

# A Study on Island Ecotourism Development Models Based on System Dynamics: A Case Study of Amami-Oshima Island

Yining Wang<sup>1</sup> and Aiko Endo<sup>2\*</sup>

<sup>1</sup>Graduate School of Fisheries and Environmental Sciences, Nagasaki University, 1-14 Bunkyo-Machi,  
Nagasaki 852-8521, Japan

<sup>2</sup>Graduate School of Integrated Science and Technology, Nagasaki University, 1-14 Bunkyo-Machi,  
Nagasaki 852-8521, Japan

## ABSTRACT

Sustainable island tourism development refers to tailoring tourism to the specific conditions of an island, ensuring that tourism activities remain within reasonable environmental capacity while promoting coordinated development economic, environmental, and social benefits. However, the fragility of the ecological environment, and the uniqueness of economic and social development conditions limit the sustainable development of island tourism. Research topics on the sustainable development of island tourism have gradually shifted towards the direction of ecotourism. Firstly, this study establishes a comprehensive evaluation index system for island ecotourism, using Amami-Oshima Island as a case study, encompassing the environmental, economic, social, and other-sector tourism aspects. The Coupling Coordination Degree Model is applied, utilizing data from Amami-Oshima Island from 2010 to 2021, to conduct quantitative analysis of the current status of island ecotourism coupling coordination development. The findings reveal: (1) From 2010 to 2021, Amami-Oshima Island exhibited an overall growth in the comprehensive development of ecotourism, with the environment-tourism subsystem showing the most significant development, the social-tourism subsystem displaying fluctuating growth, and the economic and other tourism sectors consistently progressing. (2) The coupling degree and coordination level of Amami-Oshima Island ecotourism showed an overall upward trend, evolving from minimal to intermediate coordination. Secondly, this study introduces a System Dynamics model to analyze the causal feedback relationships and construct system flow diagrams for the ecotourism operation mechanism on Amami-Oshima Island. Aiming to provide robust support for formulating scientifically sound development strategies. Finally, the research outcomes have profound implications for assessing the current state and future directions of ecotourism on Amami-Oshima Island, and provide insightful policy suggestions for promoting ecotourism on other islands.

**Keyword:** Island-destination development/ Ecotourism/ Coupling coordination degree/ System dynamics

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\*Corresponding Author: Aiko Endo  
E-mail address: endoa@nagasaki-u.ac.jp