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Circular Economy and Bioeconomy: How Are They Related?

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Abstract

Given the consensus on the urgency of environmental issues and growing concern about the scarcity of natural resources, new models related to sustainable development have been proposed. Thus, the general objective of this article is to analyze how two of these concepts that permeate sustainability — Circular Economy and Bioeconomy — have been combined in the scientific literature. It also aims to identify how biorefineries are part of this context. In order to reach the proposed objective, it was decided to use the systematic literature review procedure following the protocol proposed by Cronin, Ryan, and Coughlan (2008), from *Scopus* database. Besides synthesizing knowledge about this subject, the article highlights the characteristics of the studies (temporal distribution of publications, main journals, major themes addressed, authors and their respective countries), as well as methodological aspects, main initiatives and programs, and the actors involved. The results showed that although the first studies date from 2016, the increasing interest of researchers in the subject is evident. The recent initiatives of Circular Economy and Bioeconomy formulated by the European Union in 2012 and 2015 and the United States National Bioeconomy Blueprint are policies guiding the actions of the countries that have published most about these subjects. As for the methods of analysis, there is a domain of the LCA method (Life Cycle Assessment) in the studies that deal with the environmental impacts of the productive processes. From the analysis of the network created by the most recurrent keywords, it was possible to perceive a greater centrality and strength around the term Circular Economy, and the second keyword with the greatest prominence is Bioeconomy, which reinforces the relation of complementarity of the approaches. Finally, studies point to the need for cooperation between the scientific community, private companies, government, and society to establish an effective environmental policy based on the principles of Bioeconomy and Circular Economy.

Keywords: *Circular Economy, Bioeconomy, Biorefinery, Sustainability, Systematic Literature Review*