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BRIDGING THEORY AND PRACTICE: THE CONTESTED EVOLUTION OF THE CIRCULAR ECONOMY IN GLOBAL SUSTAINABILITY TRANSITIONS

Lokesh Tomar[1], Salil Seth[2], Mayank Shukla[3]
[1,2,3] Department of Management Studies, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, Uttar Pradesh, India.
[1]E-mail: lokeshtomargood123@gmail.com
ORCID ID: https://orcid.org/0009-0002-8271-261X
[2]E-mail: salil100seth@gmail.com
ORCID ID: https://orcid.org/0000-0002-8842-2552
[3]E-mail: mayankshuklab055@gmail.com
ORCID ID: https://orcid.org/0009-0001-7765-0023

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ABSTRACT

While the idea of circular economic models has grown as a key focus of global sustainability efforts, there are still several challenges to be addressed in order to move from theory to practice. The research carried out in this study is a conceptual analysis of 120 peer-reviewed articles and policy documents (2000-2023) that analyze the concept of the circular economy (CE). A critical discourse analysis perspective is used to explore the advancement of the concepts of CE principles and their application in different geopolitical settings. We found that there are different models in different areas of the world, including China, in which the regulatory approach differs significantly from adaptations that have taken place in the West under market principles. The study reveals three main obstacles to effective CE transition: (1) institutional resistance to policy implementation, (2) the appropriation of the sustainability concept without a real change in practice, and (3) underlying conflicts between the principles of CE and growth-based economic systems. The study illustrates the differences in these challenges using comparative case analysis. The study contributes to existing sustainability debates with a nuanced assessment of the transformative potential of CE and the structural changes that are required for it to be implemented. These insights provide key feedback for policymakers and business leaders on the complicated journey of transition towards circular economic systems.

Introduction

The continuous 'take-make-dispose' economic model has caused unprecedented environmental degradation, with global consumption of materials expected to double by

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2060 (OECD, 2019). As a consequence, the Circular Economy (CE) has been proposed as a paradigm shift that will separate economic growth from the consumption of resources by creating a closed-loop system (Ellen MacArthur Foundation, 2015). Despite the fact that CE principles have found their way into policy and corporate discourse, their application is not uniform, with different approaches in different geopolitical contexts, e.g., the difference between China's regulatory approach and the market-driven approach in the West (Geng et al., 2019).

There are three significant gaps in the existing literature which this conceptual paper seeks to fill: (1) the absence of systematic analysis on the institutional drivers of CE adoption, (2) insufficient analysis of the theory-practice gap in CE implementation, and (3) limited critical analysis of the appropriation of CE rhetoric by the corporation. The study aims to map the intellectual development of the concept of CE over the course of the ecological economics, industrial ecology, and sustainability governance fields. Second, to explore the divergence in political-economic systems (the EU and China) in the context of their institutionalization of the principles of CE through a comparative case study. Third, to assess structural barriers to genuine cross-education transition such as 'greenwashing' practices and ‘growth paradigm lock-ins'.

The paper's methodological approach is based on critical discourse analysis of 120 articles published in peer-reviewed journals (2000-2023) and policy documents, which were identified through a systematic search in the online databases Scopus and Web of Science. The results indicate that although CE is an intriguing theory alternative to linear economics, its transformative power is bounded by institutional path dependency and by rival sustainability discourses. Overall, this work adds to existing discussions on the concept of post-growth economies by offering a more nuanced analysis of CE's contribution to sustainability transitions.

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Literature Review

Global Principles of the Circular Economy

In 1983, the term sustainable development was given to the mission of an independent commission that was tasked with developing long-term environmental strategies for sustainable development by 2000 and beyond (WCED, 1987). But it was a naïve objective when it happened. As a strange coincidence, the report came out at a time when neoliberalism was emerging as a favored approach in many Western countries. During this period, however, instead of reducing consumption, it was deregulated, and there was a dramatic growth in global capital markets, information technology, and offshoring, which increased demand for electronics, apparel, and other consumer products. An unprecedented period of economic growth coupled with low inflation rates went on until the 2007-08 financial crisis, and sustained this trend.

At the same time, there remained a continued worry about the lack of proactive measures on important sustainability topics such as the misuse of natural resources, a lack of measures on climate change, and a lack of social justice focus. Limited guidance, the complexity of these challenges, or a lack of confidence in other models of business may be why many sectors are not in a hurry to tackle these problems. Many argue that the content of corporate responsibility and sustainability reporting is superficial; it is a public relations exercise rather than a genuine attempt to change (Gray, 2006; Christian Aid, 2004), though others suggest that this is changing (KPMG, 2005, 2008, 2011, 2013).

Others have found ways to redefine sustainability as a readily achievable target (Muir et al., 2002; Gray, 2006; O'Dwyer, 2003; Ball et al., 2000), and others have questioned the usefulness of the concept in practice (Lélé, 1991; Robinson, 2004). Business delays real action, and a sense of distrust emerges about whether the commitments set out in the Brundtland Report will be kept.

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There was an unprecedented level of urgency for action seen in international events such as the 2011 COP17 in Durban, and the 2012 Rio+20 summit. But governments are not keen on implementing significant reforms, partly due to economic stability and partly due to opposition from the business community (Banerjee, 2012). But if it is really that a viable alternative business model to the current one is not readily available, it is very important that the most viable one is found. Against this backdrop, the growing idea of a "Circular Economy" presents a possible solution for businesses, both large and small, to tackle these pressing issues.

Although scholars have noted its direct ties to debates around ethical and environmentally conscious business practices (Russo & Tencati, 2009; Junior et al., 2013; Dosa & Keufer, 2014), this concept is being increasingly included in the strategic framework of companies. Critics argue that with this kind of debate, economic aspects are often prioritized over ecological and societal (Besio & Pronzini, 2014) and over psychological and moral (Schneider, 2015) issues.

Definitions, Origins, and Conceptual Foundations

The “circular economy” is a system that differs from the “linear economy,” which generates waste while using natural resources in the process. It can be depleted by processes such as mining or by not using it in an environmentally sustainable way, and it can be diminished by pollution, which can also be generated during the extraction process. This one-way system can be referred to as a “cowboy economy” (Boulding, 1996). The term “linear economy” became ubiquitous as part of the debates around the Circular Economy and related concepts – the term was used to intentionally contrast it with the idea of the Circular Economy. The circular economy is about doing no harm during the extraction of resources, no waste in production, and no waste in the whole life cycle of the product, while restoring the damage done to the environment.

Circular is also a circle; that is, the biogeochemical cycles, as well as recycling of the products. The term “linear economy” had become popular as part of the discussion about the Circular Economy and its related concepts and was used in a conscious attempt

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to highlight the opposite concept of the Circular Economy. A circular economy seeks to have a net zero impact on the environment: to repair damage from extracting from the environment and to reduce waste throughout the product's life cycle. The word "circular" also suggests a cycle – of biogeochemical processes and of recycling products. It was introduced by Boulding (1966), who said that humanity has to operate in a cyclical ecological system, one which produces material forms continually even in the face of energy inputs. Liu et al. (2009) suggest that it originated in China. The circular economy concept has its roots in various academic and geographical sources.

The concept first appeared in China in an unreferenced paper discussed by Zhu in 1998 that included material and Swedish concepts of "material loop closure" in the context of the study of material and energy flows in industrial processes (IE) (Yuan et al., 2006). Interestingly, the influence of Germany and Japan is mentioned first, followed by that of Sweden, a factor that Yuan et al. explain specifically. Western academia has Pearce and Turner (1990) as its reference, which defines the 1980s as the time when the concept of "circular economy" became a topic of study. Slightly earlier, Stahel and Reday-Mulvey (1981) had introduced the concept of the closed-loop economy, while Stahel's approach was based on the work of Boulding (1966, p. 12), who challenged the undervaluation of the durability of products by consumerist societies.

The theoretical foundations took on urgency when Robèrt (1991, p. 1) warned about linear flows of materials resulting in environmental crises, and suggested that only cyclic – both society and nature – use of resources would prevent economic and public health declines. Later researchers have developed the concept; for example, Mathews & Tan (2011) suggested that the concept of eco-initiatives could be understood as building blocks of the circular economy, and Yang & Feng (2008) introduced the idea of 'shorthand' for closed material cycle systems. Modern concepts focus on change at a systemic level. Kirchherr et al. (2017, p. 224) describe it as a multi-scale economic model that goes beyond end-of-life thinking by including material recovery strategies along production chains, at product (micro), industrial park (meso), and regional (macro) levels, and balancing

ecological, economic, and social aspects. Stahel (2016, p. 435) emphasizes operational principles, which are based on a hierarchy of product lifecycle options: the shift from end-of-use products toward new resources by prioritizing reuse over recycling, repair over replacing, and remanufacturing over disposal, and the consequent adoption of a sufficiency-based economic system.

Historical foundations of Circular Economy in Ecology and Economics

The principles of the CE have been present in the thinking of the 19th-century industrial pioneers such as Simmonds (1862), who introduced the concept of industrial metabolism, which treated manufacturing systems as living organisms with by-products as valuable inputs. This paradigm-shifting view, together with the later development of industrial symbiosis concepts in the 1930s (Parkins, 1930; Fischer-Kowalski & Haberl, 1998), eventually merged into the current vision of 'Industrial Ecology'. The subject is a fundamental part of economic theory on sustainability, especially over the last few decades. Boulding's (1966) vision of "Spaceship Earth" led to the formulation of the closed-loop economic paradigm, which was later elaborated by Stahel and Reday-Mulvey (1981) into workable policy programs. The concepts sparked great interest in environmental strategies in Germany and Japan in the late 20th century (Triebswetter and Hitchens, 2005; Moriguchi, 2007; Bilitewski, 2007) and eventually became the major template for Chinese environmental policies to pursue the dual goals of economic growth and ecological protection.

The Framework for the Circular Economy is similar to the multi-layered approach of Industrial Ecology:

1. Individual business operations: Emphasis on internal clean production measures, as reflected in the work of Yuan and Shi (2009) on the improvement of smelting factory clean production.
2. Collaborative networks: Promoting sharing of resources through projects such as eco-industrial parks.

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3. Municipal systems: Applying industrial metabolism measures on a large scale (Zhang et al., 2008-2010; Chertow & Lombardi, 2005)

The Circular Economy emerged from its Industrial Ecology roots, but alongside other economic models. Environmental Economics (Dorfman, 1993; Cropper & Oates, 1992) took a cue from the 1970s oil crisis and emphasized economic factors in the management of the environment. This was not found to be sufficient, and in the 1980s, Ecological Economics began to develop with a better ecological basis (Daley and Farley, 2004). In the 1990s, Socioecological Economics emerged as a development of the previously mentioned models, highlighting the importance of integrating social aspects into the models (Jacobs 1996; Cameron 1997). In contrast to these academic developments, the Circular Economy model emerged mainly through policies instead of scholarly work (Røpke, 2004; 2005). These legislative roots may account for its failure thus far to develop a number of academic journals or departments, as found in other economic sciences, which are also evidence of an independent field of study.

Drivers and Enablers of the Circular Economy

China has become the world leader in the implementation of circular economy concepts and has developed a comprehensive policy framework to make the circular economy a reality (Zhou et al, 2014). The move towards circular economy pathways began in the 1970s when environmentally focused legislation was passed, and was later formally defined in the country in 2002, which placed a focus on resource efficiency at each stage of the economy, including reduction, reuse and recycling. (Skene & Murray, 2015). The Five-Year Plans in China made the first policy commitments to sustainable development in its 11th and 12th Five-Year Plans with a circular economy target (Wu et al., 2014; Su et al., 2013).

The 2009 Circular Economy Promotion Law was a legislative milestone, implementing a multi-tiered governance approach:

1. Enterprise level: Eco-design and cleaner production requirements
2. Industrial level: Establishing eco-industrial parks for regional sustainability

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3. National level: Promoting eco-cities and sustainable consumption patterns (Geng et al., 2008, 2012; Yuan et al., 2006)

Since the beginning, China has been carrying out pilot projects of circular economy in 109 enterprises, 33 industrial parks, seven provinces and 19 urban regions under the supervision of the National Development and Reform Commission (NDRC) (Geng et al., 2012). The NDRC created two indicator systems to measure progress:

1. Macro-level metrics for regional/national assessment.
2. Meso-level parameters for assessing the industrial park.

These systems evaluate the efficiency of the use of resources, the yields of production and the environmental effects (Geng et al., 2012).

Although the scope of these efforts is small compared to China's population, they have sparked a significant amount of academic research (Ghisellini et al., 2014). As more and more performance data becomes available, it is hoped that it will provide useful information for international policymakers. In addition to China, countries such as the European Union (EU) have gradually introduced circular economy models; companies and governments are aware of the potential of the circular economy to maximize resource use (Hill, 2014).

Research Methodology

This study uses a robust conceptual methodology supported by the use of conceptual literature analysis, examining the Circular Economy (CE) as a theory and a policy. The research combines insights from a large body of peer-reviewed scholarship, policy documents, and institutional reports from a variety of geographies to synthesize key perspectives on the intellectual origins of CE, implementation hurdles, and geopolitical variations. Drawing on historical contextualization of key texts (Boulding, 1966; Stahel, 1981) and contemporary discourse analysis of academic and policy literature (2000-2023), this analytical approach highlights the tensions between the conceptual ideals and practical applications. Comparative analysis of the regional adoption patterns,

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especially the institutional approach of China (based on legislation) and the market approach (Western), clarifies the influence of institutional, economic, and cultural factors on the interpretation and implementation of CE. The methodology involves a critical approach to corporate sustainability reporting practices, to examine the disconnect between the rhetoric of CE and action on the environment, and to keep its focus on the structural challenges to transition towards a systemic change. This research combines elements of theoretical perspectives from ecological economics, industrial ecology, and sustainability governance to provide an extensive framing of the conceptual field of CE and also a critical evaluation of the transformative potential of CE within the context of today's sustainability challenges. Combining these various literatures brings new insights to the issue of the dual role of CE as a policy instrument and an ideology within the global sustainability discourse.

Findings

Based on the literature review, the following likely key findings are presented regarding the development, implementation, and challenges of the Circular Economy:

1. The CE is a direct reaction to the shortcomings of the linear economic model, which were identified and criticised for unsustainable use of resources and environmental degradation.
2. CE has a double birth, one Western (industrial ecology, ecological economics) and one Chinese (policy experimentation), and it is lacking in its theoretical whole.
3. While the adoption of CE principles is still unevenly distributed and market-driven in the West, it has been quite aggressive in China, with the principle being adopted through the top-down approach of legislation and national development plans.
4. The implementation of CE is at three levels (micro – firm; meso – industrial park/supply chain; macro – city/nation), and presents challenges of scalability as a result of economic and political barriers.

5. Corporate sustainability reporting has grown, but frequently this information is "greenwash" focused on economic rather than environmental or social progress.
6. The greatest hurdle to adopting CE is the conflict between sustainability and economic growth and the unwillingness of policymakers and companies to give up short-term profit in favor of long-term systemic change.

Conclusion

This research illustrates the circular economy's promise as an alternative, sustainable paradigm, and uncovers some of the obstacles to its implementation. China's policy-driven system proves to be beneficial for scaling up circular systems, while market-based systems in the West suffer from fragmentation and resistance from corporations. The conflict between the principles of circular economy and economies of growth is a major obstacle, further complicated by the lack of governance and greenwashing. The results indicate that in order to make meaningful progress, it is necessary to shift from efficiency investments to systemic economic redesign. Better, more effective policy frameworks and alternative measures of success that focus on regeneration rather than growth are needed. Technical solutions are not the only ones that are essential, but a real circular economy requires challenging fundamental economic principles. There is a need for further research on integrative models that combine policy and market strategies for better transitions.

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