ABSTRACT

Distribution is an important element in supply chain management, especially in the cement industry which is characterized by large volume products and widely dispersed demand. PT ABC as the largest construction solution company in Indonesia faces serious challenges due to the oversupply of domestic cement and the increasing burden of distribution costs. This study aims to optimize the cement distribution costs at PT ABC using the Mixed Integer Linear Programming approach in order to achieve the target of reducing distribution costs in 2023. The methodology used in this study is a combination of Distribution Requirement Planning and Mixed Integer Linear Programming. MILP is implemented to optimize the total distribution cost by considering various constraints such as capacity, demand, and delivery routes. The data used comes from observations and historical data of the company in 2022-2023. The results showed that in seven distributors in the East Java region, The cost was successfully reduced from Rp523,913,639 to Rp400,372,988, exceeding the target of Rp408,199,033 or the target reduction from 10.01% to 7.93%. This model proves the effectiveness of the mathematical approach in developing an efficient distribution network. In addition, this model has the potential to be applied more broadly to other distribution areas to support cost efficiency and improve company competitiveness. This research contributes in the form of mathematical optimization-based strategic solutions that can help PT ABC in making more efficient, adaptive, and integrated distribution decisions. The implications also include the importance of developing a real-time monitoring system and integrating digital distribution management in the face of competitive market dynamics.

Keywords: Distribution Network, Cost Optimization, Supply-Demand Reparation, MILP, DRP.