

## RESEARCH ARTICLE

# Nexus of circular economy R0 to R9 principles in integrated reporting: Insights from a multiple case study comparison

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**Abstract**

Over recent years, the Circular Economy (CE) has turned into a debated area worldwide as a way of achieving a more sustainable society. However, little is known about how companies can disclose CE-related activities in their corporate reporting. This paper aims to explore how and to what extent CE-related information is included in Integrated Reporting (IR) practices by promoting Sustainable Development Goals (SDGs). The study applies qualitative content analysis and thematic analysis approaches to explore the associations with CE, IR, the six capitals and SDGs. The institutional theory approach has been adopted to justify incorporating CE R-principles activities into IR practices. Multiple case study findings demonstrate that every case company minimum one time cites the CE R principle, while case companies seen to be more involved in the reduce (R1), reuse (R2) and recycle (R7) are engaged with IR practices and focussing on SDGs. Whereas coercive, normative, and mimetic isomorphism mechanism substantially impacts CE activities concerning IR practices, we can argue that mimetic isomorphisms need further investigation because no structures and frameworks are available. In terms of managerial implications, this study proposed a combined framework of CE and IR that provides a conceptual picture of how CE activities intermesh with the IR framework and the six capitals, both essential for the Sustainable Development (SD) agenda participation and value creation process of companies.

**KEYWORDS**

Circular Economy, institutional theory, Integrated Reporting, six capitals, sustainable development goals

## 1 | INTRODUCTION

The European Union (EU) has passed several directives stating that, by the end of 2030, 65% of all municipal waste and 75% of all

packaging waste should be recycled (European Commission, 2015a), resulting in a reduction of landfill by 10%. The Waste Directive Framework (EU, 2019; European Commission, 2008) refers to Circular Economy (CE) related activities (particularly the 'R0 to R9-Rs –

**Abbreviations:** CE, circular economy; CE R, circular economy R; CSRD, Corporate Sustainability Reporting Directive; EEA, European Environment Agency; EMF, Ellen MacArthur Foundation; EP&L, Environmental Profit and Loss Accounting; EU, European Union; GHG, greenhouse gases; IR, integrated reporting; IIRC, International Integrated Reporting Council; NFRD, Non-Financial Reporting Directive; R0, refuse; R1, reduce; R2, resell/reuse; R3, repair; R4, refurbish; R5, remanufacture; R6, repurpose/rethink; R7, recycle; R8, recover/energy; R9, remine; PSS, product-service system; SD, sustainable development; SDGs, sustainable development goals; UN, United Nations; UNFCC, United Nations Framework on Climate Change.

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refuse, reduce, resell/reuse, repair, re-furbish, re-manufacture, repurpose/rethink, recycle, recover/ energy, remine) CE involvement has been increasing in business development, with most big companies now tending toward CE-related business activities, because CE not only deals with economic development but also considers the environmental and social perspective (Ellen MacArthur Foundation [EMF], 2020; EU, 2019). This perception refers to those important practices that are needed for the proper implementation of CE activities within companies, such as regarding the choice of materials (inputs), the business models (business activities) and taking control over the production process to ensure beneficial outputs and outcomes (Barnabè & Nazir, 2020, 2022; Reike et al., 2018).

Traditionally, most countries have depended upon a linear economic model, referring to a 'take-make-waste' framework. With such a model, materials and resources are used just once, with any waste ending up in landfills, incinerators, or wastewater. The undesirable effects have their roots in a linear model that is characterized by the low level of reuse, repair, recovery and fibre-to-fibre recycling of textiles, and that often does not place best quality, durability, and recyclability as priorities for the redesign and reproduction of garments (EEA, 2022). The textile sector is still under consideration, suffering immense pollution problems (by waste gases and wastewater with chemical compounds) (EEA, 2019, 2022) and enhanced product life-cycles issues. Moreover, clothing, footwear, and household textiles found the second-highest rank in land usage, the fifth-highest rank in greenhouse gas (GHG) emissions, and the fourth-highest weight category in primary raw materials usage (EEA, 2019, 2022). The results are a significant loss of natural resources in the shape of waste products and environmentally reckless, which needs more consideration given to energy usage, material scarcity, or price variations of natural resources (EMF, 2020, 2022). Because of the difficulty of recycling and sorting clothing composed of mixed fibres, technological limitations in the textile sector represent a significant barrier to completing a fully closed-loop business model (EEA, 2019). The Circular Textiles and EU strategy for sustainability presents a new approach to harmonizing these objectives. The Strategy implements commitments made under the European Green Deal, the new CE Action Plan, and the Industrial Strategy and aims to create a greener, more competitive, more modern sector, more resistant to global shocks (EEA, 2019, 2022; EMF, 2017; EU, 2019).

The starting point and the motivation of this research are related to observing what happens daily in our natural world: in detail, the literature and environmental phenomena demonstrate that we cannot delay any more CE initiatives. For academics and industries, this entails supporting companies in launching and managing such initiatives, measuring the impacts of the actions, and reporting the key results to a broad range of stakeholders. A wide literature witnesses that CE initiatives are actually at the centre of the modern garment organizations' agenda (Bhuiyan et al., 2023; Bueno-Garcia et al., 2021; Busco et al., 2013; EC, 2015a, 2015b, 2015c; EU, 2019; Farrukh et al., 2022; Gunarathne, Lee, & Hitigala Kaluarachchilage, 2021; Gunarathne, Wijayasundara, et al., 2021; Negash & Lemma, 2020) but also that further research is needed to explore how (and somehow if)

those initiatives were monitored and communicated to relevant stakeholders.

By embedding CE activities within companies, sustainability reporting can play a key role to disclose and challenge corporate accountability practices for achieving a SD (de Villiers & Dimes, 2022). In this perspective, the European Union (EU, 2014) has executed a variety of both financial and non-financial mandatory reporting practices at the organizational level. Under the Legislative Decree no. 254/2016 that put into effect the European Directive 2014/95/EU in Italy, the commitment to report non-financial information was required for organizations, public, investors and stakeholders' interests. CE-related reporting practices also involve financial and non-financial information for stakeholder participation. Since 2016, financial analysts have had another obligation in conveying non-financial information to organizations' investors (European Union, 2017) to thereby clarify practices and results regarding social, environmental and governance rules and regulations applied to their organizations [EU Directive 2014/95/EU]. While, Integrated Reporting (IR) contains financial and non-financial reports involving aspects of business, economic, social and environmental conditions through the development of financial, manufactured and resource development (Williams & Lodhia, 2021). Many organizations now publish just a single report containing both financial and non-financial information. By combining such information, IR handles the various issues related to ordinary, voluntary sustainability reports (for example, the inability to easily communicate a corporate business model) and denotes the relationships between the different capitals that interact within the organization (such as financial, manufacturing, intellectual, human and social relationships) by using for its value creation (Barnabè & Nazir, 2020, 2022; Doni et al., 2019; IIRC, 2013a, 2017; Williams & Lodhia, 2021). The combined CE and IR can provide a framework that promotes sustainability practices, supports transits from linear to circular, and can disclose corporate accountability in companies' reports (Barnabè & Nazir, 2020, 2022). As large literature confirmed, the adoption of IR can ensure the stakeholder responsiveness (IR, 2013, 2021) by improving the quality of firm's relationship with its stakeholders to legitimate their needs and expectations (Busco et al., 2013; De Villiers et al., 2014; Rinaldi et al., 2018; Wild & van Staden, 2013). Some empirical findings demonstrated that IR preparer's accountability experience can enhance IR stakeholder dialogue practices (Lai et al., 2018) even if it is important to evaluate the effective validity of IR as an accountability tool (Silvestri & Veltri, 2019; Silvestri et al., 2017).

Generally, the role and impact of the concept of CE-R0 to R9 principle in IR practices had not been previously addressed. However, enormous potential applies (for example, within the textile industry) for those companies that incorporate products manufactured utilizing high-throughput volumes while using CE R principles (EEA, 2019, 2022; EMF, 2013; EMF, 2017; EU, 2019). The paper aims to assess how and to what extent CE concepts disclosing in manufacturing companies IR. To do this, the author used institutional theory, hierarchically ranked R-imperatives as fundamental operationalization principles (Reike et al., 2018), and IIRC's (2017) framework.

This paper can contribute to literature in manifold way. First, this study contributes to creating a relationship between CE R principles and IR for SDGs and provides a combined framework that embeds the CE R0 to R9 principles into the IR framework and the six capitals for stakeholders, policymakers, trendsetters and organizations, promoting SD and accounting statements that considered CE principles. Second, this study contributes a broad range of CE and IR literature by examining different authors' and researchers' work and how institutional isomorphisms may influence IR for disclosed CE-related information. Surprisingly, global garment manufacturing corporations are under-investigating (EEA, 2019, 2022) and attempting to justify their positions and behaviours by adopting institutional logic that emphasizes coercive, normative and mimetic variables and best practices more than legislative requirements. Third, this research is based on four significant textile manufacturing companies, giving a more comprehensive view of CE and IR trends and enabling comparison of results. Because most recent studies on IR and CE focus primarily on one particular company (Barnabè & Nazir, 2022), we have thus examined a wide range of issues, (a) the significance of the CE impact on corporate reporting context, (b) the lack of studies on how multinational garments companies disclose CE R principles information regarding their efforts towards sustainability, (c) the significance of the CE framework for controlling the adverse effects on the environment, social and economic, also motivates policymakers and trendsetters to develop standards that cover the triple bottom line by CE and IR. Finally, our findings can be used to inform corporate decisions on developing or revamping performance measuring systems for businesses and enhancing external reporting practices.

This study is based upon just one question: “*how and to what extent are multinational garments companies disclosing circular economy R principles into their integrated reporting practices and multiple capital approach?*”. To address these objectives, the research design entailed content analysis (searching textual elements, number and frequency of concepts) and thematic analysis is described as “a method for identifying, analysing and reporting patterns (themes) within data” (Braun & Clarke, 2006, p 79). For both cases, codebooks of words (content analysis) and sentence-wise identification analysis (thematic analysis) are required to interpretation of the report pattern (Schilling, 2006; Vaismoradi et al., 2013, p. 399), the study has developed a codebook by using different authors' definitions, international organization glossaries and expert opinions. Four case studies are examined utilizing the companies' CE practices as described in their IR publications, and the comprehensive findings are presented. The discussion is present in the light of past scholarly work, the author's arguments and the institutional theory approach to justify incorporating CE R-principles activities into IR practices.

The rest of paper proceeds as follow. The next section analyses CE and IR backgrounds and the related literature, Section 3 is the theoretical framework while Section 4 presents the research design and methodology. Section 5 and 6 explain and discuss the main findings. Finally, the conclusion, limitations and suggestions for potential further research are presented.

## 2 | BACKGROUND AND LITERATURE REVIEW

### 2.1 | Defining ‘Circular Economy’

Over recent years, the CE has turned into an inexorably debated area worldwide as a way of achieving a more sustainable society. The intention of CE is to identify provisions that will ensure SD between the economy, society and the environment. Although the literature provides several different definitions for the concept, we analyse in this study (e.g., Kirchherr et al., 2017 analysed 114 definitions of this concept), “*a circular economy is an economic system where products and services are traded in closed-loop cycles*”. Geng and Doberstein (2008, p. 233) portray the CE as the “*acknowledgment of closed-loop material flow in the entire economy*”. Webster (2013, p. 545) adds that “*CE is helpful to restorative material by design, which expects to keep the product, parts [and] materials for long periods with zero waste as well as create new job opportunities at the local level*”. In the same manner, the Ellen MacArthur Foundation (EMF, 2020, 2022) states that “*the CE is the closed-loop flow of materials and utilization of raw materials for energy through various stages*”. CE is a regenerative framework in which resource inputs, waste, emanation and energy emissions are limited, closing and narrowing material and energy circles. The EMF (2013) describes CE as “*an industrial economy that is supportive or regenerative by expectation and framework*”. The CE concept is well presented by the Ellen MacArthur Foundation as three key standards, first preserving resources, second optimizing resource life and third eliminating negative externalities (EMF, 2013, pp. 22–23).

It can be seen that the EMF has adjusted the CE framework in several ways: ‘waste’, ‘redesign’, ‘remanufacturing’, ‘reuse’, ‘materials waste’, ‘durable’, ‘material returns’, ‘extend product life-cycle’, ‘supply chain management’, ‘eliminate lethal synthetic substances’, ‘sustainable energy power source’, ‘product design flexibility’ and ‘minimize the production cost’. This framework alters and reconsiders how economic and value creation can keep working within long-running SD (EMF, 2015). CE is broadly acting like a substitute model of production and utilization, a progress framework empowering the ‘decoupling’ of natural resources used for economic development, along with SD contributions (EC, 2015a, 2015b, 2015c; EMF, 2016; EU, 2019; Geissdoerfer et al., 2017; Ghisellini et al., 2016). These demanding situations and possibilities call for more excellent systemic solutions consistent with the European Green Deal aim to make progress sustainable, environment, electrical energy- and aid-efficient CE principles. CE Action Plan (2019) and in 2021 update of the EU Industrial Strategy (EEA, 2022) state that the textile is a crucial product of value creation and needs robust potential for the transition to sustainable and circular consumption and production business frameworks.

Subsequently, businesses, customers and government inside the EU are already focussing on this area's growing sustainability and circularity. Furthermore, the transition could be faster, and the environmental and climate footprint of the textile sector remains excessive. The production and consumption of fabric products keep growing, and so does their impact on the environment, water, waste and

energy consumption. Global textile (garments) production nearly doubled between 2000 and 2015 (EMF, 2017), and the consumption of clothing and footwear is predicted to upsurge by 63% through 2030, from 62 million tonnes now to 102 million tonnes in 2030 (EEA, 2019). In the EU, the consumption of textiles, most of which can be imported, now reports on average the four highest impacts on environmental changes and the three highest impacts on water consumption that case landfalling (EEA, 2019). About 5.8 million tonnes of textiles are wasted every year inside the EU (EEA, 2019), and each second somewhere in the world, a truckload of textiles waste is cast-off for landfilled or incinerated (EMF, 2017). The textile sector plays a vital role in the European manufacturing industry, performing a crucial part in the economic, social and environmental systems in many countries of Europe. According to 2019 facts, 160,000 firms in the textile industry employ 1.5 million individuals and generate a turnover of €162 billion. Italy, France, the UK, Sweden, Germany, Spain and Portugal are the most prominent manufacturers in this business. They account for approximately three-quarters of EU production (EU, 2019). Figure 1 demonstrates how the R principles embed within an organization's materials, manufacturing, sales, customers, waste and landfall processes.

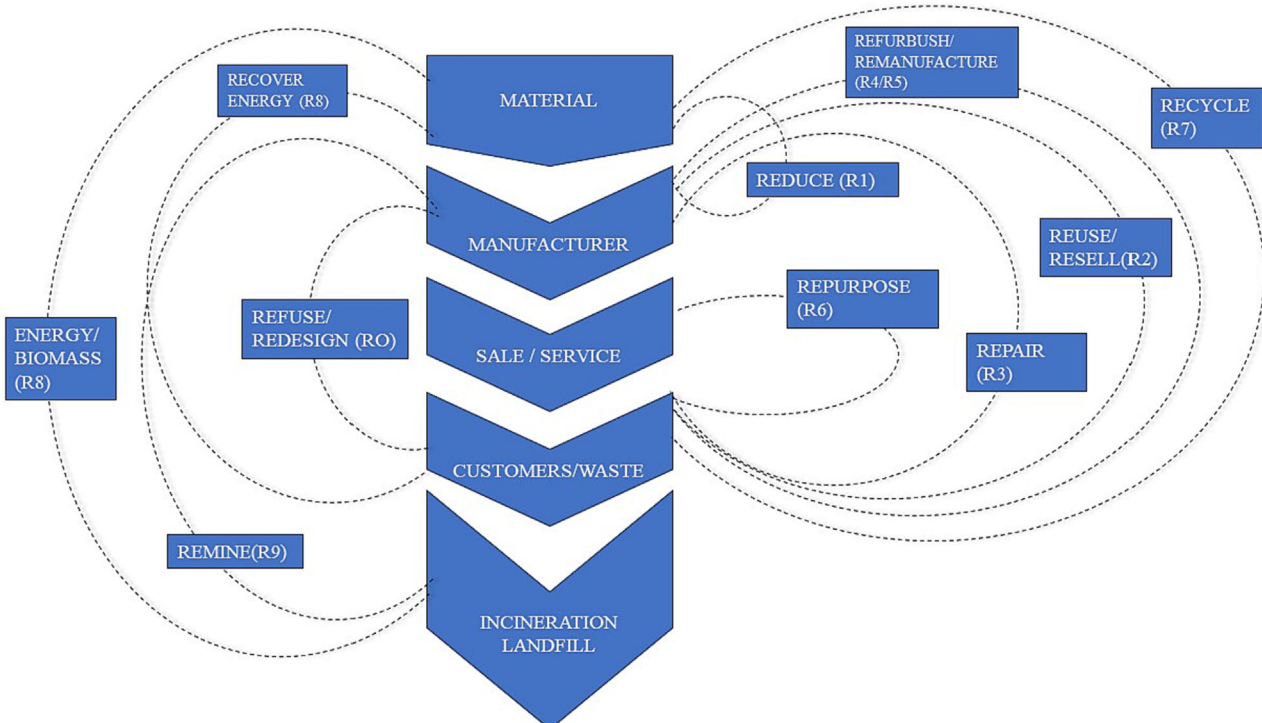
Reike et al. (2018) define in-depth CE key operationalization principles as either 'new or refurbished' and build up definitive components of the transformative perspective of CE and operationalization as principles or R imperatives. Although the 3 R principles (reduce, reuse and recycle) recognize the CE's principal concepts, more progressive systems with closed-loop circles (such as recover, redesign and repurpose) emphasize the significant value of the preservation of

resources over different lifecycles of products (Barnabè & Nazir, 2022). Reike et al. (2018) investigated the key operationalization imperatives that applied within company operations and drew-up R principles as a reaction to ongoing SD for a better conceptualization of CE that integrates with resource value preservation choices. The authors represent R principles (particularly the 'R0 to R9-Rs' – reduce, recycle, repair, reuse, reproduce, redesign, remanufacture, refurbish, refuse and recover) that integrate with IR and SD.

## 2.2 | How the CE encircles in sustainable development

CE has been gaining popularity as a means to achieve regional, national and international SD, which has gained considerable attention from global organizations (Lacy & Rutqvist, 2015) and policy-makers (EC, 2015b; EU, 2019). The variables of SD for human prosperity integrate with food security, salary, water and sanitation, medical services, training, vitality, sex equity, social values, voice (e.g., political support, opportunity of speech), occupations and flexibility (Dearing et al., 2014) that are now protected by the United Nations' Sustainable Development Goals (SDGs) (UN, 2015).

The term 'sustainable development' was first used in the Brundtland Report of the World Commission on Environment and Development in 1987, the Brundtland report briefly defines the concept of SD as the "ability to make development sustainable to ensure that it meets the needs of the present without compromising the capacity of future generations to meet their own needs". As many



**FIGURE 1** Business activities flow combines with R0-R9 principles. Source: Adopted from EMF (2013, p. 33) and Reike et al. (2018).

studies demonstrated, CE-related activities can lead to SD (Panchal et al., 2021). Specifically, several CE practices contribute toward accomplishing the targets of SDG 7 (affordable and clean energy). Waste recovery from industrial actions and modern waste-to-energy frameworks, particularly when connected in eco-industrial processes, offer huge possibilities to enhance modern energy production in SDG 7.3 (“By 2030 agenda, enhancement of energy productivity”). For the decrease of waste under SDG 12 (“By 2030 agenda considerably diminish waste through remedial action, reduce, recycle and reuse”), the CE practices of reuse prompt an environmentally preferred option in contrast to numerous other waste management practices. Reuse promotes resource productivity capacity and reduces GHG emissions, water reuse and soil contamination over the product’s lifecycle (Castellani et al., 2014). Reuse practices offer expanded product life and product design frameworks (Stahel, 2014) that can play a vital role in accomplishing these aims.

The CE offers a useful approach for explicit SDGs (e.g., industry associations, remanufacturing closed-circle with supply chain management, PSS models, circular business models and circular innovation models, as sketched out under SDG 17). CE practices focus on waste and E-waste, wastewater reuse and sanitation, industrial symbiosis, remanufacturing, reuse of products and energy effectiveness for SD. By transforming waste into resources of different designs or of the same design, industry associations play a dynamic role in CE practice and SD. Innovative business models in CE practices aim to maximize those products and materials already in the system, by remanufacturing (Gray & Charter, 2007), redesigning (Preston, 2012), repairing (Lacy & Rutqvist, 2015) and reusing (Castellani et al., 2014). Generally, the role and impact of the concept of CE-R0 to R9 in IRs had not been previously addressed while Barnabè & Nazir, 2020, 2022 have addressed this concept in the CE-4Rs and 6Rs with IRs but ignored the SDGs concept.

The purpose of the study is to investigate how and to what extent CE activities are developing within companies and being disclosed in IR practices and multiple capital approach, to enhance SD. Researchers and practitioners continue to develop conceptual relationships with CE business models, enhancing social, environmental and company value creation (Bocken et al., 2018; Shela et al., 2023), with researchers highlighting new strategies to review environmental, social and economic SD execution through circular business models and circular production (*op. cit.*).

### 2.3 | How CE encircles with IR

Implementing IR entails the development of new accounting practices and management development operations. To achieve this, there are a number of international bodies engaged with IR and collaborating to accommodate the developing interest of business sectors as well as helping policymakers, society activists and agenda setters establish new and emerging rules and regulations (IIRC, 2011).

Although IR has currently achieved a high level of importance (Abhayawansa et al., 2019; Barnabè & Nazir, 2020, 2022), there is an

urgent need to investigate the potential of IR to transform corporate reporting (Williams & Lodhia, 2021). Furthermore, developing fine practices for each sustainability pillar continues to be evolving. It needs to be stated that there may be always a potential difference between what is reported and what is being done (Barnabè & Nazir, 2020). Consequently, there has usually been an urgent need in company sustainability research to move from only qualitative analysis in the direction of quantitative frameworks and measurements for defining indicators (Ibáñez-Forés et al., 2022), together with greater similar facts and proof approximately sustainability practices (Barnabè & Nazir, 2020) in some explored regions. IR in Central and Eastern Europe is at its highest level, extensive progress in sustainability regulations and the law has been made over the years. The most current fundamental milestone is the European Green Deal in 2019, placing the shared vision of a climate-impartial Europe by 2050 (EU, 2019). This became later observed by UNFCCC COP26 in November 2021, discussing environmental change by approximately 200 countries. Furthermore, regarding sustainability disclosure, European Commission proposed in April 2021 the Corporate Sustainability Reporting Directive (CSRD), substantially broadening the pool of corporations required to publish environmental, social and governance information as well as defining more comprehensive reporting necessities compared with preceding NFRD-based regulation (European Commission, 2021; EU, 2019), that could be easily possible if embedded CE and IR practices together and can provide true information to stakeholders and trendsetters (Dumay et al., 2019).

With regard to CE-related IR and EU directives, the CE Action Plan (European Commission, 2015b; EU, 2019), just as with many national coercive instruments, demonstrates that the circumstances within the EU nations are quite varied. The European Commission (2015c) proposes a materials resource efficiency policy for 31 nations, endorsing that the front-runner nations unequivocally advance towards CE with increased vigour. By and large, the EU is confronted with two challenges for policymaking: (a) supporting developing nations (European Commission, 2015c) and (b) moving towards closed-loop R principles (Reike et al., 2018; EU, 2019; Barnabè & Nazir, 2022). Likewise, national administrative endeavours and systems for CE practice impact essentially upon organizations’ CE-related IR. Furthermore, the authors argue that CE-related IR practices may vary from organization to organization, industry to industry and region to region.

Many organizations, beginning with the presumption that natural resources are not boundless and must be overseen cautiously, have started to embrace the CE approach. The CE approach can also enhance the product lifecycle by implementing the R principles approach into the production process (Reike et al., 2018). The capital incorporated into the IIRC (2013a, 2013c, 2017) framework for value creation and SD should consolidate both financial and non-financial returns through the use of circular approaches (Barnabè & Nazir, 2022; Busco et al., 2013; IIRC, 2017). Interestingly, this circularity includes not only value creation from waste (e.g., Barnabè & Nazir, 2022) but also additionally managing properly the rare natural resources at an organization’s disposal and its operational procedures



and, last but not least, adopting accounting and reporting frameworks to facilitate the incorporation and as well as include communication of information on systemic and long term activities (e.g., Barnabè & Nazir, 2020, 2022; Geissdoerfer et al., 2017; Hassan et al., 2021; Kunc et al., 2020; Liu et al., 2019; Terblanche & De Villiers, 2019). Hassan et al. (2021) focus on an aspect of information discourse and suggest approaches for enhancing the quality of reporting to make it more stakeholder-friendly. Starting from these concerns and considering that previous research mainly focused on sustainability reporting practices (Ibáñez-Forés et al., 2022), this study advocates an enhanced role for including reporting (IR) practices (IIRC, 2017) for the analysis and disclosure of CE-related information. Based on the IR framework (IIRC, 2017), IR has emerged not only as one of the latest developments in the area of corporate and sustainability reporting (e.g., Barnabè & Nazir, 2020, 2022) but also as a doubtlessly excellent fit for organizations interested in representing holistically and comprehensively CE-related information (Barnabè & Nazir, 2020, 2022; Kunc et al., 2020; Stewart & Niero, 2018). A complete and comprehensive integrated approach to dealing and reporting CE-related information might entail not only speaking records about the resources being used, the activities executed, the results achieved and the influences generated (Ellen MacArthur Foundation, 2015) but also identifying, revealing and disclosing the interconnections and the feedback loops active among the elements aforementioned inside an organization CE-orientated strategy (e.g., Kunc et al., 2020). See Table 1 for previous scientific contributions toward CE transits.

Researchers and academic scholars have more actively engaged with CE disclosure using an integrated thinking approach (Barnabè & Nazir, 2022; Kunc et al., 2020; Gunarathne, Lee, & Hitigala Kaluarachchilage, 2021; Gunarathne, Wijayasundara, et al., 2021; Stewart & Niero, 2018). Barnabè and Nazir (2020) specifically examined integrated reports using a sample of EU companies between 2011 and 2018 and determined CE information into IR. They have taken CE-4Rs-related activities (reduce, reuse, recycle and remanufacture) into the four IR framework categories: inputs, business activities, outputs, and outcomes. At the same time, the study highlighted a more general reporting strategy for CE data. Additionally, a case study has demonstrated that 'integrated thinking' can successfully enable businesses to manage their resources from a circular viewpoint and portray the connected information. Kunc et al. (2020) offered a preliminary methodology to identify businesses' environmentally friendly 'hot spots' from a dynamic resource-based view standpoint, have further demonstrated the usefulness of IR for CE disclosure.

Additionally, Barnabè and Nazir (2022) conducted a case study to investigate how an Italian family-owned small-sized agri-food company implements integrated thinking concepts in releasing CE-related 6Rs (reduce, reuse, recycle, remanufacture, redesign and recover) information through IRs. Their research demonstrated how IR might be a crucial tool for managers to pinpoint strategic assets (i.e., IR capitals) and CE-related actions and possibilities. Additionally, their findings emphasized the possibility of integrating CE and IR for decision-making processes.

Gunarathne, Lee, and Hitigala Kaluarachchilage (2021) and Gunarathne, Wijayasundara, et al. (2021) have developed a general strategy for CE disclosure in Sri Lankan companies' IR and found less disclosure of direct and explicit CE keywords and a more significant level of implicit CE disclosure. These results imply that businesses should be more conscious of CE and improve sustainability performance using environmental management principles. In contrast, Myeza et al. (2021) have examined the CE-related information in the integrated reports of African mining corporations and attempted to create a normative framework for integrating CE into strategic objectives. However, it determined how CE transmission of information was very generalized, which prevented a study of the information's quality. The literature review, described in Table 1, showed that no scientific research had examined the factors that influence CE R0-R9 disclosure in the context of IR and SD. It also demonstrated the need for researchers to continue concentrating their analysis on IR capital's function in CE R0-R9 practices and promote SD.

To address this gap, this current study highlights CE activities detailed in IR practices regarding company participation in SD over short-, medium- and long-term value creation. While companies use different strategies by operating various types of capital (e.g., financial, manufactured, intellectual, human, social and natural) (Doni et al., 2019; IIRC, 2013a, 2013b, 2017, 2021). With this stated, while preceding literature already addressed how IR may help companies in managing and reporting on sustainability-related problems (e.g., Albertini, 2021; Barnabè & Nazir, 2020, 2022; Kunc et al., 2020; Stewart & Niero, 2018), a research gap is present in terms of adopting and tailoring IR and tools to report and manage CE-related R0-R9 principle and information (with few examples to be had, however calling for extra research – e.g., Barnabè & Nazir, 2020, 2022; Kunc et al., 2020). On the contrary, the framework promoted by way of IIRC (IIRC, 2017) explicitly conveys a feedback-loop orientation to IR, which underpins the whole value creation process and involves managing simultaneously the six capitals (Doni et al., 2019) at disposal in addition to their interplays and trade-offs (Barnabè & Nazir, 2020; Kunc et al., 2020), these capitals associate with their respective CE activities. IR is manipulated to execute the CE strategies and governance, and these strategies have future impacts on SD and value creation (Albertini, 2021; Hassan et al., 2021). See Figure 2 (IIRC, 2017), which denotes the basic framework of IR.

Figure 2 represents the basic IR framework and capital, which are incorporated in the business for SD. Within the IR framework, the company's strategy and business model are revealed in order to clarify how the business capitals (inputs) can be changed into the output through business activities (Doni et al., 2019; Feng et al., 2017). Recently, a new way of thinking called the 'integrated thinking and reporting cycle' (IIRC, 2016, 2017) has been developed (Feng et al., 2017), which is closely related to circular thinking (Barnabè & Nazir, 2022). These new perspectives urge companies to integrate SD problems into their business models and strategies (Nishitani et al., 2021), and this issue impacts upon accounting, reporting and management control (Albertini, 2021; Giorgino et al., 2016; Shela et al., 2023). In this respect, the author suggests that CE 10 R

**TABLE 1** Scientific contributions towards CE transits.

Authors and years	Country	Corporate reporting documents (methodology)	Main findings
Wang et al., 2014	China	CSR reports (content analysis)	Ownership governance and institutional pressures principally define the CE accounting information disclosure quality.
Stewart and Niero, 2018	Globally	CSR reports (content analysis and mapping)	The most reported CE activities are focused on the end-of-life management and sourcing strategies of products and packaging rather than on circular product design and business model strategies.
Ünal & Shao, 2019	Italy	Case study	To achieve the CE objectives in business models, managerial commitment as a moderating factor between the value network and the customer value proposition and interface dimensions has been identified as pivotal.
Jakhar et al., 2019	India	Survey	The adoption of CE practices is positively influenced by exploratory innovation. However, the exploitative innovation capability restrains the implementation of CE practices.
Dagilene et al., 2020	Europe	Sustainability reports (content analysis)	By disclosing sustainable practices, manufacturing companies seek to gain societal legitimacy by reflecting institutional logic-centred around regulatory factors and best practices rather than legislative requirements
Istudor and Suci, 2020	Europe	Sustainability reports (content analysis)	By analysing information disclosed following the global reporting initiatives standards, different levels of involvement in sustainable practices across European agri-food companies have emerged.
Kunc et al., 2020	Africa and Italy	Integrated reports (case study)	A framework that integrates the IR principles and the dynamic resource-based view for CE disclosure has been developed.
Janik et al., 2020	Europe	Sustainability reports (content analysis)	In sustainability reports, the energy sector predominantly discloses information regarding GHG, without declaring the methodology adopted to address them.
Scarpellini et al., 2020	Spain	Survey	There is a positive relationship between the firms' circular scope, the level of corporate social responsibility and their environmental accounting practices.
Barnabè & Nazir, 2020	Globally	Integrated reports (content analysis)	The CE-related reporting practices of worldwide firms indicate differences in reporting choices and highlight the role of IR.
Gunarathne, Lee, & Hitigala Kaluarachilage, 2021; Gunarathne, Wijayasundara, et al., 2021	Sri Lanka	Integrated reports (content analysis)	The research revealed the low disclosure of direct and explicit keywords about the CE principles.
Kuo and Chang, 2021	China	CSR and sustainability reports (content analysis)	Environmentally sensitive firms and larger firms are committed to disclosing significantly more CE information to fulfil the information-related needs of stakeholders.

(Continues)



TABLE 1 (Continued)

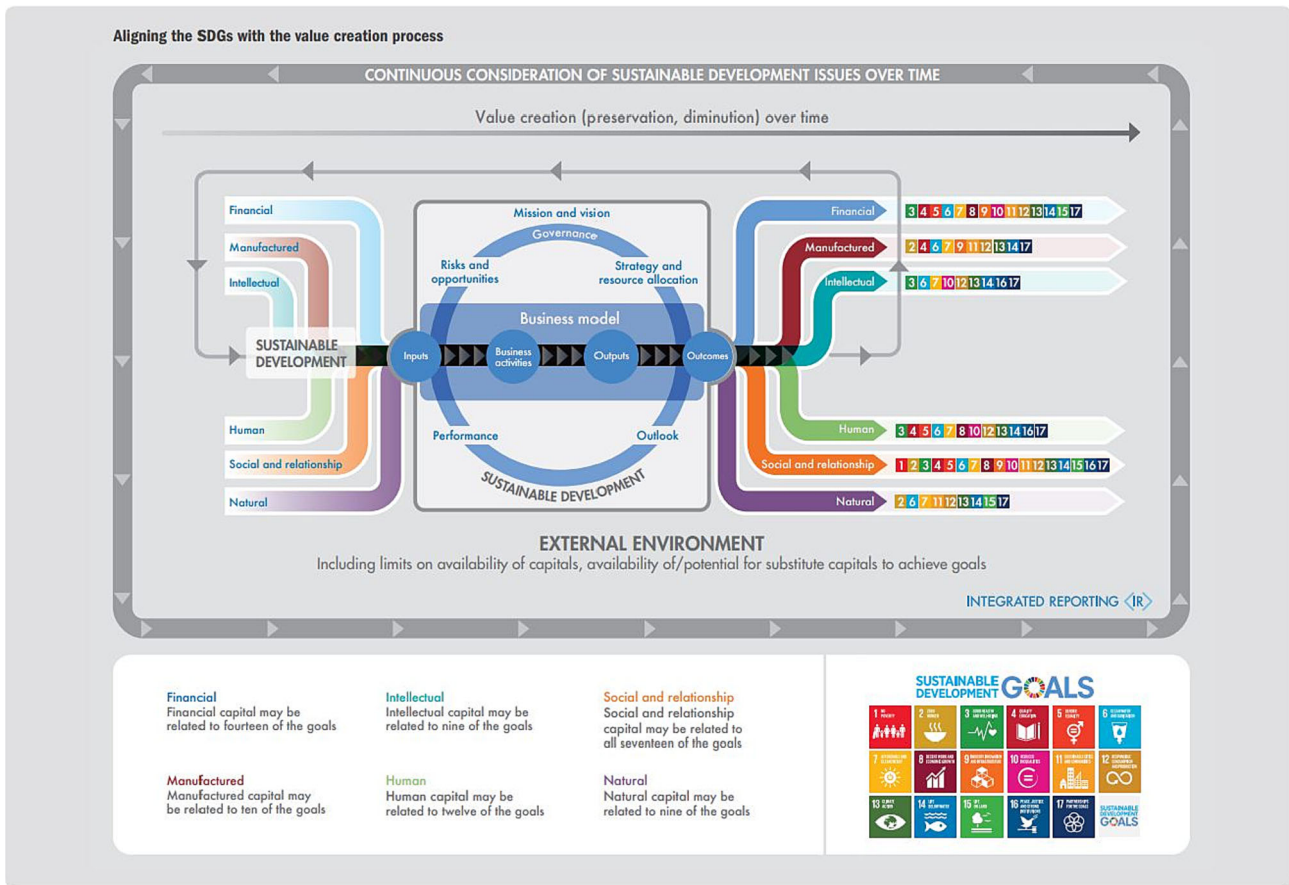
Authors and years	Country	Corporate reporting documents (methodology)	Main findings
Marco-Fondevila et al., 2021	Spain	Sustainability reports (content analysis)	Spanish companies do not consider CE a priority, but the firms operating in the energy-intensive sector are more likely to adopt CE as a strategic line.
Myeza et al., 2021	South Africa	Integrated reports and sustainability reports (content analysis)	The examined mining companies disclose CE information in integrated and sustainability reports in light of reporting principles.
Opferkuch et al., 2021		Sustainability reports (literature review and content analysis)	The results showed discrepancies between the CE and sustainability reporting literature.
Barnabè & Nazir, 2022	Italy	Integrated reports (case study)	The IR concept allows a better understanding of CE-related activities and opportunities for developing future strategies.
Moneva et al., 2023	Europe	Sustainability reports (content analysis and case study)	CE information and initiatives are still in the launching stage since they comprise a minority of all the disclosed issues.
Alfatlah et al., 2022	Globally	Sustainability reports (content analysis)	Countries with the lowest tax rate recorded the lowest disclosure rate.
Opferkuch et al., 2022	Europe	Sustainability reports (content analysis)	CE information within sustainability reports is predominantly shallow and inconsistent.
García-Sánchez et al., 2022	Spain	Corporate websites and sustainability reports (content and textual analysis)	Companies mainly disclose information concerning about sustainable future, resource management and GHGs reduction.
Roberts et al., 2023	Globally	Annual and sustainability reports (content analysis)	Companies provide limited and confusing information regarding CE and biodiversity. Moreover, the motor industry has emerged as the most engaged in CE compared with the other industrial sectors.
Tiscini et al., 2022	Globally	Sustainability reports (frequency term analysis)	The recent integrated reports include environmental information from reports published before the EU action plan for CE and information is under consideration with respect of governance, strategy, management and performance fields.
Vitolla et al., 2023	Globally	Sustainability reports (content analysis)	Companies provide adequate dissemination of CE information within the sustainability reports. Firm size, financial leverage and firm profitability represent positive drivers of the level of CE disclosure.
Esposito et al., 2023	Europe	Integrated reports (content analysis)	Corporate governance mechanisms affect the amount of CE information disseminated through IR.

Abbreviations: CE, circular economy; CSR, corporate social responsibility; GHG, greenhouse gas; IR, integrated reporting.

principles merged into IR can be suitable for SD and value creation over the short-, medium- and long-term. EU Directive 2014/95 describes significant development towards the development of financial and non-financial information and towards a more extensive

implementation of the integrated approach (integrated thinking and reporting) (Dumay et al., 2019; Feng et al., 2017; Guthrie et al., 2017; IIRC, 2017). IR approach can provide an insight into the connections and relationships of the social, economic and environmental factors





**FIGURE 2** Integrated reporting framework: SDGs with value creation process. Source: IIRC (2017, p. 14) by Carol Adams “With the permission of International integrated reporting council, 2020 (C)”.

that impact upon a company's capacity to value creation over the short-, medium- and long-term timescale (Busco et al., 2013).

### 3 | THEORETICAL BACKGROUND

#### 3.1 | Institutional theory

To justify incorporating CE R-principles activities into IR practices, we adopted the institutional theory approach. Institutional theory is used to identify company practices and why it would be necessary for companies to change their practices (e.g., IR practices), what then arose, and to what extent disclosing practices, or prompting the selection of single or combined frameworks for emerging strategies, affected opportunities and future perspectives (DiMaggio & Powell, 1983a, 1983b; Meyer & Rowan, 1977; Scott, 2005). This involves looking at the impact on an organization by its external environment and trying to adopt relevant CE activities into an organization legitimately so that it can participate in SD.

Companies may try to increase their legitimacy by developing and incorporating new practices, frameworks and standards, as well as communicating to their external stakeholders the value creation of the organization's SD (Bhuiyan et al., 2023; Bueno-Garcia

et al., 2021; Milne & Patten, 2002). Back in the 1970s, Meyer and Rowan (1977) recognized that a company may employ certain procedures (in line with other companies in similar circumstances) to adopt SD conditions in an effort to appear more legitimate. DiMaggio and Powell (1983a, 1983b, p. 148) refer to the propensity for companies to adopt comparable frameworks and practices as ‘isomorphism’. Meyer and Rowan (1977) denote ‘harmonization’ as a procedure within which social procedures, commitments and facts take on socially SD standards.

Institutional theory explores organizational structures that clarify the purposes behind organizational frameworks within similar ‘organizational fields’. DiMaggio and Powell (1983a, 1983b, p. 147) characterize an organizational field as “a perceived area of institutional life, key resources, suppliers, customers, services, products that require a common framework for sustainable development”. Carpenter and Feroz (2001, p. 566) state that “the organizational sustainable development is operating within the framework of social, environmental and economic legitimacy norms for SD among environmental, social and economic areas”. DiMaggio and Powell (1983a, 1983b, p. 149) describe the ‘isomorphism’ concept as best practice for modernization and as a supportive process in which one framework can embed with other different frameworks and contribute towards similar processes of environmental, social and economic conditions. Hannan and

Freeman (1977), DiMaggio and Powell (1991), Oliver (1992), Greenwood and Hinings (1996) and Moll et al. (2006) divide the power of such competitive forces into two parts: competitive isomorphism and institutional isomorphism. Competitive isomorphism refers to “how competitive authorities drive companies towards receiving least-cost, efficient & effective frameworks for activities and practices” (Moll et al., 2006, p. 187), while institutional isomorphism can be divided into three different isomorphisms (‘coercive isomorphism’, ‘normative isomorphism’ and ‘mimetic isomorphism’) (DiMaggio & Powell, 1983a, 1983b, p. 151).

Coercive isomorphism identifies with external elements (such as stakeholders, intellectual capital, social and relationship capital, natural capital) and how governmental directives can impact upon a firm's performance and legitimacy (Bueno-Garcia et al., 2021; EEA, 2022; EU, 2014; Farrukh et al., 2022). This process arises from critical stakeholders requiring change within institutional practices, such as in corporate social responsibility (CSR) reporting (Deegan, 2014). An “organization disclosed its corporate reporting practices [at] the demand and [for the] engagement of stakeholders for managerial decision making” (Deegan, 2014, p. 360).

DiMaggio and Powell (1983a, 1983b, p. 151), believe that coercive isomorphism “originates from political impact and issues of legitimacy”. It results from a number of internal and external influences on different organizations, such as governmental guidelines, reporting standards and frameworks. Scott (2005) notes that coercive isomorphism mainly alludes to set-up rules (e.g., see UN Agenda 2030 [UN, 2015]), to inspect conventionality and impose directives, with governmental bodies being the expected characters to complete this part. The existence of environmental and social regulations can influence the involvement of organizations with the SDGs to contribute, for instance, poverty eradication (SDG, 1) and gender equality (SDG, 5) (DiMaggio & Powell, 1983a, 1983b). As Othman et al. (2011) note, administrative directives, as coercive isomorphism, influence corporate IR practices and are significant in promoting CE activities in such organizations (Barnabè & Nazir, 2022; EEA, 2022). However, Milne and Patten (2002) note that managers may provide precise records regarding the range of organizational practices utilized to decrease pollution (for example, environmental councils, ISO 14001, ISO 14040, ISO 14044, natural reviews and environmental audits). Such initiatives can change corporate reporting practices and contribute towards SD (Bhuiyan et al., 2023; Farrukh et al., 2022; Ibáñez-Forés et al., 2022).

‘Normative isomorphism’ presents a perspective, evaluation and mandatory measurement of social, environmental and economic activities (Scott, 2005). Normative isomorphism arises “basically from professionalization” (DiMaggio & Powell, 1983a, 1983b, p. 152). Organizing experts, institutionalization (Deegan, 2014), formal education and skill development (human capital) processes are fountains for normative isomorphism, especially relating to norms, values and corporate labour practices (*op cit.*) and environmental disclosure activities (EC, 2015a, 2015b, 2015c; EU, 2019; Negash & Lemma, 2020; Farrukh et al., 2022). For example, an organization's appropriation of institutionalized management frameworks, ISO 14001, ISO 14040

and/or ISO 14044, or the EMF (2020, 2022) is viewed as an instrument that gives information to identifying SD indicators and standards and rules established during the formal education of organization members can trigger more conscious and SDG-related behaviours. In this way, organizations can, for instance, try to reduce inequalities (SDG 10) and be more responsible and inclusive (SDG 16) (DiMaggio & Powell, 1983a, 1983b). IR may be established for professionalization as well as other reasons; it supports the need to incorporate sustainability reporting characteristics and frameworks as a reflection of global sustainability (De Villiers & Sharma, 2020), high levels of professionalism and good corporate reporting practices. IIRC (2017) provides a framework that assumes, among other factors (such as materiality issues, strategy, resource allocation, opportunity, risk and future outlooks) that likeness (as consistency after some time), certainty and attributes understandably control the end quality (Bhuiyan et al., 2023; Busco et al., 2013) and professional standard. We argue that organizations that utilize the IIRC (2017) framework/guidance disclose more sustainable practices in the context of their CE activities.

‘Mimetic isomorphism’ denotes ‘standard reactions of uncertainty’ (DiMaggio & Powell, 1983a, 1983b, p. 151). When structures and frameworks are not entirely known or understood, when objectives are questionable, or when SD is unsure, organizations turn to follow other established organizational standards and frameworks to demonstrate their legitimacy. Organizations are currently experiencing vulnerability regarding social, economic and environmental factors that demand sustainability disclosure (both financial and non-financial) to achieve best business practices (Bhuiyan et al., 2023; Gunarathne, Lee, & Hitigala Kaluarachchilage, 2021; Gunarathne, Wijayasundara, et al., 2021). Organizations operating within SD criteria (such as in the textile industry) abide by business standards (e.g., GRI, G4 and sustainability guidelines), showing business responsibility regarding green activities (Crane et al., 2008). Mimetic factors regarding the industry may have the impact of including even more CE-related activities in IR practices.

## 4 | RESEARCH DESIGN

The research design entailed multiple case study analysis that is employed when a phenomenon is being explored and when there is a need to develop a relationship between the context and the event for explaining a specific situation (Yin, 2014). In qualitative case studies, researchers will use different methods to explore organizational phenomena in greater detail and then explain them in convincing ways. Sometimes a single case study, consisting of an organization, department, individual or even a specific procedure (O'Dwyer, 2005, p. 232), might not provide sufficient evidence to support the argument(s) on its own, whereas multiple cases studies can explore and explain organizations' perspectives in different ways by similarities and differences, providing predictable or comparative outcomes from the investigations which are reliable and cover the circumstances of many different companies practices (Baxter & Jack, 2008; Eisenhardt, 1989;

Stake, 2005; Yin, 2014). Thus, the researcher can establish whether the findings are significant or not (Eisenhardt, 1989).

Researchers use case study analysis to ascertain a research question to clarify assumed causal relationships (Yin, 2014). Case studies explore strategies and techniques within retrieved data and explain how and to what extent CE-related activities are implemented into IR practices, to enhance SD. Such studies are a convenient way to observe companies' practices and provide a convincing way of explaining such practices (Baxter & Jack, 2008; Eisenhardt, 1989; Stake, 2005; Yin, 2014); with the increasing concern over energy and water consumption, pollution, natural resource scarcity, and emission of GHGs, textile manufacturing companies have to face tremendous social, economic and environmental challenges (Bueno-Garcia et al., 2021; Bhuiyan et al., 2023; Busco et al., 2013; EC, 2015a, 2015b, 2015c; EU, 2019; Farrukh et al., 2022; Gunarathne, Lee, & Hitigala Kaluarachchilage, 2021; Gunarathne, Wijayasundara, et al., 2021; Negash & Lemma, 2020). The research design entailed searching for CE-related concepts in IR documents. We selected this source because of the inclusion of reports that adhere closely to the IR guiding principles, content elements, and fundamental concepts, aligning with our theoretical framework. This multiple case study used integrated reports samples for *content analysis*, and *thematic analysis*, which is "a research technique for the objective, systematic and quantitative description of the manifest content of communication" (Berelson, 1952). Notably, this technique can be used with either qualitative or quantitative data and allows organizing "the text of writing into various groups or categories based on selected criteria" (Guthrie et al., 2004, p. 287). In content analyses, frequency is usually calculated and used for measuring and communicating the relevance of the subject matter (Krippendorff, 2004) and may help in evaluating

the amount of disclosure about a specific concept or group of concepts (Milne & Adler, 1999). It is to emphasize that content analysis in the field of sustainability has been already used and is recognized as a reliable research method (e.g., Guthrie & Abeysekera, 2006; Milne & Adler, 1999).

As described above authors also adopted a thematic analysis approach used for data analysis that could be reliable to interpret findings. Thematic analysis is described as "a method for identifying, analysing and reporting patterns (themes) within data" (Braun & Clarke, 2006, p 79). The theme and patterns are the findings of related data in the thematic analysis. Data within the tables and figures presented make the case studies more authentic and reliable, along with the appendices containing additional data, all of which help to make this study progressively more reliable (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). To guide the analyses more details are anyhow provided below (see Figure 3).

To this end, the authors created a specific codebook (Neuendorf, 2017) (see Appendix A for more details). The codebook is derived from the combination of main sources (IIRC main concepts – retrieved from the IR Framework, IIRC, 2017, the Glossary of CE by the US Chamber of Commerce (<https://www.uschamberfoundation.org/circular-economy-toolbox/about-circularity/glossary>, different authors' definitions, and experts' opinions). This list of terms is developed by the US Chamber of Commerce Glossary, the world's largest business organization representing the interests of millions of businesses of all sizes, sectors and regions. Additional terms, selected by the two researchers applying a basic brainstorming method (Wilson, 2013), were added to enlarge the analysis of CE concepts. The codebook aimed to aid in the development of more standardized and established terminology for CE research and IR (see Appendix A).

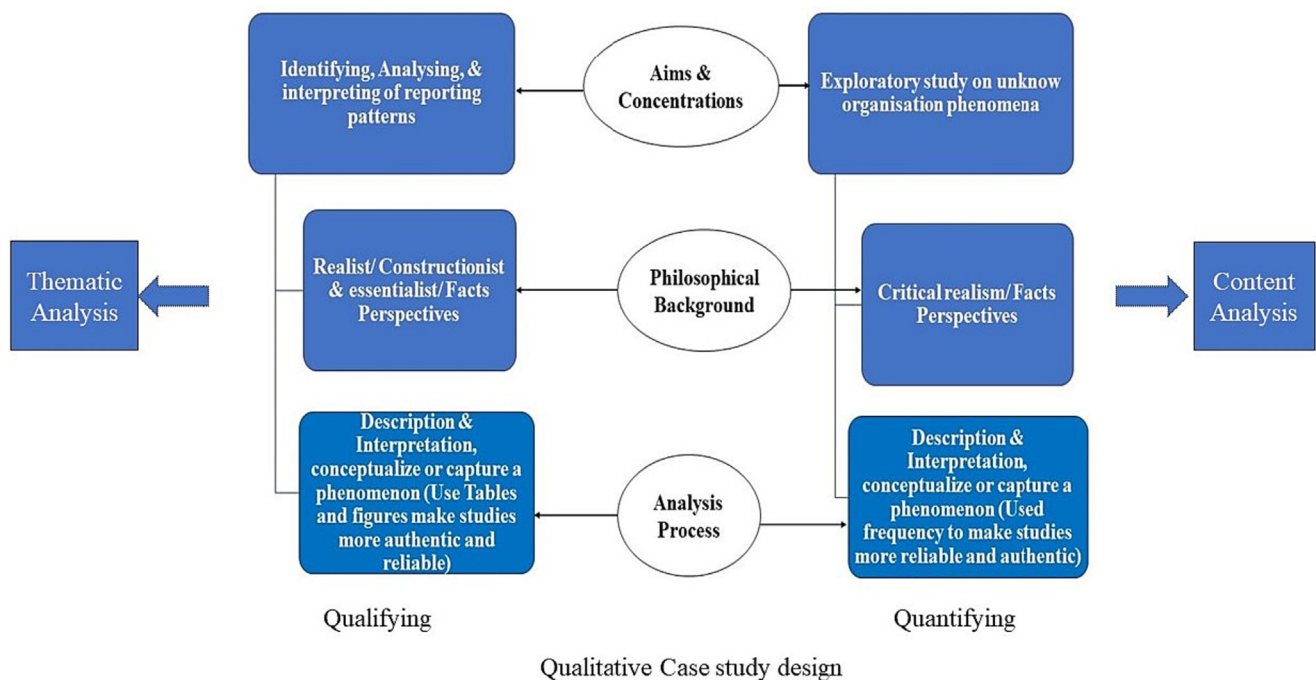


FIGURE 3 Content analysis and thematic analysis process. Source; qualitative description study (Vaismoradi et al., 2013, p. 399).

In both cases, we developed codebooks of words (content analysis) and sentence-wise identification analysis (Thematic analysis), and interpretation of the reporting pattern (Schilling, 2006; Vaismoradi et al., 2013, p. 399). Content analysis and thematic analysis were performed by using the software N-Vivo (used the Exact Matches method) and according to a top-down process: the glossary (single concepts, groups and/or categories of concepts) was defined *ex-ante* (Schilling, 2006). These CE R principles recommend value preservation options (Rs) for both customers and businesses, based upon R0 (refuse), R1 (reduce), R2 (reuse), R3 (repair), R4 (refurbish), R5 (remanufacture), R6 (repurpose), R7 (recycle), R8 (recover) and R9 (re-mine) (Reike et al., 2018). Additionally, Schroeder et al. (2019) identify the links between CE practices and SDGs (see Appendix B). CE practices offer the potential to make collaborations between SDGs, that is, connections exist between CE practices and SDGs like SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, innovation and infrastructure), SDG 11 (sustainable cities and communities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate change), SDG 15 (Life on Land), SDG 1 (No poverty), SDG 2 (Zero hunger), SDG 14 (Life below water), and SDG 15, (Life on land), author implants these practices together, no study has been made in this sense [see Appendix B]. Appendix B presents the relationships among IR capitals, CE principles and UN (2015) SDGs and discloses how these connections have a relation (IIRC, 2017, p. 14, by Carol Adams; Reike et al., 2018; Schroeder et al., 2019; Doni et al., 2019).

To select suitable companies for analysis, the author first investigated the 2015–2019 records from the Knight Global 100 (with permission, Knight, 2020) most sustainable corporations in the world index (<https://www.corporateknights.com/>), ranking accessible by World Economic Forum and available in Forbes. The authors considered primary source data from 2015 to 2019 that is publicly available IRs within company websites operating within EU countries that demonstrated transition into CE practices and presentation of IR and found that only four garments European companies existed in the topmost sustainable companies ranking (Knight Global 100) (see Table 2), those selected were Hennes & Mauritz (H&M) [Sweden] (<https://hmgroup.com/investors/reports.html>), Marks & Spencer (M&S) [United Kingdom] (<https://corporate.marksandspencer.com/sustainability>), Kering [France] (<https://www.kering.com/en/sustainability/>) and Benetton [Italy] (<http://www.benettongroup.com/sustainability/>). IR is a voluntary practice worldwide, except in

South Africa, where it has been mandatory since 2010 on a 'comply or explain' basis for companies listed on the Johannesburg Securities Exchange (Burke & Clark, 2016; Veltri & Silvestri, 2020). The research does not include the COVID-19 period, for the reason to explore a well-defined pattern and can be used to measure during and after COVID-19 effects. (See Table 2 for Companies background).

## 5 | FINDINGS

As the study mentioned describing the research design adopted for this study, the first step of the data analysis entailed searching the Integrated Reports drawn up by the organizations included in our sample with the N-Vivo software (Table 3).

In detail, Table 3 presents the results of the content analysis for the M&S, as described study retrieved IRs, 2014 to 2019 from the company website. It is noted that M&S was R2 (reuse) top words/terms cited reference, secondly, R7 (recycling) and thirdly (R3) reduce and less cited CE principle was R8 (recover), respectively, while the trend of disclosing CE practices in IRs is continuously increasing.

Table 4 reflects that H&M IRs disclosing the CE-related (R2) principle are more cited terms while the recover (R8) term is less cited, even though in 2015 and 2019 H&M IRs increasingly disclosed CE-related principles. Move forward to the Kering Company (see Table 5).

Notably, the Kering Company most referenced with R principles, for example, the reuse (R2), reduce (R1) and recycling (R7) are more cited reference terms. In contrast, the Recover (R8) is less cited according to word reference. Regarding, the year-wise, terms cited, references were increasing, but the means of references and the SD is less as compared with other M&S and H&M reports. Move forward to Table 6.

Table 6 presents the results of the Benetton Company content analysis of IRs. It can be seen that recycle (R7), reduce (R1) and reuse (R2) is more cited terms reference as compared with other CE-related principles while remanufacturing (R5) and recover (R8) were less cited terms referenced in IRs. On the other hand, in 2019, Benetton Company disclosed more CE-related activities as compared with previous years. This trend shows that the Benetton Company is increasingly engaged in CE-related activities. Move forward to thematic analysis for a more in-depth explore the CE-related principle in IRs.

**TABLE 2** Background information of four case study companies.

Company	M&S	H&M	Kering	Benetton
Industry	Textile	Textile	Textile	Textile
Reporting documents (mandatory/voluntary)	IR (voluntary)	IR (voluntary)	IR (voluntary)	IR (voluntary)
Turnover (sales) (2019)	£10.7bn	£21.43bn	£13.7bn	£1,230 m
Operating income (2019)	£580.9 m	£1.8bn	£3.94bn	£29.893 m
Employees (2019)	81,000	177,000	34,795	7,500
Products	Garments	Garments	Garments	Garments

**TABLE 3** Content analysis of M&S Company.

Years	R0	R1	R2	R3	R4	R5	R6	R7	R8	R9	MEAN	SD
2015	264	649	1,153	567	494	403	420	700	237	632	551.9	249.85
2016	275	635	1,234	545	456	386	403	657	241	681	551.3	270.58
2017	332	677	1,206	579	447	422	465	636	326	481	557.1	243.07
2018	365	728	1,307	632	514	448	469	746	287	754	625	275.11
2019	485	741	1,391	610	464	428	462	786	309	580	625.6	289.67
<b>MEAN</b>	344.2	686	1258.2	586.6	475	417.4	443.8	705	280	625.6		
<b>SD</b>	79.53	42.047	82.93	30.923	25.091	21.275	27.006	55.375	35.709	92.287		

**TABLE 4** Content analysis of H&M Company.

Years	R0	R1	R2	R3	R4	R5	R6	R7	R8	R9	MEAN	SD
2015	149	300	461	437	344	333	473	334	113	165	310.9	123.938
2016	177	306	456	417	340	306	467	318	135	184	310.6	110.723
2017	217	336	446	404	331	296	395	356	155	200	313.6	90.901
2018	224	380	540	337	303	269	348	370	163	218	315.2	101.243
2019	275	388	542	415	361	304	403	387	187	238	350	96.791
<b>MEAN</b>	208.4	342	489	402	335.8	301.6	417.2	353	150.6	201		
<b>SD</b>	43.051	36.485	42.736	34.199	19.072	20.519	47.067	24.657	25.120	25.471		

**TABLE 5** Content analysis of Kering Company.

Year	R0	R1	R2	R3	R4	R5	R6	R7	R8	R9	MEAN	SD
2015	105	116	73	58	68	47	48	65	67	90	73.7	21.927
2016	99	116	202	119	100	84	94	132	42	70	105.8	40.330
2017	134	159	267	169	139	112	140	173	50	110	145.3	52.877
2018	175	222	256	207	170	125	161	239	63	149	176.7	54.591
2019	284	396	230	174	166	141	142	303	143	265	224.4	81.962
<b>MEAN</b>	159.4	201.8	205.6	145.4	128.6	101.8	117	182.4	73	136.8		
<b>SD</b>	67.854	104.572	70.001	51.971	39.271	33.162	40.938	82.654	36.127	69.216		

**TABLE 6** Content analysis of Benetton Company.

Year	R0	R1	R2	R3	R4	R5	R6	R7	R8	R9	MEAN	SD
2015	23	666	76	22	16	8	19	25	16	56	92.7	192.122
2016	240	455	297	245	282	176	202	325	174	174	257	83.576
2017	270	493	335	262	322	202	237	358	191	184	285.4	90.246
2018	304	570	359	319	381	239	304	397	231	210	331.4	99.732
2019	258	601	403	352	361	249	258	472	238	259	345.1	113.372
<b>MEAN</b>	219	557	294	240	272.4	174.8	204	315.4	170	176.6		
<b>SD</b>	100.203	75.479	114.297	115.601	132.617	87.396	98.218	153.245	80.644	67.098		

The findings of thematic analysis from IRs disclosed the main themes of the inputs, business activities, outputs and outcomes into IR frameworks (IIRC, 2017) that integrated with capitals and how, and to what extent, CE activities interacted with different capitals. It also identified the sustainable practices utilized by these case study companies (see Table 7).

Table 7 presents six capitals (Financial, Manufacturing, Intellectual, Human, Social & Relationships and Natural Capital), which are integrated into the IR frameworks as inputs to the business activities.

Financial capital in IR refers to keeping the product's lifecycle at its best level by using different principles (such as reduce, reuse, recycle and decreased water, energy, consumption, and GHGs emissions



TABLE 7 Overview of IRs framework's six capitals for the case study companies.

Capitals	Organization practices	M&S	H&M	Kering	Benetton
<b>Financial</b>	Refuse (R0), reduce (R1), reuse (R2), Recover (energy R8)	<p><b>Inputs:</b> [2017/2018 developed community energy fund to reduce wastage plastic] [greenhouse gas emissions] [installed renewable energy, e.g., LED lighting in stores] [decrease in water consumption (–10%) and reuse strategy]</p> <p><b>(outputs and outcomes):</b> [UK renewable energy generation and increase ROI energy efficiency, Plan A 2025] [zero waste, remove packaging, 3 million garments reused every year (2017 to 2025)]</p>	<p><b>Inputs:</b> [financial management for cleaner production] [96% of renewable energy solar energy] [64% of water reuse operations]</p> <p><b>Outputs and outcomes:</b> [20% reduction in energy consumption and save 4 million euros per year from electricity cost]</p>	<p><b>Inputs:</b> [reintegrated thinking approach 13.7 billion euros revenue] [optimize investment in organic growth] [energy efficiency measurement and smart sustainable stores]</p> <p>[60% renewable energy resources]</p> <p><b>Output and outcomes:</b> [2.8 billion euros increase by this approach in 2018] [8% reduced water consumption and 14% reduced water pollutants]</p>	<p><b>Inputs:</b> [green campus, reduction in energy consumption] [use of green energy] [65% of stores use certified renewable energy]</p> <p><b>Outputs and outcomes:</b> [–5% electrical consumption, –10% natural gas consumption, 36% restructured sale points]</p>
<b>Manufacturing</b>	Reuse (R2) Repair (R3), Refurbish (R4), Remanufacture (R5) Recycle materials or secondary materials (R7)	<p><b>Inputs:</b> [90% cotton recyclable and from a sustainable source] [circular packaging strategy] [unsold product refurbishes]</p> <p><b>Outputs and outcomes:</b> [sustainable production] [recycle all products (2022 plan A)] [key raw materials used for the integrated ecosystem] [products and packaging redesign]</p>	<p><b>Inputs:</b> [shift from linear to circular model] [In 2019 production process reduce, reuse and recycle] [92% of waste recycled in 2018 circular garments designs] [product reuse and recycle circularity]</p> <p><b>Outputs and outcomes:</b> [35% to 45% of textile product-by-product through recycling] [50% to 60% reusables products, 70% of products are recycled]</p>	<p><b>Inputs:</b> [renewable production of textiles, leather products and shoe fibres] [sustainable recyclable materials] [rethink the multiband business model]</p> <p><b>Outputs and outcomes:</b> [resource optimization results for 1 million euro saving per year]</p>	<p><b>Inputs:</b> [material bio-based fibres, 27% of sustainable cotton, 87% recyclable waste]</p> <p><b>Outputs and outcomes:</b> [wastewater reused, packaging recycled and reused] [CO2 emission reduction in stores, CO2 reduction in logistics] [waste production (87%)], [B-green sustainable base product]</p>
<b>Intellectual</b>	Rethinking/repurpose (R6), Repair (R3), recycling (R7), New products with old parts by adopting new channels	<p><b>Inputs:</b> [strengthen brand and promotion through intellectual property]</p> <p><b>Outputs and outcomes:</b> [all online stores for the international community in 2023]</p>	<p><b>Inputs:</b> [fast efficient product flow by using artificial intelligence to enhance product performance, machine learning]</p> <p><b>Outputs and outcomes:</b> [circular business model and rethink and recycling the fashion and product]</p>	<p><b>Inputs:</b> [explore new technologies for CE] [disruptive technology used in raw material and manufacturing processes] [Omnichannel approach]</p> <p><b>Outputs and outcomes:</b> [100% key raw materials traceable by 2025]</p>	<p><b>Inputs:</b> [digital innovation (RFID technology, content factory, omnichannel approach, Benetton.com)] [E-commerce, big data and artificial intelligence]</p> <p><b>Outputs and outcomes:</b> [eliminate barriers of online &amp; offline distribution channels]</p>

TABLE 7 (Continued)

Capitals	Organization practices	M&S	H&M	Kering	Benetton
<b>Human</b>	Repurpose (R6), Employees' development	<b>Inputs:</b> [eliminate current and future market skills gap by training and development of employees] <b>outputs and outcomes:</b> [enhancing skills of employees and performance]	<b>Inputs:</b> [wage management system, 60:40 female: Male BOD participation, employees' development] <b>Outputs and outcomes:</b> [1.6 million jobs creation, equal and fair jobs, health and safety of customers, workers and employees, support fair living wages]	<b>Inputs:</b> [encourage creativity] [developing employees' talent] <b>Outputs and outcomes:</b> [gender equality, recognition by Thomson Reuters diversity and inclusion index, Bloomberg, gender equality index]	<b>Inputs:</b> [Employees' training, development and branding] <b>Outputs and outcomes:</b> [commercial partnerships for production and distribution]
<b>Social and relationships</b>	Remine (R9); Local authorities and landowners (in developing countries people try to live by scrapping valuable materials); Recover (R8) energy and waste content (collector, municipality, energy companies, waste management processors, local and national govt., international bodies).	<b>Inputs:</b> [create a relationship between the customer and suppliers] [supplier best practices, supplier responsibilities, community donation] <b>Outputs and outcomes:</b> [generate returns from stakeholders] [local govt. recycle policy by 2022 (plan A)] [zero waste to landfill tonnes]	<b>Inputs:</b> [follow child labour policy, home working policy, global social policy] [sustainable workplace standards, post-consumer waste] [industrial relations, civil, political, social security, economic, social, health and cultural rights, (UN, ILO)] <b>Outputs and outcomes:</b> [100% suppliers code of ethics] [safety and security compliance level of 85%, 100% of supplier sustainable commitment]	<b>Inputs:</b> [environment profit and loss (EP&L) to assess the monetary value] <b>Outputs and outcomes:</b> [84.9% completion of code of ethics]	<b>Inputs:</b> [long-term relationships with stakeholders, such as local and global institutions and organizations (UN, ILO)] <b>Outputs and outcomes:</b> [supplies ensure that wastewater recovers, long-term relationships with stakeholders]
<b>Natural</b>	Re-mine (R9), Free from hazardous chemicals; Recover (R8), reverse logistic, use of biomass.	<b>Inputs:</b> [using natural resources, zero waste] [In 2017 33% decreased carbon 430,000 as compared with 2006/2007 630,000] <b>Outputs and outcomes:</b> [zero landfills by operating activities in the UK and Ireland since 2012] [reduce greenhouse gas emissions plan A by 80% compared with 2006/07, by 90% by 2035]	<b>Inputs:</b> [best chemical management practice] [no discharge of hazardous chemicals, technological carbon sinks] <b>Outputs and outcomes:</b> [GHGs emission reduction, reduction outside of GHGs] [100% recycle and sustainable material from chemical perspectives]	<b>Inputs:</b> [environmental policy, 10% reduction between 2015 and 2017 environment profit and loss indicators] <b>Outputs and outcomes:</b> [40–50% reduced waste pollution] [GHG emissions, land use, waste, reduced water consumption and water pollution by 2025]	<b>Inputs:</b> [waste management, reduction in the use of chemical pollutants] [logistics, reduce carbon footprint, ZDHC wastewater guidelines] <b>Outputs and outcomes:</b> [natural fibres, BCI (23% of better cotton initiatives)]

within the production processes) that impact upon financial returns. M&S keep to zero waste criteria, reducing packaging, have gained a return on their investment of energy and reuse 3 million garments every year. H&M use renewable resources and have thus retained 4 million euro, Kering use a reintegrating approach, utilize organic materials and have increased financial investments, while Benetton have reduced natural resource inputs and increased investments. The main differences between these results highlight how CE can reduce dependency by supply chain and increase company's performance by enhancing the benefits from financial investments (Deloitte, 2022).

Manufacturing capital belongs to the business operations area. M&S use 90% recyclable cotton in their operations and, from 2022, have plans to recycle all used products. H&M introduced a circular production model that achieved 92% waste recycling by 2018. Kering introduced rethinking and renewable manufacturing into its production processes. Benetton use bio-based materials in their production processes, achieving 87% for material recycling, and packaging waste is reused.

Intellectual capital, identified through research and development, enables an organization to adjust their tasks, procedures and contributions. It was seen that all four case study companies are dependent upon a product development approach for new products or services through the use of artificial intelligence.

Utilization of human capital refers to those activities, which result in SD, such as the creative development of employees' talents (Kering) and employee branding (Benetton).

Social and relationship capital acts to improve public relations and marketing and raise the brand image. M&S was seen to have developed its recycling strategy with local governments, while H&M and Benetton have followed the UN agenda (UN, 2015) to protect social rights.

Finally, natural capital denotes that production will be free from hazardous chemicals, waste materials will be recovered, and the carbon footprint reduced, and biomass use considered within the production processes. M&S reduced their carbon footprint through production changes, decreasing their GHG emissions by 90%, while H&M, Kering and Benetton utilized improved technology and carbon sinks to reduce their emissions.

Table 8 represents the inside practices of the IR frameworks for the case study companies, identifying four factors (Risk & Opportunity, Strategy & Resource Allocation, Performance and, finally, Outlook).

Every organization operates with a certain amount of risk and opportunity. Risk, in particular, influences business capacity over a company's short-, medium- and long-term operations. M&S, H&M, Kering and Benetton all have risk management procedures in place to reduce risk and create opportunities. These case study companies also use key performance indicators to access business opportunities. M&S, H&M and Kering all utilize supply chain management for optimized opportunities. However, the case study companies have each applied different approaches (such as resale, redesign and remanufacturing into production), and these opportunities are closely allied to their CE activities. These strategies identify the respective company's

short-, medium- and long-term plans to meet their objectives and effectively allocate their resources, which means implementing their strategies within their limited organizational resources. M&S, Kering and Benetton all moved forward towards a CE, utilizing renewable energy, achieving zero landfill targets, and reusing and/or recycling clothing within their organizations.

Performance indicates those outcomes of the organization which impact on their past, present, and future performance. These companies used indicators to evaluate their performance regarding GHG emission ratios, sales or other financial objectives. Both Kering and Benetton used artificial intelligence and big data analysis strategies to develop and achieve sustainable performance.

Outlook refers to each case study company's goals or expectations which they expect to achieve in the future. M&S plans, by 2025, to achieve zero waste, use less plastic, have a sustainable supply chain and fully utilize sustainable packaging materials. Similarly, H&M plans to reduce its waste to zero, and to introduce a new water roadmap to reduce the use of water through recycling. Kering plan, by 2025, to ensure 100% responsible sourcing and traceable materials for use in their products.

We will now progress to consider SDGs and their relationship with IR and CE practices.

The UN (2015) SDGs 2030 agenda is harmonized with the CE, identifying potential challenges through the over-consumption of natural resources globally (Nishitani et al., 2021). With regard to waste production, CE practices offer reuse options to address waste management, which is emerging now in developing nations. If we look at the CE relationship with the IR capital elements for the case study companies, M&S, H&M, Kering and Benetton all comply with SDG8 (promoting supported, comprehensive and sustainable financial development for a profitable business) and manufacturing capital-related SDG 12 (Sustainable Consumption and Production). Meeting the UN 2030 agenda for SDG 4 (Quality Education), SDG 9 (Industry, Innovation and Infrastructure), SDG 10 (Reduced Inequalities), SDG 13 (Climate Action), SDG 16 (Peace, Justice and Solid Institutions) and SDG 17 (Partnerships for the Goals) all demonstrate that the case companies have a strong relationship with both IR and CE practices. These four case study companies have also followed SDG 3 (Good Health and Well-being), SDG 5 (Gender Equality) and SDG 10 (Reduce Inequalities), where all of these practices relate to the IR human capital content. The CE principle of reming closely relates to the IR social and relationships content, and all four of the case study companies have followed and complied with SDG 11 (Sustainable Cities and Communities), SDG 16 (Peace, Justice and Strong Institutions) that interlink specifically with SDG 17 (Partnerships for the Goals/Means of Implementation).

## 6 | DISCUSSION

This research demonstrates that state-of-the-art CE R principles are utilized in the context of the IR framework. To answer the research question "how and to what extent are multinational garments companies

**TABLE 8** Overview of the inside practices of the IR framework for case study companies.

	Practices	M&S	H&M	Kering	Benetton
<b>Risk &amp; opportunities</b>	Risk influences the capacity of business and opportunity refers to value creation in the short-, medium- and long-term.	Optimize opportunities by removing extensive packaging cost; risk management and creation of opportunities, customer and people value; risk analysis and reporting; example - monitoring the Brexit risk.	Recycle 100% of all materials; risk management operations; use low-risk suppliers; low-risk sourcing; measure water impact and risk within the stores and warehouses; eliminate water-related challenges; risk mitigation; redesign production.	High-quality sustainable market and risk-taking; the creativity of design through all stages of R&D; seize opportunities through the supply chain; risk management procedures; rethinking and exploring economic opportunities; develop technologies to promote CE.	Strategy, executive, financial, legal and external risks; the common vision of green-oriented business toward the CE; diversity and equal opportunity to suppliers.
<b>Strategy and resource allocation</b>	CE practices, resource optimization, waste products, packaging, water emission, product service model.	Move towards CE; zero waste, renewable energy, waste to landfill zero, clothes reused and recycling plan.	Maximize resource and minimize waste, 95% of cotton use to be by recycling; 35–45% textile product from by-products; 50–60% from reusable products, 70% of products recycled; 100% circular and renewable strategy; zero discharge of hazardous chemicals (ZDHC); new circular packaging strategy; entire value creation.	Reduce 40% environmental profit and loss (EP&L), 50% CO2, 2025 sustainable strategy; promote organic growth and enhance synergies and integration; development of innovative technology by CE and biotechnologies.	Waste management strategy; reduce chemical pollutants, logistics, carbon footprint, ZHDC wastewater guidelines; towards a CE strategy to design products (rationalization of collection, waste projects, reduction in use, biobased fabrics).
<b>Performance</b>	The ratio of carbon emission, water usage, sustainable practices and ranking.	Certified international social, environmental and ethical standards; more sustainable business operations; 2016 & 2017 to rank in knight global 100 most sustainable corporations.	Sustainable circular model, 93% of electrical energy was renewable, 2015, 2016, 2017, 2018 to rank in knight global most sustainable corporations.	Sustainable development through CE and long-term economic performance. Use artificial intelligence for sustainable performance, 2016, 2017, 2018, 2019 to rank in knight global most sustainable corporations.	Sustainable performance indicators, economic, social and environmental indicators used for evaluation of performance; big data and artificial intelligence used in performance management.
<b>Outlook</b>	Future	Plan A 2025(move towards sustainable circular business models); help 10 million people live happier, help to transform 10,000 communities, goal of zero waste, less use of plastics, sustainable supply chain, increased wages, sustainable	The operation to reduce CO2 by further 11%; 2040 climate positive value chain; new water roadmap for supply chain until 2022; supply chain management; develop 2030 GHS emission reduction goals, 100% waste to be recycled, 2040	2025 plan to ensure animal welfare, innovative sustainable circular business model; reduce the environmental impact; 2025 plan to set 100% responsible sourcing - environmental, social, animal welfare, traceability	Reduce risk, maximize resources and influence on the wool market; 2025 100% sustainable cotton to be used in production, by 2020 only organic cotton to be utilized in production.

(Continues)

TABLE 8 (Continued)

Practices	M&S	H&M	Kering	Benetton
	packaging, sustainable retailer, participation in UN development goals.	use renewable energy 100%; local government recycle policy by 2022 (plan A).	and chemical substance; set up ideas lab for knowledge sharing between working groups and develop new ideas and solutions for problems.	

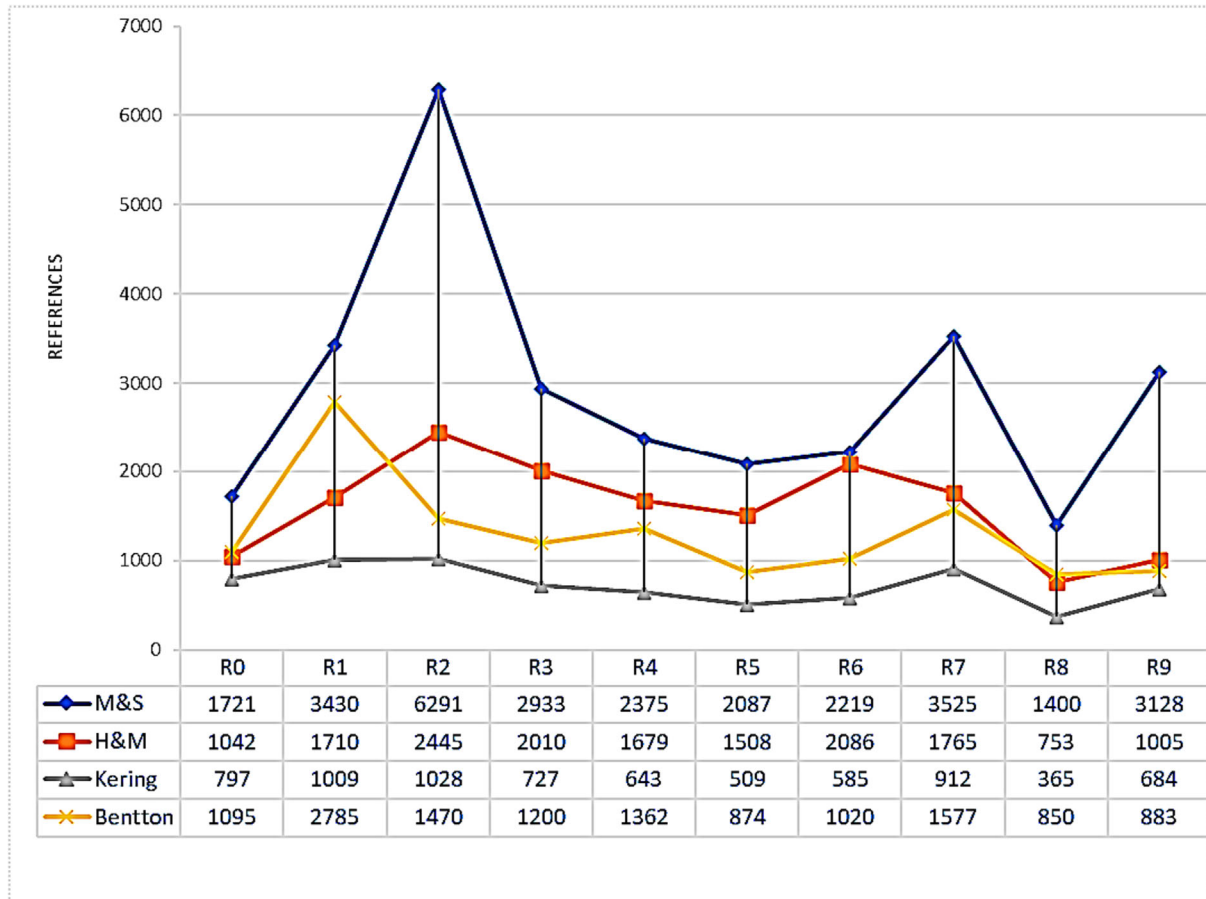


FIGURE 4 Total case companies' references.

disclosing circular economy R principles into their integrated reporting practices?". See Figure 4 for the total case companies' references cited.

Figure 4 argues that all four companies provide information about their IR and comprehensively cover all essential elements that correspond with CE R principles. The content analysis shows that case study companies were seen to be more involved in the reduce (R1), reuse (R2) and recycle (R7) engaged with IR practices. Traditionally, the capital elements often emphasize creating, delivering and capturing economic value (Bocken et al., 2018; DiMaggio & Powell, 1983a, 1983b; Meyer & Rowan, 1977; Scott, 2005), which tend to refer only

to the resources used to obtain such economic performance, while neglecting their environmental and social values. Increasing numbers of financial analysts, stakeholders and rating agencies now observe that economic execution associated with environmental, social and financial-related criteria are significant terms to describe an organization's overall performance (Bueno-Garcia et al., 2021; Deegan, 2014; Meng et al., 2014). In this perspective, the importance to link financial and sustainable aspects highlights the relevance of our findings on financial-related outcomes, which can be supported by IR reporting practices. The impact of CE on the financial capital can generate different outcomes in terms of reduction of energy consumption or



**TABLE 9** Overview of case study companies' contributions towards SDGs 2030 with IR & CE.

Capital	M&S	H&M	Kering	Benetton	CE R principles
Financial	6, 7, 8, 12	9, 12, 17	5, 6, 8, 12, 13	8	Refuse (R0), reduce (R1), reuse (R2), recover energy (R8)
Manufactured	7, 8, 11, 12, 14, 15, 17	6, 7, 9, 12, 13, 14, 17	6, 8, 12, 13	12, 13, 17	Reused (R2), repair (R3), refurbish (R4), remanufacture (R5), recycle material (R7)
Intellectual	9	10	3, 12, 13	17	Repair (R3), rethinking/repurpose (R6), recycling (R7)
Human	3, 4, 5, 10	5, 10	5, 13, 15	5, 8	Repurpose (R6), Employees' development
Social and relationships	1, 2, 4, 5, 8, 9, 10, 11, 12	1, 2, 3, 4, 5, 8, 10, 14, 15, 16, 17	6	5	Remine (R9), local authorities and landowners, recover (R8) energy and waste content
Natural	6, 7, 12, 14, 15	13, 15	13, 15	12, 13, 17	Re-mine (R9), free from hazardous chemicals, recover (R8), reverse logistic, use of biomass

material waste or other resources that can be disclosed in a detailed way by using IR model. The CE and IR combined framework can provide an interesting model for representing the connection between financial materiality and CE (Nwachukwu, 2022) that may build new revenue streams (Deloitte, 2022) and improve investment results, especially in the aftermath of severe shocks.

Given the theoretical underpinnings of institutional theory, past researchers (DiMaggio & Powell, 1983a, 1983b; Meyer & Rowan, 1977; Scott, 2005) and the current research findings (see Tables 7, 8 and 9) demonstrate that CE R principle-related activities closely tally with organizational legitimacy and create a more sustainable environment within society. IR framework (IIRC, 2017) integrated with six capitals can be seen to interact with the external environment and business models to create value over the short-, medium- and long-term. The case study companies' capitals represent different features of SD that are interlinked with economic, social and environmental principles and CE R principles (Barnabè & Nazir, 2020, 2022; Busco et al., 2013; De Villiers & Sharma, 2020; Reike et al., 2018). DiMaggio and Powell (1983a, 1983b p. 147) identify organizational fields as being those organizations that comprise a perceived area of institutional life, have essential resources, suppliers and customers, produce similar services and products, and require a common framework for SD. Coercive isomorphism recognizes that certain external elements (such as stakeholders, intellectual capital, social and relationships capital, natural capital and governmental directives) impact a firm's performance and organizational legitimacy.

A sustainable business has a more comprehensive understanding of all the economic, environmental and social aspects that prompt the selection of single or combined frameworks for emerging strategies, opportunities and future perspectives (DiMaggio & Powell, 1983a, 1983b; Meyer & Rowan, 1977; Negash & Lemma, 2020; Scott, 2005). Furthermore, companies try to increase their legitimacy by combining or developing new practices, frameworks and standards, as well as communicating to their external stakeholders their organizational value creation through utilizing SD (Bueno-Garcia et al., 2021; DiMaggio & Powell, 1983a, 1983b; Milne & Patten, 2002). It is worth mentioning that businesses moved towards CE even faster (Hassan et al., 2021), hoping for a better future with less waste, less impact,

and more benefits for business, society, and the environment. Hassan et al. (2021) supported this notion and suggested implementing the CE model for SD.

With regard to financial capital-related outcomes, M&S use a renewable energy strategy (EEA, 2019), H&M utilize increased amounts of solar energy, Kering use a reintegrated thinking approach (EEA, 2022) and Benetton use an energy reduction (Gunarathne, Lee, & Hitigala Kaluarachchilage, 2021; Gunarathne, Wijayasundara, et al., 2021) approach to gain financial benefits and all these activities are close to CE principles R0, R1, R2 and R8, as well as SDGs 7, 8, 9 and 12.

With regard to manufacturing capital-related outcomes, the case study companies followed the R principles (such as R1, R2, R3, R4, R5 and R7) within their production processes (Reike et al., 2018) as well as SDGs 8, 9, 11 and 12. Regarding intellectual capital and human capital, the case study companies demonstrated only the CE principle of rethinking/repurposing (Feng et al., 2017), but engaged with SDGs 3, 5 and 10. The CE R9 principle was seen to have been incorporated within the social and relationship capital of the case companies. SDG 16 perspectives related to the four case study companies were seen to have a strong relationship with their stakeholders (e.g., local, national & international bodies) and had developed a CSR culture within their organizations. While normative isomorphism demonstrates such elements (such as stakeholders, manufacturing capital, natural capital, formal education and skill development (human capital) and governmental directives all impact upon a firm's performance and organizational legitimacy (Bueno-Garcia et al., 2021; Carpenter & Feroz, 2001; DiMaggio & Powell, 1983a, 1983b, p. 152; Negash & Lemma, 2020). The case study companies also followed the R8 and R9 principles (EMF, 2015) for promoting natural capital and also integrated with SDGs 12, 13 and 14. All four companies utilized an effective strategy for reducing GHG emissions, were free from the use of hazardous chemicals, and all were seen to have reduced their landfill and carbon footprints (European Commission, 2015b; Farrukh et al., 2022). As all operate in different countries with strong regulatory policies regarding CE issues, they tend to disclose considerable amounts of information about their CE and 10 R principles within their reporting practices.

The IIRC framework (IIRC, 2017) represents the risk influences on the capacity of business, and opportunity refers to the value creation over short-, medium- and long-term operations. The case study companies have also assumed an institutionalized management framework (e.g., ISO 14001, ISO 14040 and/or ISO 14044) as an environmental management instrument that can provide information with SD indicators. IR may be established in a company through the process of professionalization (DiMaggio & Powell, 1983a, 1983b, p. 152; De Villiers & Sharma, 2020) and may utilize different methods, reflecting the need to interpret sustainability reporting characteristics and frameworks as a reflection of global SD layouts (Bhuiyan et al., 2023; Crane et al., 2008; European Commission, 2021; Reike et al., 2018; Schroeder et al., 2019) as well as CE-related 10 R principles. In this respect, M&S has adopted a strategy of optimizing opportunity by eliminating extensive packaging costs and also by increasing risk monitoring within the organization (e.g., M&S carefully monitors the Brexit risk). H&M works upon minimizing risk (Moll et al., 2006) by their management selecting low-risk suppliers and sourcing (by measuring the water input) and has created an opportunity within the organization to use the redesign of production to re-utilize waste and decrease the per-unit cost. Both Kering and Benetton have followed the strategy of redesign/rethinking (Guthrie et al., 2017) and have explored economic opportunities through the use of CE, with the aim of addressing SDG 12 and ensuring sustainable consumption and production. The author thus argues that organizations utilizing institutionalized IIRC (2017) framework/guidance are more inclined to disclose these more sustainable practices within the context of their CE activities, while, certain mimetic isomorphism signifies (DiMaggio & Powell, 1983a, 1983b) that cover structures and frameworks which are not completely known or understood/unavailable and case companies objectives are questionable or SD is unsure, organizations turn to follow other established organizational standards and IIRC framework to demonstrate their legitimacy.

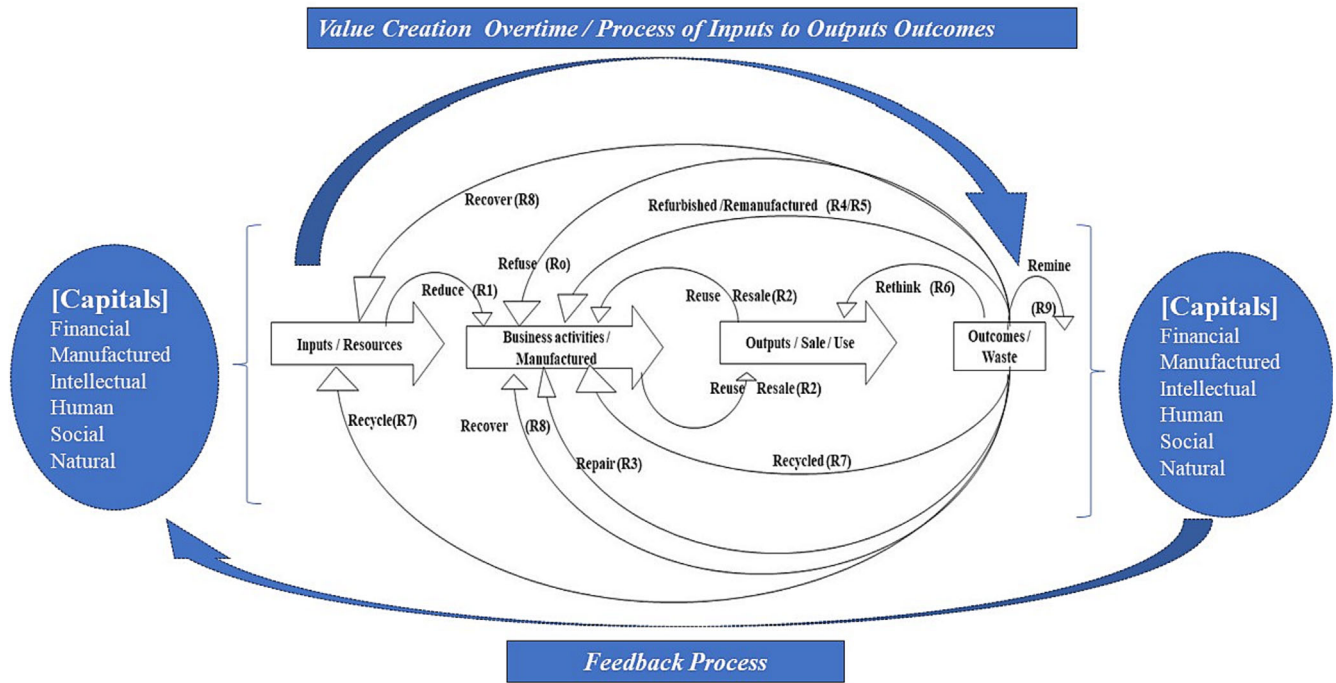
From a strategy and resource allocation point of view, most of the four case study companies used the CE 3-R principles of reduce, reuse and recycle (Kirchherr et al., 2017) within their clothes and fashion production. The findings indicate the case study companies following the EMF, SDG and EU directives, such as the CE action plan (European Commission, 2015b; EU, 2019) and developing their organizational activities towards close-loop systems and a shorter product circle (Barnabè & Nazir, 2020, 2022; Reike et al., 2018). In 2017, collaboration between the EMF and H&M commenced to investigate the greater use of circular store design, whereby H&M took on a circular fibre initiative and consequently published "A new textiles economy: redesigning fashion's future" (EMF, 2017). H&M is certainly a pioneer in its actions towards becoming a company with a CE. Head of Sustainability, Anna Gedda, stated in an interview that H&M focuses upon three specific areas: creating sustainable fashion, development of its technologies and, lastly, exploration of how the customer will buy fashion in the future. M&S, Kering and Benetton have also progressed towards improved reuse and recycling of clothes, achieving zero waste and towards a circular biotechnology strategy. Being bio-based develops the legitimacy of the company and its employees

(Linder & Williander, 2017). Chief Executive Steve Rowe (H&M, 2019a, 2019b, p. 4) stated, "M&S needs to change and fast. We are now in the first phase of our transformation, restoring the basics so that we can deliver sustainable, profitable growth to investors, colleagues, and the communities in which we operate".

H&M, Kering and Benetton have each used a sustainable CE model with performance-related CE R principles, artificial intelligence and big data approaches for their long-term value creation. Their forecasts for SD targets are impressive. H&M has a plan for a new water map by 2022, for zero waste by 2030 and to reduce their carbon emissions by 11% by 2040. The H&M group has a CE framework throughout the entire value chain. It entails switching from a linear to a circular model that uses resources as efficiently as possible and produces no waste. The circular method applies to commercial and non-commercial goods, including packaging, storefronts, and structures (Barnabè & Nazir, 2020, 2022; Busco et al., 2013; De Villiers & Sharma, 2020; DiMaggio & Powell, 1983a, 1983b; Reike et al., 2018). H&M Innovation leads to circularity initiatives, including developing innovative methods for producing, reusing, resale, and recycling wise products and encourages people to make more environmentally friendly decisions by creating services and other methods to repair, reuse, repurpose, and recycle products whenever possible (Barnabè & Nazir, 2022; Reike et al., 2018). By 2030, the H&M group wants to make all its commercial items and packaging from recycled or sustainably developed materials. H&M group reduced the percentage of new materials used in the organization's goods in 2019 by increasing the share of recycled content from 1.4% to 2.2% (EEA, 2022, 2019; EU, 2019; UN, 2015). By 2025, all packaging must be reusable, recyclable, or compostable, and by 2030, all packaging and non-commercial goods must be created from recycled or other sustainably developed materials (H&M, 2019a, 2019b, p. 47).

The Kering aims to establish a foundation of best practices for sourcing raw materials (such as leather, precious skins, wool, cotton, and diamonds) and manufacturing processes (such as training and metal refining) to ensure the long-term success of our activities by encouraging sustainable growth and uniformly applying the Sustainability Strategy and focus on five areas, environmental effects, social impact, animal welfare, traceability, and chemicals (EEA, 2022, 2019; EU, 2019; UN, 2015). The standards, backed by challenging goals, are crucial for reducing Kering's environmental profit and loss by 40% by 2025 (IR, 2019, p. 39). Several efforts that the Benetton Group started and continued in 2019 aimed to enhance the circular supply chain, from design to production, consumption, and product end-cycle (EEA, 2022, 2019; EU, 2019; UN, 2015; Benetton, 2019). The goal is to create a medium- to long-term 'circular economy' plan or a manufacturing model that limits the amount of energy and resources brought in while at the same time minimizing waste and losses (Benetton, 2019, p. 58).

Additionally, organizations, which practise SD, contribute to improve business standards, both employing and endorsing the textile industry's best conduct on green initiatives (EEA, 2022, 2019; EU, 2019; UN, 2015).



**FIGURE 5** Encircle circular economy R0 to R9 principles into integrated reporting framework. Source: combined framework (IIRC, 2013a, p. 13) and & Reike et al. (2018).

In this respect, the authors expect that environmental factors regarding the industry may impact upon company reports, detailing even more CE-related activities becoming integrated into IR practices. These trends confirm that the four case study companies have not only demonstrated their CE-related activities being transformed into their IR, but also have plans for waste recycling principles that are beneficial for decreased packaging waste. IR comprehensively covers all the essential elements that correspond with CE for SD. The authors argue that the CE R principles embed with both IR and SD. Thus, this study proposes a combined framework of CE and IR that supports SD activities, as well as following global standards of SD. The framework not only covers all the elements of CE and IR but also supports the value creation of the organization (Figure 5).

## 7 | CONCLUSION

In this paper, the authors introduced a preliminary study of CE R0 to R9 principles disclosure in IR practices; as mentioned, IR is assuming an increasing role in the business communication processes (e.g., Barnabè & Nazir, 2020, 2022; IIRC, 2017; Kirchherr et al., 2017; Reike et al., 2018; Williams & Lodhia, 2021). Its actual use to effectively disclose data about CE activities still needs to be researched, thus calling for more investigation and evidence (e.g., Barnabè & Nazir, 2020, 2022; Stewart & Niero, 2018). Specifically, the study considered the framework for IR developed by the International Integrated Reporting Council (IIRC, 2017, p. 14 by Adams), an international coalition of regulators, investors,

companies, standard setters, accounting professionals and NGOs. The framework (IIRC, 2017) proposes a precise and complete model of corporate reporting aimed at communicating to all stakeholders the value created by the organization in the short, medium and long term (Barnabè & Nazir, 2020, 2022; Geissdoerfer et al., 2017; Hassan et al., 2021; Kunc et al., 2020; Liu et al., 2019; Terblanche & De Villiers, 2019).

In more detail, and starting from these considerations, this study explored the nexus of IR and the multiple capitals approach with CE issues and activities. In detail, through content analysis, the study provided data valid to investigate “*how and to what extent are multinational garments companies disclosing circular economy R principles into their integrated reporting practices and multiple capitals approach?*”. Our preliminary findings show that the amount of disclosure of CE concepts still needs to be improved in this typology of integrated reports. The content analysis shows that case study companies are actively more involved in the reduce (R1), reuse (R2) and recycle (R7), engaged with IR practices and focused on SDGs. To the author's knowledge, such an extensive study has not been conducted before in the context of CE and IR practices. According to the term cited, M&S and H&M have disclosed more CE-related activities and focus on SDGs than Kering and Benetton.

The coercive, normative, and mimetic isomorphism (DiMaggio & Powell, 1983a, 1983b; Meyer & Rowan, 1977) mechanism substantially impacts CE activities concerning IR practices. The study concluded that a combined framework of CE and IIRC is required, with the aim of value creation and participation in the SD agenda. While the impact of mimetic isomorphisms needs further

investigation because no structures and frameworks are available which are not entirely known or understood that measures whether the objectives are questionable or when SD is unsure within the organization. However, policymakers and trendsetters can establish new organizational standards and frameworks to demonstrate their legitimacy. Organizations are currently experiencing vulnerability regarding social, economic, and environmental factors that demand sustainability disclosure (both financial and non-financial) to achieve best business practices (Albertini, 2021; Barnabè & Nazir, 2020, 2022; Doni et al., 2019; IIRC, 2013a, 2013b, 2017, 2021; Kunc et al., 2020; Stewart & Niero, 2018). The study's main contribution is related to interpreting all the R principles (R0-R9) with IR and the six capitals and creating a link with their SDGs practices. That opened a new avenue for management accounting practitioners to develop a business model and accounting statement (i.e., Environment profit and Loss Account (EP&L) that can be considered CE principles with SDGs. The proposed framework also provides a conceptual picture of how CE activities intermesh with the IR framework and the six capitals, both essential for the organization's SD and value creation.

## 8 | LIMITATIONS, FUTURE RESEARCH AND PRACTICAL IMPLICATIONS

Our study provides a preliminary analysis and certainly has some limitations. One limitation of the study may be its research design and the choice of content analysis. As previous research demonstrated, content analysis's limitations have traditionally been the excessive focus on the quantity rather than the quality of disclosure (Guthrie & Abeysekera, 2006). Stated differently, the quantity of disclosure does not necessarily entail an organization disclosing information of high quality or relevance to its stakeholders (Guthrie & Abeysekera, 2006; Guthrie et al., 2004; Milne & Adler, 1999). Second, the limitation of this study is that it draws upon a relatively limited sample of integrated reports; third, a study could conduct a qualitative in-depth approach utilizing semi-structured interviews of responsible persons and policymakers of companies (Yin, 2014), an analysis of which would enhance this current research and produce new prospective ideas to test. Fourth, a study could be undertaken to test the robustness of this combined framework by applying it to another industry (such as food or automation), then comparing the results with this research, and further studies could be conducted to compare this research with other regions of the world (such as Africa or the USA), identifying how and to what extent these regions and other sectors more polluting sectors, such as the electricity sector, agri-food, marine maritime pots, fishing (Barnabè & Nazir, 2020), could contribute more and promote CE-related IR practices, and also what policies and barriers to change such regions and sectors (Burke & Clark, 2016; Veltri & Silvestri, 2020). The research does not include the COVID-19 period for a reason to explore a well-defined pattern, and the study can use to measure the effects during and after COVID-19 effects. These limitations also open up avenues for further research,

specifically towards statistical analyses that could be performed to correlate data emerging from the content analysis (Guthrie et al., 2004, p. 287) with a range of other relevant factors for CE.

From the practical perspective, corporate managers and stakeholders should use this study's findings to deploy CE-related practices in the organization and society to enhance sustainable consumption practices. The study provides an accurate picture and well shape information to all the stakeholders for managerial decision-making, policymakers, and trendsetters for developing new standards and regulations for adequately implementing CE activities into their organization reporting. It can use for developing indicators (Key Performance Indicators) to measure the CE and its role in the organization's and companies' SD performance (EEA, 2019, 2022; European Commission, 2015a). A combined framework helps minimize resource consumption, promote regenerative activities in the business, generate new accounting information for stakeholders and companies to rethink their value-creation strategies.

### CONFLICT OF INTEREST STATEMENT

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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## APPENDIX A: CODEBOOK USED IN THIS STUDY

CE R principles	Terms	Sources
<u>Refuse (R0)</u>	Buy less, use less product, prevention of waste creation, post material lifestyle of product, Deal with virgin material (rethinking), product life assessment, less materials to be used, designer side-steps waste creation, designer avoids specific toxic material, designing product lifecycle by a producer	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Reduce (R1)</u>	Consume few natural resources, reduce CO2 emissions, reduce water consumption and energy, Rapier for the extent of product life, dematerialization, less material per unit of production, production ratio of green products, ratio of water and energy used minimized, ratio of reducing packaging, reduce packaging	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Resell/reuse (R2)</u>	Reusing part of the products, stakeholders, manufacturers, suppliers, retailers, consumers, and waste managers, online business to customer products, ratio of parts repair/refurbishment for Sale, Sale ratio in the second-hand market, share economy, redesign ratio by short-term/long-term closed-loop process	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Repair (R3)</u>	Extend the product life, make product in a new form, recreated for original function, collection centre for old products, number of defective product repair, number of second-hand product repair, repair without change ownership (enhance the labour skills)	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Re-furbish (R4)</u>	Upgrade of product, use more advanced components, upgrade the worker skills by training (product by product), number of products refurbished by using new components, number of training sessions	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Re-manufacture (R5)</u>	Multi-component products are disassembled and replaced for the new product, reprocessing, recycling used for the new product, number of reconditioning of the product, number of products by product, the ratio of restoration	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Re-purpose/rethink (R6)</u>	Rethink fashion upgrading, new product with old parts, reproduce for new function, number of redesigned products for new functions, number of old parts used for new product	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Recycle (R7)</u>	Post-consumer product waste/post-producer product waste, follow health standards, quality of product maintained, technology transfer for low carbon energy, control over harmful substances (EC action plan), number of recycling technology used, high-quality recycling, participation in job creation by recycling, quantity recycles material	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Recover/energy (R8)</u>	End of life of the product, energy recovery, basic material recovery, capture of energy, use of biomass, quantity of basic material recover	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary
<u>Remine (R9)</u>	The material after the landfill phase, free from hazardous chemicals, policymaker and business role in remine process, area restoration of land for urban, reduce the incineration of materials	EEA, 2019, 2022; EU, 2019; EMF, 2017, 2022; IIRC, 2011, 2013a, 2013b, 2013c, 2016, 2017, 2021; European Commission, 2015b, 2015c, 2021; Barnabè & Nazir, 2020, 2022; Kirchherr et al., 2017; Reike et al., 2018; US Chamber of Commerce glossary

## APPENDIX B: RELATIONSHIPS AMONG IR CAPITALS, CE R0-R9 PRINCIPLES AND SDGS

Capital	CE R0-R9 principles	SDGs 2030
Financial	Refuse (R0), reduce (R1), reuse (R2), repair (R3), recover (R8)	3, 4, 5,6,7,8,9,10,11,12, 13,14,15,16,17
Manufactured	Reused (R2), reduce (R1), repair (R3), refurbish (R4), remanufacture (R5), recycle material (R7)	2,4,6,7,9,11,12,13,14,17
Intellectual	Repair (R3), rethinking/repurpose (R6), recycle (R7)	3,6,7,10, 12,13,14,16,17
Human	Repurpose (R6),	3,4,5,6,7,8,10,12,13,14,16,17
Social and relationships	Recycle (R7), recover (R8), re-mine (R9)	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17
Natural	Recover (R8), re-mine (R9)	2,6,7,11,12,13,13,14,15