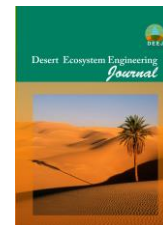




University of Kashan

Desert Ecosystem Engineering Journal

Journal homepage: <http://deej.kashanu.ac.ir>

Analysis of Institutional Power in the Governance Network of Desert Regions: An Application of Social Network Analysis

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Received: 07/05/2025

Accepted: 02/08/2025

Extended Abstract

Introduction: The governance of desert and arid regions, such as southeastern Iran, faces complex challenges for sustainable development and resource management. These regions are defined by scarce water, fragile ecosystems, and intricate socio-economic dynamics, all of which underscore the need to understand stakeholder interactions. The urgency for effective governance is heightened by factors like climate change, population growth, and the need for equitable resource allocation. Analyzing the power structures and interaction patterns among organizations is crucial for successful development initiatives, as traditional hierarchical governance models are often insufficient. Social Network Analysis (SNA) provides a valuable framework for examining the relational dynamics and power distribution within these systems. This study uses an SNA approach to investigate the institutional power structure and interactions among governmental and non-governmental organizations in Taftan county, a developing desert region of southeastern Iran. The primary goal is to analyze how these interaction patterns and power distributions evolved after the implementation of the Development and Advancement Plan of Rural Constellations. The findings will provide practical insights for future development strategies in similar contexts.

Materials and Methods: This study strategically employed Social Network Analysis (SNA) to map and analyze relationships among key organizations involved in rural development in Taftan County, a desert and arid region. The research focused on the rural development governance network of Taftan County. The network's boundaries were defined to include all organizational institutions directly involved in rural development, with a specific focus on those influenced by a recent development plan. A purposive sampling strategy, supplemented by snowball sampling, was used to identify and include a comprehensive list of stakeholders. This process involved: Reviewing project-related documents, conducting interviews with experts, Examining the county's broader organizational landscape. Data were collected using specialized SNA questionnaires administered to organizational representatives. The questionnaires were designed to capture the existence, nature, and intensity of interactions both before and after the implementation of the development plan. Interactions were categorized by type, including collaboration, information exchange, participation, service provision, and resource support, and were often measured using Likert scales. Collected data were structured into adjacency matrices, which were then processed using UCINET 6 software. The software was used to calculate key network metrics, with a specific focus on micro-level centrality measures such as degree, betweenness, and closeness. These metrics were analyzed to understand shifts in power dynamics and relational patterns that resulted from the development intervention. Network structures were visually represented using NetDraw software.

Results and Discussion: The network analysis revealed distinct interaction and power distribution patterns in Taftan County both before and after the Development and Advancement Plan of Rural Constellations. Before the plan, the network displayed a hierarchical structure centered on traditional government bodies. The Agricultural

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Jihad Organization had a high out-degree centrality, positioning it as a primary source of information dissemination. The Governorate exhibited high in-degree centrality, reflecting its central role as a key coordinator. The Governorate and the Technical and Vocational Training Center both had relatively high betweenness centrality, indicating their important intermediary roles in connecting different parts of the network. Conversely, organizations such as the Industry, Mining, and Trade Organization and the Electricity Distribution Management had lower closeness centrality, suggesting they were more distant from the network's core. Following the plan's implementation, the network's structure showed significant changes. While the Agricultural Jihad Organization and the Governorate maintained their central positions, new actors gained prominence. The Hope Entrepreneurship Fund and the Cultural Heritage Organization saw a notable increase in both betweenness and closeness centrality. This shift suggests that these organizations strengthened their brokerage roles and gained improved access to the network's resources and information. This change likely reflects the development plan's strategic focus on economic empowerment and cultural tourism. The findings indicate a clear redistribution of institutional power within the governance network. Organizations whose objectives were aligned with the new development plan's priorities, particularly in entrepreneurship and cultural heritage, gained increased prominence. This supports existing research on the dynamic nature of power in governance networks and highlights how targeted development interventions can successfully reshape stakeholder influence and collaboration.

Conclusion: This research successfully utilized Social Network Analysis (SNA) to examine the changes in the institutional power structure within Taftan County's governance network following the implementation of the Development and Advancement Plan of Rural Constellations. The findings confirm that the plan led to a notable shift in interaction patterns and power distribution among organizational stakeholders. While traditional authorities, such as the Agricultural Jihad Organization and the Governorate, maintained their central roles, other organizations gained significant prominence. Specifically, the Hope Entrepreneurship Fund and the Cultural Heritage Organization exhibited increased betweenness and closeness centrality. This suggests they have developed stronger intermediary roles and improved their access to resources and information within the network. This redistribution of power highlights how a strategic development plan can effectively realign a governance network to support its key objectives. The study underscores the value of SNA as a robust methodology for understanding the dynamic nature of governance networks and for evaluating the impact of development interventions in arid regions. For future research, it would be beneficial to explore the qualitative aspects of these new interactions and to assess the long-term sustainability of the observed network changes.

Keywords: Rural Development, Taftan County, Development and Advancement Plan, Dynamics and Power Assessment, Institutional Governance.