

Evaluation of hub-spoke airport networks in Sumatra island, Indonesia to increase efficiency of air transportation

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First Author	Sugiyanto, Gito; Santosa, Purwanto Bekt; Jajang;
Last Author	Santi, Mina Yumei
Authors	Sugiyanto, G; Santosa, PB; Jajang; Fadli, A; Santi, MY;
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Abstract	Kualanamu International Airport is the busiest airport in Sumatra. In 2015, it served 8 million passengers and 41.6 thousand tons of goods for international and domestic flights. Hub-spoke networks are optimized when generally having a transport efficiency of at least 49-52% as well as providing air service in a wide geographic area and to many destinations. The aim of this study is to analyse the hub-spoke airport networks based on the Herfindahl-Hirschmann Index (HHI) to increase air transport efficiency in Sumatra Island. This study uses data from cargo production and couple's flights from 10 airports in Sumatra Island for domestic flight route pairs and 6 airports for international flight route pairs. The results of the study show that route networks in Sumatra Island in existing conditions have not developed with the hub-spokes concept. The HHI analysis, indicates 2 hubs for domestic flights and 1 hub (Kualanamu) for international flights. Kualanamu International Airport and Hang Nadim International Airport were indicated as hub airports in Sumatra Island for domestic flights. The efficiency of air cargo transportation through the system (2 hubs and 8 spokes) results in a transport efficiency at 68.37%, which is still far above the efficient range at 49-52%.
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Author	Prof. Dr. Ir. GITO SUGIYANTO, S.T, M.T., IPM.,ASEAN Eng