sustainable development.

The results have shown that, besides the environmental impacts of CE strategies, social impacts are receiving more and more attention in the transition towards a circular economy. Moreover, various trends and patterns in data extracted from the systematic literature review were confirmed. The main conclusions followed the research questions posed at the beginning of this work; they can be stated as: (1) social aspects are relevant in CE since they can give an overview on how strategies and actions impact or benefit society; moreover, social aspects can bring better understanding of circular economy monitoring. (2) The most cited socio-economic aspects related to CE found in this literature review were those related to employment, health and safety, and participation; however, there were other social issues that were relevant, but were not included in studies analyzed. These issues were: eradicating poverty, food security, and gender equity. We consider these social issues important because they could help in understanding the negative externalities created by moving to a circular economy. (3) In terms of tools and metrics used for social dimension within CE, we found that SLCA can be used to include social aspects of goods and services within a life cycle perspective, to complement environmental and economic dimension of CE. These social aspects, inherently linked with circular economy goods and services, must be included for engineering tools and should not be neglected.

Our review has shown that there is no consensus (as yet) to select an appropriate framework or approach that considers all social issues, due to its dependence on the scope of the study, data availability, and the priorities of the group of interest involved in the CE under consideration. Contrarily, the reviewed papers have not tried to cover multiple aspects; the studies are focused on very narrow aspects, where the main efforts focused on employment. However, the social aspects covered are useful when evaluating the social impacts of a circular economy. After reviewing all of the papers, we outlined that diverse social impacts can be associated with circular economy, particularly, circular economy strategies. These potential impacts are based on the affected stakeholder groups, i.e., those produced on (1) workers, small-case enterprises and local communities, in the product value chain, and those produced on (2) users of products and services. The distinguishments are based on circular economy strategies that are focused on closing material loops (workers, small enterprises, and local communities), and using products more efficiently (final users).

Therefore, this review can help CE practitioners by providing directions about aspects to be considered in the development of a holistic framework, to measure the social impacts of circular strategies, and to take into account all stakeholders involved in the supply chain. However, future research should begin to analyze the importance of other dimensions that matter concerning CE, such as governance and cultural aspects. As per our understanding, these two aspects are crucial to continue research on CE. This may require significant re-examination of the current theory, and, thus, lead to a new paradigm of CE. This led us to incorporate a wider win-win vision of the CE. Moreover, further studies should define and specify how to measure social indicators and how circular economy practices can improve human well-being in society. Real-world case studies to facilitate the development of a circularity database, particularly for social impacts of the circular economy, need to be implemented. In fact, this could only be done by comparing social aspects of a linear economy against a circular economy—some years after implementation—and sustained with different indicators for circularity. Alternately, the real-world-case could look at two regions, where one is circular and the other is lineal, although there may be a regional bias on the social aspects considered.

Despite the remaining challenges, considering the current social aspects, it can be an outset point for evaluating the social dimension in the circular economy to inform decision makers about enhancing, or preventing, social impact derived from circular economy strategies.

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