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20th International Forum on Knowledge Asset Dynamics

Knowledge Futures: AI, Technology, and the New Business Paradigm

IFKAD 2025
2-4 JULY 2025
NAPLES, ITALY

CALL FOR ABSTRACTS – IFKAD 2025

Special Track n.: 17

Thematic Area: ESG, AI and Organizational Systems

Can the Regenerative Approach Support Manufacturing Industries in Facing Unsustainable Conditions? Building New Business Paradigms on Evidence and Best Practices

Description

The industrialization experienced in the last two centuries has undeniably left a heavy legacy for the planet. Manufacturing industries face increasing pressure to address the environmental and resource constraints posed by their operations (Ferreira, Lopes, Gomes, & Rammal, 2023). In particular, the management of Critical Raw Materials (CRMs), deemed critical for their economic importance to the European manufacturing industry and their high supply risks, has far-reaching implications that extend beyond mere competitiveness and supply disruptions, such as the exacerbation of environmental and for human health risks (European Commission, 2023). Hence, with rising concerns over climate change, resource depletion, and ecosystem vulnerability, traditional manufacturing models are proving unsustainable in the long term. These industries (from aerospace to food ones), often reliant on finite CRMs and energy-intensive processes, must now confront the urgent need for more sustainable practices. In response to these challenges, adopting a regenerative approach is gaining attention as a transformative solution (Gualandris et al., 2023). Unlike conventional methods focused solely on reducing negative impacts, a regenerative approach aims to restore, renew, and revitalize the ecosystems affected by industrial activities (Das & Bocken, 2024). In this vein, the regenerative approaches are driving sustainable innovation strategies at several levels, often interconnected with each other's. At the organizational level, the regenerative approach influences business management, starting from the definition of business strategies and, therefore, business models to processes and operations. Regenerative business models, leveraged on the application of Circular Economy (CE) principles, focus on creating net-positive impacts that benefit all stakeholders, including nature, societies, employees, and investors, through regenerative leadership and co-creative partnerships (Konietzko et al., 2023; Das and Bocken, 2024). Embracing a regenerative approach since business management, imprints the company vision on the promotion of resilience and restoring natural resources, to enhance biodiversity and human health and to improve the ability of manufacturing industries to adapt and flourish in a resource-

constrained environment. By aligning business operations with natural cycles, integrating renewable energy, and promoting practices like industrial symbiosis, biomimicry and upcycling, regenerative processes management contributes positively to the achievement of sustainable development goals (SDGs) (i.e. SDGs 12, 13, 15), further enhancing their adaptability and resilience to external disruptions (de Sousa et al., 2019; Bag & Rahman, 2023; Ali, 2024). Indeed, the regenerative supply chains are recognized as better equipped to handle shocks and maintain operational continuity (Salteh et al., 2024). Therefore, at the supply chain level, extant studies attested regenerative approaches as enablers of closed-loop systems, which reduce the need for new resource extraction (Gaustad et al., 2018; Cimprich et al., 2023) and, in turn, decrease environmental degradation and help conserve biodiversity, acting along the entire supply chain (Wang et al., 2024). Thus, the concept of the regenerative supply chain emerges as a new business paradigm, where supply chains need to be redesigned going beyond a minimal harm approach and following a proactive apporach in order to become regenerative social-ecological systems (de Sousa et al., 2019; Gualandris et al., 2023).

Hence, for manufacturing industries, the transition toward this new business paradigm is not only an opportunity to innovate, create long-term resilience, and drive sustainable growth but also a need to comply with stricter environmental regulations (i.e. EU's Nature Restoration Law (2023), Critical Raw Materials Act (2023)). In this digital age, diverse digital technologies can assist in this transition, improving supply chain collaboration and process integration (Benzidia et al., 2021). Particularly, the integration of advanced technologies such as artificial intelligence (AI) and big data analytics (BDA) can improve the transparency and accuracy of decision-making processes by triggering the development of more informed and data-driven decisions. While AI-driven systems strengthen supply chain resilience by proactively detecting and predicting disruptions and enabling rapid responses to environmental or operational risks (Gallo et al., 2023; Kumari et al., 2023), the implementation of BDA facilitates closed-loop supply chains by enabling resource recovery and recycling, thereby advancing the principles of CE and regenerative business models (Pal, 2023). Therefore, these technologies can support managers in improving sustainability outcomes and adjusting their sustainability initiatives in real time (Bag & Rahman, 2023; Salteh et al., 2024).

While the regenerative approach has demonstrated transformative potential across various applications, significant gaps in the literature remain. First, there is a need to explore the mechanisms through which this transformation unfolds at both the organizational and supply chain levels. Investigating in-depth about the impact of regenerative approaches, on both micro and macro environments, could highlight the direct effects on the economic, social, and environmental sustainability. Additionally, understanding how regenerative practices are implemented, supported by emerging technologies, could allow the assessment of their scalability and integration within existing industrial frameworks. Furthermore, identifying the barriers and risks—whether technological, financial, or regulatory—that industries face when adopting regenerative practices can be of value to ensure broader and more conscious implementation. Finally, there is a need to discover

qualitative, quantitative or mixed methods or tools to evaluate the resilience potential that regenerative approaches can offer to both businesses and ecosystems.

This track aims to explore how industries, governments, practitioners and researchers can collaboratively rethink development and innovation paths through the lens of regenerative approaches, promoting a sustainable and resilient industrial future. By embracing the principles of regenerative design, CE, and sustainable resource management, this track will showcase innovative strategies that not only mitigate CRM-related risks but also actively contribute to the regeneration and resilience of ecosystems.

Therefore, this track welcomes submissions across a broad spectrum of topics, including but not limited to::

- Exploration of risk management strategies and frameworks that help organizations navigate the challenges and uncertainties involved in transitioning to regenerative supply chains;
- Analysis of how regenerative supply chains improve resilience to disruptions, shocks, and external risks, particularly in resource-constrained environments;
- Exploring how regenerative supply chains can reduce dependency on finite resources, enhance material recovery, and secure access to CRMs, minimizing supply disruption risks;
- Empirical research using quantitative methods (e.g., Life Cycle Assessment and Material Flow Analysis) to measure the performance improvements gained through regenerative supply chain strategies;
- Case studies that have successfully transitioned to regenerative supply chain, with measurable environmental, social, and economic benefits;
- Demonstrating how regenerative practices contribute to the achievement of specific SDGs;
- Development of new theoretical models that explain the dynamics, potential outcomes and scalability of adopting regenerative approaches within various industries;
- Refinement of theoretical models that explain and predict the transition from traditional to regenerative, offering frameworks that connect supply chain management with ecological and social systems;
- Examination of how embracing regenerative supply chains can enhance industrial competitiveness by fostering innovation, resource efficiency, and adaptability in global markets;
- Exploration of how policies and regulations, particularly within the European Union, are influencing and accelerating the adoption of regenerative supply chain models;
- Investigating how innovative business models that integrate regenerative principles, shifting from profit-focused to socially and environmentally aligned practices that meet market demands.
- Research identifying the key enabling factors and antecedents that drive successful adoption of regenerative supply chains, including leadership, culture, and technological capabilities;

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- Research on the role and engagement of stakeholders—including governments, NGOs, and local communities—in fostering the adoption and success of regenerative supply chain practices;
- Investigating the role of emerging technologies such as AI and BDA, contributes to transparency, efficiency, and the transition to regenerative supply chains.

Keywords

regenerative approach, sustainable innovation, critical raw material, mitigation strategies

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Special Track details published on IFKAD website ››

Guidelines

Researchers wishing to contribute are invited to submit an **EXTENDED ABSTRACT** (in editable format) of **min 500 and max 1000 words** not later than **31 JANUARY 2025**, using the submission procedure available on the website. The abstract should address theoretical background, research objective, methodology, and results in terms of expected contribution to Knowledge Management theory and practice. Authors are required to follow the guidelines for both extended abstracts as well as full papers available on IFKAD site: www.ifkad.org

Important dates

31 January 2025	*Extended Abstract submission deadline*
24 February 2025	*Acceptance notification to authors*
20 April 2025	*Early-Bird registration cut off*
02 May 2025	*Full paper submission deadline*
31 May 2025	*Registration deadline*
2-4 July 2025	*Conference sessions*

For further information

For any information related to the event, please see the event website at www.ifkad.org or contact the conference manager at info@ifkad.org