



Circular economy as an essentially contested concept

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ABSTRACT

The Circular Economy (CE) is currently a popular notion within the policy and business advocacy groups. Despite being visionary and provocative in its message, the research on the CE concept is emerging. The two intertwined objectives of the paper are; first to identify, discuss and develop the various definitions provided by the emerging literature. Secondly, to suggest an initial research approach with which research on CE can be conducted. Our analysis shows that the existing CE work is mainly done on the practical and technical levels of the actual physical flows of materials and energy in production-consumption systems. The focus of the extant literature is on concrete metrics, tools, instruments and computations. Therefore, the basic assumptions concerning the values, societal structures, cultures, underlying world-views and the paradigmatic potential of CE remain largely unexplored. We argue that CE has already become what Gallie (1955) more than six decades ago termed as an “essentially contested concept” (ECC). The paper further suggests a model for CE research that helps in the categorization, classification and organization of research and investigation on CE. The model can help in limiting the observed unbalance and enhance the contribution of the CE approach to a more sustainable global society.

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1. Introduction

Circular Economy (CE) as an approach to combat environmental challenges and promote sustainable development has recently received increasing attention in the discussions on industrial development. These discussions are primarily led by policy makers such as the European Commission (COM, 2015) and business advocacy bodies such as the Ellen MacArthur Foundation (EMAF, 2015; EMAF, 2013; EMAF, 2012; COM, 2015; COM, 2014). The practitioners view CE as a way to set in motion mechanisms to induce regenerative industrial transformations that will pave the way for achieving sustainable production and consumption. The ambition is that the evolution of CE based industrial production instead of the prevailing linear models will not only have a positive impact on the environment but also contribute to economic growth (COM, 2014; EMAF, 2013; CIRAI, 2015). At the global level some have even suggested that once CE is fully implemented it would result in economic gains exceeding 1000 billion US dollars annually (FICF and McKinsey, 2014). CE as a potential future industrial

paradigm is not only confined to old industrialised nations. For instance, China, as the first country in the world, has already adopted a law for the implementation of the circular economy in 2008 (CIRAI, 2015). Since then, others have followed; The European Union, for example, has created a CE package by extending the earlier waste directive (COM, 2015).

In a policy and a business development context, CE is embraced as an approach simply because it is viewed as an important approach to achieving sustainable environmental and economic development (EMAF, 2015; EMAF, 2013; EMAF, 2012; COM, 2015; COM, 2014). This vision is underpinned by dissatisfaction with the prevailing and traditional linear *extract-produce-use-dump* material and energy flow model of the modern economic system which is problematic in terms of economic, social and environmental sustainability (Frosch and Gallopoulos, 1989). Accordingly, CE is expected to provide the impetus for an economic system with an alternative flow model, one that is cyclical and regenerative (see EMAF, 2015; EMAF, 2013; EMAF, 2012; CIRAI, 2015; Geissdoerfer et al., 2017).

Although the idea of materials cycles has been around since the dawn of industrialization (Desrochers 2002, 2004) it has been given potency by the current day discussions on climate change mitigation and sustainable development. Unlike traditional recycling the

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practical policy and business advocacy orientated CE approach emphasizes product, component and material reuse, remanufacturing, refurbishment, repair, cascading and upgrading as well as the potential of sustainable energy sources such as solar, wind, biomass and waste-derived energy utilization throughout the product value chain using a cradle-to-cradle life cycle approach (EMAF, 2013; Rashid et al., 2013; Mihelcic et al., 2003; Braungart et al., 2007). Subsequently, CE once fully developed will promote high value material cycles instead of recycling only for low value raw materials as in traditional recycling (Ghisellini et al., 2016). Thus, the notion of CE is not only about production but also it aims to develop sustainable consumption alongside sustainable production e.g. by promoting and applying the sharing economy approach (e.g., Naustdalslid, 2017; EMAF, 2013). Groups of consumers share the function and the service provided by the physical product for substituting current individual ownership-based consumption patterns. In such an economy, more value is extracted from the physical resources within the economy.

However, the CE approach has almost exclusively been developed and led by practitioners, i.e., policy-makers and business development agencies such as business consultants, business associations, business foundations etc. (e.g., EMAF, 2013; COM, 2014; CIRAIG, 2015). From a scholarly position, the conceptual discussions on CE are still in their infancy and the literature is only emerging. Consequently, there is a need for deeper analysis of the concept, its units of analysis as well as the theoretical basis that underpins it. In this context, CE might *prima facie* fit what Gallie (1956) in his seminal work called an essentially contested concept (ECC). According to Gallie (1956) a concept becomes essentially contested if there is agreement on the means and goals of a concept but disagreements on how to define it, which units of analyses to use to capture the dynamism, what the conceptual cornerstones are and what methodology of enquiry is appropriate.

In this context, CE shares the characteristics of being an ECC with other concepts such as Corporate Social Responsibility (Okoye, 2009; Choi and Majumdar, 2014), Markets (Rosenbaum, 2000), Ecosystem services (Schröter et al., 2014), resilience of complex adaptive systems (Folke, 2006) or the concept of sustainable development itself (Connelly, 2007). CE and all these other concepts are equipped with positive connotations and noble goals but pose conceptual challenges for researchers. Additionally, the scientific knowledge base of CE remains largely unexplored although the idea dates far back, even to the 18th and 19th centuries (cf. Boulding, 1966; Desrochers 2002, 2004). There are also clear differences and separation between relevant research communities engaged in CE research in addition to the lack of a holistic approach (e.g., Korhonen et al., 2004; Shwom, 2009). For instance, although the natural science and engineering orientated research communities have to a large extent addressed CE using physical materials and energy flow-based models of economic systems, they have not managed to comprehensively connect the knowledge base to business, organizational and management study research communities (Korhonen et al., 2004).

Against this background, this paper has two interdependent research objectives which are motivated by the fact that today the CE concept is, on the one hand, a noble approach to mitigate environmental and economic challenges, while on the other hand, in terms of scientific research, it appears to be vague and needs a critical analysis. The objectives are:

- To analyse the concept of circular economy. We do this by highlighting the extant literature with the goal to identify the main academic bodies of knowledge, definitions and conceptual foundations that lie behind the current policy and business

development discourse. We arrive at a suggestion on how to solve the definition issue of CE.

- Second, we develop a tentative framework to guide research on the CE concept. We will consider the different options for the actual unit of analysis and the different methodological approaches suitable to study them from the perspective of sustainable development. What are the complexities, tradeoffs and problem displacement risks involved with the diverging units of analysis and respective methods of investigation?

Our ambition is not to diminish the goals and the ambitious visions of the CE discourse. Rather, our intention is to highlight the variety of delineations in the literature, address how the concept is currently defined and suggest an initial methodological model on how to conduct CE related research considering the definitional challenges of the concept.

Apart from this introduction, the paper is organized as follows. The next section provides a discussion and analysis of some of the CE literature including the variety of definitions that exist and identifies some of the limitations of these. Through a literature review we identify the focus of existing research about CE and pinpoint elements that help us characterise CE. In section three, we work toward a new definition. After this, we arrive at the conclusion that CE should be understood as an essentially contested concept (ECC). We base this argument on the consideration of CE from the perspective of the seven main properties in Gallie's ECC. Section five constructs an initial model for carrying out research on CE. Finally, conclusions are made and their implications are discussed.

2. CE and its many definitions

The notion of CE is loosely based on a fragmented collection of ideas derived from a variety of scientific disciplines and semi-scientific concepts. In the engineering field, in particular in industrial ecology, CE related research has found a home as a point of departure (Frosch and Gallopoulos, 1989; Lifset and Graedel, 2001; Graedel, 1996). Apart from established research fields e.g. ecological economics, which has a long tradition in recycling and its related issues (Georgescu-Roegen, 1971; Daly, 1996; Ring, 1997; Boulding, 1966; Ayres, 1999), CE also provides a natural point of departure in other research streams. These include industrial ecosystems (Jelinski et al., 1992) and industrial symbioses (Chertow and Ehrenfeld, 2012), cleaner production (Ghisellini et al., 2016; Lieder and Rashid, 2016; Stevenson and Evans, 2004), product-service systems (Tukker, 2015), eco-efficiency (Huppes and Ishikawa, 2009; Haas et al., 2015; Welford, 1998), cradle-to-cradle design (Braungart et al., 2007; McDonough and Braungart, 2002, 2003), biomimicry (Benyus, 2002) resilience of social-ecological systems (Folke, 2006; Crépin et al., 2012), the performance economy (Stahel, 2010; EMAF, 2013), natural capitalism (Hawken et al., 2008), the concept of zero emissions (Pauli, 2010) and others.

2.1. Existing knowledge base

An essential first step of capturing the knowledge base of any field or in our case a concept is to conduct a literature review which identifies not only the conceptual aspects but also major channels of publication. In order to increase our knowledge and respond to the aim of the paper, we conducted a two-part literature review. Part one covered the main academic bodies of knowledge, theories and conceptual foundations that constitute the currently popular Ellen MacArthur Foundation (EMAF) discussion and discourse on CE. The business or policy foundation EMAF has been able to attract interest in business communities, policy communities, and also in

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