CONTAINER SHIPPING OPTIMIZATION MODEL WITH HUB-AND-SPOKE SYSTEM TO DETERMINE TIME TO ACHIEVE MAXIMUM CAPACITY OF NEW SORONG PORT

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ABSTRACT

In the globalization era, logistics plays an important role in the growth and development of world trade. In terms of logistics costs, eastern part of Indonesia has the highest logistics costs by 50% -60% over the western part of Indonesia (eg Sumatra) and the central part of Indonesia that is only 30% (eg Bali and Makassar). To reduce the cost of ocean freight logistics in the eastern part of Indonesia, PT. Pelindo will undertake the construction of three International Hub Port, named Kalibaru Port, Port of Tanjung Anchors Batam, and the Port of New Sorong. New Sorong port will have a capacity up to 500,000 TEUs for the next 20 years, from the beginning capacity of Sorong Port is 25,000 TEUs.

Optimization model created using transportation models with integer programming to determine the optimal allocation of container shipments of commodity-producing region to the feeders port and feeder ports to the collection ports. The result of forecasting the amount of commodity production of coffee, cocoa, and palm oil in the container unit using a linear regression method and the addition of oil palm production from projected results MIFEE (Merauke Intergrated Food and Energy Estate) is used as input. Based on the results of these calculations, the total number of containers that will be shipped according to the scenario projected utilization of Sorong Port and the Port of New Sorong. So that it can be seen towards the development of container port capacity and their collection every year, because there will be a gradual decline in Sorong Port and gradual increase in the Port of New Sorong. New Sorong Port will be able to accommodate up to a maximum of container from Papua in 2024. According to these results will be used as a suggestion to the manager in making policy regarding the process of adding capacity and with establishment of related facilities. It is also conducted a sensitivity analysis on the delivery of distance factor and port capacity to determine its effect on the results of the allocation of shipping containers. From the two factors, the capacity of the port is a factor that is sensitive to the results of the allocation of container shipping.

Key word: Optimization Models, Port of Sorong, Forecasting, Container, Hub-and-spoke System.