

MAPPING THE EVOLUTION OF TOURIST CLUSTERS: A DYNAMIC MODULARITY APPROACH IN MULTI-DESTINATION TRAVEL ANALYSIS

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Abstract

Understanding evolving tourist movement patterns is essential in multi-destination areas like Bali, where diverse attractions cater to a wide range of preferences. Traditional static analyses of tourism networks miss temporal shifts that reveal deeper trends in tourist behavior. Dynamic clustering is critical, especially in response to disruptions like the COVID-19 pandemic, which reshaped travel preferences globally. This study applies a dynamic modularity approach to map the evolution of Bali's tourism clusters from 2019 to 2024, addressing the need for adaptive tourism management. The analysis shows Bali's tourism network transitioned from a stable two-cluster structure in 2019 to fragmented clusters in 2020 due to pandemic restrictions, with domestic tourism dominance by 2021. As international tourists returned in 2022, Bali's network diversified into four distinct clusters, achieving maximum diversification by 2024. This shift illustrates Bali's resilience and adaptive recovery. Each year's network structure highlighted shifts in tourist demographics and preferences, with clusters showing balanced interest in nature, culture, recreation, and wellness. Dynamic clustering exposed Bali's capacity to adjust from a domestic-focused network to a diverse international tourism hub as conditions stabilized. This study emphasizes the importance of dynamic clustering in revealing evolving tourism trends, enabling Bali's tourism managers to create responsive strategies that cater to diverse tourist needs. These insights support sustainable tourism growth, ensuring Bali's competitiveness in a shifting global landscape.

Keywords: Dynamic Modularity, Destination Clusters, Multi-Destination Tourism, Network Analysis
