

A Decision Model for Livestock Maritime Transportation: Comparing Specialized Livestock Vessels and Container- Based Systems

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Abstract

Livestock logistics across the Indonesian archipelago faces systemic challenges, particularly in maritime transportation efficiency. This study develops a decision-making model to select optimal livestock transport modes using a multi-criteria approach based on the Analytic Hierarchy Process and weighted scoring analysis. The focus is the strategic Kupang–Surabaya route, one of the main corridors for inter-island livestock distribution. The goal is to evaluate the comparative advantages of conventional cargo vessels versus modular livestock containers, considering cost, animal mortality, facility adequacy, and travel time. Findings reveal that containerized modular systems perform better in terms of animal welfare and operational stability, while conventional cargo vessels retain an advantage in load capacity. The study recommends a reorientation of national livestock maritime policy toward adaptive solutions tailored to the spatial and ecological characteristics of Eastern Indonesia.

Keywords

Maritime livestock transport, specialized vessels, container logistics, animal welfare, multi-criteria analysis, Kupang–Surabaya