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Managing Food Losses in International Supply Chains: A Study of India's Cereals Exports

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Abstract

Amid rising demand for global food security, livelihoods, and sustainable supply chains coupled with frequent trade logistics disruptions, mapping and managing food losses has become a crucial area of research for policymakers and scholars. This study focuses on the stages and causes of food losses in the cereals' international supply chain (ISC) as they hold high nutritional, energy, and dietary significance. It comprehensively accentuates food losses at each logistics stage, i.e., export-country logistics, inter-country logistics, and import-country logistics from an Indian perspective, outlining the movement of exportable cereals from the packaging stage to the final tradable point(s), excluding retail and consumption stages, aligning with the Sustainable Development Goals (SDGs). The study constructs a conceptual framework identifying critical causes in the ISC using the theory of constraints and employs the PLS-SEM approach to model interrelationships between different loss stages. Findings indicate that inter-country logistics is the most impactful loss stage, with the ingress of rainwater leading to mould growth and pest and rodent attacks causing physical damage to cereal shipments. Losses are also visible during the export-country logistics stage due to the inappropriate use of mechanical augers in cargo stuffing and the lack of cargo handling and loading gear. At the same time, the holdups in food certification and import approvals primarily influence losses in import-country logistics. This pioneering research offers insights into the international supply chain of a highly traded commodity from a developing nation's viewpoint, highlighting significant social, economic, and environmental implications for producers, traders, exporters, importers, and consumers.

Keywords: Food Losses; International Supply Chain; Cereals; Logistics; Food Security