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Distribution of Spatial Clusters of Tourist Villages and its Relationship with the Formation of Population Centers in Khorasan Razavi Province

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Abstract
Purpose: This study aimed to depict the placement of rural settlements with religious and nature tourism patterns throughout the province of Khorasan Razavi and to delineate the differences among them, from 1976 to 2011. According to the available statistics, there are 390 villages with a religious tourism pattern and 952 villages have a nature tourism pattern throughout this province.
Design/methodology/approach: This study is based on spatial analysis techniques such as "directional distribution", "K-function", and also spatial autocorrelation and Moran's I.
Findings: The findings of the study showed that the spatial distribution of these villages is clustered and is more observable in villages with a nature tourism pattern. Using the indicator of population and utilizing spatial autocorrelation models, specifically Moran's I, it became clear that some differences exist in villages' spatial patterns. In villages with a religious tourism pattern, rural settlements have moved toward population centers, in a way that in these villages spatial clusters can be seen alongside population centers; while in villages with a nature tourism pattern, no such correlation and accompaniment is discernable. In other words, clustered patterns in these villages have not led to the formation of population centers. Considering the relatively similar levels of enjoyment of urban services in the tourist villages of Khorasan Razavi province, it can be stated that the inner cluster relationships among villages with a religious tourism pattern, have reinforced settlements in each cluster, thereby creating a favorable environment for its development. This cannot be seen in villages with a nature tourism pattern.
Research limitations/implications: Collecting, creating and forming a database of the villages in Khorasan Razavi province was a major limitation of the current study.
Practical implications: In the current situation that rural settlements are increasingly losing their status, using such patterns can prove effective in stabilizing the rural population.
Originality/value: The innovation of the study is to depict the creation of population centers around the villages with religious and nature tourism patterns.
Keywords: Spatial clusters, population centers, nature tourism, religious tourism, Khorasan Razavi province.

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1. Introduction

1.1. Statement of the Problem

Today, tourism is considered to be the third largest economic sector in the world (Lozano, & Oyla, 2012). In the twenty first century, the tourism industry has become a major tool in achieving a high standard of quality of life (Zargham Boroujani, & Shalbafian, 2013).

Tourism is one of the tools that can play a considerable role in the development of less-developed regions, specifically rural areas. According to Ganon, development of tourism in rural areas can help reduce or eradicate problems and pave the way for economic development, diversification of the economy, creation of jobs, reduction of foreign immigration, attracting population and improving the infrastructures in rural areas (Holland, Budeanu, & Dixey, 2003; Sgroi, 2014).

Undoubtedly, the first step in orginizing tourist villages is to be cognizant of their placement and spatial distribution and their related factors. In the literature of spatial planning, the placement of all geographic phenomena is classified in clustered, scattered or random categories. In this framework, in addition to the distribution of the phenomena, other aspects of their features can be assessed, yielding a recognition of more aspects of their distribution pattern in the envrionment. Therefore, the first step in assessing tourist villages is study their placement with regards to clustered, scatterd and random patterns, and the second step is attend to the other features of their geographical location. Have adjacent villages developed similar features during a specific period? This is an important question to answer since, in addition to revealing the spatial clusters of palcement, it depicts clusters of varied features pertating to rural areas and explains the reason why spatial clusters have been successful in the creation of social, economic and populaiton centers.

Not always will creation of spatial clusters lead to the formation of centers related to their features. Thus, it is possible to see clusters of geographical phonomena througout an envrionment that do not lead to the creation of similar socio-economic centers. In an envrionment, if both the cluster and the center are aligned, it can be deduced that these phonomena are appropriately connected to one another. Moreover, it shows that their socio-economic features are reinforced. Such a concentration will help these settlements thrive in terms of their similar features.

The natural zone of Khorasan Razavi has variations in its different latitudes. This varition has given rise to various patterns of settlement in rural areas and to the formation of tourist attractions in rural areas of this province. In a general classification, these spatial pattenrs can be placed into two categories of natural envrionemnt attractions and man-made attractions. To give a better picture of these villages, these patterns can be classified as the spatial patterns of either nature tourism or religious-historical tourism which, overall, include 1300 villages, accounting for 37 percent of the entire villages in Khorasan Razavi Province. The present study aimed to make a compariosn between villages with nature tourism patterns and those with religious tourism patterns on the basis of formation of spatial clusters and reinforcement of populaiton centers. Furthermore, it aimed to find out whehter during a 35-year period (1976–2011), villages with a nature or religious tourism pattern have moved toward the creation of population centers considering the potentials of the villages.

The importance of the present issue stems from the fact that, based on the census of 2011, Khorasan Razavi has the highest number of rural areas in Iran. In addition, from 1996 to 2006, nearly 1000 villages lost their settlers. Similarly, studies show that, during the last decade, the rural population of this province has mainly concenterated around cities. Continuation of this trend will lead to marginilization in the future (preparation studies of Khorasan Razavi, 2013).

Such conditions denote the unsustainble status of rural settlements thorughout the natural zone of this province; however, it is possible to change this situation by relying on extant potentials and facilities. Paying attention to the tourism potential of rural regions is of great importance. However, no comprehensive study has been conducted in this regard in Khorasan Razavi. Therefore, the extent to which the spatial patterns of tourism in the rural areas of this province play a role in this regard is not clear.The present study aims to illustrate spatial patterns of tourism in rural areas and to evaluate their role in producing effective spatial changes around it.

The main objective of the study is to anlayze the relationship between rural spatial clusters and creation of popultion centers in villages with eithrer nature or religious spatial patterns of tourism in Khorasan Razavi.

1.2. Review of Literature

Many studies on tourism and rural tourism have been conducted all over the world as this issue is of utmost importance; however, few studies have dealt with the subject matter of the present research. Thus, it can be considered a pioneering study in this regard. For this reason, the background of the study mainly deals with the issues related to the subject of the study and not the study itself. Some of these studies are mentinoed in the following table:

Table 1. Background of the Study

Autohrs	Title of the Study	Findings and Conclusions
Möller and Amcoff (2016)	Tourism's localized population effect in the rural areas of Sweden	This paper examines how population change among young adults in rural areas is affected when tourism is the dominant industry. The relation between tourism and population change is often implicitly assumed but has not been well examined on a broader societal level. The net population change among young adults is clearly more positive in tourism-dominated areas (TDAs) than in non-TDAs, and this becomes more significant in the more remote the areas.
Getz (1986)	Tourism and population change: Long-term impact of tourism in the Badenoch and Strathspey district	Studies the long-term effects of tourism development on the magnitude and characteristics of the host population. The findings of this study show that tourism activities have had a positive effect on migration and increasing the population of the region.
Ray et. al (2012)	Rural tourism and its impact on socioeconomic conditions: evidence from west Bengal	This study investigates rural tourism in west Bengal and concludes that rural tourism plays an effective role in economic growth, employment potential, livelihood, attracting population, and changes in life style of the local people
Teodoro Lasanta et. al (2007)	Do tourism-based ski resorts contribute to the homogeneous development of the Mediterranean mountains	In this study, researchers have studied the effects of ski-based tourism in Spanish Pyrenees and their findings show that some changes have occurred in the human population (number of inhabitants, demographic structure and the structure of the working sector) and the production activities of the area (number of farms and livestock).
Thomas Niedomysl (2005)	Tourism and interregional migration in Sweden: an explorative approach.	In his study, Niedomysl investigates whether places with a successful tourist industry are also successful in attracting migrants. This hypothesis is tested in Sweden. The findings show that tourism exerts a positive influence on migration but the effects vary among various age groups.
Kauppila and Rusanen (2009)	A grid cell viewpoint on resorts:	In this study, population is used as a variable to indicate tourism development in the studied resorts in Finland
Vázquez et. al (2012)	Rural tourism as an alternative to the development for rural areas and the creation of employment	In their study, the authors introduce rural tourism as a solution for development, job creation, change in population pyramid, and quality of life and investigate the development of rural tourism in Spain.
Mohammadi, Yeganeh and Rostami (2009)	Rural tourism and its role in sustainable economic development (Case study: Orman Takht village)	Regardless of not taking rural tourism as a comprehensive solution to all of the problems facing rural regions, authors consider it as an option with important economic outcomes, capable of hindering the evacuation of rural settlements.
Rajabi (2011)	Investigating and analyzing potentials of environmental tourism in the village of Fromad	This study investigates the potentials of environmental tourism in the village of Fromad, Shahroud, Iran and concludes that this village, owing to its location on the road between Tehran and Mashhad and its natural attractions, is capable of attracting many tourists.
Hajinejad et. al (2015)	Developing the strategic plan for development of rural tourism in Iran	In their study, using quantitative strategic planning matrix (QSPM) in SWOT, the authors identify the strengths, weaknesses, opportunities of and threats to the development of rural tourism in Iran, and specifically the village of Delfard.

2. Research Methodology

2.1. Geographical Scope of the Research

The population of the research consisted of villages with religious and nature spatial patterns of tourism in Khorasan Razavi province and included 1300 villages that accounted for 37% of the entire villages in this province (Figure 1).

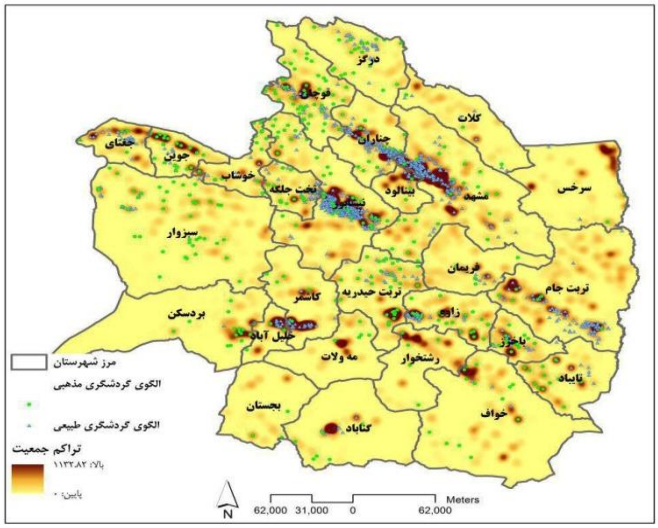


Figure 1. Location of the villages with religious and nature patterns of tourism in relation to the rural population density in Khorasan Razavi
(Source: Research Findings, 2016)

2.2. Method

Considering the aim of the research, this study is a combination of descriptive and analytical methods. Descriptive methods entail documentary studies regarding the subject of the research and the research framework. In addition, descriptions pertaining to the status of villages with a tourism pattern in Khorasan Razavi province, from the perspectives of location and population changes are made. In the documentary section of the study, after developing the theoretical framework of the research, the study tried to investigate the relationship between spatial clusters and population centers in villages with spatial patterns of religious and nature tourism and thus, evaluate the possibility of development and reinforcement of other political, bureaucratic and economic aspects of villages. To this end, in the analytical section of the study, using spatial models, we tried to gain some understanding for measuring this relationship. Hence, first, using "directional distribution" and "K-function", spatial distribution and clustered patterns in the placement of villages with a tourism pattern were analyzed and, then, using the statistics pertaining to the years 1976 to 2011 and Moran's I, the status of population centers and their relationship with spatial clusters were investigated. For this purpose, Arc Gis and SPSS were used. The indicators of the study included three sets of indicators related to spatial patterns, location and the population of villages. These indicators included. 1. The presence of spatial patterns of nature and religious tourism in the rural regions of Khorasan Razavi province (research population 1), 2. The exact location of the villages under study according to latitude and longitude for determining spatial clusters, and 3. The population of the target villages based on the data gathered from five censuses from 1976 to 2011 for determining population centers.

2.3. Models Used in the Study

A. Directional distribution: is a general method for measuring the process and the trend for separate calculation of the standard distance of a set of points or ranges in length and width. These two measurements entail axes of an ellipse which defines the distribution of processes and patterns. This ellipse is drawn based on the standard deviation, where the standard deviations of the coordinates of width and length from the intersection of the axes of the ellipse are

calculated. This oval figure allows us to see the distribution of features and their protraction and can be calculated using the following formula

$$SDE_x = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{X})^2}{n}}$$

$$SDE_y = \sqrt{\frac{\sum_{i=1}^{n}(y_i - \bar{Y})^2}{n}}$$

where x_i and y_i are the coordinates of the feature i, $\{\bar{X}, \bar{Y}\}$ is the central point of the features and n is the total number of features.

B. K- function

This function shows the degree of clustering and distribution of geographical features. When the value of "observed K" is bigger than the "expected K", the distribution of features is more like a clustered pattern as opposed to dispersed and random patterns. However, if the values of "observed K" are smaller than the values of "expected K", a random pattern of distribution can be inferred. This relationshiip can be calculated using the following formula (Bailey and Gartell, 1995, p. 395).

$$L(d) = \sqrt{\frac{A \sum_{i=1}^{n} \sum_{j=1, j\neq i}^{n} k_{i,j}}{\pi n(n-1)}}$$

1. Other features of rural tourist attractions in Khorasan Razavi can also be identifed through classification of rural attraction; however, at the moment, no accurate or reliable data for such features are availabe. Therefore, only two types of tourist attractions, i.e. nature and religious attractions can be named. The data pertaining to these two attractions can be gathered thorugh two reliable sources. First, the data provided by the Statistical Center of Iran, in the census of 2011, where the presence or lack of religious tourist attractions for various rural regions is determined and, second, the data pertaining to the ecological potential of Khorasan Razavi province which is based on the studies conducted for the Preparation of Khorasan Razavi (2013) and for identification of suitable zones for natural tourism or ecotourism.

A. Spatial Autocorrelation Model based on Moran's I: In the classification of spatial models, similarities and dissimilarities of each pair of adjacent geographical features can be measured. When such similarities and dissimilarities for spatial patterns are determined, spatial autocrelltion is formed. In fact, spatial autocorrelation measures the spatial relationship between the location of the feature and the value assigned to it (Rahnama & Aghajani, 2009). As a result of this model, the distribution pattern of features with regards to the characteristics of each feature (population, employment, etc.) is determined as either dispersed, random or clustered (Figure 2).

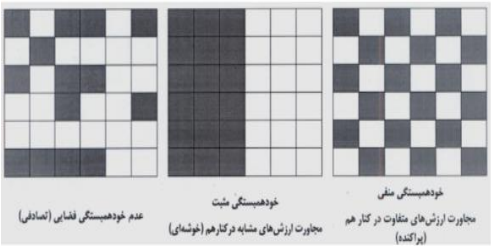


Figure 2. Various types of spatial autocorrelation (Source: Rahnama & Aghajani, 2009).

Moran's I is a measure of spatial autocorrelation which calculates autocorellation based on the location of the features and the value of their characteristics. It can be calcuated as follows:

$$I = \frac{n}{S_0} \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} w_{i,j} z_i z_j}{\sum_{i=1}^{n} z_i^2}$$

Where Z_i is the deviation of a value of the phenomenon i from the average $(x_i - \bar{X})$, $w_{i,j}$ is the weight and the spatial value between the characterisitics of i and j, n is the total number of characteristics and features, and S_0 is the sum of all spatial values.

3. Theoretical Framework

Rural tourism is an integral part of the transition from a production-based economy to a

consumption-based economy in rural areas. It is widely accepted that rural tourism is a composite of agricultural products, eco-products, cultural resources and spatial amenities, which includes diverse functions, such as economic, social, educational, environmental, recreational, and therapeutic activities (Hwang & Lee, 2015).

To increase earnings and to create a homogeneous societiy for marginalized groups and less-developed rural areas, development of tourism can be a major driving force in reduction of poverty, sustainable development, and protection of the enviornment (Wang et al., 2013). From 1960s onwards, in many central and northern European countries, rural tourism has been developed with the aim of reducing rural immigration and economic development of deprived areas (Goebel et al., 2012).

In fact, rural tourism, considering the natural and cultural potentials of villages, can play an important role in revitalization of villages, ceration of jobs and income, protection of natural, historical and cultural heritage, and uniform and sustainable rural development (Soteriades et al., 2009).

On a global scale, rural tourism is a growing type of tourism for which no comprehensive or identical definition exists. This, to a large extnet, can be attributed to the diverse features of rural communities in different countries and predominance of specific patterns of tourism in different regions along with varied definitions of villages and ruralism (Hajinejad et al., 2015).

Initially, the concept of rural tourism was mainly used with respect to tourism and farms and agricultural tourism; However, later, different forms of rural tourism emerged; to the extent that it can be said that rural tourism is an umberalla term, encompassing different forms of tourism in rural areas (Lane, 2009). Due to the potentials of each place or village, tourism in rural areas has various patterns, including green tourism, agricultural tourism, cultural tourism, heritage tourism, ecotourism, religioius tourism and adventure tourism (Salehifard, 2010). Major types of rural tourism include nature tourism and religious tourism which play an important role in boosting the rural envrionment. Most experts have classified ecotourism as a major form of tourism and rural tourism (Rezvani, 2003). Ecotourism is a type of tourism in the post modernist era that was mentinoed in scientific communities following the creation of such concepts as sustainable development. It is capable of providing the opportunity for rural development in all aspects (Hashemi, 2010). Some experts believe that the term ecotourism was first used in the late 1970s, whereas, others believe it dates back to the late 1980s. However, this concept was developed in 1980, in a coherent way, with the advent of the sustainable paradigm in the development literature and the negative effects of tourism on the nature and social envrionment. This type of tourism, to a large extent, makes the recreational activities of humans in the natural envrionment possible and is based on purposeful travelling coupled with cultural, and spiritual impressions, visiting natural attractions, studying them and enjoying diverse natural phenomena. It highly emphasizes the protection of natural values and attractions (Jiang, 2008). Moreover, considering the prevalence of holy palces in rural areas of Iran, religious tourism is also among the major tourism patterns in rural areas of the country (Mohammadi Yegane, Cheraghi, & Valai, 2013). Religious tourism which is rooted in religious beliefs and convictions, in its specialized sense, on its own and beyond dependence on time and leisure, is considered to be a major factor in the formation of travel, creation of focus centers and cultural perspectives in human geography (Daghahi, Mousavi & Gholami, 2010). In general, religious tourism can be considered a type of tourism whose participants have religious or a combination of religious and other motives and visit holy places such as churches, mosques, tombs, shrines, etc. (Meyer, 2004). Similarly, tourism is mainly considered a method of confronting demographic challenges in rural areas (Sharpley & Telfer, 2002) as it creates jobs for people and has the potentioal to attract local young people (Lundmark, 2006,). In the previous decades, many inhabitants of rural areas in Europe lost their jobs and left villages due to urbanism and economic reconstruction. Sectors that are dependent on natural resources such as minning, forestry and agriculture have generally witnessed a reduction in their workforce (Hall, Müller & Saarinen, 2009). Planners and policy makers in rural areas mostly consider tourism-related jobs as a potential alternative to the missed jobs in such sectors (Telfer & Sharpley, 2002). Since

employment is a major reason for migration, increase in tourism may affect the population change in these regions. Moreover, it has been argued that tourism, in particular, can help attract migrants (Niedomysl, 2005).

Tourism is proved to play a positive and considerable social role in society by helping the local innovative envrionment (Brouder, 2012) which can increase the attractiveness of such places. In addition, tourism has proved to increase subsidiary production and services and to help livelihood opportunities and population growth. This increase in population is mainly the result of increased migration to the region as opposed to the decreased migration to other places (Beale & Johnson, 1998).

Considering the role of rural tourism in stabilizing and increasing rural populations, the conceptual framework of the present study can be drawn as follows: the presence of spatial patterns of tourism in rural areas leads to an increse in population and, in case the distribution of these villages is in the form of orderly clusters, it seems within these clusters population centers are formed. Thus, on a regional level and based on spatial planning studies, it can be said that the first step regarding rural settlements, owing to the multiplicity of their distribution, is to identify homegeneous spatial clusters as in such clusters, there is a higher probability for adoption of shared approaches, procedures and convergence. The next step in this regard would be to determine whehter, by the passage of time, the identified clusters have moved toward formation of population centers. Thus, considering the identification of clustered patterns in spatial distribution, and bearing the population factor in mind, two different arrangements for these settlements can be determined:

a) settlements where, by the passage of time, a kind of relationship and accompaniment between spatial clusters and population centers can be seen. In other words, in this pattern, spatial clusters alongside population centers can be discerned.

b) settlements where no such relationship or accompaniment is discernable (see the following image)

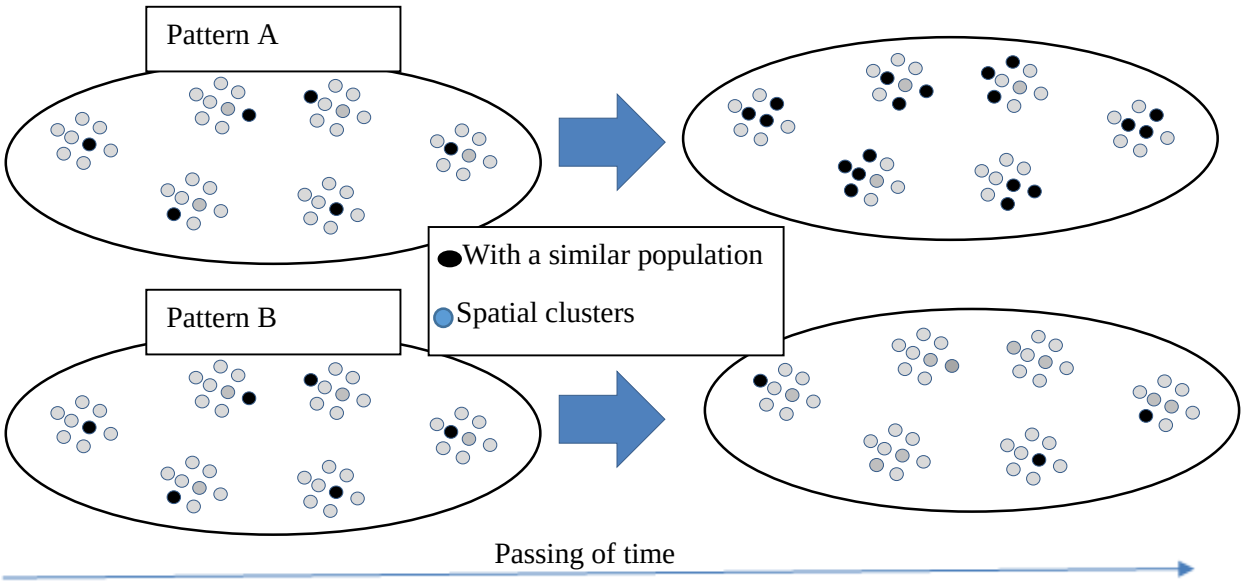


Figure 3. Accompaniment and relationship between spatial clusters and population centers of settlements in a geographical zone
(Source: Research Findings, 2016)

Such a relationship and interaction is important since the convergence of spatial clusters and population centers in a geographical zone, gradually, paves the way not only for the improvement of organizational and bureaucratic apparatus but also for the attraction of facilities and hence, further development of such settlements. This can be considered a stimulus for spatial development (Figure 4).

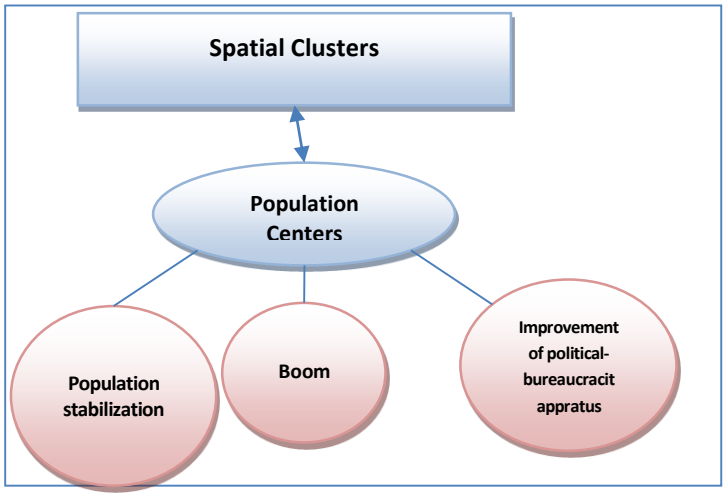


Figure 4. Shared effects of convergence of spatial clusters and population centers in a geographical area
(Source: Research Findings, 2016)

4. Research Findings

4.1. A Brief Evaluation of Rural Spots and Populations in Khorasan Razavi

Based on the data provided by the census of 2011, the population of Khorasan Razavi exceeds 5,994,346 people, of whom 4,311,210 people (71.9 percent) live in urban areas, 1,682,405 people (28.07 percent) live in rural areas and 731 (0.012 percent) lack any settlement. In 2011, rural spots of this province exceeded 3,571, whereas in 2006 3,609 rural spots existed. During this time, 32 villages have incorporated into urban areas and 6 villages have been promoted to cities.

Table 2. Rural spots of Khorasan Razavi based on number, total population, average population and growth percentage 2006 - 2011
(Source: Research Findings, 2016)

Statistical Period	Average population	Number of rural spots	Total Population	Average 5-year growth rate
2006	482	3610	1741039	-5.42
2011	462	3571	1666871	

Analysis of demographic classes of the villages in Khorasan Razavi in 2011 denotes that the general rural pattern of this province is that of small villages (less than 500 people) and includes 73.6 percent of the rural spots in the region. However, these villages have accommodated only 21.7 percent of the rural population of this province. Larger villages of this province (more than 1000 people) which cover 13.8 percent of rural spots accommodate 56.9 percent of the rural population (Table 3).

Table 3. Demographic classes of rural population in Khorasan Razavi, 2011
(Source: Research Findings, 2016)

Demographic classes	2011				
	Average Population	Number	Percentage of total villages	population	Percentage of population
Small (less than 500)	136	2657	73.6%	361483	21.7%
Medium (between 500 and 999)	720	497	13.8%	357636	21.5%
Large (more than 1000)	2078	456	12.6%	947752	56.9%

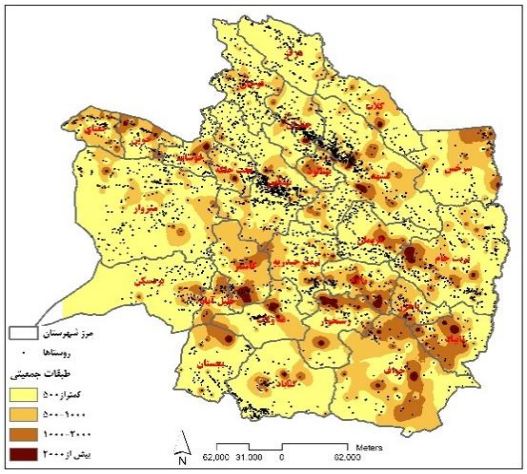


Figure 5. Spatial distribution of rural spots in Khorasan Razavi for different demographic classes of villages in 2011
(Source: Research Findings, 2016)

The following map depicts the dispersion and spatial distribution of rural spots in Khorasan Razavi for different demographic classes in 2011.

4.2. Evaluation of Spatial Patterns of Tourism in Rural Areas of Khorasan Razavi

The natural zone of Khorasan Razai, owing to its breadth and expansion in different latitudes, enjoys a great diversity. This diversity has opened the way for formation of various types of rural settlement patterns and has led to the creation of rural attractions. In a general classification, these spatial patterns can be classified into attractions related to the natural environment and man-made attractions. Undoubtedly, the initial evaluation of spatial patterns of tourism in rural spots of Khorasan Razavi requires identification of patterns in these areas. To yield a more exact picture of these villages in Khorasan Razavi, these spatial patterns can be classified into two categories of spatial patterns of nature tourism and those of religious-historical tourism, each of which is further discussed below.

A) Villages with a religious and historical pattern of tourism

Based on the data provided by the Statistical Center of Iran in 2011, of all the rural spots of Khorasan Razai, 390 villages, or 10.8 percent, have Imam Zadeh shrines (burial places of sons or daughters of Imams) which is somehow indicative of the historical-religious tourism potential of these rural spots. The population of the inhabitants of these villages in 2011 exceeded 306,355 people which includes 18.4 percent of the entire rural population of this province. The average population of these villages in 2011 was more than 785 people which is a higher figure compared to the average rural population of 462 people of this province in the same year and it somehow denotes the higher status of these villages in attracting rural population compared to other villages (Figure 5). When these figures were compared with those of the year 2006, it was indicated that these villages played a significant role in attracting rural population (from 17.7 percent in 2006 to 18.4 percent in 2011) and reduction of the average population of these villages (from 789 to 785). (Table 4)

Table 4. The status of villages with a religious tourism pattern considering percentage of population and average rural population in 2006 and 2011.
(Source: Research Findings, 2016)

Statistical Year	Average population	Number of villages	Percentage of villages	Population	Percentage of population
2011	785	390	10.8%	306335	18.4%
2006	789	390	10.8%	307707	17.7%

B) Villages with a nature pattern of tourism

Based on the studies conducted for the Khorasan Razavi's preparation plan and its sustainable ecological model, 952 villages with a population of 542,786 people have natural tourism potentials in this province. This figure amounts to 26.4 percent of rural spots and 32.56 percent of the rural population of this province in 2011. The average population for these villages in 2011 was 570 people, which is higher than the average rural population of this province, but lower than the population of villages with a religious pattern of tourism. An evaluation of the status of these villages in 2006 and a comparison with the statistics of the year 2011 is also indicative of their role in decreasing the average rural population and their role in attracting rural population in this province (Table 5).

2. Other features of rural tourist attractions in Khorasan Razavi, through classification of rural attraction, can also be identifed; however, at the moment, no accurate or reliable data for such features are availabe. Therefore, only two types of tourist attractions, i.e. natural and religious attractions can be named. The data pertaining to these two attractions can be gathered thorugh two reliable sources. First, through the data provided by the Statistical Center of Iran, in the census of 2011, where presence or lack of religious tourist attractions for various rural regions are determined and, second, the data pertaining to the ecological potential of Khorasan Razavi province which is based on the studies conducted for the Preparation of Khorasan Razai (2013) and for identification of areas suitable for natural tourism or ecotourism.

Table 5. The status of villages with a nature pattern of tourism in terms of percentage of population and average rural population in 2006 and 2011

(Source: Research Findings, 2016)

Statistical period	Average population	Number of villages	Percentage of villages	Population	Percentage of population
2011	570	952	26.4%	542786	32.6%
2006	581	952	26.4%	553078	31.8%

4.3. Studying the Placement of Villages with a Spatial Pattern of Tourism in Khorasan Razavi

A) Determining Directional Distribution in Villages with a Spatial Pattern of Tourism

Using this method, we could demonstrate the direction and the span of distribution of the villages under study. In this study, first elliptical distance was used to measure the deviation from the central average. As can be seen in the following map, 70 percent of features are concentrated in this range.

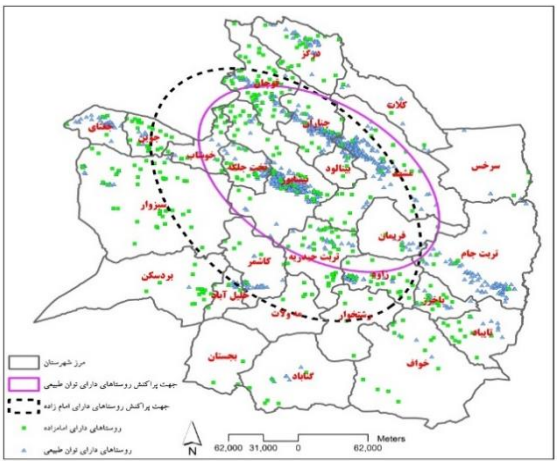


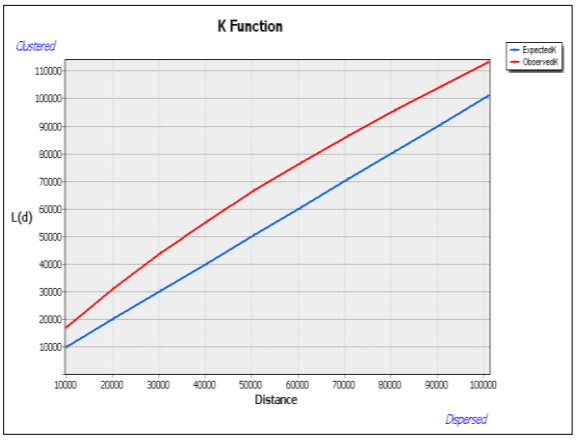
Figure 6. Directional distribution of villages with a spatial pattern of tourism in Khorasan Razavi area

(Source: Research Findings, 2016)

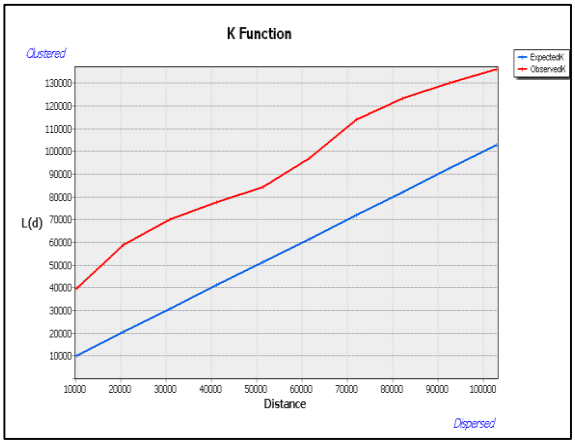
As can be seen in Figure 6, in this province, villages with a spatial pattern of tourism are distributed in a northwest-southeast direction which is nearly in line with the direction of the mountain ranges in this province. Furthermore, the area of directional distribution for each type of village shows that villages with a religious pattern of tourism, regardless of being fewer in number compared to villages with a nature pattern of tourism, have a wider distribution span in this province. Directional distribution of these villages covers an area of 44.697 Km^2 while villages with a nature pattern of tourism are distributed over an area of 28.829 km^2 which is a much lower figure. In other words, the average distance of villages with a nature tourism potential with one another is much less than the distance of the villages with a religious tourism potential. This shows that villages with a religious pattern of tourism have a more distributed pattern throughout this province. This type of spatial distribution, at first sight, is indicative of a higher degree of clustered distribution in villages with a nature pattern of tourism compared to villages with a religious pattern of tourism. To confirm this observation, K-function and Moran's I were used.

B) Determining Clustered/Dispersed Placement of Villages with a Spatial Pattern of Tourism

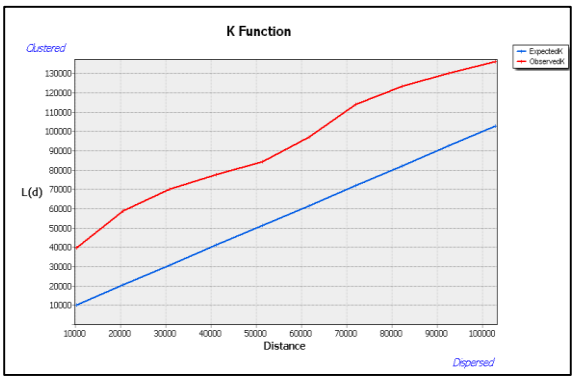
To determine whether villages with a spatial pattern of tourism are distributed in a clustered or dispersed pattern, K-function was used. The results for both types of villages are depicted in two separate charts.



A) Villages with a religious pattern of tourism



B) Villages with a nature pattern of tourism



Villages with a nature pattern of tourism

Figure 7. Pattern of spatial distribution of villages with tourism potential in Khorasan Razavi using K-function
(Source: Research Findings, 2016)

As can be seen in the above charts, the values of "observed K" in both villages with religious and nature tourism patterns are more than the values of the "expected K" which indicates a clustered

pattern of distribution of the villages under study in this province. This means that, using the pattern of distribution and without the interference of any other variable, clusters of target villages in this province can be observed. Of course, the values of these clusters varies in the villages under study. In villages with a nature pattern of tourism, the pattern shows a higher degree of intensity compared to the villages which have a religious pattern of tourism. Therefore, it can be said that, in terms of the spatial distribution indicators, villages which have a tourism pattern are situated in a clustered fashion next to one another (Figure 7).

4.4. Analysis and Review

As it was previously determined, the pattern of spatial distribution of the villages under study is a clustered one. In all areas of Khorasan Razavi a collection of villages with a spatial pattern of tourism can be seen, but whether within these clusters similar demographic characteristics are discernable is an issue which can clarify other aspects of the status of these villages and can be a major step forward for other studies in this regard. For a better understanding of the changes in the distribution of villages with a tourism pattern with regard to the indicator of population in different censuses, processes of change for each type of village were analyzed. To this end, spatial autocorrelation and Moran's I were used. In fact, in this part of the study we aimed to determine whether similar population centers for villages with a tourism pattern in the spatial zone of Khorasan Razavi could be seen. We also aimed to find out whether during a 35-year period (1976-2011) changes of the rural population in Khorasan Razavi showed any adjustments in this regard, and whether these centers had become disintegrated. The findings of this analysis for different types of villages under study are as follows:

1. Villages with a religious tourism pattern: Population changes in the villages with a religious tourism pattern during the studied period showed that the pattern of placement, considering the indicator of the number of population, has moved from a random pattern toward a clustered pattern. The findings of this analysis are shown in Table 6 and Figure 8.

Table 6. Intensity of the spatial autocorrelation pattern regarding the placement of villages with a religious tourism pattern based on the indicator of population for 1976 -2011

(Source: Research Findings, 2016)

Statistical Test	Moran's Index:	Expected Index:	Variance:	z-score:	p-value:
1976	0.029045	0.002571	0.000437	1.511857	0.13057
1986	0.039338	0.002571	0.000436	2.006046	0.044851
1996	0.052041	0.002571	0.000436	2.616525	0.008883
2006	0.07397	0.002571	0.000435	3.667893	0.000245
2011	0.091359	0.002571	0.000435	4.504486	0.000007

Considering the above table and charts, it can be said that Morans' I for the placement pattern of villages with a religious tourism pattern, based on the indicator of population, has increased from 1976 to 2011. This increase is discernable in all censuses and its value increased from 0.029045 in 1976 to 0.091359 in 2011. This indicates that spatial autocorrelation has increased and rural population centers were formed around one another.

The value of Z-score is indicative of an increase in the confidence level of the spatial autocorrelation coefficient in the period under study. The findings reveal that it has increased from 90 to 99 percent, confirming the above mentioned point. Moreover, considering the direction of the mentioned coefficients, it became clear that this degree of correlation was a positive one and denoted the placement of villages with similar demographic conditions next to one another.

All the above mentioned factors show that, in the studied period, population changes in the villages with a religious tourism pattern followed an orderly and regular trend. Moreover, a logical and accurate relationship was seen between the location of the villages and population changes in these villages. That is the location of the studied villages had influenced the changes in their populations. In other words, all these changes have led to formation of villages with high populations next to one another.

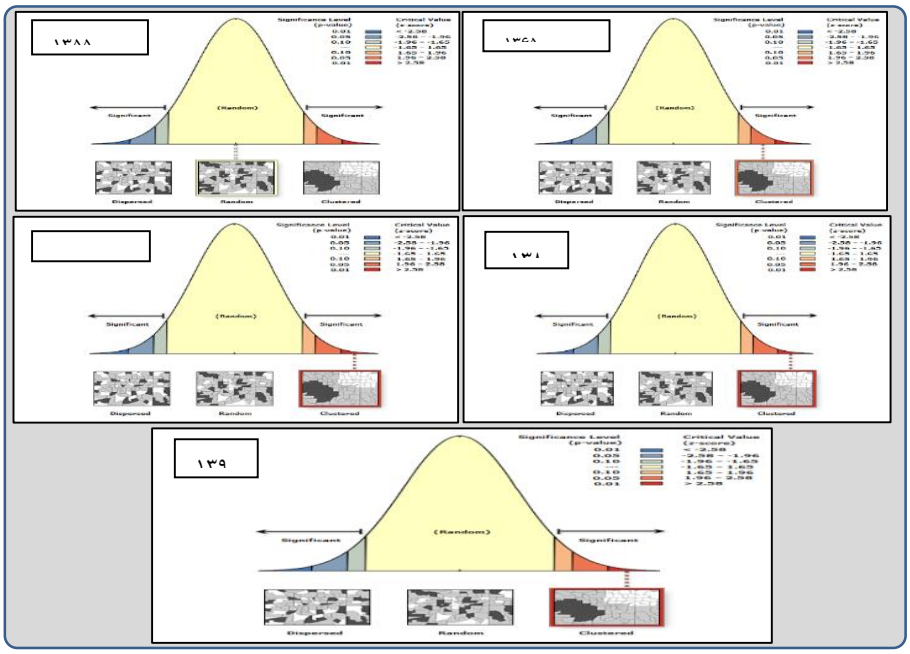


Figure 8. Spatial autocorrelation pattern regarding the placement of villages with a religious tourism pattern based on the indicator of population for 1976-2011
(Source: Research Findings, 2016)

Reinforcement of the clustered pattern denotes that, in the period under study, target villages have formed population centers next to one another to the extent that a clear pattern regarding their spatial distribution and population dispersion in Khorasan Razavi can be seen. In case spatial distribution of villages with religious tourism potentials are observed in clustered patterns, regarding rural population growth in each cluster, it is worth mentioning that this growth is not unique to a single village and includes several other adjacent villages. Overall, this issue highlights a specific type of distribution of these villages in Khorasan Razavi.

2. Villages with a nature pattern of tourism: Analyzing the population changes of these villages in the period of 1976-2011 in Khorasan Razavi, with respect to their physical location, depicted a different trend compared to villages with a religious pattern of tourism. Studying the trends of population changes made it clear that no clustered or dispersed pattern existed. In other words, their pattern was a random one, without any specific order. This issue is also discernable in Table 7 and Figure 9.

Table 7. Intensity of the spatial autocorrelation pattern regarding the placement of villages with a natural tourism pattern based on the indicator of population for 1976-2011
(Source: Research Findings, 2016)

Statistical test	Moran's Index:	Expected Index:	Variance:	z-score:	p-value:
1976	0.161996	-0.001052	0.016011	1.288556	0.197553
1986	0.168867	-0.001052	0.016092	1.340756	0.018007
1996	0.161919	-0.001052	0.016129	1.283244	0.199407
2006	0.069307	-0.001052	0.012776	0.622464	0.533637
2011	0.166387	-0.001052	0.016092	1.323546	0.185654

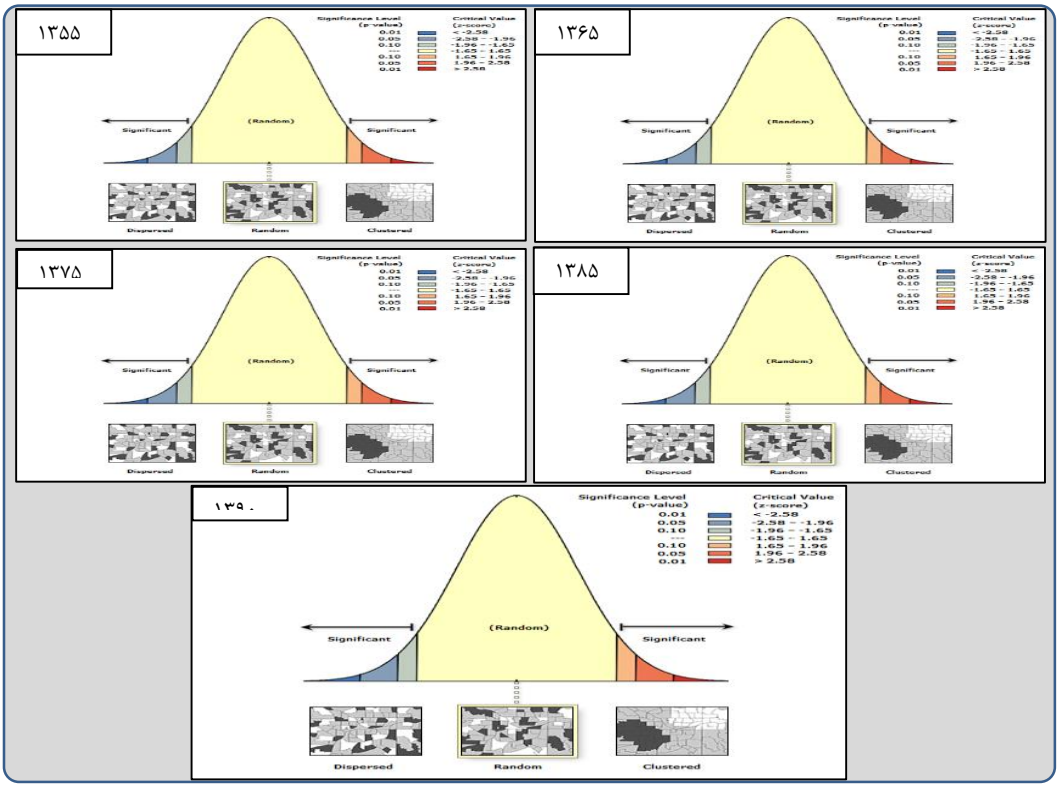


Figure 9. Spatial autocorrelation pattern regarding placement of villages with a nature tourism pattern based on the indicator of population for 1976-2011
(Source: Research Findings, 2016)

Considering the Table 7 and Figure 9, it can be said that Moran's I showed a regular and distinct trend. This index had increased during some of the years and decreased during some other years. Its lowest value can be seen in 2006. Nonetheless, its value increased from 0.161 in 1976 to 0.166 in 2011, which is not a considerable change. It shows that population centers were formed next to one another and revealed that these centers are randomly scattered throughout Khorasan Razavi. In other words, rural population centers have not led to the creation of other population centers around them.

Moreover, the value of z-score showed that the confidence level of this autocorrelation is lower than 90 percent, indicating the insignificance of Moran's I. Location and spatial distribution of these villages, as shown by the findings of this study, are indicative of a high degree of intensity of clustered patterns in placement of these villages, though this pattern has not led to the creation of population centers throughout Khorasan Razavi province; hence, a kind of divergence of population centers in these types of villages in this province can be seen.

5. Discussion & Conclusion

This study shows that some differences regarding placement and evolution of rural habitat with a tourism pattern were discernable in Khorasan Razavi. In villages with a religious tourism pattern, during the period of 1967 to 2011, clustered patterns of spatial distribution showed that population centered along with the factor of population, while in villages with a nature tourism potential only clustered patterns of their spatial distribution could be seen. In short, the potential of villages with a religious tourism pattern in changing the specific formation characteristics of population centers compared to the villages with a nature tourism potential, throughout the province, became clear.

In villages with a religious tourism potential, the issue of competition in tourism for attracting maximum facilities, which at times led to the omission or reduction of the role of some fields compared to others, has received less attention. In other words, sanctity and attitude towards such

settlements has ushered in regional confluence for the development of other settlements as well. On the other hand, it should also be noted that the unsustainable, rural natural environment and changing natural factors, largely affect villages with a tourism potential, but such changes in villages with religious tourism potentials, which affect the very tourism attraction itself, happen less. Studying the causes of this phenomenon calls for a special research in the spatial zone of Khorasan Razavi. The present study can make the initial steps for such an undertaking perfectly clear. In the current situation that rural settlements are increasingly losing their status, exploiting such potentials, which can play a prominent role in stabilizing rural populations, seems appropriate and worthy of attention. An issue which should be, specifically and attentively, considered by planners.

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بررسی پراکنش خوشه‌های فضایی روستاهای گردشگری و ارتباط آن با شکل‌گیری هسته‌های جمعیتی در استان خراسان رضوی

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چکیده مبسوط

۱. مقدمه

بدون شک اولین قدم در خصوص ساماندهی روستاهای گردشگری، توجه به شیوه استقرار و پراکنش فضایی آنها و نتایج مترتب بر آن می‌باشد. در ادبیات علمی برنامه‌ریزی فضایی، شیوه استقرار و پراکنش کلیه پدیده‌های جغرافیایی را در قالب سه الگوی خوشه‌ای، پراکنده و تصادفی طبقه‌بندی می‌کنند. از سوی دیگر در این چارچوب، علاوه بر پراکنش پدیده‌ها، می‌توان ابعاد دیگری از سایر ویژگی‌های آنها را در ارتباط با موقعیت فضایی‌شان مورد ارزیابی قرار داد و به ابعاد کامل‌تری از نحوه توزیع عوارض در فضا آگاهی پیدا کرد. با توجه به آنچه گفته شد قدم اول در بررسی روستاهای گردشگری، نحوه الگوی استقرار آنها در قالب الگوهای خوشه‌ای، پراکنده و تصادفی و در قدم بعد توجه به ابعاد دیگر این روستاها در ارتباط با موقعیت جغرافیایی آنهاست. به عبارتی آیا طی دوره زمانی مشخص، روستاهای پیرامون یکدیگر، ویژگی‌های مشابه نیز پیدا کرده اند؟ این بررسی از آن جهت حائز اهمیت است که می‌توان در کنار خوشه‌های فضایی استقرار، خوشه‌های دیگری نیز از سایر ویژگی‌های نقاط روستایی مشاهده کرد. این موضوع مبین آن است که آیا خوشه‌های فضایی، موفق به شکل‌بندی هسته-های جمعیتی، اجتماعی و اقتصادی نیز شده‌اند؟

۲. مبانی نظری

دو نوع از انواع مهمترین گردشگری روستایی شامل گردشگری طبیعی و مذهبی است که نقش مهمی در رونق محیط روستایی ایفا می‌کند. برنامه‌ریزان و سیاستمداران، اغلب مشاغل گردشگری را به عنوان یک جایگزین احتمالی برای مشاغل از دست رفته در این روستاها در نظر می‌گیرند. از آنجا که اشتغال نیز دلیل مهمی برای مهاجرت است، افزایش گردشگری ممکن است تغییر جمعیتی در این نواحی را تحت تاثیر قرار دهد. علاوه بر این، استدلال شده است که گردشگری به طور خاص می‌تواند به جذب مهاجران کمک کند.

با توجه به مطالب عنوان شده و نقش گردشگری روستایی در تثبیت و افزایش جمعیت روستایی می‌توان چارچوب نظری این مطالعه را بدین صورت شکل داد که وجود الگوهای فضایی گردشکری در مناطق روستایی سبب افزایش جمعیت می‌شود و در صورتیکه پراکنش این روستاها به شکل خوشه‌های منظم باشد، به نظر می‌رسد داخل این خوشه‌ها، امکان شکل‌گیری هسته‌های جمعیتی نیز فراهم است. از این رو می‌توان در سطوح منطقه‌ای و بر اساس مطالعات برنامه‌ریزی فضایی اینگونه عنوان کرد که گام اول در ارتباط با سکونتگاه‌های روستایی به دلیل تعدد پراکندگی آنها، شناسایی خوشه‌های همگن فضایی است. چراکه در چنین خوشه‌هایی امکان اتخاذ یک رویکرد و رویه مشترک و همگرایی بیشتر، فراهم می‌شود. قدم بعدی در این زمینه پی بردن به این نکته است که آیا خوشه‌های شناسایی شده با گذر زمان به سمت شکل بندی هسته‌های جمعیتی نیز حرکت کرده‌اند؟

۳. روش تحقیق

با توجه به هدف تحقیق، این مطالعه ترکیبی از روشهای توصیفی تحلیلی است. بر این اساس در روش‌های تحلیل سعی گردید با استفاده از مدل‌های فضایی نسبت به سنجش این ارتباط، آگاهی حاصل آید. به گونه‌ای که ابتدا با بهره‌گیری از مدل‌های "جهت پراکنش" و "کا فانکشن" اقدام به بررسی پراکنش فضایی و شناسایی الگوهای

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خوشه‌ای در استقرار روستاهای دارای الگوی فضایی گردشگری طبیعی و مذهبی گردید و در ادامه با توجه به آمارهای سال های ۱۳۵۵ تا ۱۳۹۰ و با بهره‌گیری از شاخص موران به بررسی وضعیت هسته های جمعیتی و ارتباط آن با خوشه‌های فضایی پرداخته شد. در این مسیر از نرم افزارهای ArcGIS به منظور تجزیه و تحلیل اطلاعات استفاده شده است.

۴. یافته‌های تحقیق

استقرار روستاهای دارای الگوی گردشگری مذهبی و طبیعی از یک الگوی خوشه‌ای تبعیت می‌کند اما بررسی تغییرات جمعیتی روستاهای مورد نظر طی دوره زمانی ۱۳۵۵ تا ۱۳۹۰ نشان دهنده آن است که در روستاهای با الگوی گردشگری مذهبی هسته‌های جمعیتی در خوشه-های فضایی شکل گرفته و تقویت شده‌اند. در حالی‌که در روستاهای با الگوی گردشگری طبیعی چنین موضوعی مشاهده نمی‌شود.

۵. نتیجه گیری

به نظر می‌رسد محیط طبیعی ناپایدار روستایی عمدتاً روستاهای دارای الگوی گردشگری طبیعی را متاثر از خود می‌سازد درحالی‌که چنین تغییراتی در روستاهای دارای الگوی گردشگری مذهبی کمتر وجود دارد. بررسی علل این امر نیازمند مطالعه ویژه در پهنه فضایی استان است که این مطالعه می‌تواند گامهای اولیه در این زمینه را به خوبی روشن نماید. در شرایط فعلی که سکونتگاه‌های روستایی، با کاهش جایگاه در طول زمان مواجه‌اند، بهره گیری از چنین الگوهای گردشگری فضایی که می‌تواند نقش اثر گذاری در ثبات جمعیت روستایی داشته باشد امری جالب توجه است. موضوعی که می‌بایست به شکل ویژه مورد اهتمام جدی برنامه‌ریزان واقع شود.

کلمات کلیدی: خوشه‌های فضایی، هسته‌های جمعیتی، گردشگری طبیعی، گردشگری مذهبی، استان خراسان رضوی.

تشکر و قدرانی

این پژوهش حاضر حامی مالی نداشته و حاصل فعالیت علمی نویسندگان است.

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