

Green, circular, and bio economy concepts: obstacles and opportunities for accountability

Abstract

Despite their evidently different assumptions and operationalization strategies, the concepts of Circular Economy, Green Economy and Bioeconomy (CE, GE and BE) are joined by the common ideal to reconcile economic, environmental and social goals (Loiseau et al., 2016). The three concepts are currently mainstreamed in research, policy making and private governance as key sustainability avenues, but a comparative analysis of such concepts is missing. We explored the diversity within and between such concepts using a machine learning algorithm reviewing almost two thousand scientific articles published within the last three decades, coupled with a conceptual analysis.

For what concerns environmental sustainability, GE acts as an ‘umbrella’ concept, including elements from CE and BE concepts (e.g. eco-efficiency; renewables), as well as additional ideas, e.g. nature-based solutions. A subordinate role of CE and BE to GE was also observed by e.g. Loiseau et al. (2016); Ollikainen (2014). In particular, CE and BE are resource-focused, whereas in principle Green Economy acknowledges the underpinning role of all ecological processes. Regarding the social dimension, GE is more inclusive of some aspects at local level (e.g. eco-tourism, education), while there is an emerging discussion in BE literature around local processes in terms of biosecurity and rural policies. When considering weak/strong sustainability visions, all concepts remain limited in questioning economic growth. By comparing the different sustainability strategies promoted by these concepts we do not advocate for their substitutability, but for their clarification and reciprocal integration.

Based on our findings, two main areas of concern for accountability can be signalled. In national and international policy, there are multiple and at times conflicting understandings of CE, GE and BE (e.g. McCormick and Kautto, 2013), while the three concepts are disconnected from each other. Promoting a coherent policy framework and accounting for the effectiveness and efficiency of policy instruments requires clarifying and connecting CE, GE and BE concepts and strategies towards common sustainability goals, without denying their intrinsic diversity. It is also necessary to identify opportunity areas and related societal actors to pursue synergies and minimise conflicts. For instance, CE principles are being introduced in BE strategies (Hetemäki et al., 2017), but there is still a need to formalise the role and impacts of CE and BE on natural capital, biodiversity and ecosystem services (Marchetti et al., 2015; Székács, 2017).

In the private sector, corporate sustainability is increasingly encouraged, but appropriate means to pursue it are often unclear. Corporate sustainability is focused on reduction of energy/material inputs and outputs and the role of renewables, while regulating and cultural processes delivered by ecosystems are less emphasized. The concept of ecological limits is very rarely acknowledged and addressed (Whiteman et al., 2013). The current corporate sustainability agenda is centred in eco-innovations, eco-efficiency and corporate social responsibility practices, which are considered important but insufficient to deliver the holistic changes in long-term sustainability (Bocken et al., 2014). Attention should thus be dedicated to which sustainability concept(s) and related instruments are chosen by companies to align with and pursue concrete improvements in sustainability performance. Corporate reporting and related indicators, for instance, can be an instrument for accountability in this sense.

Keywords

Bioeconomy; Circular economy; Green economy; Sustainability; Machine learning.

References

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