



Role of Small Towns in Rural Development Using Concentration Index and Location Quotient (LQ) (Case Study: Roudbar)

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Abstract

Today, inequality and spatial imbalances between rural and urban areas are mainly discussed by regional planners. To achieve balance and reduce inequalities in rural areas, it is essential to highlight the role of small towns. This paper employs a descriptive-analytical methodology using quantitative methods and models, such as the location quotient (LQ) and concentration index, to analyze the functions of towns existing in Roudbar County. The purpose of this study is to explain the relationship between the function of urban areas in providing services to rural areas, rank the provided services, and determine the development of villages. The LQ of Roudbar County is >1 for agriculture, industry, and the export of manufactured products, while <1 for services, indicating a dependence on other towns. Based on the concentration index, the levels of villages in Lowshan, Manjil, Rostamabad, and Bareh Sar are regular, while the villages in Jirandeh and Tutkabon are irregular. In addition to administrative and political relationships that result in the dependence of villages on cities, the people of these towns are referred to other towns in the county for economic, social, and cultural relations.

Keywords:

Small towns, urban function, rural development, location quotient (LQ), concentration index, Roudbar County

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INTRODUCTION

Inequality and the neglect of villages in the area result in weakness and the rapid deterioration of settlements, leading to spatial imbalances, and a one-way flow of services, capital, information, and population to urban areas. To address this issue and promote balance and development in rural areas, the establishment and development of small towns by upgrading larger villages could partially enhance the quality of life in rural areas and curb migration to larger cities. Cities and villages are socially, economically, and environmentally interdependent; therefore, disregarding spatial considerations at the local and regional levels and neglecting the urban and rural systems can lead to inconsistencies in settlements.

Rural development holds significant importance due to its impact on economic growth and social security. Counties with poor rural development experience uneven economic growth, an inappropriate economic structure, regional imbalances, and a lack of infrastructure services. These factors contribute to unemployment and increased migration of villagers to cities, resulting in social and economic challenges. One of the most crucial solutions to this problem is the improvement of small towns to provide better urban services to rural settlements. This, in turn, can stimulate rural development, mitigate excessive migration, stabilize the population, establish spatial balance, and enhance service provision and employment opportunities in the villages surrounding Roudbar County.

The diversity of rural settlements in Roudbar County, within the framework of unequal interactions between urban and rural areas, has resulted in an incoherent and disrupted network of rural settlements. These circumstances necessitate a transformation in the settlements of Roudbar County. To attain spatial equilibrium between rural settlements and small towns, it is crucial to scrutinize the functioning of cities in contrast to rural areas.

Literature review

The idea and subject of the role of small

urban areas at regional and local levels can be traced back to Johnson (1970). The discussion on rural development gained prominence with the work of Funnel (1976), marking a relatively recent topic in the field of regional development (Barean, 2009). Notably, Dennis Rondinelli and Ruddle (1978) significantly contributed to this discourse with their extensive exploration in "Urban Functions in Rural Development" (Baresky, 2009).

Hansen (1980) conducted several studies on small towns, emphasizing their importance in achieving growth, justice, and public welfare in the Third World. According to Hansen, small and middle towns play a pivotal role in linking economic growth, justice, and public welfare (Mohamadzadeh-Titkanloo, 2002).

In the context of South American small towns, Kamanda's research revealed that the development and improvement of small towns have resulted in employment opportunities, decentralization, increased investments, and reduced regional disparities. Small towns are viewed as ideal places for settlement development, attracting rural migrants to engage in various industrial and service activities while deterring their migration to larger cities (Kamanda, 2007).

When evaluating the role of small towns in the national development of Africa, it was concluded that these small towns function as central hubs in rural areas, driving development in these regions. Umo (1983), while studying small and middle towns as a development strategy in the Third World, emphasized the importance of a logical settlement system and their improvement in fostering rural development (Umo, 1983).

Hardoy and Satterthwaite (1986) emphasized the multifaceted role of small towns in the Third World, serving as political and administrative hubs, service centers, and managerial focal points in rural areas (Hardoy & Satterthwaite, 1986).

In Iran, small towns were recognized as pivotal elements for achieving environmental balance within rural populations through the Scetiran project (1977). Following the Islamic

Revolution in Iran, the second to fifth development plans actively supported small towns, with a strong emphasis on curbing excessive development in major cities (Zebardast, 2003). Nasiri (2009) investigated the impact of small towns on spatial organization, with a particular focus on Boomehen, one of the cities surrounding Tehran. This study assessed the evolution of Boomehen in the years before and after its promotion. Nasiri examined factors such as population growth, employment opportunities, and the provision of services in Boomehen and its influence on the surrounding rural areas. The findings indicated that Boomehen effectively maintained its population and provided employment opportunities and services to the neighboring rural areas (Nasiri, 2009). Ebrahim-Zadeh et al. (2012) conducted a functional analysis of the economic role of small towns in rural development in Zahed Shahr, Shibkaveh, and Fasa. The results highlighted that Zahed Shahr had the potential to serve as a significant provider of administrative, educational, and commercial services, acting as a market for surplus agricultural products. Furthermore, the development of Zahed Shahr was closely tied to the social and economic conditions of its surroundings. The presence of a stable rural population and agricultural production strongly influenced the surrounding areas, thanks to the efficient services offered by these small towns. The development of these small towns contributed to reduced reliance on decentralized urban functions and an increased emphasis on the development of villages through the integration of non-agricultural activities (Ebrahim-Zadeh et al., 2012).

In a study on the role of urban areas in balancing and developing rural regions, Shakoor and Shamsi-Abadi (2012) concluded that despite its expanded spatial functioning domain, Masiri, founded in 1997, failed to become a dynamic city in the area. Despite an increase in population due to immigration, the city struggled to retain its rural population. Moreover, it had a limited impact on dis-

tributing services to the surrounding areas and addressing unemployment in the region. Ultimately, Masiri fell short in achieving spatial balance and promoting development in the neighboring villages (Shakoor and Shamsi-Abadi, 2012).

Neoclassic theory and regional development

Neoclassical economists argue that regional development is influenced by factors such as a balanced structure and displacement. Over the long term, this equilibrium facilitates the unhindered movement of resources within a country. In such conditions, capital and resources are relocated from regions with higher costs to regions with lower costs (Ghanbari and Hoseynzade, 2006).

New Keynesian theory (economic basis)

Neo-Keynesians argue that regional development is reliant on exports. Consequently, an increase in external demand leads to economic growth in the primary sectors. This growth, driven by increased external demand for essential goods and services, results in higher income and employment not only in the primary sectors but also in the non-primary sectors (Ziyari, 1999). However, a notable weakness of this theory is its limited focus on the concept of development and its exclusive emphasis on the economy and equitable distribution, with less consideration given to mass participation and the environmental and resource impacts of growth (Sarafi, 2000).

Small towns play a crucial role in fostering economic development in rural areas, particularly in the following domains:

Agricultural development: Small towns serve as vital conduits for agricultural development by facilitating the transportation of agricultural products from farms to final markets. Cities are heavily reliant on agricultural production for their own growth and sustainability. Moreover, the economies of small towns depend on agricultural production activities to generate employment (Rondinelli, 1983).

Small towns play a crucial role in bolstering the growth of agricultural production and rural income in two primary ways. Firstly, they serve as central hubs for the collection and marketing of agricultural products, which is their more visible role. Secondly, they are responsible for the distribution of inputs required by the agricultural sector, although this role is partial in comparison (Evans, 1992).

Rondinelli emphasizes the significance of market towns and small towns as pivotal markets for agricultural products, as well as sources for commercial and agricultural inputs, and providers of agricultural employment. The economic and physical connections that exist between rural and urban areas, as well as between small and large cities within a region, play a crucial role in facilitating dynamic relationships that contribute to regional economic growth and equitable income distribution.

Generally, services and rural development are channeled through cities. Cities are central to unity and stability, serving as the breeding ground for development and innovation, which subsequently radiate out to rural areas. Consequently, theorists are keenly interested in methods to achieve spatial balance between settlements, particularly small towns, which act as intermediaries between urban and rural areas.

Geography of Roudbar county

Roudbar County is situated in the southern part of Guilan province in Iran. The county shares its borders with several neighboring regions: it is bordered to the north by Rasht County, to the south by Qazvin Province, to the northwest by Shaft County, to the west by Zanzan Province, and to the east by Siahkal County.

Covering an area of approximately 2,517 square kilometers (Statistical Yearbook of Gilan, 2010), Roudbar County extends from a latitude of 36°33' to 37°07' in the north and from a longitude of 49°11' to 50°05' in the east.

Roudbar is a mountainous county located along the shoreline of the Sefidrood River in the southern part of Guilan Province. It is noteworthy that Roudbar is the highest county within the province. The local climate is influenced by both the arid and semiarid conditions of the central region and the Mediterranean climate. The Sefidrood River, the primary river in Guilan Province, flows through Roudbar County. This river originates in the Chehelcheshme Mountains of Kurdistan, known as Qezel Ozan, and after traversing through Kurdistan and Zanzan provinces, it enters Guilan Province. Within the province, the river crosses the Manjil valley and the city of Roudbar before reaching the Sefidrood Delta and eventually emptying into the Caspian Sea. The elevations in Roudbar County vary widely, ranging from 50 meters to 2,703 meters above sea level. The town of Roudbar itself is situated at an elevation of approximately 250 meters above sea level.

Based on data obtained from the Manjil synoptic station, the temperature in Roudbar County was recorded over the period from 1993 to 2003. The maximum temperature occurred in August, reaching 29.9°C, while the minimum temperature was recorded in December at 3.22°C. Rainfall in the region exhibits fluctuations throughout the year, with the highest precipitation levels occurring in November (37.8mm) and the lowest in August (0.7mm).

According to the General Census of Population and Housing conducted in 2011, Roudbar County is divided into 4 districts, comprising 7 cities, 10 rural districts, and 205 villages, including 164 inhabited villages and 41 unoccupied ones. As of the 2011 census, the population of Roudbar County stood at 100,943 people residing in 30,350 households. This population accounts for approximately 4.07 percent of the total population of Guilan Province. It's worth noting that a comparison between the 2011 and 2006 censuses reveals a negative growth trend in the population of Roudbar County.

Data

This paper employs a descriptive-analytic methodology, which incorporates field data collection, document analysis, and library research. The primary focus of this research is to describe and analyze key variables, including the geographical aspects and functions of cities, as well as the relationships between urban and rural areas. The study also investigates the impacts and functions of urban areas on the economic, social, and physical development of villages.

RESULTS

Roudbar, Manjil, Lowshan, and Rostamabad have the potential to significantly enhance prosperity and boost the level of development in the surrounding villages. This is primarily due to their strategic location along the main Rasht-Qazvin road and their rich history of civilization. Conversely, Tutkabon faces challenges in achieving substantial progress in uplifting the surrounding villages. This limitation can be attributed to its proximity to Rostamabad, which serves as an economic and service hub in the Rahmatabad and Blukat Districts. In the case of Jirandeh, its effectiveness in promoting prosperity and increasing the level of development in rural areas has been hindered by several factors, including the dispersion of villages and unfavorable natural conditions in the region.

Based on the concentration index and the results presented in Table 2, a city is categorized into 5 groups based on the extent to which it utilizes infrastructural and super-structural facilities. The highest level of rural facilities is associated with the first category, while the lowest is linked to the fifth category. Each category is defined by a factor calculated using the concentration index. The table's first column displays levels 1 through 5 from top to bottom. The second column presents the index for each category. The third column enumerates the number of villages equipped with facilities within each category. The fourth column specifies the percentage of these villages. Lastly, the last

column lists the number of inhabitants with access to facilities within that category. In this table, a higher number of villages falling into categories 1, 2, and 3 indicates a higher rank for cities in terms of their level of development.

Based on calculations conducted for Roudbar County, it was determined that Roudbar, Manjil, Lowshan, and Rostamabad exhibit a logical hierarchy among their rural settlements. This hierarchy is consistent in Roudbar and Rostamabad, evident in Lowshan and Manjil with higher central indexes, and no villages fall within the lower indexes.

However, Bareh Sar, Jirandeh, and Tutkabon exhibit irregularities in their settlement hierarchies. In Jirandeh, 86 percent of the villages are categorized into levels 4 and 5, indicating an irregular settlement hierarchy. In Tutkabon, 75 percent of the villages are classified as level 4, with no villages falling into levels 5 and 3, signifying an irregular settlement hierarchy. In Bareh Sar, 76.5 percent of the villages are situated in levels 4 and 5, while one and two villages are found in levels 1, 2, and 3, respectively, further highlighting the irregularity in the hierarchy of settlements.

LQ calculations for Roudbar County yield the following results: In the case of agricultural LQ, some cities exhibit values greater than 1 in comparison to the number of workers in the county. Consequently, Roudbar County is considered an exporter of agricultural products, with agriculture serving as a fundamental economic activity within the county. Furthermore, the economies of three cities, namely Jirandeh, Tutkabon, and Bareh Sar, heavily rely on agriculture, making them exporters of agricultural products to other areas. In contrast, Rostamabad and Roudbar engage in lower degrees of agricultural export, while Lowshan and Manjil have a relatively weak presence in agriculture and consequently import these products.

For industrial LQ, values exceeding 1 are observed in Lowshan, Jirandeh, and Bareh Sar, indicating that they export surplus industrial products and consider industrial activity

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Table 1

Level of Services Provided for Villages of Roudbar County based on the Concentration Index.

County	Level	Con. Index	Village	Percentage	Mean population
Roudbar	1	185.94 and above	1	10	551
	2	139.52-185.96	2	20	1419.5
	3	93-139.52	1	10	1314
	4	46.44-93	2	20	91.5
	5	46.44 and less	4	40	83.75
Manjil	1	185.94 and above	2	100	600
	2	139.52-185.96	0	0	0
	3	93-139.52	0	0	0
	4	46.44-93	0	0	0
	5	46.44 and less	0	0	0
Lowshan	1	185.94 and above	2	40	450
	2	139.52-185.96	2	40	288
	3	93-139.52	1	20	36
	4	46.44-93	0	0	0
	5	46.44 and less	0	0	0
Rostamabad	1	185.94 and above	2	18.2	662
	2	139.52-185.96	1	9.1	214
	3	93-139.52	2	19.2	239.5
	4	46.44-93	5	45.5	488
	5	46.44 and less	1	9.1	84
Jirandeh	1	185.94 and above	1	6.7	630
	2	139.52-185.96	0	0	0
	3	93-139.52	1	6.7	131
	4	46.44-93	7	46.7	149.4
	5	46.44 and less	6	40	23.8
Tutkabon	1	185.94 and above	1	8.3	787
	2	139.52-185.96	2	16.7	209
	3	93-139.52	0	0	0
	4	46.44-93	9	75	163.6
	5	46.44 and less	0	0	0
Bareh Sar	1	185.94 and above	1	5.9	2047
	2	139.52-185.96	1	5.9	676
	3	93-139.52	2	11.8	30.5
	4	46.44-93	7	41.2	368
	5	46.44 and less	6	35.3	62.9

Table 2

LQ of Roudbar County in 2011

Economic activity	Agriculture	Industry	Services
Roudbar	1.33	0.66	1.04
Manjil	0.51	0.87	1.11
Lowshan	0.64	1.64	0.89
Tutkabon	2.11	0.58	0.94
Jirandeh	2.37	1.96	0.55
Bareh Sar	3.10	1.13	0.64
Rostamabad	1.21	0.68	1.05

as fundamental. In contrast, Roudbar (LQ=0.66), Manjil (LQ=0.87), Tutkabon (LQ=0.58), and Rostamabad (LQ=0.68) import industrial activities and products.

In the realm of services, the LQ (indicating a basic economy) of Roudbar, Manjil, and Rostamabad, which are older and economically dynamic, surpasses 1, suggesting prosperity in the field of services for these cities. Conversely, Lowshan, Tutkabon, Jirandeh, and Bareh Sar have LQ values less than 1, signifying their dependence on other cities within the county to provide services.

To achieve a balanced settlement system and prevent the over-concentration of the population in large cities, it is crucial to prioritize the development and enhancement of small towns. The results of the present study demonstrate that small towns within Roudbar County play a positive role in population stabilization and preservation. The analyses reveal that the formation and nature of activities in these towns are closely intertwined with the topography, climate, and water and soil resources of Roudbar County. Consequently, there are ample pastures and fertile lands in the plains, foothills, and mountainous regions of the county.

Tutkabon, Rostamabad, and Roudbar are situated within the plateau, while Manjil and Lowshan are nestled in the foothills, and Jirandeh and Bare Sar are located in mountainous areas. Historically, Jirandeh and Bare Sar were populated villages. The distance between these villages and their need for public services prompted the government to elevate these two populated villages to the status of cities. Today, these cities serve as intermediaries and complementary hubs for providing services to rural areas.

The functions of Jirandeh and Bare Sar encompass both agriculture and industry, with a significant focus on service provision. This service aspect is more pronounced in Jirandeh and Bare Sar than in Lowshan, Manjil, and Rostamabad.

Compared to other cities within the county, the government has played a significant role

in the promotion of Bare Sar and Jirandeh. The primary aim of the government has been to deliver public services to the mountainous regions of the county. In contrast, Lowshan, Manjil, and Rostamabad have larger populations than other cities due to their strategic location along the Rasht-Qazvin highway, which has led to immigration. With the exception of Roudbar, which serves as the political and administrative center of the county, Jirandeh, Bare Sar, and Tutkabon offer more political and administrative services to their respective villages, despite having smaller populations compared to Lowshan, Manjil, and Rostamabad. Improvement of cities increases urban and rural incomes. The cities with local access can play an important role in providing scientific and technological development for industries, warehousing and distribution of agricultural products to preserve the population.

According to the LQ data presented in Table 2 and Figure 2, the agricultural and industrial sectors have demonstrated better performance than the service sector in Roudbar County. Roudbar, Tutkabon, Jirandeh, Bare Sar, and Rostamabad are exporters of agricultural products, whereas Lowshan and Manjil import these products. Lowshan, Jirandeh, and Bare Sar export industrial products, while other cities import them. Lastly, Lowshan, Rostamabad, and Manjil export services, while others import services. The LQ analysis indicates that the agricultural and industrial sectors can actively contribute to the county's economy by exporting their products, whereas the service sector is not as robust, rendering Roudbar County a net importer of services.

The concentration index data (Table 1) reveal that Roudbar, Manjil, Lowshan, and Rostamabad have successfully elevated the level of prosperity and development in their rural areas. Table 1 further illustrates that villages in Roudbar and Rostamabad are distributed across all levels, indicating a regular hierarchy. In Manjil and Lowshan, there are relatively few villages in levels 1, 2, and 3, suggesting a high

degree of development in these areas. Conversely, Bare Sar, Jirandeh, and Tutkabon exhibit irregularities in their settlement hierarchies. More than 86% of the villages in Jirandeh (with a mean population of 173.2) fall into levels 4 and 5, indicating irregularities in the settlement hierarchy. Similarly, 75% of the villages in Tutkabon (with a mean population of 163.6) are classified as level 4, with none in levels 5 and 3, signaling irregularities in the settlement hierarchy. In Bare Sar, 76.5% of villages (with a mean population of 431) are in levels 4 and 5, with few villages found in the higher levels, indicating irregularities in the settlement hierarchy in Bare Sar. However, it is important to note that there are variations in population size, city operations, and economic development levels among the cities and villages within the county.

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CONFLICT OF INTEREST

The authors have not declared any conflict of interest

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