# TECHNOLOGY STRATEGY FOR A SUSTAINABLE AND CIRCULAR AGRICULTURE: A BIBLIOMETRIC STUDY ON SUSTAINABLE TECH AND BUSINESS STRATEGIES IN AGRICULTURE

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## RELEVANT SPOKE, WP, and TASK:

This research is part of **Spoke 8**: Circular Economy in Agriculture Through Waste Valorization and Recycling, under **Work Package 8.4**: Evaluation and Assessment of New Circular Technologies in Agriculture, specifically contributing to **Task 8.4.1**: Economical, Financial, and Cost/Benefit Measures of the Proposed Technologies.

## INTRODUCTION TO THE RESEARCH

**Abstract**: The shift to sustainable agricultural practices is vital amid rising climate challenges. This study uses bibliometric analysis of Web of Science data to examine the integration of green technologies in agribusiness. Key trends, influential authors, and thematic clusters like biogas, biochar, and low-carbon agriculture are identified. The findings emphasize the crucial role of strategic planning, policy frameworks, and technological innovation in advancing sustainable agricultural development.

**Aim**: This study seeks to clarify the integration of green technologies in agribusiness, a critical yet underexplored area. Using bibliometric tools like R Bibliometrix and VOSviewer, the research maps the academic landscape, identifies key themes, and offers insights to enhance both environmental sustainability and economic viability in agribusiness.

## METHODOLOGY

This study employs a **bibliometric analysis** to explore the integration of green technologies within agribusiness strategies. Data were sourced from the **Web of Science Core Collection**, covering the period from **1990 to 2023**. The search strategy involved the use of **keywords** related to green technologies, sustainable farming, and agribusiness, ensuring a comprehensive capture of relevant literature.

The analysis was conducted using the R package **Bibliometrix**, a tool designed for science mapping and bibliometric analysis. Bibliometrix facilitated the cleaning and preprocessing of the dataset, which included 240 papers authored by over 1,000 scholars and published across 113 academic journals. Additionally, **VOSviewer** was used to construct and visualize bibliometric networks.

Bibliometric tools, particularly **bibliographic coupling** and **keyword co-occurrence analysis**, were employed to map trends and relationships in the field, offering insights into the development and interconnected themes within the research landscape.

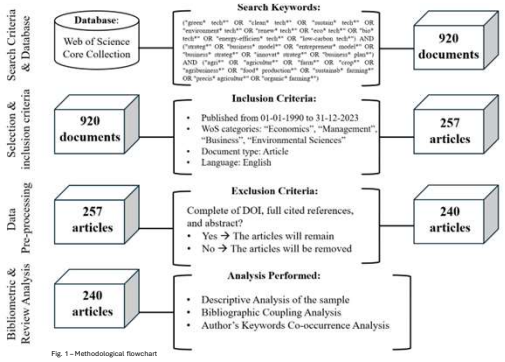


Fig. 1 – Methodological flowchart

## FIRST RESULTS

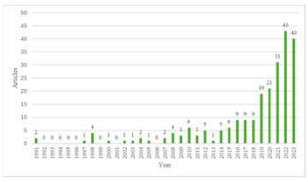


Fig. 2 – Annual Scientific Production

| Journals | Country | Publisher | IF 2022 | Articles |
|---|---|---|---|---|
| Journal of Cleaner Production | NL | Elsevier | 11.1 | 26 |
| Sustainability | CH | MDPI | 3.9 | 25 |
| Science of the Total Environment | NL | Elsevier | 9.8 | 14 |
| Environmental Science and Pollution Research | USA | Springer | 5.8 | 12 |
| Energy Policy | NL | Elsevier | 9.0 | 7 |
| Journal of Environmental Management | NL | Elsevier | 8.7 | 6 |
| Environmental Development and Sustainability | USA | Springer | 4.9 | 4 |
| Fresenius Environmental Bulletin | DEU | Parlar SP | 0.6 | 4 |
| Chemosphere | NL | Elsevier | 8.8 | 3 |
| Environmental Research | NL | Elsevier | 8.3 | 3 |

Fig. 3 – Top 10 Publishing Journals

The results of the study reveal significant trends and patterns in the integration of green technologies within agribusiness strategies. As illustrated in the bar graph in Fig. 2, there has been a **steady increase in annual scientific production**, particularly after 2015, reflecting a growing global focus on sustainable agricultural practices. The analysis of the top 10 journals (Fig. 3) highlights the **interdisciplinary nature of this research**, with leading publications spanning environmental science, business, and technology. The country collaboration map (Fig. 4) shows **extensive international cooperation**, with China, the USA, and India emerging as major contributors. The bibliographic coupling analysis identified six distinct clusters, each representing a significant area of research focus, including **biogas, biochar, biotech remediation, sustainable agriculture transition, low-carbon agriculture, and green strategies**. Finally, the keyword co-occurrence network analysis (Fig. 5) underscores the **interconnectedness** of these topics within the academic discourse, revealing key thematic areas such as **growth**, **strategies**, and **agriculture**.


Fig. 4 – Author's Keywords Co-occurrence Network

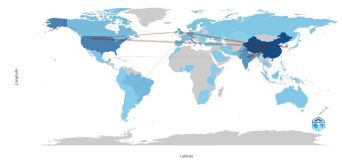

Fig. 5 – Countries' Collaboration Map

## REFERENCES

The complete bibliography is just a scan away:

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