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“Reconcile land system changes
with planetary health”

Resilient agricultural trade and land system sustainability: A comparative advantage analysis of Iranian pistachios and dates

MOJTABA NIKZAD¹, EVA GERHARZ²

¹*Hochschule Fulda (Fulda University of Applied Sciences), Dept. of Social and Cultural Sciences, Germany*

²*Hochschule Fulda (Fulda University of Applied Sciences), Social and Cultural Sciences, Germany*

Abstract

Sustainable agricultural trade plays a crucial role in shaping resilient food systems and ensuring the long-term viability of land-use strategies. Iran's economic diversification strategy has increasingly emphasised non-oil exports, with pistachios and dates being among the most significant contributors to the country's agricultural trade portfolio. This study examines the comparative advantage of these commodities in the context of sustainable land-use systems and planetary health, integrating trade dynamics with ecological and economic sustainability considerations. Using the Revealed Comparative Advantage (RCA) index, we analyse the export performance of pistachios and dates from 1970 to 2023, highlighting structural changes and competitiveness trends. Despite Iran's traditional comparative advantage in these sectors, our findings reveal a declining RCA trend, suggesting vulnerabilities in maintaining export competitiveness. To further investigate the determinants influencing these trends, we employ a Vector Error Correction Model (VECM) and time-series econometric techniques, identifying key factors such as exchange rate volatility, international price fluctuations, resource constraints, and environmental pressures affecting long-term trade performance. The study underscores the critical need for integrated policies that align agricultural trade with sustainable land management, emphasising the role of climate-resilient production systems, agro-ecological approaches, and efficient resource allocation. We propose policy interventions aimed at stabilising trade performance through enhanced market mechanisms, investment in sustainable production technologies, and adaptive governance structures. Addressing supply chain vulnerabilities and improving land and water management strategies will be essential to ensuring the resilience of Iran's pistachio and date industries within global agricultural trade networks. Our research provides valuable insights into sustainable land-use transitions and food system resilience by integrating economic, environmental, and policy perspectives. This study offers pathways to foster sustainable agricultural trade while safeguarding ecological integrity and enhancing rural livelihoods.

Keywords: Comparative advantage, pistachios and dates, resilient agricultural trade, sustainable land-use, vector error correction model