Green, Circular, Bio economy: a comparative analysis of sustainability concepts

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Research relevance

Method

Findings

Conclusions

Explore interactive results!
Research relevance

CE, GE and BE are currently mainstreamed in academia and policy making as sustainability avenues.

Different assumptions and operationalization strategies.

Multiple actors adopt the concepts as the gain political momentum, or as they can legitimise their interests and activities.

A critical comparison would provide important basis to further inform research, industry and policy implementation.
Method

Review of almost 2000 scientific articles from CE, GE and BE literature, using text analysis*.

The software identifies keywords and topic clusters based on words frequencies.

This method allows to perform content analysis on a large amount of text.

*latent Dirichlet allocation (LDA)
Findings

Literature distribution in time

- CE strategy (EC 2015)
- GE report (UNEP 2011)
- BE strategy (EC 2012)
- BE blueprint (USA 2012)
- CE law (China 2008)
Findings

Literature distribution in space

- CE law (China 2008)
- GE strategy (EEA 2013)
- BE blueprint (USA 2012)
- BE strategy (EC 2012)
Findings

**BIOECONOMY**
Biobased energy and material through knowledge and innovation

**CIRCULAR ECONOMY**
Efficiency and recycling in production systems

**GREEN ECONOMY**
Nature-based solutions, conservation

- Murray et al. 2015, Martins 2016
- Pfau et al. 2014, Hausknost et al. 2017
<table>
<thead>
<tr>
<th>Overlaps</th>
<th>Divergences</th>
<th>Shared limits</th>
<th>Synergies</th>
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<tbody>
<tr>
<td>Energy, emissions and natural resources utilization; Eco-efficiency.</td>
<td>CE and BE resource-centred, while GE addresses all natural processes; CE focussed on urbanization and BE on rural development.</td>
<td>Fail to question the growth paradigm; Incomplete in addressing all aspects of sustainability dimensions.</td>
<td>Circular bioeconomy; GE as an umbrella concept.</td>
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Bezama 2016, Vis et al 2016
Conclusions

Great internal diversity of GE and BE.

GE is the most inclusive concept.

The concepts do not question economic growth.

Synergies should be sought to complement the individual concepts.

Text analysis offers new methods to literature review.


EC, 2015. Closing the loop - An EU action plan for the Circular Economy. Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions. COM/2015/0614.


