

Boosting Knowledge Valorization of Bioeconomy Research

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Abstract

Despite the increasing number of **bioeconomy-related studies**, effective **knowledge transfer** and **utilization** remain significant challenges. This work explores the **state-of-the-art** in **knowledge valorization**, highlighting key mechanisms – such as **technology transfer**, **intellectual property management**, **stakeholder engagement**, and **policy integration** – alongside common **barriers** and **best practices**. The findings provide **actionable insights** into how **scientific knowledge** can be more efficiently transferred to **industry**, **policymakers**, and **society**, supporting the transition toward a **sustainable** and **circular bioeconomy**.

Introduction

The **bioeconomy** holds immense potential to address pressing global challenges such as **climate change**, **resource scarcity**, and **sustainable development**. However, unlocking its full **societal** and **economic impact** depends not only on **scientific breakthroughs**, but also on how effectively the resulting **knowledge is valorized** – translated into **practical applications**, **policies**, and **innovations**. The **valorization of research knowledge** in the **bioeconomy sector** is crucial for **bridging the gap** between **scientific advancements** and **real-world applications**.

Why is this important?

Many bioeconomy research outputs **fail to reach commercialization** due to fragmented knowledge transfer strategies

Lack of effective valorization mechanisms limits the real-world impact of scientific findings.

Addressing these challenges is **critical for Europe’s transition to a climate-neutral economy** and the achievement of **Green Deal objectives**.

Methodology

The review is based on a **systematic analysis of recent literature** in bioeconomy knowledge valorization. The methodology **includes**:

Literature Screening: Selection of **peer-reviewed articles, reports, and policy documents** published in the last **10 years**.

Thematic Analysis: Categorization of research findings into key themes:

- Knowledge transfer models
- Industry-academia collaboration
- Policy and funding frameworks
- Digital tools for research valorization

Comparative Study: Cross-analysis of successful knowledge valorization cases across different bioeconomy sectors (e.g., agriculture, biotechnology, circular bioeconomy). The analysis provides a **structured overview** of current challenges, trends, and opportunities in knowledge valorization.

Table 1. Sources of Knowledge in the Bioeconomy

Source	Type of Knowledge Generated	Examples of Application
Academic Research	Studies, patents, publications	New materials, biotechnologies, economic models
Private Sector	Technological innovations, internal R&D	Bio-based products, bioenergy, bioplastics
Public Policies	Regulations, strategies	Support for bio-startups, subsidies
Civil Society	Tacit knowledge, best practices	Regenerative agriculture, co-creation models

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Results & Discussion

Knowledge Transfer Mechanisms

- Effective **university-industry partnerships** accelerate knowledge implementation.
- Open innovation platforms and **living labs** facilitate multi-stakeholder collaboration.

Barriers to Knowledge Valorization

- Limited access to **funding for technology transfer** and scaling-up innovations.
- Fragmented **policy frameworks** and lack of harmonized regulations.
- Insufficient training in **entrepreneurial and commercialization skills** for researchers.

Best Practices & Opportunities

- ✓ **Public-private partnerships** have led to successful bioeconomy innovations (e.g., bio-based materials, circular bioproducts).
- ✓ **EU policy support** (e.g., Horizon Europe, Circular Bioeconomy Initiatives) is driving knowledge valorization.
- ✓ **Digitalization and AI** offer new tools for accelerating knowledge transfer and innovation in the bioeconomy.

=> most impactful strategies for improving knowledge valorization and strengthening the link between **research, industry, and policy**.

Table 2. Challenges vs. Solutions for Knowledge Valorization in the Bioeconomy

Challenge	Proposed Solution	Expected Impact
Limited access to open data	Development of a shared knowledge platform	Accelerated innovation and collaboration
Gap between research and industry	Implementation of technology transfer programs	Increased number of bioeconomy startups
Complex regulatory frameworks	Tailored policy support for bio-based innovations	Reduced time-to-market for new technologies
Insufficient funding for scaling-up	Creation of specialized bioeconomy investment funds	Enhanced commercialization of research outputs
Low stakeholder engagement	Strengthening multi-actor co-creation networks	More effective and inclusive innovation models

Conclusions

Key Takeaways:

- Effective knowledge valorization** is essential for a competitive and impactful bioeconomy.
- Bridging the research-industry-policy gap** requires well-structured transfer mechanisms.
- Investment in knowledge transfer infrastructure** (e.g., innovation hubs, digital platforms) is a strategic requirement.
- Stronger policy alignment** and funding frameworks can significantly enhance the impact of bioeconomy research.

Enhancing **knowledge valorization** frameworks enables more effective integration of research outcomes into society, fostering **sustainable economic growth** and **advancing environmental goals**.