

Revitalizing Agri-Food Supply Chain for Sustainability

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Abstract

Agri-food supply chains are complex networks involving production, processing, distribution, retailing, and consumption, and they face growing challenges related to environmental degradation, climate change, resource scarcity, food security, and social responsibility. This study aims to investigate how agri-food supply chains can be revitalized to achieve greater sustainability and contribute to a greener future. The research focuses on four interconnected dimensions: supply chain mapping and logistics optimization, carbon footprint and carbon-credit allocation, climate change risk assessment and mitigation, and the integration of Environmental, Social, and Governance (ESG) considerations. Particular attention is given to the potential role of digital technologies, including Internet of Things, blockchain, and big data analytics, in improving supply chain visibility, sustainability-oriented decision-making, resilience, and resource efficiency. The study will employ a multifaceted research design incorporating an extensive literature review, industry case studies, expert interviews, stakeholder surveys, climate-data analysis, simulation modelling, and quantitative analysis. Supply chain mapping will be used to identify opportunities for transportation optimization, resource efficiency, waste reduction, and emissions reduction, while climate-risk assessment will support the development of feasible mitigation strategies. The research will also examine social and ethical dimensions, including stakeholder inclusion and responsible supply chain practices. The expected outcomes include optimized agri-food supply chain models, a framework for carbon-credit allocation, climate-risk mitigation strategies, and an integrated ESG sustainability framework. The study is expected to contribute to both academic knowledge and practical decision-making for building resilient, environmentally responsible, and socially sustainable agri-food supply chains. ventures operate in increasingly competitive markets where merely satisfying basic customer expectations may not be sufficient to achieve sustainable competitive advantage.

Keywords: Agri food Supply Chain, Supply chain Sustainability, Carbon Footprints Reduction, ESG Practices