

Thesis Title	Operational Risk Assessment Framework for Consumable Ice Manufacturing Industry: A Case Study of Chiang Rai, Thailand
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ABSTRACT

The increasing demand for consumable ice in Thailand has been significantly driven by global warming and the post-COVID-19 economic and social recovery. As a result, Thai consumers are incorporating more ice into their daily beverage consumption, particularly within the food and beverage industry. Despite this rising demand, the number of new ice manufacturing facilities has been steadily declining since 2016, highlighting the existence of operational challenges and industry risks that may hinder future growth.

This study aims to identify, assess, and prioritize the potential risks faced by the consumable ice manufacturing industry. Data was collected through field observations and in-depth interviews with key stakeholders in the production sector. The Failure Mode and Effects Analysis (FMEA) method was applied to evaluate the severity, occurrence, and detection of each identified risk, allowing for a structured ranking of risk factors. Subsequently, the findings from the FMEA were integrated with a Multi-Criteria Decision-Making (MCDM) approach to develop strategic recommendations. These recommendations consider both feasibility and operational impact to ensure practical implementation. The study provides actionable insights to enhance risk management practices and support the sustainable development of the ice manufacturing industry in Thailand.

Keywords: FMEA, MDCM, COVID-19, Risk Assessment