

# **Monte Carlo Simulation of Forest Ecosystem Service Use in Aviation-related Industries by Ecological Footprint Based Scheme**

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Aviation related industries have large impact to natural ecosystems through carbon dioxide, sulfur/nitrogen emission in fuel consumption process and dependence to natural ecosystems by using biomass resources and water intake in their business operation. In order to design a sustainability model for aviation related industries such as air transportation and operation of airport, we develop a project ([http://www.dfeia.or.jp/lab1/project\\_sustainability/](http://www.dfeia.or.jp/lab1/project_sustainability/)). In this study, we show a case study of conducting monte carlo simulation about forest Ecosystem Service Use (ESU) evaluation in aviation related industries by using Ecological Footprint (EF) concept. Aviation related industries are composed of airplane machinery, travel and cargo transportation, air traffic control, airport maintenance activities and airport business operations. As a result, interlinkage between forest ecosystems and aviation related industries from 2010 to 2050 were simulated by monte carlo method. This result will provide the quantitative balance of ESU and forest treatment and implications to technology development strategy of aviation related industries in order to support decision making about their planning of ecosystems recovery for biodiversity conservation and sustainable ecosystem service use through supply chain network.

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