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Towards a Model for Analyzing the Circular Economy in Ecuadorian Companies: A Conceptual Framework

Gabriela Sucozhañay [1,*], Iván Vidal [1] and Paúl Vanegas [1,2]

[1] Space and Population Department, University of Cuenca, Cuenca 010203, Ecuador; ivan.vidalv@ucuenca.edu.ec (I.V.); paul.vanegas@ucuenca.edu.ec (P.V.)
[2] Faculty of Chemical Sciences, University of Cuenca, Cuenca 010203, Ecuador
* Correspondence: carolina.sucuzhanay@ucuenca.edu.ec

Abstract: A successful implementation of a CE requires an appropriate comprehension of its conceptual framework and the identification of the elements that composed it. However, there is still no consensus on a unique CE definition, which makes it difficult for companies to adopt circular practices in their business models. In this context, this study proposes a CE framework based on four fundamental elements: principles, drivers, stakeholders and strategies, which was complemented by circular-organization-oriented metrics. Then, local case studies were used to assess the implementation of CE strategies in Ecuadorian companies. Among the identified elements, it was found that there are general action lines that facilitate the understanding of the CE. On the other hand, the majority of elements and metrics are oriented toward the production and end-of-life stages, while extraction, design, use, marketing and distribution are less considered. Furthermore, although environmental, economic and social aspects are considered, the latter are mostly limited to employment generation. Finally, for the local case studies it was observed that the current adoption of circular practices in companies derives from the incorporation of the sustainability approach instead of a structured and systematic implementation of CE strategies.

Keywords: circular economy; circular economy framework; circular economy elements; business model; ecuadorian companies

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1. Introduction

The circular economy was conceived as a response to the environmental degradation and over-exploitation of natural resources toward which current economic growth is leading [1–3]. The conceptualization and understanding of the CE have been influenced by many schools of thought such as the laws of ecology, regenerative design, industrial ecology, cradle to cradle, biomimicry, the performance economy and the blue economy. There is no clear agreement about a unique definition of the CE. Even though it was formulated several decades ago, its definition is still unclear and has diverse meanings for different stakeholders as a result of a broad spectrum of principles and proposals that have been developed [4,5]. One of the definitions most recognized has been framed by the Ellen MacArthur Foundation, where "a circular economy is one that is restorative by design, and which aims to keep products, components and materials at their highest utility and value, all the time" [6]. Some existing literature reviews, such as the one conducted by [7], have found 114 distinct definitions of the CE within consultancy reports, peer-reviewed articles and policy papers, ultimately compiling them as "an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations" [7].

Over the last few years, the CE has received increasing interest in academic research, with special emphasis on certain areas such as closed loop value, supply chains [8], circular business models and circular product design [9]. The concept has gained the attention of policy makers and governments at local, regional, national and international levels [10]. It has also been related to corporate social responsibility (CSR) as it shares some considerations with the CE, and the two may complement each other in their operationalization. However, they are based on different motivations and, therefore, pursue different goals [10]. CSR can be considered as the voluntary integration by companies of social and environmental concerns in their activities and interaction with stakeholders, in order to positively affect the reputation of the company and its long-term success. On the other hand, the CE promotes a systemic change for a transition from a linear to a circular economy, retaining the value of materials and products for as long as possible, with the aim of providing a systemic response to present and future challenges at the economic, environmental and social levels [7]. Nowadays, the CE has been adopted as an operationalization for implementing the concept of sustainable development [10–12] in many countries' policies, which have taken different approaches to its implementation [1,13–15]. At an international level, CE concerns have been also incorporated, most notably, in the EU's 2015 Circular Economy Strategy [16]. However, the role of the CE in sustainability is unclear. Although most scholars recognize the relationship between both concepts with respect to economic and environmental aspects, there is still a lack of social elements in the CE [10].

The substantial discrepancy between CE approaches makes it difficult to define a consented theoretical framework that enables the implementation of circular systems at different levels [17]. In this sense, some common elements have been found in the literature including principles [18,19], drivers [20] and strategies [21,22]. These are frequently used by different stakeholders, who operate in distinct ways trying to connect theory with practice [19]. In the process of transition to a CE, circularity indicators are fundamental tools, as they provide crucial information for the design of policies and strategies and make it possible to measure and evaluate the impacts derived from their application [4]. In this regard, companies, governments and academics have formulated various proposals for measuring circularity. However, "what to measure" is still a matter of debate [4,23]. The classification of circularity indicators is diverse and complex. Many authors have grouped them by taking into account different criteria and according to the understanding of the CE from their respective fields [4,23]. One of the most widespread classifications is, based on their scope and groups, to place the indicators into three levels: macro, meso and micro [7,23–26]. The macro level is usually applied at the level of province, region, nation or the global economy and includes the development of eco-cities, eco-municipalities or eco-provinces [7,23–27]. The meso level focuses on eco-industrial parks and industrial symbiosis [28]. Lastly, the micro is used to support the implementation of product policies, energy efficiency and integrated waste management at the company level [24].

The majority of the CE indicators in the literature are found at the macro level, while the meso and micro levels are less prevailing [29]. Although there is a growing number of micro indicators, most of them are under development and still in the pilot phase [30]. As mentioned by [29], these indicators are mainly focused on recycling and waste management practices, with most CE principles barely taken into account. In addition, there is currently no standardized way to measure circularity at this level. This low degree of maturity could be the reason for its limited implementation in industrial practices [31]. According to [29], these can be classified into three groups: (1) simple indicators, which define circularity as a single number; (2) guidelines and tools, which evaluate circularity through less complex metrics; and (3) composite indicators, constituted by multiple indicators or by the combination of Type 1 and 2. However, there is a noticeable preference in the use of Type 2 micro indicators in practice, which include less complex metrics such as energy or water consumption, waste generation and reduction or financial, social and management aspects. Among the most recognized tools there are Circulytics and Material Circularity Indicator (MCI), developed by the Ellen MacArthur Foundation in collaboration with

partnerships, leading business, universities and investors. The aim of these tools is to enable companies to measure its current stage of circularity, identify areas for improvement and support decision making and strategic development for CE adoption [32–34].

The transition to a CE in companies requires the adoption of new visions, strategies and, in some cases, a fundamental redesign of product concepts and service offerings. In this context, business models play a key role as they enable systematic change by providing analysis, planning and communication tools [35]. The term circular business model (CBM) was first introduced by [36] as an exploration of types of individual business models for circular value creation. Then, it re-emerged with the wider dissemination of the CE by the Ellen MacArthur Foundation and the World Economic Forum. Although it lacks a unified understanding [37], from a general point of view a CBM articulates the way in which an organization creates, delivers and captures value to its wide range of stakeholders while minimizing social and ecological costs [38]. For its implementation, it requires organizations to adopt circular strategies based on the least amount of resources for the longest time while extracting the most value in the process [39]. In this regard, the development of a conceptual framework which includes CE elements such as principles, drivers, stakeholders or strategies, allows companies to identify existing circular practices and facilitates decision making to create a circular business, diversify its current business models, acquire a circular business or transform their business model into a circular one, based on their performance [40].

In Ecuador, small business (formal and informal) and citizen collectives have been practicing circular activities such as electrical equipment repair, shoe repair, tailoring, rental stores, organic food production or bulk stores for a long time. However, the concept of the CE as an economic model is relatively new [41]. Some of the most important Ecuadorian companies have started to incorporate the sustainability approach in their business model by implementing economic, environmental and social strategies, some of them related to the CE. Nonetheless, the adoption of circular practices is still uncertain. In January 2020, the draft organic law for circular economy was presented, with the intention of establishing specific criteria and mechanisms to reduce the generation of waste and promote its reuse, recycling and other types of recovery, through the implementation of circular economy principles, extending producer responsibility and other waste management instruments [42,43]. Then, in 2021, the now-called "Inclusive Circular Economy draft organic law" was finally approved [44,45]. In this context, the aim of this study is to identify the current integration of circular practices at the organizational level in Ecuador. For this purpose, a conceptual framework of the CE that incorporates principles, drivers, stakeholders and strategies is firstly proposed. Secondly, a set of indicators and tools to measure the CE is established based on a literature review. Lastly, case studies are used to assess the implementation of the CE in Ecuadorian companies.

2. Materials and Methods

2.1. Circular Economy Framework

To establish the circular economy framework, a literature review was performed inspired on Fink's methodology considering a search in tools, guides, reports and scientific databases, such as ResearchGate, Science Direct, Springer, Taylor and Francis, ProQuest, SpringerLink and Google Scholar, focusing on the CE elements. For this purpose, search terms like "Circular Economy", "Elements of Circular Economy", "Components of Circular Economy" "Circular economy framework" were used. In the literature review, 60 items were analyzed (Appendix A). Principles, stakeholders, drivers and strategies were proposed as the main elements of the circular economy framework. This structure was inspired in a previous article developed by the authors of this study called "Towards a sustainability balanced scorecard for managing corporate social responsibility in Ecuador: A conceptual model" [46], where Principles refer to the fundamental basis for decision making or to determine behavior, Stakeholders refer to individuals or groups that are interested in any decision or activity of the organization, and Strategies correspond to the method or manner

of doing something. Additionally, for this study the element "Drivers" was included and considered as a factor encouraging the adoption of CE initiatives [47].

Each article analyzed was coded using elements of the CE framework as predefined codes, i.e., Principles, Drivers, Stakeholders and Strategies and summarized using four findings matrices where the items of each code were registered. For principles and drivers, its definition (if available) and context were analyzed in order to better understand its meaning, and they were grouped based on their similarities. For stakeholders, only six articles of the total sample had a list of circular economy stakeholders, which were contrasted with each other in order to avoid repetition. For strategies, the practices mentioned in the sample were summarized. Then, according to their action lines these were clustered in macro groups. As an additional exercise, the CE framework elements were compared with the Business Models Canvas components proposed by [48].

2.2. Circular Economy Indicators

To complement the proposed circular economy framework, circular economy micro indicators of Type 2 (evaluation tools) were analyzed as they are the most used in industrial practices. Five CE tools were selected based on their popularity and the availability of indicator data bases. The selected tools were: Circulytics (52 metrics included in 10 themes), Cradle 2 Cradle (C2C) (83 metrics divided into five critical sustainability categories), Circular Transition Indicators (CTI) (10 indicators and 19 metrics), Material Circularity Indicator (MCI) (four main inputs) and Circular Economy Indicator Prototype (CEIP) (15 metrics grouped according to product life cycle stages). These tools were analyzed and systematized using a comparison matrix where all metrics of the tools were contrasted with each other. The similar metrics were grouped to avoid repetitions and the final result was classified in 9 evaluation categories: Energy, Water, Waste, Materials, Emissions, Design, Social, Financial and Management.

2.3. Circular Economy Implementation in Local Cases

The third stage consisted in the analysis of the CE implementations in local companies. To this end, a verification matrix was constructed based on annual reports of case studies and the CE analysis framework established in this study. Seven local case studies were selected, considering both service and production companies. For this purpose, information from the MERCO sectorial ranking, which classifies the most representative companies in Ecuador into 31 sectors was used. These sectors were simplified into 6 categories: food, health, materials, wholesale and retail, industrial and others. Then, based on the availability of companies' annual reports, a case study of each category was selected for the analysis, except for the "others" category for which no company reports were found. It is important to mention that due to the current sanitary crisis, the latest reports from most companies are from 2019. In addition, information from the Sustainable Ecuadorian Companies Ranking was used, since most local companies consider the CE as a tool to achieve sustainable development and report some circularity elements in their sustainability reports. The ranking mentions the 30 Ecuadorian companies with the best sustainable performance considering four criteria: sustainable business management, recognition in sustainability, membership in sustainability guilds and the opinion of specialists in sustainability. Four of the five selected from MERCO were consistent with the ranking of sustainable companies. The remaining case study represents the food sector, which is important for the local context, reason why it was included. In addition, to ensure better coverage of the country's productive sectors, two case studies on the sustainable ranking were included in the sample: one corresponding to the banking sector and the other to a higher education center. The selected case studies were: Alpina (2019), Difare (2019), Novacero (2019), Almacenes Tia (2019), Ingenio San Carlos (2019), Universidad Técnica Particular de Loja (UTPL) (2019) and Banco Pichicha (2019). A detailed description of the case studies is presented in Table 1.

Table 1. Selected case studies.

Business Sector	Name	Founding Date	Products or Services	Nº of Employees	Website
Food	Alpina	1996	Dairy Drinks, Cheeses, Creams and Butters, Desserts and Sweets	670	www.alpinaecuador.com (accessed on 1 February 2022)
Health	Difare	1984	Pharmaceutical distribution and development	4100	www.difare.com (accessed on 1 February 2022)
Materials	Novacero	1973	Construction and Metal-mechanic products, Industrial and Road solutions	1400	www.novacero.com (accessed on 1 February 2022)
Wholesale and retail trade	Almacenes Tía	1960	Grocery Store	7500	www.tia.com.ec (accessed on 1 February 2022)
Industry	Ingenio San Carlos	1897	Sugar, Panela	2836	www.sancarlos.com.ec (accessed on 1 February 2022)
Ranking of sustainable companies	UTPL	1971	University	1347	www.utpl.edu.ec (accessed on 1 February 2022)
	Banco Pichincha	1906	Private Bank	5113	https://inicio.pichincha.com (accessed on 1 February 2022)

3. Results

3.1. Circular Economy Framework

The proposed circular economy framework is presented in Figure 1. It was structured into four key elements: principles, drivers, stakeholders and strategies. Regarding principles, a total number of 60 were identified and grouped into 17 categories, mostly related to in-use products and materials maintenance, natural and economic capital preservation, maximization of resource productivity and design for the circular economy. Among the CE principles, it was observed that concepts such as waste revalorization (10R), Innovation, Efficiency, Design and Systemic Thinking stand out. Moreover, it was found that most the CE principles include environmental and technical aspects of products and services but lack social ones. As for the drivers, a total number of 55 were identified and grouped into six categories based on their similarities. It was found that the CE drivers are related to environmental and economic aspects and, unlike principles, to social ones, specially focused on the generation of employment and public health. Some of the main topics of drivers are the scarcity of resources, climate change, the promotion of new technologies, the development of skills and capacities for the CE, the development of circular models and the improvement of the supply chain. On the other hand, 12 types of CE stakeholders were identified, evidencing a wide variety of applications of the concept. Among the stakeholders found are investors, shareholders, designers and experts in materials relevant to the application of circular practices, with consumers and governments being the most relevant.

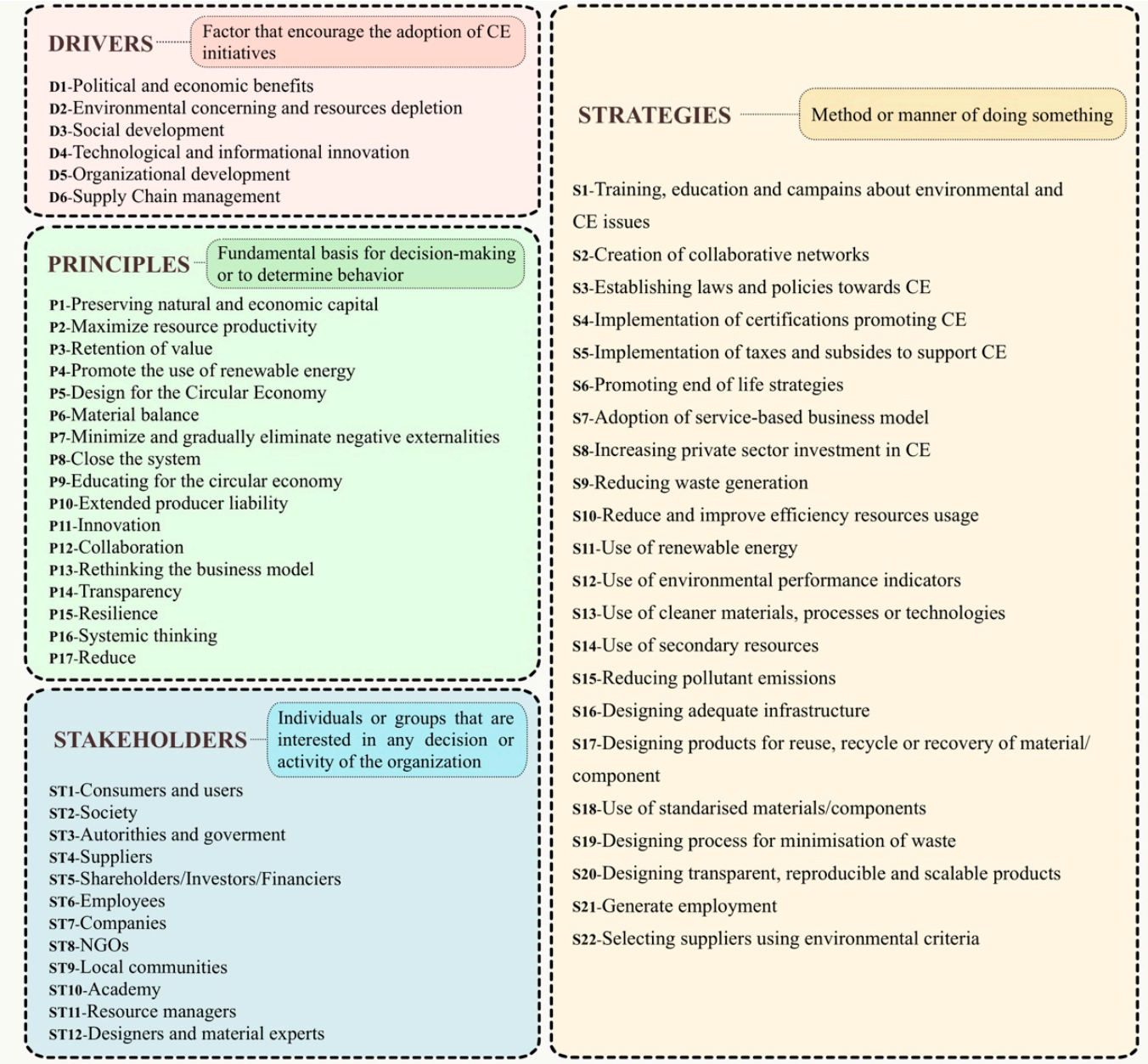

Figure 1. The resulting the CE framework.

Finally, with regard to the CE strategies a total number of 160 were identified and grouped into 27 action lines. Most of the strategies focus on training, education and campaigns concerning environmental and CE issues, reducing and improving the efficiency of resource use, facilitating repair and upgrading, and promoting end-of-life strategies. It was found that most strategies consider environmental, economic and management aspects, while the social aspect is addressed only with strategies related to employment generation. In addition, CE strategies were found throughout the entire life cycle of a product or service, with the use and end-of-life phases being the most prevalent.

By comparing the CE framework with Business Models Canvas, it was found that the CE elements can be adapted to business model components to facilitate the implementation of circular aspects as presented in Figure 2. However, a more in-depth analysis of this topic should be addressed in future research. This study is mainly focused on the comprehension of the CE framework as a starting point to enable the inclusion of these elements in business models.

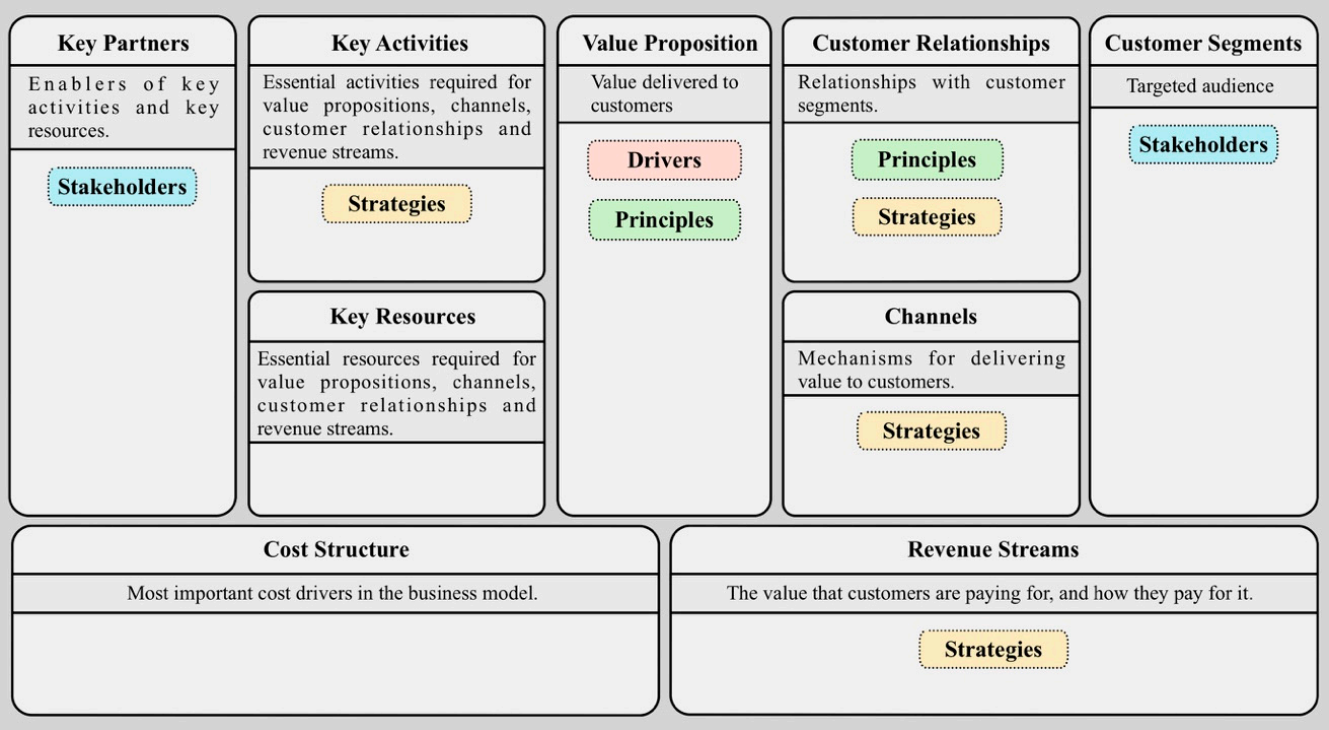

Figure 2. Integration of the CE elements into the Business Model Canvas components.

3.2. CE Metrics

The analysis of the circularity tools evidenced significant similarities between their proposed evaluation metrics. These were grouped into 10 categories: Energy, Water, Waste, Materials, Emissions and Effluents, Design, Employment, Financial and Management, as shown in Table 2. A total number of 83 metrics were identified (Appendix B), most of them related to economic and environmental aspects. As for social aspects, similarly to the CE strategies, the metrics were mostly related to employment generation and health. Some of the most representative metrics are the amount of waste generated, total consumption of water, fuels, electricity and materials, percentages of recycled waste and economic profits. In addition, metrics were found throughout the entire life cycle, with greater emphasis on the design, production and end-of-life stages.

3.3. Case Studies

The analysis of the case studies at the local level showed that Ecuadorian companies include many aspects of the CE in their practices. However, the aspects vary according to the specific goals of the companies and are not implemented under a CE approach. What happens in most cases is that there is a strong component of sustainability in which several elements coincide with circular practices. Among the most applied principles (Figure 3) in local production and service companies are Transparency, Innovation and Collaboration, which correspond to general principles of the CE. However, more specific principles such as Design for circular economy, Material balance, Close the system, Rethinking the business model and Reduce the size of the system were not considered.

Table 2. Circular economy metrics.

Aspect	**Environmental**						**Management**	**Economic**	**Social**
CATEGORIES	Design	Emissions	Materials	Waste	Water	Energy	Management	Financial	Employment
METRICS	-MD1 -MD2 -MD3 -MD4 -MD5 -MD6	-ME1 -ME2	-MM1 -MM2 -MM3 -MM4	-MWAS1 -MWAS2 -MWAS3 -MWAS4 -MWAS5 -MWAS6 -MWAS7 -MWAS8 -MWAS9 -MWAS10 -MWAS11 -MWAS12 -MWAS13 -MWAS14 -MWAS15	-MWAT1 -MWAT2 -MWAT3 -MWAT4 -MWAT5 -MWAT6 -MWAT7 -MWAT8	-ME1 -ME2 -ME3 -ME4	-MMA1 -MMA2 -MMA3 -MMA4 -MMA5 -MMA6 -MMA7 -MMA8 -MMA9 -MMA10 -MMA11 -MMA12 -MMA13	-MF1 -MF2 -MF3 -MF4 -MF5 -MF6 -MF7 -MF8 -MF9 -MF10 -MF11 -MF12 -MF13 -MF14 -MF15 -MF16 -MF17	-MS1 -MS2 -MS3 -MS4 -MS5 -MS6 -MS7 -MS8 -MS9 -MS10 -MS11 -MS12

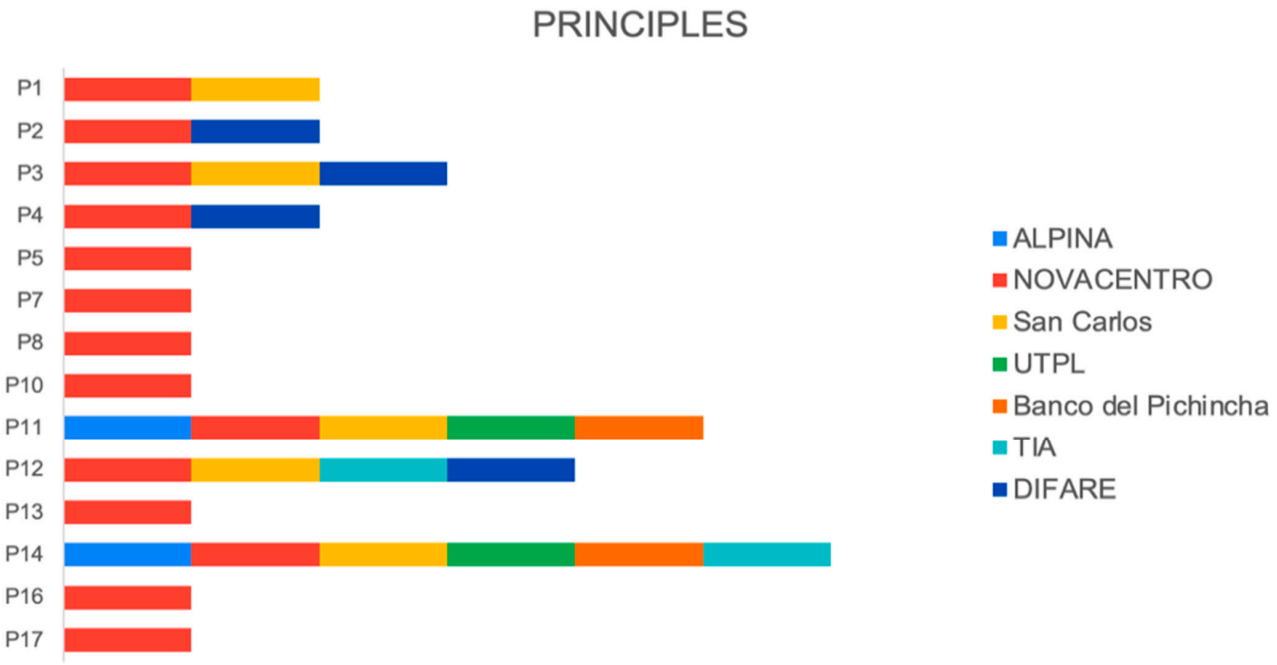

Figure 3. Principles identified in the case studies. Note: For a detailed description of Principles see Figure 1. Principles P6, P9 and P15 were not found in any company.

Regarding the CE drivers (Figure 4), the most prevalent in both product and service companies were Social development, followed by Political and economic benefits and by Environmental concerning and resource depletion.

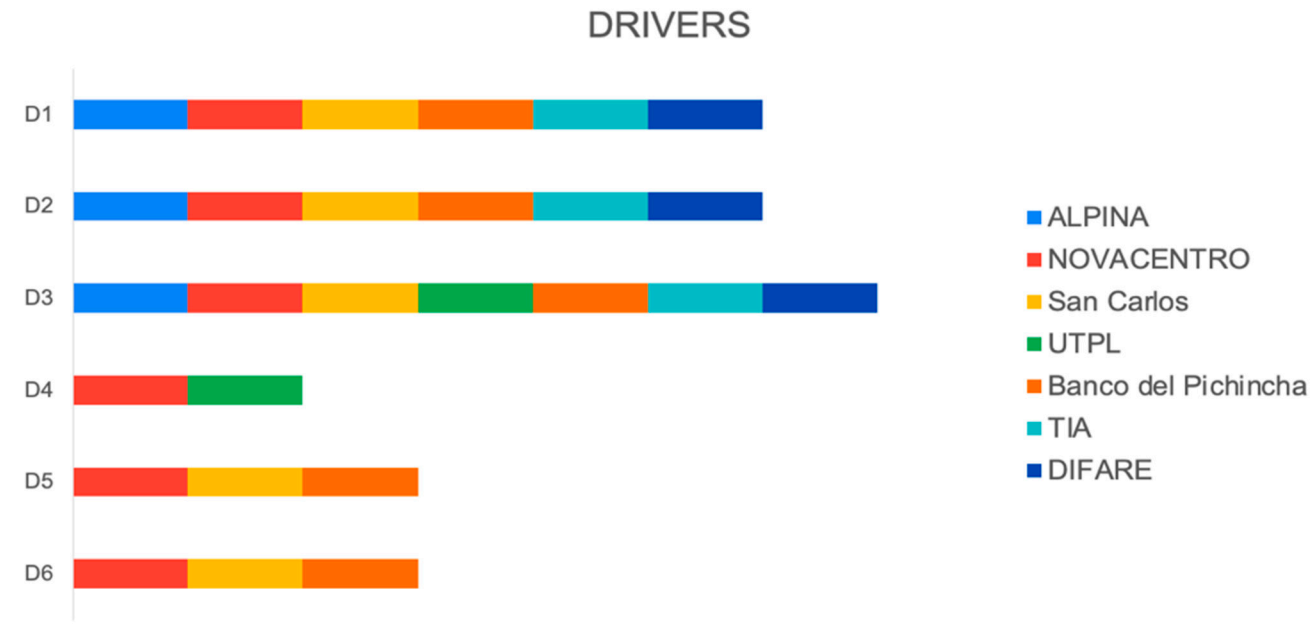

Figure 4. Drivers identified in the case studies. Note: For a detailed description of Drivers see Figure 1.

For the CE stakeholders (Figure 5), it was found that Consumers and Users and Suppliers are the most relevant for both product and service companies, while Society, Employees and NGOs are less prevailing.

Figure 5. Stakeholders identified in the case studies. Note: For a detailed description of Stakeholders see Figure 1. Stakeholders ST11 and ST12 were not found in any company.

With respect to the CE strategies (Figure 6), it was identified that the most frequently applied strategies for both product and service companies are Generate Employment, Promote proper waste management, Training, education and campaigns about environmental issues and the CE and Creation of collaborative networks. For product companies, some additional strategies such as Reduce and improve efficiency resources usage and Reducing pollutant emissions were found. On the other hand, a significant number of more complex strategies such as Minimize the use of hazardous materials, Promote monomaterial designs, Incorporate systems to control failed components, Design transparent, reproducible and scalable products, Establish laws and policies towards the CE, Design

products for reuse, recycling and/or recovery of materials/components, among others, were not included in any of the companies analyzed. In addition, it was found that in the local context, companies show a high interest in promoting strategies in environmental and social aspects, for the latter promoting strategies for the eradication of violence and discrimination, freedom of association and the development of projects with the locality. However, these strategies were not included in the analysis as they were not identified as part of the CE framework.

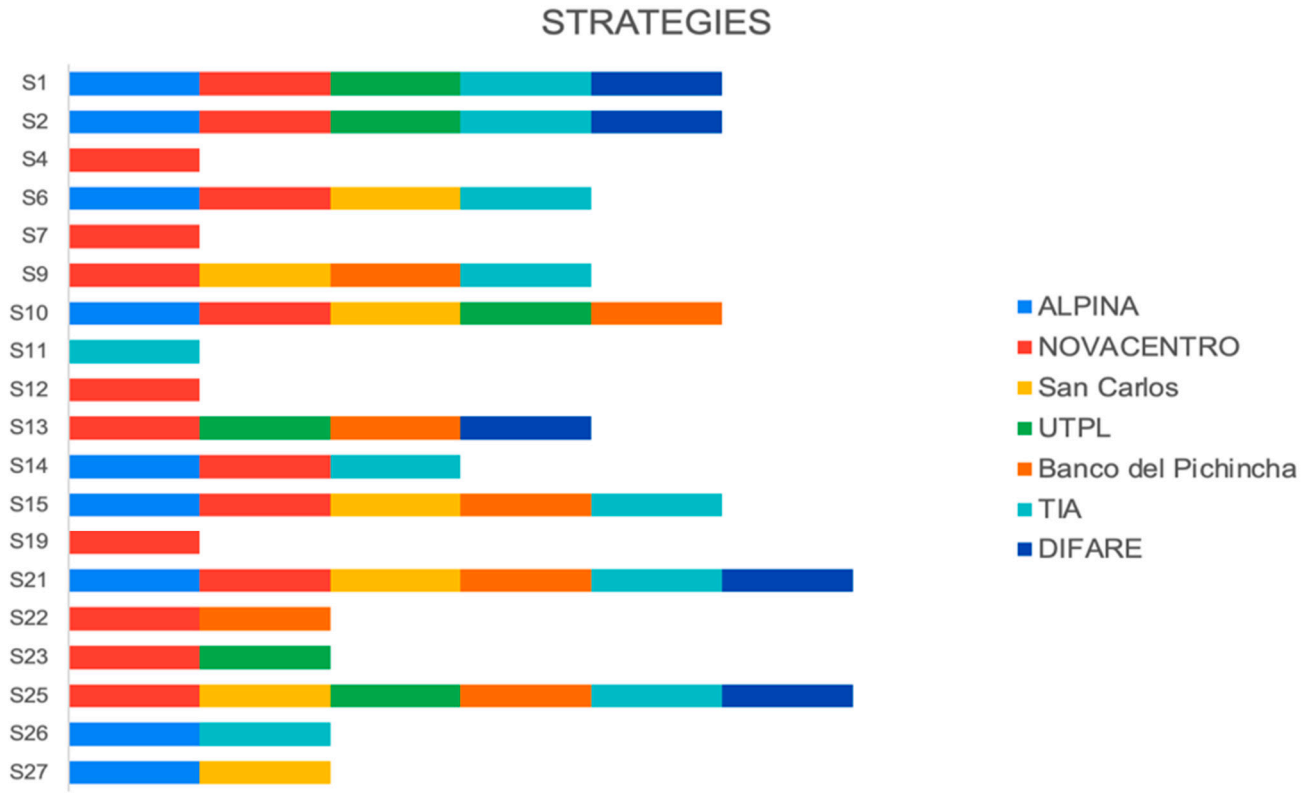

Figure 6. Strategies identified in the case studies. Note: For a detailed description of Strategies see Figure 1. Strategies S3, S5, S8, S16, S17, S18, S20 and S24 were not found in any company.

Finally, for circular metrics (Figure 7) it was found that the categories of Energy, Water, Waste, Waste recovery and Social (related to job creation and occupational safety and health) are the most reported by product and service companies, while no Design metrics were reported in the analyzed sample. Among the most reported metrics are Total revenues, Percentage of occupational injuries, Number of jobs generated, Total energy and water consumption and Percentage of waste recycled. It was identified that the most reported CE metrics by local companies are mostly environmental related, while financial and management aspects are less prevailing. In addition, the metrics identified in the local context correspond to the production and end-of-life life cycle stages.

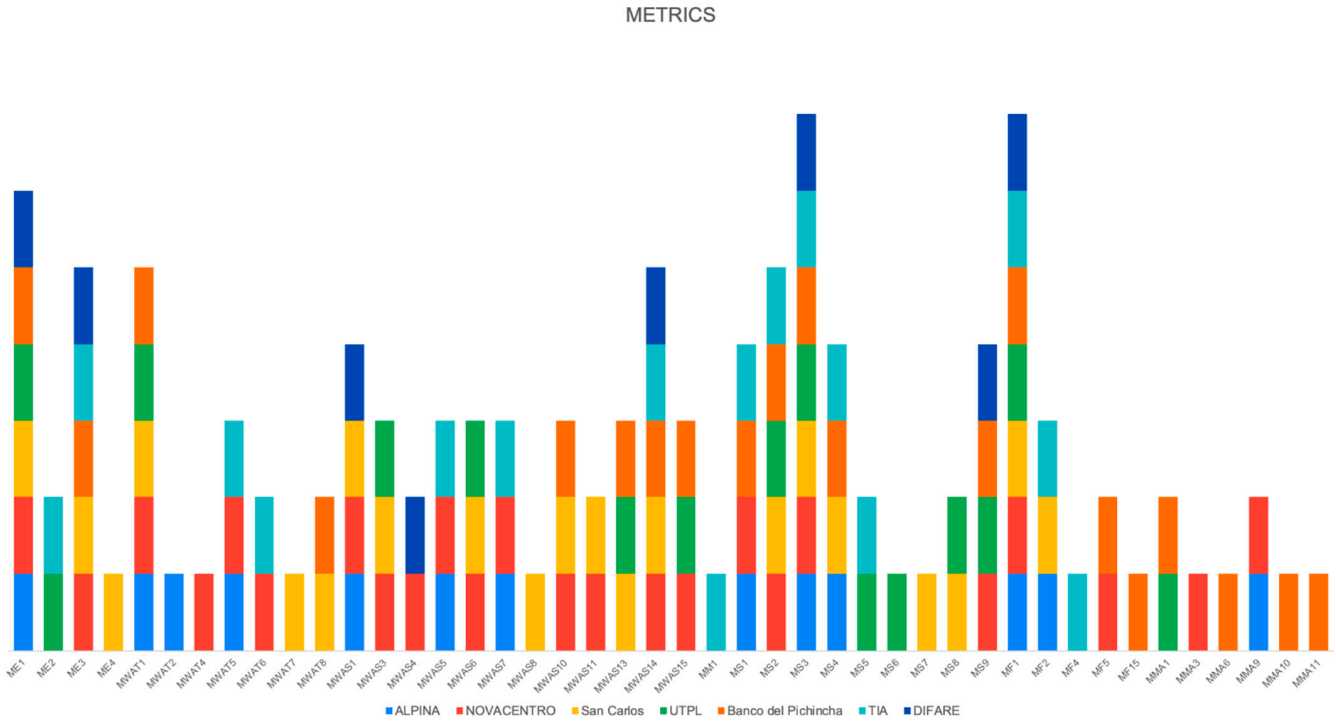

Figure 7. Metrics identified in the case studies. Note: For a detailed description of Metrics see Appendix B. From 82 identified Metrics, only 44 were reported by companies.

4. Discussion

As mentioned by many authors, the CE concept has evolved and been adapted to different contexts since its introduction, which has aroused growing interest among researchers, governments and decision-makers. However, and despite its popularity, the conceptualization of the CE is still under development and debate [4,5]. In 2017, the paper by [7] studied 114 definitions of the CE, which evidenced the diversity and complexity of the concept. Furthermore, the literature review conducted in our work found that, as with definitions, there is a wide variety of CE elements, resulting in an extensive and, to some extent, confusing conceptual framework. However, by means of the proposed framework, general action lines were found that facilitate the understanding of the CE, since it structures better its elements and relationships. With regard to the principles of the CE, an emphasis on resource use efficiency as well as on waste management was evidenced. In addition, there is a growing interest in principles related to structural changes in organizations, which have an impact on the different components of business models such as value proposition, distribution channels, revenue streams, key activities, key resources and the relationship with strategic partners, which derives in strategies such as the design and creation of circular products with fewer raw materials and less energy use and with repair or remanufacturing capabilities, the proposal of new sales channels such as virtual ones, the use of secondary materials and circular sourcing, the use of renewable energies, the reduction of water consumption or the creation of cooperation networks in the value chain and supply chain [49].

The principles of the CE have a clear lack of social aspects, which is somewhat contradictory since one of the main drivers identified, in addition to environmental concern and political and economic benefits, is social development. On the other hand, the wide variety of CE stakeholders found indicate the current considerations of the approach to be beyond companies and decision-makers, extending to civil society, local communities and consumers and users. With respect to CE strategies, it was observed that environmental, economic and social aspects are considered. However, the latter focus almost exclusively on employment generation and occupational safety and health, which implies that the

social component is not comprehensively addressed. In addition, most CE strategies are oriented to the end-of-life and production stages, while extraction, design, use, marketing and distribution are neglected. Finally, a strong relationship was identified between the elements of the CE, where the drivers promote the adoption of the CE, which is based on basic principles for its implementation and is operationalized through strategies that involve different stakeholders. To complement the CE framework and evaluate its level of implementation at the organizational level, circularity micro indicators of Type 2 (circularity tools) were used, since Type 1 and 3 micro indicators embrace the CE principles in a broader way and at higher degree of complexity, which makes them less extended in industrial practices [29]. It was found that circularity tools propose metrics to evaluate environmental and economic aspects to a greater extent, while the social component, in a similar way to the CE strategies, is mostly associated with employment generation and occupational safety and health. At the same time, the majority of metrics are oriented to the end-of-life stage, and some aspects related to production and design.

In recent years, the CE has aroused growing interest in Ecuador. Many public initiatives such as the CE Pact, the CE White Book or the "Inclusive Circular Economy organic law" have attempted to guide the different stakeholders towards a National Circular Economy Strategy, through the promotion of the practices of efficient resource use, reduce, reuse, recycling, waste management or renewable energy use [42,43]. In this context, when assessing the local case studies some CE practices were found. However, these practices are mainly associated with the efficient use of resources and waste valorization, while elements related to product and service design, systemic thinking, closing loops and rethinking of business models are not taken into account. The current adoption of the CE at the company level does not have specific application frameworks, so that the implemented strategies are the result of the sustainability approach adopted by companies, where the CE is conceived as a tool to achieve their objectives. As mentioned by [49], the implementation of the CE in companies requires the adoption of new visions, strategies and a fundamental redesign of product concepts and service offerings towards long-term solutions. In this sense, business models enable a systemic change in a company's dynamics by providing analysis, planning and communication tools, as well as a strategic asset for the company's competitive advantage and performance. In this sense, companies willing to adopt circular practices in their business models must in the first place understand the CE framework and identify the elements of this approach that contribute to rethinking their value propositions. This CE framework could also be applied in other countries to identify the integration of circular practices at the organizational level since it derives from the convergence of multiple elements presented on a broad spectrum of proposals and approaches. Nonetheless, the existence of regulatory frameworks and standardized indicators should be taken into account, as they could drive the implementation of the CE in specific contexts.

5. Conclusions

This study proposed a CE framework based on four fundamental elements: principles, drivers, stakeholders and strategies, which contribute towards a better comprehension of the CE. The assessment was complemented by the identification of metrics for the evaluation of circularity in companies. Despite the extent and diversity of the items, it was possible to establish relationships and to identify general action lines that conduct the CE framework. It was found that most of the elements and metrics of the CE are environmental and economic oriented, with social aspects being reduced to employment generation and occupational safety and health. With regard to life cycle stages, it was observed that production and end of life are more prevailing. On the other hand, through the assessment of local study cases it was evidenced that the current adoption of circular practices in companies derives from the incorporation of the sustainability approach instead of a structured implementation of the CE. In this context, a proper understanding of the elements of the CE framework may facilitate the incorporation of the CE into companies' business models.

The results in this study present some shortcomings due to the broad scope of the CE concept. In this case, a systematic literature review was conducted based on Fink's methodology. However, there are other methodologies such as PRISMA, developed for a literature review and meta-analysis, which could be used for future in-depth research, since it is feasible for the identification of additional elements and action lines within the CE.

In Ecuador, companies are not currently compelled to inform their activities. Therefore, the information provided in their reports cannot be verified and does not contain specific CE-related data, as it is mostly used to improve their corporate image. In addition, reports are only available for big companies, so that the results do not necessarily reflect the adoption of circular practices throughout the entire business sector, as small and medium-sized organizations are not represented.

Finally, as the "Inclusive Circular Economy draft organic law" was not in effect at the time of this study, it would be necessary to evaluate the implementation of the CE in companies once it is approved.

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Appendix A

Table A1. Full list of references read in the literature review for the CE framework.

Nº	Resource Type	Title	Year	Author
1	Article	Design of indicators for measuring product performance in the circular economy	2017	Cayzer
2	Article	Performance indicators for a circular economy: A case study on post-industrial plastic waste	2017	Huysman
3	Tool	Circular economy tool kid	2013	X
4	Article	Hybrid top-down and bottom-up framework to measure products' circularity performance	2017	Saidani
5	Report	CIRCULARITY INDICATORS An Approach to Measuring Circularity	2015	Ellen Macarthur fundation
6	Report	The business opportunity of closed loop innovation	2014	Kingfisher's
7	Article	Two life cycle assessment (LCA) based methods to analyze and design complex (regional) circular economy systems. Case: making water tourism more sustainable	2016	Scheepens
8	Article	What Do We Know About Metal Recycling Rates?	2011	Graedel

Table A1. *Cont.*

Nº	Resource Type	Title	Year	Author
9	Tool	Input-Output Balance Sheet	2017	Capellini
10	Book	Cradle to cradle certified_ product standard	2016	Cradle to Cradle Products Innovation Institute
11	Article	Product Circularity Assessment Methodology	2017	Angioletti
12	Article	A Metric for Quantifying Product-Level Circularity	2017	Linder
13	Article	Recycling indices visualizing the performance of the circular economy	2016	Van Schaik
14	Article	Resource duration as a managerial indicator for Circular Economy performance	2016	Franklin-Johnson
15	Article	Establishing and testing the "reuse potential" indicator for managing wastes as resources	2014	Park
16	Article	Do We Have the Right Performance Indicators for the Circular Economy?: Insight into the Swiss Waste Management System	2017	Haupt
17	Tool	Circular Pathfinder	2017	European Union's/Rescom
18	Tool	Circularity Calculator	2017	IDEAL&CO Explore/Rescom
19	Keynote	Building circularity indicators	2016	Verberne
20	Article	Operational principles of circular economy for sustainable development: Linking theory and practice	2019	Suárez-Eiroaa
21	Article	Integrated design of remanufacturable products based on product profiles	2006	Zwolinski
22	Article	A framework for assessing product End-Of-Life performance: reviewing the state of the art and proposing an innovative approach using an End-of-Life Index	2014	Lee
23	Article	A design for EoL approach and metrics to favour closed-loop scenarios for products	2016	Favi
24	Article	The need for better measurement and employee engagement to advance a circular economy: Lessons from Biogen's "zero waste"	2017	Veleva
25	Article	What should be recycled: An integrated model for product recycling desirability	2017	Sultan
26	Article	Measuring resource efficiency and circular economy: A market value approach	2017	Di Maio
27	Article	Longevity and Circularity as Indicators of Eco-Efficient Resource Use in the Circular Economy	2018	Figge
28	Article	Assessing the economic and environmental impact of remanufacturing: a decision support tool for OEM suppliers	2016	Van Loon
29	Article	Ease of disassembly of products to support circular economy strategies	2018	Vanegas
30	Article	Applying data mining technique to disassembly sequence planning: a method to assess effective disassembly time of industrial products	2018	Marconi
31	Article	Circular economy assessment tool for end of life product recovery strategies	2019	Alamerew
32	Article	Developing a set of sustainability indicators for product families based on the circular economy model	2018	Mesa

Table A1. *Cont.*

Nº	Resource Type	Title	Year	Author
33	Article	A Design Method to Improve End-of-Use Product Value Recovery for Circular Economy	2019	Cong
34	Article	Coupling material circularity indicators and life cycle based indicators: A proposal to advance the assessment of circular economy strategies at the product level	2019	Niero
35	Article	A simulation-optimization model for sustainable product design and efficient end-of-life management based on individual producer responsibility	2018	Saee
36	Article	Quality of resources: A typology for supporting transitions towards resource efficiency using the single-use plastic bottle as an example	2019	Covidou
37	Article	Circular Economy: Theoretical Benchmark or Perpetual Motion Machine?	2017	Cullen
38	Web page	What is a circular economy? A framework for an economy that is restorative and regenerative by design	2017	Ellen Macarthur Fundation
39	Article	Technological Elements of Circular Economy and the Principles of 6R-Based Closed-loop Material Flow in Sustainable Manufacturing	2016	Jawahir
40	Article	An introductory note on the environmental economics of the circular economy	2006	Andersen
41	Article	Using a gate-to-gate LCA to apply circular economy principles to a food processing SME	2020	Colley
42	Guide	Framework for implementing the principles of the circular economy in organisations—Guide	2017	bsi
43	Article	Circular Economy in China: Translating Principles into Practice	2019	Pesce
44	Article	A systematic review on drivers, barriers, and practices towards circular economy: a supply chain perspective	2018	Govindan
45	Article	Legitimacy building and stakeholder identification in circular economy: A case study	2015	Haimelin
46	Article	The circular economy and the bio-based sector—Perspectives of European and German stakeholders	2018	Leipold
47	Article	Mapping the interactions between the stakeholders of the circular economy ecosystem applied to the textile and apparel sector in Romania	2019	Staicu
48	Article	Design for circular economy: Developing an action plan for Scotland	2018	Whicher
49	Article	Business models and supply chains for the circular economy	2018	Geissdoerferab
50	Article	A systematic review on drivers, barriers, and practices towards circular economy: a supply chain perspective	2018	Govindan
51	Article	Critical appraisal of the circular economy standard BS 8001:2017 and a dashboard of quantitative system indicators for its implementation in organizations	2018	Pauliuk
52	Article	A Review of the Circular Economy and its Implementation	2016	Heshmati
53	Article	Towards a more circular economy: Exploring the awareness, practices, and barriers from a focal firm perspective	2018	Masi
54	Article	Identifying design guidelines to meet the circular economy principles: A case study on electric and electronic equipment	2018	Bovea

Table A1. *Cont.*

Nº	Resource Type	Title	Year	Author
55	Report	Measuring Scotland's progress towards a circular economy to help combat the climate emergency. Results from a preliminary scoping study reviewing key indicators.	2020	Nwabufo
56	Article	The regenerative supply chain: a framework for developing circular economy indicators	2018	Howard
57	Article	A systematic review on drivers, barriers, and practices towards circular economy: a supply chain perspective	2018	Govindan
58	Article	Unlocking circular business: A framework of barriers and drivers	2019	Turaa
59	Article	Supply Chain Configurations in the Circular Economy: A Systematic Literature Review	2017	Masi
60	Article	Business models and supply chains for the circular economy	2018	Geissdoerferab

Appendix B

Table A2. Detail of the Circular economy metrics.

Category	Number	Code	Metrics
ENERGY	1	ME1	Total energy used (annual consumption)
	2	ME2	Percentage of renewable energy used
	3	ME3	Reduction of energy consumption
	4	ME4	On-site energy generation
WATER	5	MWAT1	Total water consumption
	6	MWAT2	Water quality
	7	MWAT3	Effluent volume
	8	MWAT4	Regulatory compliance for wastewater
	9	MWAT5	Wastewater treatment
	10	MWAT6	Water recirculation
	11	MWAT7	Rainwater harvesting
	12	MWAT8	Reduction in total water consumption
WASTE	13	MWAS1	Quantity of waste generated (biological and technical cycle)
	14	MWAS2	WEEE generation rate
	15	MWAS3	Hazardous waste generation rate
	16	MWAS4	Quantity of waste collected
	17	MWAS5	Quantity of waste avoided
	18	MWAS6	Existence of waste sorting
	19	MWAS7	Amount of waste recovered
	20	MWAS8	Percentage of waste incinerated and converted into energy
	21	MWAS9	Percentage of waste that ends up in landfills
	22	MWAS10	Waste recycling rate
	23	MWAS11	Percentage of materials or products reused
	24	MWAS12	Percentage of recycled materials used in products
	25	MWAS13	Percentage of circular products manufactured

Table A2. *Cont.*

Category	Number	Code	Metrics
	26	MWAS14	Percentage of materials or products renewed
	27	MWAS15	Percentage of waste composted
MATERIALS	28	MM1	Total amount of materials consumed for the production cycle
	29	MM2	Percentage of resource use efficiency
	30	MM3	Compliance with national regulations regarding materials and substances
	31	MM4	Percentage of materials coming from renewable sources
EMISSIONS	32	ME1	GHG emissions
	33	ME2	Avoided GHG emissions
DESIGN	34	MD1	# of new products and processes on the market
	35	MD2	Percentage of increase in product durability
	36	MD3	Product recyclability rate
	37	MD4	Product repairability rate
	38	MD5	Product remanufacturability rate
	39	MD6	Design for disassembly
SOCIAL	40	MS1	Creation of communication channels with customers
	41	MS2	Number of jobs created
	42	MS3	Number of employee injuries
	43	MS4	Employee rotation rate
	44	MS5	Presence of child labor
	45	MS6	Presence of forced labor
	46	MS7	Freedom of association
	47	MS8	Salary evaluation
	48	MS9	Gender equality
	49	MS10	Number of local stakeholders articulated
	50	MS11	Integration of stakeholders in the design of CE strategies
	51	MS12	Number of community projects engaged
FINANCIAL	52	MF1	Total income
	53	MF2	Total sales
	54	MF3	Certification costs
	55	MF4	Market growth rate
	56	MF5	Return on investment (resilience)
	57	MF6	Raw material costs
	58	MF7	Water costs
	59	MF8	Energy costs
	60	MF9	Costs of ordinary and special waste management and disposal
	61	MF10	Hazardous waste management and disposal costs
	62	MF11	Waste electrical and electronic equipment (WEEE) management and disposal costs
	63	MF12	Revenues from energy generation
	64	MF13	Costs reduction resulting from the implementation of CE strategies

Table A2. *Cont.*

Category	Number	Code	Metrics
	65	MF14	Percentage of revenue from the sale of circular products or services (repaired or reused)
	66	MF15	Investment in CE projects or initiatives
	67	MF16	Amount of leased company assets
	68	MF17	Number of second-hand company assets
MANAGEMENT	69	MMA1	Contribution to SDGs
	70	MMA2	Measurable CE targets
	71	MMA3	Existence of CE policies
	72	MMA4	Replicability of CE strategies within and outside the company
	73	MMA5	Scalability of CE strategies within and outside the company
	74	MMA6	Use of IT and digital systems to support circular models, products or services (LCA)
	75	MMA7	Contribution to changing consumption patterns (sustainable products or services)
	76	MMA8	Existence of infrastructure to support circular models, products or services
	75	MMA7	Contribution to changing consumption patterns (sustainable products or services)
	76	MMA8	Existence of infrastructure to support circular models, products or services
	77	MMA9	Employee training in the CE
	78	MMA10	Corruption prevention actions
	79	MMA11	Percentage of suppliers selected using environmental criteria (environmental procurement standards)
	80	MMA12	Awareness-raising and sensitization campaigns on the CE
	81	MMA13	Industrial symbiosis with other companies or stakeholders

References

1. Lieder, M.; Rashid, A. Towards Circular Economy Implementation: A Comprehensive Review in Context of Manufacturing Industry. *J. Clean. Prod.* **2016**, *115*, 36–51. [CrossRef]
2. Winans, K.; Kendall, A.; Deng, H. The History and Current Applications of the Circular Economy Concept. In *Renewable and Sustainable Energy Reviews*; Elsevier: Amsterdam, The Netherlands, 2017; pp. 825–833. [CrossRef]
3. Ellen Macarthur Foundation. *Founding Partners of the Ellen MacArthur Foundation 2013 Circular Economy towards the Economic and Business Rationale for an Accelerated Transition*; Ellen Macarthur Foundation: Isle of Wight, UK, 2013.
4. Corona, B.; Shen, L.; Reike, D.; Rosales Carreón, J.; Worrell, E. Towards Sustainable Development through the Circular Economy—A Review and Critical Assessment on Current Circularity Metrics. *Resour. Conserv. Recycl.* **2019**, *151*, 104498. [CrossRef]
5. Blomsma, F.; Brennan, G. The Emergence of Circular Economy: A New Framing Around Prolonging Resource Productivity. *J. Ind. Ecol.* **2017**, *21*, 603–614. [CrossRef]
6. Webster, K. *The Circular Economy: A Wealth of Flows*, 2nd ed.; Ellen MacArthur Foundation: Isle of Wight, UK, 2015.
7. Kirchherr, J.; Reike, D.; Hekkert, M. Conceptualizing the Circular Economy: An Analysis of 114 Definitions. *Resour. Conserv. Recycl.* **2017**, *127*, 221–232. [CrossRef]
8. Govindan, K.; Soleimani, H.; Kannan, D. Reverse Logistics and Closed-Loop Supply Chain: A Comprehensive Review to Explore the Future. *Eur. J. Oper. Res.* **2015**, *240*, 603–626. [CrossRef]
9. Bakker, C.; Bakker, C.A.; den Hollander, M.; van Hinte, E.; Zijlstra, Y. Chapter 5: Which Product Design Strategies Apply to Your Product? *Prod. Last Prod. Des. Circ. Bus. Model.* **2014**, 97–118.
10. 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]
11. Murray, A.; Skene, K.; Haynes, K. The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *J. Bus. Ethics* **2015**, *140*, 369–380. [CrossRef]

12. Merli, R.; Preziosi, M.; Acampora, A. How Do Scholars Approach the Circular Economy? A Systematic Literature Review. *J. Clean. Prod.* **2018**, *178*, 703–722. [CrossRef]
13. George, D.A.; Lin, B.; Chen, Y. A Circular Economy Model of Economic Growth. *Environ. Model. Softw.* **2015**, *73*, 60–63. [CrossRef]
14. Su, B.; Heshmati, A.; Geng, Y.; Yu, X. A Review of the Circular Economy in China: Moving from Rhetoric to Implementation. *J. Clean. Prod.* **2013**, *42*, 215–227. [CrossRef]
15. Ministry of Economy, Trade and Industry. *Handbook on Resource Recycling Legislation and 3R Trends in 2003*; Ministry of Economy, Trade and Industry: Tokyo, Japan, 2003. Available online: https://www.meti.go.jp/policy/recycle/main/data/pamphlet/pdf/cRecycle3R.pdf (accessed on 11 July 2021).
16. Closing the Loop—An EU Action Plan for the Circular Economy COM/2015/0614 Final—European Environment Agency. Available online: https://www.eea.europa.eu/policy-documents/com-2015-0614-final (accessed on 11 July 2021).
17. Korhonen, J.; Nuur, C.; Feldmann, A.; Birkie, S.E. Circular Economy as an Essentially Contested Concept. *J. Clean. Prod.* **2018**, *175*, 544–552. [CrossRef]
18. Howard, M.; Hopkinson, P.; Miemczyk, J. International Journal of Production Research the Regenerative Supply Chain: A Framework for Developing Circular Economy Indicators the Regenerative Supply Chain: A Framework for Developing Circular Economy Indicators. *Int. J. Prod. Res.* **2019**, *57*, 7300–7318. [CrossRef]
19. Suárez-Eiroa, B.; Fernández, E.; Méndez-Martínez, G.; Soto-Oñate, D. Operational Principles of Circular Economy for Sustainable Development: Linking Theory and Practice. *J. Clean. Prod.* **2019**, *214*, 952–961. [CrossRef]
20. Tura, N.; Hanski, J.; Ahola, T.; Ståhle, M.; Piiparinen, S.; Valkokari, P. Unlocking Circular Business: A Framework of Barriers and Drivers. *J. Clean. Prod.* **2019**, *212*, 90–98. [CrossRef]
21. Govindan, K.; Hasanagic, M. A Systematic Review on Drivers, Barriers, and Practices towards Circular Economy: A Supply Chain Perspective. *Int. J. Prod. Res.* **2018**, *56*, 278–311. [CrossRef]
22. Masi, D.; Kumar, V.; Garza-Reyes, J.A.; Godsell, J. Towards a More Circular Economy: Exploring the Awareness, Practices, and Barriers from a Focal Firm Perspective. *Prod. Plan. Control* **2018**, *29*, 539–550. [CrossRef]
23. Moraga, G.; Huysveld, S.; Mathieux, F.; Blengini, G.A.; Alaerts, L.; Van Acker, K.; de Meester, S.; Dewulf, J. Circular Economy Indicators: What Do They Measure? *Resour. Conserv. Recycl.* **2019**, *146*, 452–461. [CrossRef]
24. An, V.; Maarten, C.; Veronique, V.H. Indicators for a Circular Economy. 2018. Available online: https://circulareconomy.europa.eu/platform/sites/default/files/summa_-_indicators_for_a_circular_economy.pdf (accessed on 11 July 2021).
25. Pauliuk, S. Critical Appraisal of the Circular Economy Standard BS 8001:2017 and a Dashboard of Quantitative System Indicators for Its Implementation in Organizations. *Resour. Conserv. Recycl.* **2018**, *129*, 81–92. [CrossRef]
26. 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]
27. Yuan, Z.; Bi, J.; Moriguichi, Y. The Circular Economy: A New Development Strategy in China. *J. Ind. Ecol.* **2008**, *10*, 4–8. [CrossRef]
28. Kalmykova, Y.; Sadagopan, M.; Rosado, L. Circular Economy—From Review of Theories and Practices to Development of Implementation Tools. *Resour. Conserv. Recycl.* **2018**, *135*, 190–201. [CrossRef]
29. Kristensen, H.S.; Mosgaard, M.A. A Review of Micro Level Indicators for a Circular Economy—Moving Away from the Three Dimensions of Sustainability? *J. Clean. Prod.* **2020**, *243*, 118531. [CrossRef]
30. Walker, S.; Coleman, N.; Hodgson, P.; Collins, N.; Brimacombe, L. Evaluating the Environmental Dimension of Material Efficiency Strategies Relating to the Circular Economy. *Sustainability* **2018**, *10*, 666. [CrossRef]
31. Saidani, M.; Yannou, B.; Leroy, Y.; Cluzel, F.; Kendall, A. A Taxonomy of Circular Economy Indicators. *J. Clean. Prod.* **2019**, *207*, 542–559. [CrossRef]
32. Ellen Macarthur Foundation. *Circularity Indicators An Approach to Measuring Circularity Project Overview*; Ellen MacArthur Foundation: Isle of Wight, UK, 2015.
33. Ellen Macarthur Foundation. Material Circularity Indicator. Available online: https://www.ellenmacarthurfoundation.org/resources/apply/material-circularity-indicator (accessed on 11 July 2021).
34. Ellen Macarthur Foundation. Circulytics—Measuring Circularity. Available online: https://www.ellenmacarthurfoundation.org/resources/apply/circulytics-measuring-circularity (accessed on 11 July 2021).
35. Ferasso, M.; Beliaeva, T.; Kraus, S.; Clauss, T.; Ribeiro-Soriano, D. Circular Economy Business Models: The State of Research and Avenues Ahead. *Bus. Strateg. Environ.* **2020**, *29*, 3006–3024. [CrossRef]
36. Schwager, P.; Moser, F. The Application of Chemical Leasing Business Models in Mexico. *Environ. Sci. Pollut. Res.* **2006**, *13*, 131–137. [CrossRef] [PubMed]
37. Urbinati, A.; Chiaroni, D.; Chiesa, V. Towards a New Taxonomy of Circular Economy Business Models. *J. Clean. Prod.* **2017**, *168*, 487–498. [CrossRef]
38. Board of Innovation. Circular Economy Business Models Explained by Board of Innovation. Available online: https://www.boardofinnovation.com/circular-economy-business-models-explained/ (accessed on 11 July 2021).
39. Geissdoerfer, M.; Pieroni, M.P.P.; Pigosso, D.C.A.; Soufani, K. Circular Business Models: A Review. *J. Clean. Prod.* **2020**, *277*, 123741. [CrossRef]
40. Geissdoerfer, M.; Morioka, S.N.; de Carvalho, M.M.; Evans, S. Business Models and Supply Chains for the Circular Economy. *J. Clean. Prod.* **2018**, *190*, 712–721. [CrossRef]

41. Revista Portafolio y Economía | 6ta Edición | Junio 2020. Available online: https://www.yumpu.com/es/document/read/63569215/revista-portafolio-y-economia-6ta-edicion-junio-2020 (accessed on 11 July 2021).
42. Observatorio Legislativo. Proyectos de Ley y Leyes Aprobadas: Observatorio Legislativo. Available online: http://2017-2021.observatoriolegislativo.ec/legislacion/proyectos-de-ley/proyecto-de-ley-organica-de-economia-circular-tr394099_91673 (accessed on 11 July 2021).
43. Centro de Innovación y Economía Circular (CIEC). Economía Circular y Políticas Públicas. Available online: https://www.kas.de/documents/273477/273526/Economía+Circular+y+Políticas+Públicas.pdf/e7d98c0f-423c-947c-fe3e-6a83ae5fb7c3?version=1.1&t=1580245377248 (accessed on 11 July 2021).
44. Radio Visión Cuenca 106.1. Comisión de Desarrollo Económico Tramitará Proyecto de Ley de Economía Circular. Available online: https://radiovisioncuenca.com/comision-de-desarrollo-economico-tramitara-proyecto-de-ley-de-economia-circular/ (accessed on 11 July 2021).
45. Ecuadorenpositivo. Comisión de Desarrollo Económico Inició Análisis del Proyecto de Ley de Economía Circular. *Ecuador en Positivo.* Available online: https://www.ecuadorenpositivo.com/comision-de-desarrollo-economico-inicio-analisis-del-proyecto-de-ley-de-economia-circular/ (accessed on 11 July 2021).
46. Nummenmaa, J.; Pérez-González, F.; Domenech-Lega, B.; Vaunat, J.; Fernández-Peña, F.O. *Advances and Applications in Computer Science, Electronics and Industrial Engineering*; Springer: Berlin, Germany, 2021; Volume 1307. [CrossRef]
47. Agyemang, M.; Kusi-Sarpong, S.; Khan, S.A.; Mani, V.; Rehman, S.T.; Kusi-Sarpong, H. Drivers and Barriers to Circular Economy Implementation: An Explorative Study in Pakistan's Automobile Industry. *Manag. Decis.* **2019**, *57*, 971–994. [CrossRef]
48. Osterwalder, A.; Pigneur, Y. *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*; John Wiley and Sons: Hoboken, NJ, USA, 2010; p. 288.
49. Lewandowski, M. Designing the Business Models for Circular Economy—Towards the Conceptual Framework. *Sustainability* **2016**, *8*, 43. [CrossRef]