Journal of Research and Rural Planning
Volume 11, No. 2, Spring 2022, Serial No. 37, Pp. 1-22
eISSN: 2783-2007 **ISSN: 2783-2791**
http://jrrp.um.ac.ir

Original Article

Spatial Analysis of Tourism Development Potential of Tourism Destination Villages (Case Study: Mashhad Tourism Sphere of Influence)

Hamideh Mamoodi[1]- Hamid Shayan[*2]- Hamdollah Sojasi Qiedari[3]- Tahereh Sadeghloo[4]- Masou'd Minaei[5]

1- Ph.D. Candidate. in Geography and Rural Planning, Ferdowsi University of Mashhad, Mashhad, Iran.
2- Full Prof. in Rural Geography, Ferdowsi University of Mashhad, Mashhad, Iran.
3- Associate Prof. in Geography & Rural Planning, Ferdowsi University of Mashhad, Mashhad, Iran.
4- Assistant Prof. in Geography & Rural Planning, Ferdowsi University of Mashhad, Mashhad, Iran.
5- Associate Prof. in GIS & RS, Ferdowsi University of Mashhad, Mashhad, Iran.

Abstract

Purpose- Today, tourism is mentioned as a suitable approach for socio-economic and physical development in rural areas. Therefore, rural areas have capabilities and potentials in terms of tourist attractions; however, not all areas have the same capabilities for development. The purpose of this study is to evaluate the ecological potential of the study area and to find the relationship and alignment between tourism capacity and ecological potential in rural areas of Mashhad tourism sphere of influence.

Design/methodology/approach- The present theoretical study was conducted with applied purposes using the descriptive-analytical method. GIS and SPSS software and CoCoSo multi-criteria decision-making model were used to analyze the data.

Findings- According to research findings the most influential indicator was the distance to tourism water resources and the least influential indicator was the distance to fault. Therefore, the highest ecological potential belongs to the foothill villages of the study area. Also, in terms of tourism capacity, the most effective factors have been the natural attractions of the village and its suburbs and the quality of village road.

Original/value- On this basis, the highest tourism potentials belong to villages of Pivehzhan, Virani, and Radkan, respectively. According to the results of the study there is a significant positive relationship between ecological potential of the studied villages and their tourism capacity and there is no relationship between the number of tourists and ecological potential of the studied villages.

Keywords- Ecological Potential, Tourism Capacity, Village, Tourism Sphere Influence, Mashhad.

Use your device to scan and read the article online

How to cite this article:
Mamoodi, M., Shayan, H., Sojasi Qiedari, H., Sadeghlou, T. & Minaiei, M. (2022). Spatial analysis of tourism development potential of tourism destination villages (Case study: Mashhad tourism sphere of influence). *Journal of Research & Rural Planning, 11*(2), 1-22.
http://dx.doi.org/10.22067/jrrp.v11i2.87483

Date:
Received: 25-09-2021
Revised: 04-11-2021
Accepted: 10-02- 2022
Available Online: 10-02-2022

Corresponding Author:
Shayan, Hamid, Ph.D.
Address: Department of Geography, Faculty of Letters & Humanities, Ferdowsi University of Mashhad, Mashhad, Iran
Tel: +989155161518
E-Mail: shayan34@um.ac.ir

1. Introduction

Today, tourism is considered an important industry in almost all areas of the globe in such a way that it has been known as a powerful tool for the development, encouraging economic growth, increasing foreign exchange, investment in small sectors and local employment (Patterson et al., 2008). In recent years it has also influenced many people's lives as a multidimensional and multifaceted activity (Kurniawana et al., 2019). As it is often considered as an opportunity to promote economic and social development (Lacitignola et al., 2007). In 2017, this industry has created 313 million jobs or 9.9% of the world's total employment and has increased world GDP to 10.4% (WTTC, 2018). It is predicted that, the share of the tourism industry in the world GDP will increase to 380 million jobs by 2027. It equals to 11% of the world's total employment (Sokhanvara, 2018). Hence, according to the above, it can be stated that this industry can improve the livelihood of local communities and help reduce poverty (Wu & Tsai, 2016; Yuxi & Linshen, 2020). Meanwhile, tourism is a driving force that can affect the quality of the environment because on the one hand, it decomposes non-renewable natural resources and creates many environmental problems (Petrosillo et al., 2006); these problems can be attributed to complex reasons such as irrational tourism planning, excessive construction and creation of tourism facilities that are beyond the capacity of the environment and poor management of tourism flows that have a negative impact on the quality of tourism capacity in the region and in the long run reduce the level of tourism development in the region (Yuxi & Linshin, 2020). On the other hand, tourism, especially tourism in rural areas, is a suitable approach for socio-economic development, especially in rural areas, and a solution to reduce the negative environmental effects (Patterson et al., 2007; Ryu et al., 2020). In this regard, in order to provide the tourism grounds and a way to reverse migration, the tourism development potentials should initially be evaluated, since this can be among suitable strategies for development, and by being aware of the potential of the region, the ground for planning to reduce the negative effects of tourism and increase its positive effects is provided. However, it should be noted that, all areas have not equal capabilities and potentials to develop tourism (Ghadiri et al., 2014). So that, in some environments the nature is prepared for the most development with the least losses; while in others the least development leads to the destruction of the environment. This means that, in order to create development in the region, first, its ecological potential must be evaluated in the framework of a regional planning and then the facilities and tourism capacity of the region must be planned in accordance with its ecological potential. However, a logical and correct planning is necessary to achieve good results. Today, proper planning and comprehensive use of the environment is based on recognizing the talents, capacities and evaluating the production potentials of the land (Rostam pour, 2014). Therefore, recognizing, reviewing and analyzing the current situation, especially in terms of natural and human capacities of tourism development, is a category that will pave the way for very positive development evolutions with the approach of academic studies, ecological assessment and appropriate qualitative and quantitative methods. This important issue with emphasis on tourism development, will revolutionize the field of planning and expansion of tourism by identifying the environmental capabilities of tourism development (Saeb, 2017). Nevertheless, in recent years, numerous studies have been conducted on tourism potential of Iran and the world (Table 1).

Table 1. A review of research on tourism development potential of Iran and the world

Source: Research findings using available sources 2020

Authors	Title of article	Results
Soltani & Nouri (2010)	Environmental capability assessment of Khansar city for tourism development using GIS	The results of the ecological model of tourism and system analysis method in this study show that all levels of the region have high power for the development of extensive outing or centered outing, and most villages have the ability to develop a kind of tourism problems.
Firoozi et al. (2013)	Evaluation of ecological power of the exemplary tourism area of Shaheed Abbaspour Dam with emphasis on sustainable tourism development	The results show that economic investment in central tourism is not economical due to the high slope of the region and also due to the high slope and inappropriate rock and soil in the region, it is concluded that the extensive outing is the best type of tourism application in this region.

Authors	Title of article	Results
Akbar Fazeli et al. (2014)	Zoning of areas for nature tourism development Case study: Forests around Garan Dam- Marivan	.The results of this study showed that ٪۶۵۴of the area has class power, meaning that dewatering of Garan Dam can increase the region's power to develop tourism, but it should be noted that increasing infrastructures such as service centers and access roads is a necessary condition for the development of tourism in the region.
Ghadiri Masoom et al. (2013)	Evaluation of desert tourism development capability and its impact on socio-economic and physical dimensions in rural settlements (Study: Villages of Khor and Biabanak county(	The results show that this area has a high potential for the development of desert tourism and ethnic-cultural tourism and can be prepared for further development of tourism in the region through logical and rational planning in line with the capacity and potential of the region.
Bozrajmehri & Modudi (2015)	Comparative evaluation of different tourism capabilities in target villages of Golestan province	The findings show that there is no effective match between the level of natural, historical and cultural capabilities of tourism villages in the region with the level of their infrastructure capabilities. On the other hand, the existence of a significant relationship between the infrastructure capabilities and the volume of tourists shows that having natural, historical and cultural capabilities of the target villages is not possible without upgrading their infrastructure.
Aliani et al. (2016)	Land power assessment for identifying suitable areas of tourism development using ANP network analysis process	The results showed that one of the ecology criteria has a total of 0.61 of the final weight and this indicates more involvement of one's ecologist criteria in creating the capability of ecoturision. Also, from the total level of the field, 75.2% of the power to develop eco-urism 24.8% of the area is not able. About 30.32% of the area has high power in terms of ecotourism application.
Saeb (2017)	Assessment of ecological power in order to develop tourism using GIS Case study: Sarein city	The results of this study showed that along with some of the existing problems, the environmental and ecological quality of tourism development in Sarein region is full of talents that can make the region a fundamental change in the direction of tourist development.
Chehr Azar et al. (2018)	Study and evaluation of tourism capability using fuzzy logic in GIS environment Case study: Hamadan city	The results indicate moderate to strong conditions of the region in order to provide services for mountain tourists. Finally, it was suggested that tourist-prone areas located mainly in the west of the province be used to expand the tourism industry in the mountains of the city.
Ebrahim (2019)	Study of tourism capability in Chahar Mahal Bakhtiari province	In this research, the tourism talents of this province have been investigated by SWOT method in order to identify the major strengths and weaknesses of opportunities and threats in the region, but also to develop and implement tourism development policies in this province in the future.
Qiao (2008)	A model for evaluating the ecological capability of tourism development in unused areas of urban suburbs	In this model, AHP method was used which in the first level of the project goal, which included the expansion of tourism in kwon area 4 of Ziang city, in the second level, criteria including ecological importance, economic importance, the importance of landscape, social importance. Finally, it was concluded that the region with a scale of 89% is suitable for the development of tourism.
Olafsdottir & Runnstrom (2009)	A GIS approach in environmental power assessment for development-tourism in environmentally vulnerable environments Sample: Southeast Iceland	In this study, a GIS model was used based on classification of identified impact factors and variables, as well as selected classification algorithms that could help decision makers in planning and managing sustainable tourism in sensitive areas facing the risk of environmental degradation in southeastern Iceland.

Authors	Title of article	Results
Kumari et al (2010)	Identifying potential tourist sites in western region, Sikkim using spatial tools	The present study tries to develop an integrated approach to ecotourism development by identifying ecotourism locations. Assessment of ecotourism stability at the surface can help identify weak and very weak indicators elsewhere. At the same time, the present study provides a basis for future studies using ecotourist indicators to identify potential ecotourist locations in other ecosystems such as coast, mangrove and desert.
Chi et al.(2020)	Zoning protected areas based on their stamina and ecological importance	In this study, the researcher dealt with zoning of protected areas of the island chain in the Dongtu archipelago in southern China. Zoning was carried out based on spatial distribution of EII and ETI and six different conservation plans, the study area showed that ecological importance and resistance within the islands showed spatial heterogeneity and islands with higher proximity to the mainland and larger areas were generally less ecologically important and endurance.
Fu et al. (2020)	Strategy of Identifying and Optimizing the Ecological Security Model of The City: A Case Study in The Leukemia Plateau, China	Creating an ecological security model is an effective factor to improve the structure and function of ecosystems, maintain ecosystem services and ensure ecological security. Overall, the study adds new insights into ESP's construction method, which can provide important resources for regional development planning and environmental protection.
Yuxia & Linshenga **(2020)**	The difference between nature-based tourism and ecological power in China	The results of this study show that most regions of China have low or moderate power. High-power areas account for 13.79% of the sample areas. The results can inform decision makers considering that they are most likely to suffer from environmental problems caused by nature-based tourism activities and which types of problems may arise. Such information could help decision-makers predict the development process between nature-based tourism development and ecological conservation, and later determine the degree of control over nature-based tourism.

A review of the research background reveals that so far no accurate and transparent study has been conducted in relation to the evaluation of ecological potential and finding a relationship and alignment between tourism capacities and ecological potential in rural areas. Thus, recognition of capabilities and tourism capacity in relation with provision approach and prioritization of ecological potential can be a fundamental strategy optimally plan for rural and regional tourism development.

Due to attractive environmental condition and meeting the needs of urban tourists for recreation and leisure, rural areas of Khorasan Razavi Province are of great importance. Also, due to their need for livelihood diversity, villagers of this area have turned to tourism and its development as a crucial strategy. On the other hand, it is necessary to pay attention to the influx of tourists to rural destinations. The pressure caused by the presence of tourists is beyond the ecological capacity of the villages and in the long run has negative and detrimental effects on rural destinations. Therefore, the purpose of this study is to evaluate the ecological potential of the tourism influence of Mashhad, to find the relationship between ecological potential and rural tourism capacities in the region and, to find alignment between rural tourism capacity and ecological potential of rural areas of Mashhad tourism sphere of influence. By recognizing the environmental and human capabilities and capacities of the studied villages, planners can come up with optimal and strategic planning so that, in case of weakness of a place, it can prevent endangering its environmental resources for the future generations. On the other hand, they can make the optimal use of existing capacities to develop the region. Hence, the main questions are raised as follows: what is the status of ecological potential of the tourist villages in the region? And what is the relationship between the ecological potential of tourist villages and the tourism tourism capacities of the region?

2. Research Theoretical Literature

In recent decades, tourism as one of the important industries (Martins et al., 2017) has supported the constructions, food/beverage and residential sectors by creating regional job opportunities, providing foreign exchange and promoting transportations. Therefore, it is referred to as the main resource of income,

employment, private sector growth and infrastructure development (Lee et al., 2011; Tohidy, 2011) which leads to increased production, increased income, improved living standards, public welfare, and more employment for more people (Shirafkan, Lamsso & Masoomzadeh, 2017). Generally, tourism can be considered as a trade in services, because it is equivalent to exports to areas receiving tourists (Marrocu & Paci, 2013). In view of the above, the tourism industry with its multidimensional nature, in addition to meeting the needs of tourists, causes major changes in the host community (Dwyer et al., 2009). Therefore, the government officials are trying to provide opportunities to benefit from the positive aspects of this industry by providing and valuing tourist attractions and capacities of the areas with the potential, especially rural areas (Rosentraub et al., 2009).

The development of tourism depends upon providing suitable conditions in two geographical poles or residential centers; one is the destination (supplier of tourism facilities) and the other is the origin (tourism suppliers). In order to provide suitable conditions, the realization of these two is necessary (Table 2), which are of great importance for tourism development as tourism tourism capacities.

Table 2. Suitable conditions in two geographical poles of destination and origin in order to develop tourism
Source: (Moradi, 2014: 44)

In the hub of tourism applicants (tourist generator)	In the hub providing tourism facilities (destinations)
- Increasing the income and savings levels of the people and providing financial facilities for tourism; - Raising people's awareness and promoting the culture of tourism; - The existence of a suitable transport system at source; - The existence of tourism service centers (tourism agencies).	- The existence of tourist attractions including natural attractions, historical monuments and man-made; - The existence of appropriate infrastructure including roads, water, electricity, telephone and proper sewage system ; - The existence of service elements for tourists, including various hotels and accommodation centers, tourism service agencies and all institutions and centers provided to tourists; - Suitable advertising and proper introduction of tourist facilities and attractions; - Appropriate policy making and efficient administrative system; - –Reception and culture of the host community in relation **to tourists**

Thus, the most important results of tourism development in the destination can be stated as follows:

- Increasing interaction and understanding between nations of origin and destination;
- Pleasure of tourists and create pleasant memory for them;
- Development of infrastructure and all elements of service centers in destination;
- Qualitative and quantitative protection and upgrading of tourist attraction in the destination

Overall, numerous factors are involved in tourism development that the relationship and interaction between them, causes the development of tourism. Among these, three main factors of tourism development are: tourists, people of the region and the characteristics of the region. Failure to pay attention to any of these three areas in planning will harm the tourism development process and, conversely, paying attention to them will create benefit for them. These benefits are generally summarized as tripartite returns for the host community (economic and social dimensions) for the region (environmental protection), and for the tourists (leisure and suburban tourism), implying a sequence related benefits (Canoves et al., 2004). In this case, competitive field is created among tourist destinations and thereupon, the destinations which have improved their tourism tourism capacities and provide tourists with high quality services, succeed in attracting tourists.

2. 1. Capacity building for tourism development

The word capacity is an almost new concept and has been used in the development literature since the 1980s and became the focus of development thoughts and technical cooperation in 1990. The great interest in capacity issues in recent years has been mainly due to the shortness of development theories in the last 6 decades in response to the needs of the people and mainly seeks to promote systematic, integrated and endogenous development-based approaches (Rokneddin Eftekhari & Badri, 2012). Therefore, in recent decades, capacity building has gained special importance among researchers of various sciences and governments have developed its principles at different levels in various fields of development such as health promotion, agricultural development, and economic, environmental and tourism development, etc. Hove et

al have defined the development of capacity building approach with three major activities as follows:

a) The infrastructure of presenting programs;
b) Collaboration and organizational environments, in a way that, strategies remain constant and strengthened; and
c) Problem solving ability (Aref & Redzuan, 2009, p. 22).

It can also be mentioned that, capacity building in tourism means a purposeful process of enhancing the capacity of individuals, groups and communities in social, economic, institutional, and physical-environmental dimensions in order to reduce the negative effects of this industry and improve its positive influence on local communities. Thus, in this process, by adopting a participatory approach, local residents and rural and urban officials are assisted to overcome their feelings of helplessness in dealing with the destruction of various natural resources by creating an empowering environment, and especially to help preserve environmental resources, to be able to provide a safe place for their activities and lives. The community capacity building in tourism development can also be described as the capacity of community members to participate in tourism activities (Cupples, 2005). Tourism operators often tend to invest on local training and capacity building of the community as a method to participate in community development. Community capacity building is applied in three important areas of tourism: organizational, social and individual areas (Kieffer & Reischmann, 2004).

On the individual level, capacity building emphasizes on developing the skills and information that allows individuals to increase control and influence on others' lives. Citizens of the community are also observed at this level. Community capacity building, at the community level, indicates that, the power of decision making should be increased to support tourism activities. This process refers to education at the social level. This level also refers to informal groups in geographical areas. At the organizational level, community capacity building needs substantial changes, which allow the experts to provide services. Organizational capacity relates to social organizations and a set of local organizations. These capacities may remain latent, unless a driving force is used (Raik, 2002). Therefore, it can be noted that, the social and regional capacities are not usually capable of reducing negative effects of tourism (except for destruction of natural resources), however, the ability to increase capacities to reduce threats from the human-induced negative effects of tourism such as resource degradation will be very impressive. Nevertheless, capacity building efforts can be oriented to reduce environmental degradation and lead to increase environmental potential of the region.

2. 2. Ecological and tourism potential

In addition to tourism facilities and capacities, we can mention the environmental potential of the region as one of the various tourism capabilities in the destination. The environmental potential of a tourism area may be very rich in terms of natural environment, such as climate, forest areas, etc., and provide a pristine, natural and beautiful environment for the tourist. Environmental abilities are the sets of environmental abilities, talents, and capabilities that exist in the natural-social and economic environment. These abilities include the shape of the land, the direction and flow of water, soil type, and plant growth in the natural environment (Betuit, 2015; Fuzuni et al., 2017). Environmental abilities create different environments according to their diversity. In order to play basic roles of livelihood, the relationship between human and the environment transforms the perspective of natural environment under the influence of human creativity and initiative and turns the potential power into actual power. These abilities and talents, especially in rural environments create conditions that can be guided in the path of rural development by proper and principled exploitation and by considering the preservation of the human environment. However, increasing the destruction of suitable lands for food production, urban and industrial development, and rapid decline in soil fertility due to erosion and pollution, have made the need for scientific and acceptable ecological assessment to be more obvious by the community, to help create the greatest socio-economic benefits and environmental protection in an area (Hessel et al., 2009). Hence, assessing the ecological potential of the environment is determining the potential power or type of natural use of land, environmental planning including regulating the relationship between man, land, and human activities on earth in order to properly and sustainably exploit all human and space facilities to improve the material and spiritual condition of society over time (Fazeli et al., 2014). Assessing the ecological potential of the land is of great importance. So that if the potential land does not have the appropriate ecological potential to be implemented for a particular use, (even if there is an economic, social need for the use), implementation of the plan not only does not improve the environmental situation, but also will cause more destruction to the environment.

The assessment of ecological potential includes three steps:

1. Identifying the ecological resources (in order for the area to be ready for the assessment, the resources available must be identified);
2. Analyzing and summarizing the resources (in order for the collected information to take less time and complex data to become easy data, it is necessary to analyze the data and summarize it);
3. Assessing the ecological potential of the environment (once the identified environmental resources of the environment have been analyzed and summarized, the assessment work begins. Assessment work is in fact a test, an evaluation or in the true sense of word measurement (Habibi et al., 2012: Betuit, 2015).

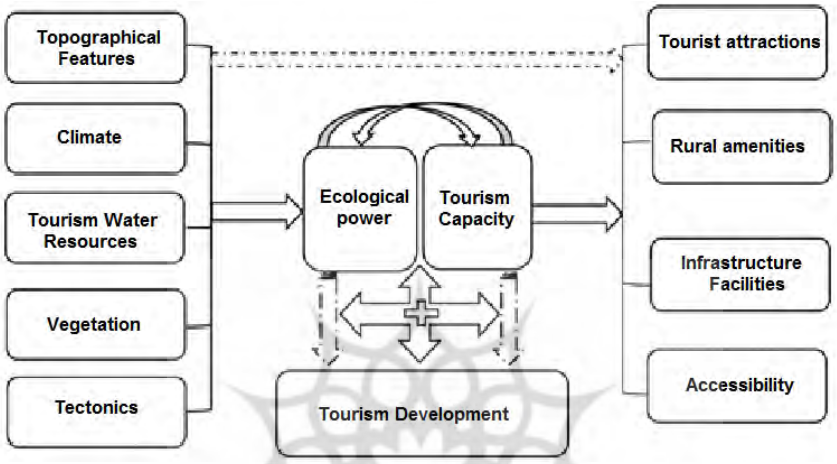

Figure 1. Conceptual model of the research

According to the mentioned items, it can be stated that, the basis of this study is the capacity building and ecological potential in tourism, since the social and regional capacities of increase abilities of reducing threats from the human-induced negative effects of tourism such as resource degradation, will usually be very impressive. Nevertheless, capacity building efforts can be oriented to reduce environmental degradation and lead to increase in environmental potential of the region.

3. Research Methodology

Considering the research purpose and question, the present theoretical study was conducted with applied purposes, using the descriptive-analytical and the library-documentary methods. Also, based on the theoretical framework, the development of different ecological and tourism potential were analyzed and the indicators were identified accordingly. The ecological potential of 5 variables (topographic features, climate, hydrology and tourism water resources, vegetation and tectonics, and distance to fault) and tourism capacities of 4 variables (tourist attractions, village amenities, accessibility and village infrastructure) are described in Table 3

.

Table 3. Variables for measuring tourism development

Source: Habibi et al., 2012; Ghaffari & Rezaei, 2013; Fazeli et al., 2014; Fuzuni et al., 2017; Aliani et al., 2016;; ChehrAzar et al., 2018; Hashemi et al., 2019; Lin et al., 2018; Yaakup et al., 2006; Chi et al., 2020; Fu et al.,2020; Yuxi & Linshen, 2020

Variable	Index	Component
Ecological power	Topographical Features	slope
		elevation
	Climate	Temperature (summer)
		Amount of precipitation
		Distance to the river
		Distance to dam

Variable	Index	Component
	Hydrology and Tourism Water Resources	Distance to the waterfall
		Distance to the fountain
	Vegetation	Tree cover, rangeland (good, medium and weak)
	Tectonics	Distance to fault
Tourism Capacities	Tourist attractions	Natural attractions of the village and its suburbs
		Historical and cultural attractions of the village and its suburbs
		Religious attractions of the village and its suburbs
	Rural amenities	Number of catering units (restaurants, cafes, grilled and sandwiches)
		Number of accommodation units (ecolodge, second house, suite, pilgrim's house and traveler's house)
		Number of subtraction units
	Accessibility	Type of road (freeway, highway, main road, rural road)
		Type of road covering (asphalt, Dirt and shose)
		Road quality (good, medium and poor)
	Village Infrastructure Facilities	Green and sports areas (rural park, sports field and gym)
		Religious (Mosque and Husayniyah)
		Additional - Infrastructure (parking, car repair shop, fuel station and police station)
		Water, electricity, gas (national electricity network, plumbing gas, plumbing water and water treatment system)
		Health- Therapy (public bathroom, health center, pharmacy, health house and Waste collection system)
		Commercial & Service (ATM Bank, Gas Cylinder Distribution Agency, Grocery, Bakery & Meat Shop)
		Communications and Transportation (Telecommunication Office, Public Access to the Internet, Access to Public Transport)

In order to operationalize the study, Mashhad tourism sphere of influence was selected as the study area (Figure 2). This area is one of the regions with the highest potential of rural tourism in Khorasan Razavi Province. And Mashhad receives millions of tourists annually who enter the city with the aim of visiting the holy shrine of Imam Reza and also visiting recreational places around this city. Considering these and other factors such as the value of attractions, the distance of attractions from Mashhad city, and the quality of roads, tourists choose some attractions to visit up to a certain distance. Rapert's modified model was used to determine the Mashhad tourism sphere of influence. The Rapert's model is one of the models related to the sphere of influence of tourism, which is calculated through the formula $A = \sqrt[\frac{1}{4}]{E}$. In this formula A=proper distance, E= ratio of the population of the city or region to 1000 people (Saghaei, 2009: 154-155). This model calculates the radius of influence. The entrance routes of Mashhad have different number of tourist entry and different number of attractions and road quality and public transport from tourist villages, so the researcher balanced the applied formula to determine the sphere of influence by determining the weight for each of the entrances of the city, so that, the desired pattern was calculated separately for each of the entrances of Mashhad and finally the sphere of influence was determined using Arc GIS software. Therefore, Rapet's modified model was used to calculate the sphere influence distance of each entrance of Mashhad city.

$$A = Ki\sqrt[\frac{1}{4}]{E}$$

A= Final limit of the metropolitan tourism sphere of influence

Ki= Weight of tourism indicators of each entrance

E= ratio of metropolitan population to 1000

The population of Mashhad city in 2016: 3057679 people

1. Final limit of tourism sphere influence of Kalat entrance (weight 38%): 31 km
2. Final limit of tourism sphere influence of Sarakhs entrance (weight 46%): 37km
3. Final limit of tourism sphere influence of Neishabour entrance (weight 69%): 56 km
4. Final limit of tourism sphere influence of Torghabeh-Shandiz entrance (weight 1.0): 81 km
5. Final limit of tourism sphere influence of Qouchan entrance (weight 92%): 75km

Then, the final limits of the tourism sphere of influence of entrances were drawn on the map of Mashhad and finally the GIS software was used to combine the final limit of the tourism sphere of influence of studied entrances. Figure 2 shows the tourism sphere of influence of Mashhad city.

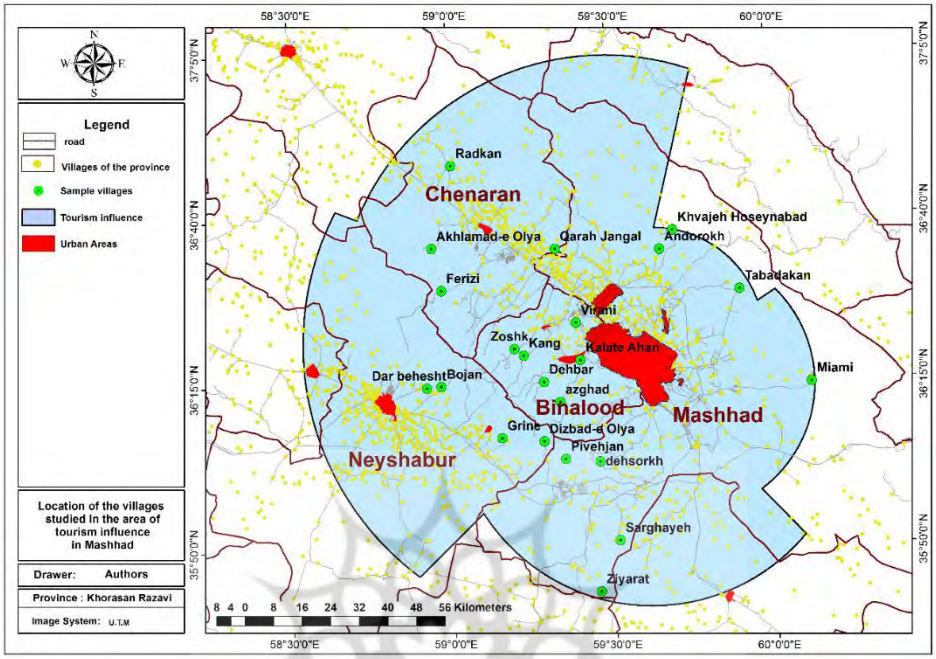

Figure 2. The location of study villages within the tourism sphere of influence of Mashhad city
Source: drawing by the author based on the basic map of Khorasan Razavi governorate (2000)

Also according to Table 4 the total number of the villages with tourist attractions within the tourism sphere of influence of Mashhad city are 167 villages.

Table 4. Number of villages with tourism attractions
Source: Ministry of Cultural Heritage, Handicrafts and Tourism (http://emamzadegan.ir, 2018)

Total villages with attractions	Natural attraction	Religious attraction	Historical-Cultural Attraction
167	128	46	45

The formula n0[1] was used for measuring the number of sample villages. According to the formula, 22 villages in the study area were selected as sample villages. Villages with more than one tourist attraction and a high number of tourists were selected as sample villages.

Table 5. Town, district, rural district of sample villages and the number of tourists of the studied villages
Source: Statistical Center of Iran (2016)

county	district	rural district	Rural	tourists	county	district	rural district	Rural	tourists
Mashhad	Ahmedabad	Pivehjan	Pivehjan	30000	Chenaran	Golbahar	Golmakan	Ferizi	180000
			Ziyarat	10000			Bizaki	Qarah Jangal	50000

[1] $N0 = 1/d^2 25 = 1/.02^2$
The value of d can be considered from 0.1 to 0.2 and in this formula its value is 0.2. Then the following formula was used to obtain the number of sample villages. $n = \frac{n\cdot}{1+n\cdot/N}$
The number of tourist villages 167=N*167

county	district	rural district	Rural	tourists	county	district	rural district	Rural	tourists
		sarjam	dehsorkh	80000		Markazi	Chenaran	Akhlamad-e Olya	700000
			Sarghayeh	7000			Radkan	Radkan	300000
	Rizvieh	Miami	Miami	3500000	Neyshabur	Markazi	Fazl	Bojan	750000
	Markazi	Tabadakan	Andorokh	10000				Dar behesht	130000
		Kenwist	Tabadakan	80000		Zeberkhan	Eshagh Abad	Dizbad-e Olya	8000
		Carde	Khvajeh Hoseynabad	10000				Grine	100000
Binaloood	Shandiz	Abardeh	Zoshk	5000	Binaloud	Torghabeh	Jaghargh	Dehbar	17000
		Shandiz	Virani	30000				Kang	18000
	Torghabeh	Torghabeh	Kalate Ahan	10000			Torghabeh	azghad	13000

Then, to obtain the value of ecological potential of each village, GIS software (FAHP weighting method) was used by systematic method. In order to rank and measure the tourism capacity of the studied villages, the multi-criteria decision-making method (CoCoSo[1]) (fuzzy Delphi hierarchical analysis weighting method and the opinions of 30 local experts and cultural heritage experts) were used. Figure 3 illustrates research process model.

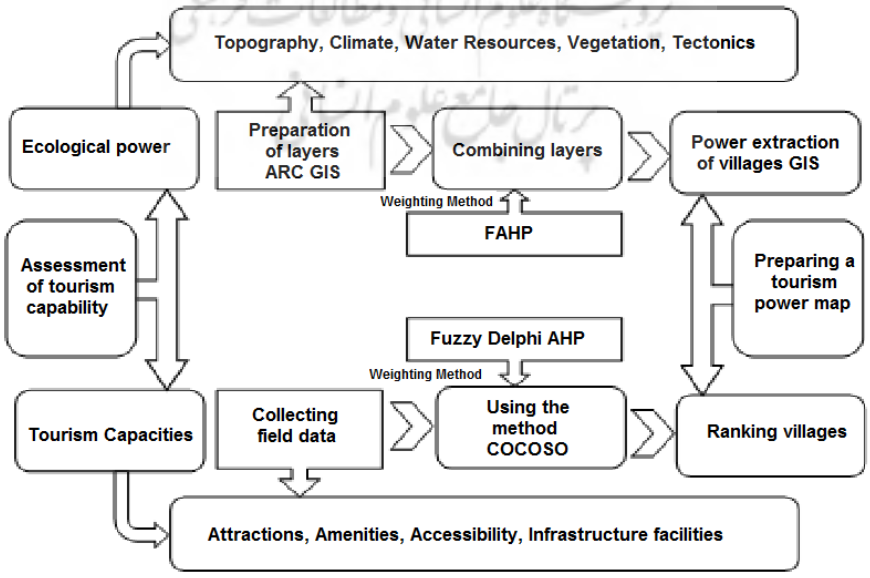

Figure 3. Research process model

1. Combined compromise solution

SPSS software and Pearson correlation test and two-sample independent t-test were used for further analysis of the results of ecological potential value of each village (topographic features, climate, tourism hydrology and water resources, vegetation and tectonics and the distance to fault) and tourism capacity assessment of each village (using 4 variables of tourism attractions, village amenities, accessibility, and village infrastructure).

4. Research Findings

Using GIS software, 10 indicators of slope, altitude, temperature (of summer), rainfall, vegetation, distance from fault, dam, spring, and river were used to analyze the ecological potential of the study area including four cities of Mashhad, Binaloud, Neishabour, and Chenaran. Accordingly, the lowest altitude in the study area is 694 meters above sea level, which is located in the east of Mashhad city and the highest altitude in the study area is Binaloud peaks at the border of Binaloud and Neishabour cities with 3293 meters.

The steepest areas are Binaloud and Hezar Masjed heights. The minimum average temperature (in summer) in synoptic stations of study tows over 30 years (1991-2020), was 23.57ºc and the maximum average summer temperature was 32.75ºc. Also, the average rainfall over 30 years (1991-2020) was 143. It is worth mentioning that the amount of rainfall has increased significantly in the recent two years (2019 & 2020) compared with the last 30 years. Investigating the vegetation of the study area shows that, 11.32% of the study area is forest, 3.93% is good pasture, 6.06% is medium pasture, 35.07% is poor pasture and 43.62% of the study area has no vegetation. The most important faults of Khorasan Razavi Province are Darouneh, Kashafroud, Tous, Sang Bast, and Shandiz faults, whose activities in recent years have caused major damages to rural areas, which has led to the reduction of tourism activities in those villages.

Various types of water resources in the study area which attract tourists include various dams, waterfalls, springs, and seasonal and permanent rivers. Important dams of interest to tourists are: Torogh, Kardeh, Ardak, Chalidareh, Dolat abad, bar, yengejah Neishabour, Abdollah Giv, Cheshmeh Sabz, Pabaz Neishabour, Darroud Neishabour, Band Golestan, and Khanlogh. Important springs include Gorab, Dehsorkh, Haft Howz, Mayamey, Garmab Taghankouh, Cheshmeh Sabz, and Kham Tarkan. The waterfalls of interest to tourists include Gerineh waterfall, Bar waterfall, Akhlamad waterfall, Dareh Al waterfall, Drroud waterfall, Kharve waterfall, Bozhan waterfall, Kimshah waterfall, Abghad waterfall, Hu waterfall, and Kang waterfall. Rivers are also the water sources which attract lots of tourists and they include Kashaf roud, Bozhan river, Dehsorkh river, Dehbar river, Radkan river, Zoshk river, and Kang river which are visited by many tourists during holidays and weekends. The research indicators were weighted using FAHP model and the opinions of 15 experts and specialists in the fields of tourism and environment in order to obtain the ecological potential of the study area. The most weight belonged to the indicator of distance to waterfall (0.3469) and the least weight belongs to the indicator of distance to fault (0.0089).

Table 6. Weights of the indicators of ecological potential (FAHP)

Weight	Index	Weight	Index
0.1346	Distance to the river	0.0289	slope
0.1643	Distance to dam	0.0316	elevation
0.3469	Distance to the waterfall	0.0349	Temperature (summer)
0.1273	Distance to the fountain	0.0363	Amount of precipitation
0.0864	Amount of vegetation	0.0089	Distance to fault

After combining the layers, the ecological potential layer of the study area was measured. The maps of ecological potential indicators and the ecological potential map can be observed in Figure 4.

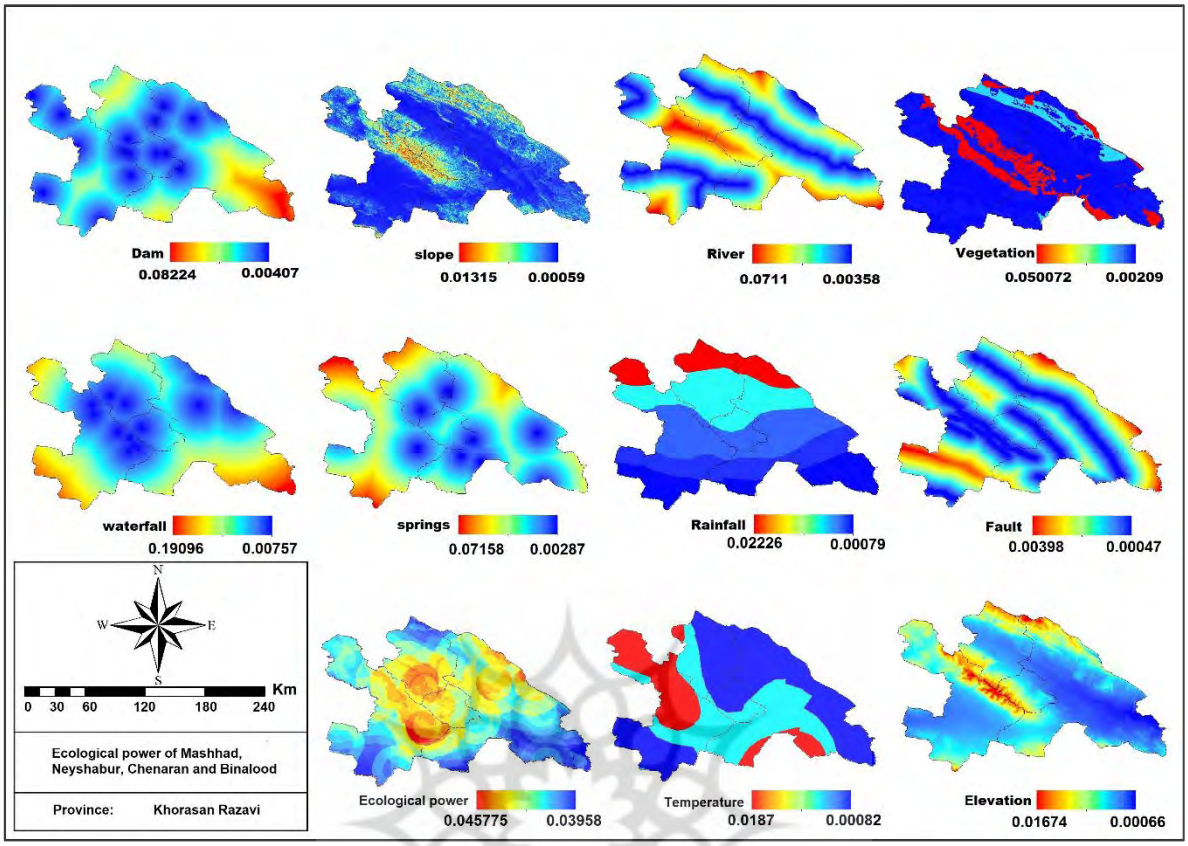

Figure 4. Ecological potential of the study area

Source: Author's drawings based on basic map of Khorasan Razavi Governorate (2020)

After obtaining the ecological potential value of each village, according to the placement of each village in each ecological potential class, each village's potential value has obtained using GIS software. The ecological potential value of each village is as shown in Table 7. The highest ecological potential values belong to the villages of Dehsorkh, Kang, and Pivehzhan and the lowest ecological potential values belong to the villages of Ziarat, Darbehesht, and Sarghayeh.

Table 7. The ecological potential values of the studied villages

rank	ecological power	Village	rank	ecological power	Village
۱۲	۰/۰۸۰۰۷	azghad	۱	۰/۱۶۶۸۱	**Dehsorkh**
۱۳	۰/۰۸۰۰۷	Dehbar	۲	۰/۱۵۱۲۳	**Kang**
۱۴	۰/۰۷۵۰۳	Bojan	۳	۰/۱۴۶۲۶	**Pivehjan**
۱۵	۰/۰۵۵۷۳	Qarah Jangal	۴	۰/۱۴۵۱۸	**Dizbad-e Olya**
۱۶	۰/۰۵۰۰۰	Virani	۵	۰/۱۱۸۶۱	**Kalate Ahan**
۱۷	۰/۰۴۹۹۷	Khvajeh Hoseynabad	۶	۰/۱۱۴۲۳	**Miami**
۱۸	۰/۰۴۹۰۵	Radkan	۷	۰/۱۰۶۴۹	**Grine**
۱۹	۰/۰۴۸۷۹	Andorokh	۸	۰/۱۰۵۹۴	**Tabadakan**
۲۰	۰/۰۴۸۶۷	Sarghayeh	۹	۰/۰۹۲۴۰	**Zoshk**
۲۱	۰/۰۴۳۹۸	Dar behesht	۱۰	۰/۰۸۸۸۹	**Ferizi**
۲۲	۰/۰۳۶۳۳	Ziyarat	۱۱	۰/۰۸۶۹۷	**Akhlamad-e Olya**

Next, the tourism capacity of the studied villages were analyzed in the form of the variables of tourist attractions, village amenities, accessibility, and village infrastructure. According to studies, the largest number of tourist attractions belong to Bozhan village including the countryside of the village, 10 to 12 small and large waterfalls, Bozhan river, springs, mountaineering, and valleys (Parastouha, Nader, Sadr, Banou Kakhneshin), 800 year old tree and the lowest number of these attractions belong to Virani village. Moreover, the most diverse villages in case of historical attractions are the 4 villages of Kang with (Hesar Kang castle, old cemetery, old mosque, Sheikh Abdollah graveyard, and old bathhouse, Takyeh Sofla), Azghad with (old mosque, Safavieh old bathhouse, old cemetery with tombstones painted in pictures, and seminary), Pivehzhan with (old bathhouse, the tomb of Imams Hashem and Mohtasham, old central mosque and old castle) , and Gerineh with (old bathhouse, 400 year old sycamore tree, old cemetery with old tombstones (painted in pictures) and old castle). Two villages of Kalateh Ahan and Dizbad Olya have no historical attractions. The villages of Andarkh, Pivehzhan, Tabadkan, Khajeh Hosein Abad, Darbehesht, Dehsorkh, Radkan, Ziarat, Sarghayeh, Farizi, Gharah Jangal, Mayamey, and Virani have religious attractions.

Among the studied villages, most catering services (restaurants, café, Kebab, sandwich shop) belong to the village of Akhlamad Olya and the least catering services belong to 7 villages: Kalateh Ahan, Andarkh, Khajeh Hosein Abad, Ziarat, Farizi, Gharah Jangal, and Dehsorkh. Most accommodation facilities (eco-lodge, second house, suite, camp of pilgrims, and inn) belong to Zoshk and Pivehzhan, and the least belong to Ziarat village. Also, among the tourism recreational facilities provided in the studied villages are underground tunnels in the villages of Pivehzhan and Dehsorkh, natural parks in the villages of Virani, Farizi and Radkan, artificial waterfalls in the villages of Farizi and Sarghayeh, museum of anthropology in Virani village.

The roads leading to Khajeh Hosein Abad and Ziarat are dirt roads. Akhlamad Olya and Tabadkan have asphalt roads with medium quality, Mayamey has asphalt road with poor quality and other villages have asphalt roads with suitable quality. In terms of the type of roads, the villages of Azghad, Virani, Dehsorkh, Dizbad Olya, and Darbehesht are located at a short distance from the highway, and the villages of Mayamey and Tabadkan are the farthest villages from the highway, and the roads leading to them are the main rural roads.

In the present study 26 types of facilities were examined in the studied villages: rural parks, sport fields, gyms, mosques, Hoseinieh, parkings, car repair shops, petrol stations, police stations, national electricity network, gas piping, tap water, water purification system, public bathhouse, clinics, pharmacies, healthcare centers, garbage collection system, ATM, gas cylinder distributers, super markets, bakeries, butcher shops, telecommunication office, public internet access and access to public transport. Among the studied villages, the highest number of facilities belongs to Radkan and Virani villages with 22 types of facilities and the lowest number of facilities belongs to Ziarat village with 10 types of facilities out of a total of 26 types of facilities.

The combined compromise solution method (CoCoSo) was used to rank the studied villages in terms of tourism capacities. The proposed combined approach is based on an aggregated weighted sum model and weighted product model. This model can be a set of compromise solutions. The CoCoSo model has 5 main steps to solve problems in decision-making which are:

1. Formation of initial decision matrix
2. Normalization of the indicators is done using the following equations. First equation is used for indicators with positive direction and second equation is used for indicators with negative direction. Based on this normalization all the indicators are placed between 0 and 1.

The calculation of the sum of comparable weight sequences (Si) and all comparable power weights of the sequences for each option (Pi), Si is obtained based on the grey relational analysis method:

$$r_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}; \Longleftarrow$$ For positive indicators

$$r_{ij} = \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \Longleftarrow$$ For negative indicators

$$S_i = \sum_{j=1}^{n} (w_j r_{ij}),$$

In this model, the weight is calculated using the fuzzy Delphi hierarchical analysis method. Table 8 shows the weights of tourism capacity indicators. The highest weights obtained according to experts belong to the two indicators of natural attractions of the village and suburbs (0.086) and the quality of rural roads (0.830).

Table 8. weights of tourism capacity indicators

Weight	Index	Weight	Index	Weight	Index
0.06	Communications & Transportation	0.036	Village Road Type	0.086	Natural attractions of the village and suburbs
0.028	Religious	0.065	Type of road covering the village	0.058	Historical and cultural attractions of the village and suburbs
0.074	Update-Infrastructure	0.083	Quality of the village road	0.056	Religious attractions of the village and suburbs
0.061	Water, Electricity, Gas	0.054	Greenery & Sports	0.078	Rural catering facilities
0.055	Health Care	0.055	Trading & Services	0.075	Village Accommodation Facilities
				0.068	Recreational facilities of the village

Pi is obtained through the product model of WASPAS:

$$P_i = \sum_{j=1}^{n} (r_{ij})^{w_j},$$

1. The following cumulative methods are used to calculate the relative weights of the indicators. In this level, three methods of evaluation score are used to calculate the relative weights of indicators, which are obtained through the formulas (R_{ia}, R_{ib}, R_{ic}**):**

$$k_{ia} = \frac{P_i + S_i}{\sum_{i=1}^{m} (P_i + S_i)}, \quad k_{ib} = \frac{S_i}{\min_i S_i} + \frac{P_i}{\min_i P_i}, \quad k_{ic} = \frac{\lambda(S_i) + (1-\lambda)(P_i)}{\left(\lambda \max_i S_i + (1-\lambda)\max_i P_i\right)}; \quad 0 \leqslant \lambda \leqslant 1.$$

The equation Ria states the arithmetic mean of total scores of WPM and WSM, while the equation Rib states the relative scores of WPM and WSM compared to the best case. The equation Ric shows the balanced scores compromise of WPM and WSM models. In equation Ric, the value of ϒ=0.5 is usually selected by decision makers. However, the flexibility and sustainability of CoCoSo can also be dependent on other values.

2. The final ranking of the options is done based on Ri, and the larger values rank better (Yazdani, 2018, pp. 8-9)

$$k_i = (k_{ia} k_{ib} k_{ic})^{\frac{1}{3}} + \frac{1}{3}(k_{ia} + k_{ib} + k_{ic}).$$

After doing the main steps of CoCoSo model, the Ri values for each of the studied villages were obtained in the form of the indicators of natural attractions of the village and countryside, historical-cultural attractions of the village and countryside, religious attractions of the village and countryside, catering facilities of the village, residential facilities of the village, recreational facilities of the village, type of the rural road, type of rural road cover, quality of rural road, green space and sports, supplementary-infrastructure facilities, water, electricity, gas, healthcare, business, services, communication and transportation. As observed in Table 9, the highest rankings belong to villages of Pivehzhan, Virani, and Radkan.

Table 9. Ri values and ranking of the studied villages based on CoCoSo model

rank	Ri	Village	rank	Ri	Village	rank	Ri	Village
۱۶	۲/۰۳۲۶	Miami	۹	۲/۱۷۳۷	Kang	۱	۲/۷۹۳۲	Pivehjan
۱۷	۲/۰۱۸۲	Akhlamad-e Olya	۱۰	۲/۱۶۸۵	Tabadakan	۲	۲/۷۷۷۳	Virani
۱۸	۱/۹۲۷۸	Dehbar	۱۱	۲/۱۱۲۱	Andorokh	۳	۲/۷۶	Radkan
۱۹	۱/۸۹۴۲	Grine	۱۲	۲/۰۹۷۱	Qarah Jangal	۴	۲/۴۷۴۷	Sarghayeh
۲۰	۱/۶۵۹۹	Kalate Ahan	۱۳	۲/۰۵۱۸	Dizbad-e Olya	۵	۲/۴۷۳۲	Ferizi
۲۱	۱/۵۰۵۷	Khvajeh Hoseynabad	۱۴	۲/۰۴۱	azghad	۶	۲/۴۲۱۶	Bojan
۲۲	۱/۰۹۴۱	Ziyarat	۱۵	۲/۰۳۶۹	Dar behesht	۷	۲/۴۱۹	Dehsorkh
						۸	۲/۳۲۰۹	Zoshk

Considering the normality of both variables, Pearson correlation coefficient was used to evaluate the relationship between ecological potential and tourism capacity of the studied villages. As observed in Table 10, the ecological potential of the studied villages with Pearson correlation coefficient of 0.641 and the value of tourism capacity of the studied villages resulted from CoCoSo model have a significant direct relationship. This means that the higher the ecological potential in the region, the greater its tourism capacity. Therefore, the correlation between these indicators and the existence of ecological potential in the study area, including rainfall increase in recent years and climate change which have strengthened water resources, rehabilitated seasonal rivers and improved vegetation status, make the managers and investors more willing to invest and build tourism capacity in the region. Moreover, according to the value obtained, there is a significant relationship between the ecological potential and tourism capacity of the studied villages and it can be generalized to the whole society.

Table 10. The relationship between ecological potential and tourism carrying tourism capacity of the studied villages

Sig. (2-tailed)	Pearson Statistics	Pearson Correlation
0.001	0.641	Ecological power/ tourism capacity

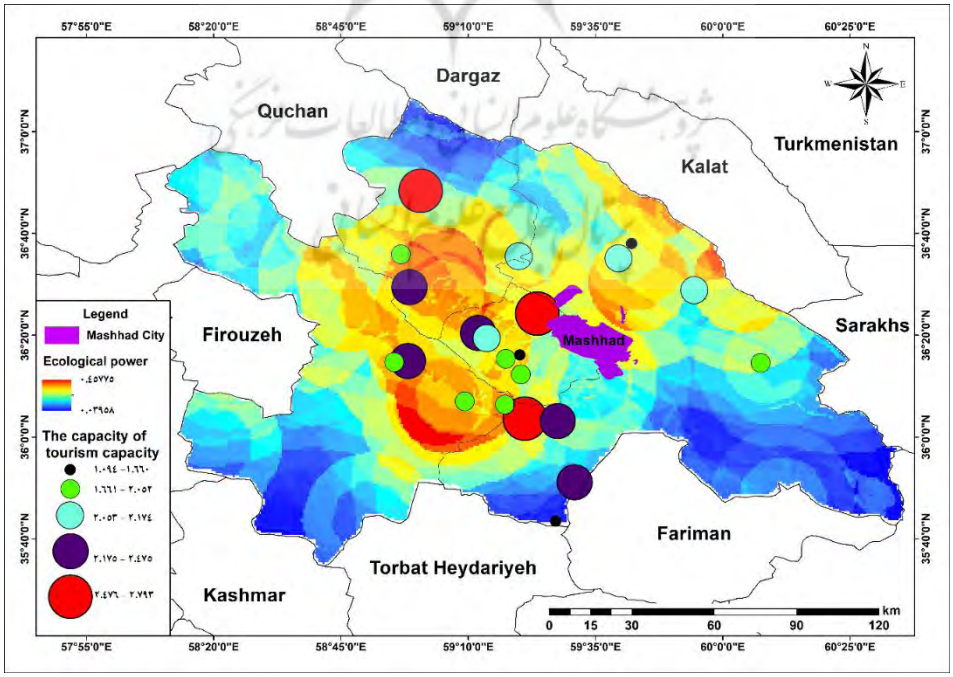

Figure 5. The amount of tourism capacity of the studied villages on the map of ecological potential of the area
Source: Author's drawing based on the basic map of Khorasan Razavi Governorate (2020)

Pearson correlation coefficient was used to further analyze the topic and investigate the relationship between tourist attractions and ecological potential of the studied villages. The results show a lack of correlation between the two indicators. Thus, it can be noted that, considering the results of weighting the ecological potential by experts, the maximum weight value belongs to water resources, which has the highest effect on the tourism ecological potential of the region. Apparently, in all periods of human life history, man has been attracted to water resources both for life and recreation and has provided work, activity, and other facilities of life and recreation near water. This is also true in the studied area. However, few villages have this attraction. Villages with a high number of tourists have religious attractions. It can be seen that the number of tourists of religious destinations does not change with seasonal and climate changes. Therefore, these cases cause a lack of relationship between ecological potential and the number of tourists in the studied villages.

Table 11. The relationship between ecological potential and number of tourists in the studied villages

Sig. (2-tailed)	Pearson Statistics	Pearson Correlation
0.412	0.184	Ecological power/ number of tourists

5. Discussion and Conclusion

Tourism is a proper approach for socio-economic development, especially in the rural areas and a solution for reducing the negative environmental effects, thus, the environment should not be considered a tool for economic development, but in this regard, in order to provide grounds for tourism and diverse migration, first the tourism development potential should be evaluated, since, the evaluation of tourism development potential is one of the proper strategies for reducing negative effects of tourism and increasing its positive effects. It should be taken into consideration that, not all places have the same capability of tourism development. Today proper planning and comprehensive use of environment is based on recognizing talents, capacities and evaluating production potential of land. Therefore, recognition, investigation and analysis of the current situation, especially in terms of natural and human capacities of tourism development is a topic that along with the approach of academic studies of ecological evaluation, provides the grounds for extremely positive developmental transformations. This principle with emphasizing on tourism development and identifying the environmental potential of tourism development will create a revolution in the field of planning and development of tourism. Hence, the purpose of this study was evaluating the ecological potential of the studied area and finding the relationship between rural tourism tourism capacities and ecological potential in rural areas within Mashhad tourism sphere of influence as the study area. Moreover, in the present study, the ecological potential was examined with 5 variables (topographic features, climate, tourism hydrology and water resources, vegetation and tectonics and distance to fault) and tourism capacities with 4 variables (tourist attractions, rural amenities, accessibility, and rural infrastructure). In general, according to the results, the highest ecological potential belongs to the foothill villages such as Dehsorkh, Kang, and Pivehzhan since these villages have suitable natural conditions for tourism and the lowest ecological potential belongs to the villages of Mashhad including Ziarat, Darbehesht, and Sarghayeh. The highest tourism capacities belong to the villages of Pivehzhan, Virani and Radkan. Investigating the relationship between the ecological potential of the studied villages and the value of tourism capacity of the studied villages, resulted from multi criteria decision making model CoCoSo, shows a significant direct relationship. This means that the higher the ecological potential in the region, the greater its tourism capacity, so that, the managers and investors are more willing to invest and create tourism capacities in the region. It should also be mentioned that, tourism capacity of an area should not be more than its ecological potential, because it leads to environmental damages which result in reduction of the potential and waste of capital in the region. The results of the study indicate that, there is no correlation between the values of attracting tourists and ecological potential in the study area which shows that, tourism ecological potential of the area is in danger. Despite the fact that some villages which have a low tourism potential, attract high number of tourists, (they are religious destinations and religious tourism is the only type of tourism which overcomes weather barriers). Therefore, the large number of tourists that are beyond the ecological potential of the area, leads to environmental damages. For instance, Mayamey

village which has a medium ecological potential receives 3.5 million tourists annually. The high volume of tourists causes damages to the environment and even leads to the reduction of the quality of tourism capacities over time. Unlike this, the village of Dehsorkh which has a high ecological potential, is not capable of attracting a large number of tourists. Thus, for further investigation, it is necessary to examine the most important factors determining the tourism flow to define what factors are effective in attracting tourists in addition to ecological potential and tourism capacities. These factors may affect the tourism management in the study area which annually receives millions of tourists and increase the presence of tourists in Mashhad and especially the villages within the tourism sphere influence of Mashhad. It can also be said that, by using evaluation models and patterns, the waste of resources and environmental potentials can be prevented; these results are in line with the findings of Saeb (2017), Ghadiri Ma'soom et al. (2013), Yuxia and Linshenga (2020) and Olafsdottir and Runnstrom (2009) who noted that using power measurement models and systematic framework play an effective role in achieving sustainable development and optimized use of resources.

However, the difference between this study and other studies is that, this study, while identifying the ecological potential of the study area, has also examined its relationship with the tourism capacity of the tourist destination villages of the region.

According to the results of this study, proper solutions can be suggested for different parts of the area, which are:

- Increasing the tourism tourism capacities of the villages according to ecological potential of the region;
- Due to the importance of road quality and accessibility in tourism, more attention should be paid to villages such as Khajeh Hosseinabad, Ziarat and Mayamey, whose situation is not suitable in this regard;
- Accurate identification of natural potentials of the areas with high ecological potential and principled and rational investment in order to use it;
- Due to the great attractiveness of water resources in the tourism industry, and the existence of few water resources in the study area and the effectiveness of the quality and volume of these resources on the tourism industry, in order to maintain these resources, a special program should be provided according to their characteristics.

Acknowledgments: The current paper is extracted from the doctoral dissertation of the first author (Hamideh Mamoudi) in the Department of Geography, Faculty of Letteres & Human Sciences, Ferdowsi University of Mashhad, Mashhad, Iran.

References

1. Akbar Fazeli, S., Mohammady Samani, K., & Pyrbauqar, M. (2014). Zoning areas for tourism development Nature Case study: Forests around Garan-Maryvan Dam. *Journal of Sustainable Forest Development*, 1(4), 365-381. [In Persian] https://fsdj.guilan.ac.ir/article_1256.html
2. Aliani, H., Babaei Kafaki, S., Saffari, A., & Munvari, S.M. (2016). Land Capability Assessment for Identifying Suitable Areas of Tourism Development Using ANP Network Analysis Process. Remote Sensing and GIS in Natural Resources, 7(4), 1-17. [In Persian] https://girs.bushehr.iau.ir/article_528878.html
3. Aref, F., & Redzuan, M. R. B. (2009). Community capacity building for tourism development. *Journal of human ecology*, 27(1), 21-25 DIO:10.5539/jsd.v3n1p81
4. Betuit, M. (2015). The role of environmental capabilities in rural tourism development Case study of Firoozkooh city. *MSc Thesis, Islamic Azad University*, Central Tehran, Tehran. [In Persian]
5. Bozrajmehri, Kh., & Mudoudi Arjadi, M. (2015). Comparative Evaluation of Different Tourism Capabilities in Target Villages of Golestan Province, *Journal of Human Habitat Planning Studies*, 10(31), 1-13. [In Persian] https://jshsp.rasht.iau.ir/article_515318_7a3d2230f124d13763f93f8c7bbb7805.pdf
6. Canoves, M. K., Priestley, G., & Blanco, A. (2004). Rural tourism in Spain: an analysis of recent evolution. *Geoforum*, 35(6), 755-769. DIO: 10.1016/j.geoforum.2004.03.005
7. Chehr-Ezar, F., Nahavandchi, M., Ballist, Ja., & Amiri, M.J. (2018). Study and evaluation of tourism capability using fuzzy logic in the environment GIS Case study: Hamadan city. *Environmental Science Studies*, 3(1), 659-672. [In Persian] http://www.jess.ir/article_80140.html
8. Chi, Y., Zhang, Z., Wang, J., Xie, Z., & Gao, J. (2020). Island protected area zoning based on ecological importance and tenacity. *Ecological Indicators*, 112, 1-17. DIO: 10.1016/j.ecolind.2020.106139

9. Cupples, J. (2005). What is community capacity building? From <https: //www.ccwa.org.uk /v2/downloads/cms/ 1121303664.pdf> (Retrieved March 4, 2008).
10. Dwyer, L., Edwards, D., Mistilis, N., Roman C., & Scott N. (2009). Destination and enterprise management for a tourism future. *Tourism Management*, 30 (2), 63–74. DIO: 10.1016/j.tourman.2008.04.002
11. Ebrahimi, F. (2019). Tourism Capability Survey in Chahar Mahal Bakhtiari Province. *Journal of Tourism Research and Sustainable Development*, 2(1), 41-46. [In Persian] http://www.trsd.ir/post.aspx?id=585
12. Firoozi, MA., Goudarzi, M., Zarei, R., & Akbari, A. (2013). Evaluation of Ecological Power of The Exemplary Tourism Area of Shaheed Abbaspour Dam with emphasis on Sustainable Tourism Development. *Journal of Applied Research in Geographical Sciences*, 13(28), 153-176. [In Persian] http://jgs.khu.ac.ir/article-1-690-fa.html
13. Fozoni, B., Istajami, A., & Vali Shariatpanahi, M. (2017). The role of environmental capabilities in sustainable development with emphasis on tourism using ahp Case study: Deylaman district of Siahkal. *Journal of Geography (Regional Planning)*, 7(2), 231-245. [In Persian] http://www.jgeoqeshm.ir/article_49647_7812c0934f451e7ecc701cccea972b79.pdf
14. Fu, Y., Xueyi Shi, X., He, J., Yuan, Y., & Qu, L. (2020). Identification and optimization strategy of county ecological security pattern: A case study in the Loess Plateau, China. *Ecological Indicators*, 112, 1–100. DIO: 10.1016/j.ecolind.2019.106030
15. Ghadiri Masoom, M., Salmani, M., & Ghasabi, M.J. (2013). Eryabi tavan desert tourism development and its impact on socio-economic and physical dimensions in rural settlements Case study of villages of Khor and Biabanak. *Journal of Geography and Planning*, 18(50), 281-304. [In Persian]. https://www.sid.ir/fa/journal/ViewPaper.aspx?ID=231727
16. Ghaffari, R., & Mousa Rezaei, M. (2013). Ecological Power Measurement and Tourism Industry Development Planning in Chaharmahal and Bakhtiari Province. *Journal of Geography and Environmental Studies*, 2(8), 79-98. [In Persian] http://ges.iaun.ac.ir/article_555321.html
17. Habibi, K., Tekyehkhah, J. & Azad Ahmadi, M. (2012). Ecotourism Capability Assessment and Sustainable Tourism Development Planning Case Study: Abydar Forest Park. *Journal of Urban Studies*, 3(3) 13-23. [In Persian] https://urbstudies.uok.ac.ir/article_2753.html
18. Hashemi, S.M., Karimi Pashaky, S. & Khalifak, E. (2019). Priority of Tourism Development Capability in Desert and Desert Regions Case Study: Kerman Province. *Journal of Urban Tourism*, 6(2), 79-98. [In Persian] DIO:10.30495/jzpm.2021.4596
19. Hessel, R. J., den Berg, J., Kabore, O., van Kekem, A., Verzandvoort, S., Dipama, J.M., Diallo, B. (2009), Linking Participatory and GIS-based Land Use Planning Methods: A Case Study from Burkina Faso. *Land Use Policy*, 26(4), pp. 1162-1172. DIO: 10.1016/j.landusepol.2009.02.008
20. Kieffer, C., & Reischmann, J. (2004). Contributions of Community Building to Achieving Improved Public Health Outcomes. *Final report*, August 2004.
21. Kumari, S., Behera, M.D., & Tewari, H.R. (2010). Identification of potential ecotourism sites in West District, Sikkim using geospatial tools. *Tropical Ecology*, 51(1), pp. 75-85. https://www.researchgate.net/publication/283809316
22. Kurniawana, F., Adriantoa, L., Bengenc, D.G., & Prasetyo, L.B. (2019). The social-ecological status of small islands: An evaluation of island tourism destination management in Indonesia. *Tourism Management Perspectives*, 31, 136-144. DIO: 10.1016/j.tmp.2019.04.004
23. Lacitignola, D., Petrosillo, I., Cataldi, M. & Zurlini, G. (2007). Modelling socio-ecological tourism-based systems for sustainability. *Ecological Economics*, 206, 191-204. DIO:10.1016/j.ecolmodel.2007.03.034
24. Lee, T.H., & Liu, R.T. (2011). Strategy formulation for the recreational areas of Central Taiwan: An application of SWOT (strengths, weaknesses, opportunities, threat) analysis. *Journal of Hospitality Management and Tourism*. 2(3), 38-47. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.824.2145&rep=rep1&type=pdf
25. Lin, W., Ying Li, Y., Xiande Li, X., & Dan Xu, D. (2018). The dynamic analysis and evaluation on tourist ecological footprint of city: Take Shanghai as an instance. *Sustainable Cities and Society*, 37, 541-549. DIO: 10.1016/j.scs.2017.12.003
26. Marrocu, E., & Paci, R. (2013). Different tourists to different destinations. Evidence from spatial interaction models. Tourism Management, (39), 71-83. DIO: 10.1016/j.tourman.2012.10.009

27. Martins, L.F, Gan, Y., & Ferreira-L. (2017). An empirical analysis of the influence of macroeconomic determinants on World tourism demand. Tourism Management, (61), 248-260. DIO:10.1016/ j. tourman. 2017.01.008
28. Moradi, F.(2014). Evaluation of Tourism Capabilities of Takab City in Order to Provide Development Strategies Using SWOT Model. *MSc Thesis, Payame Noor University*, South Tehran, Tehran, [In Persian]. DIO: 10.22059/jut.2019.234974.334
29. Olafsdottir, R., & Runnstrom, M. (2009). A GIS Approach to Evaluating Ecological Sensitivity for Tourism Development in Fragile Environments. A Case Study from SE Iceland. *Scandinavian Journal of Hospitality and Tourism*, 9(1), 22-38. DIO:10.1080/15022250902761504
30. Patterson, T.M., Niccolucci, V., & Bastianoni, S. (2007). Beyond "more is better": Ecological footprint accounting for tourism and consumption in Val di Merse, Italy. Ecological Economics, 62, 747-756. DIO: 10.1016/j.ecolecon.2006.09.016
31. Patterson, T.M., Niccolucci, V., & Marchettini, N. (2008). Adaptive environmental management of tourism in the Province of Siena, Italy using the ecological footprint. *Journal of Environmental Management*, 86, 407–418. DIO: 10.1016/j.jenvman.2006.04.017
32. Petrosillo, I., Zurlini, G., Grato, E., & Zaccarelli, N. (2006). Indicating fragility of socio-ecological tourism-based systems. *Ecological Indicators*, 6, 104–113. DIO: 10.1016/j.ecolind.2005.08.008
33. Qiao, L. (2008) A model for suitability evaluation of tourism development for the suburban mining wasteland and its empirical research, Ecological Economy 4: 338- 345.
34. Raik, B. (2002). Capacity Building for Co-management of Wildlife in North America. From http://www.dnr. cornell.edu/hdru/PUBS/HDRUReport02-2.pdf
35. Roknoddin Eftekhari, A., & Badri, S.A. (2012). Theorized Foundations of Rural Development Model, Sample, Tehran. *Noor-ol-Alam Publications*, [In Persian].
36. Rosentraub M. S., & Joo M. (2009). Tourism and economic development: Which investments produce gains for regions?. *Tourism Management*, 30(2), 759–770. https:// doi.org/ 10.1016/ j.tourman.2008.11.014
37. Rostampour, S. (2014). Development of a Risky Planning Model for Evaluating The Ability to Develop Settlement and Tourism in The West of Golestan Province. *M.Sc. Thesis, Agricultural Sciences and Natural Resources University*, Gorgan. [In Persian]
38. Ryu, K., Roy. P.A., Kim. H.L., & Ryu, H. (2020). The resident participation in endogenous rural tourism projects: a case study of Kumbalangi in Kerala. India. https://doi.org/10.1080/10548408.2019.1687389
39. Saeb, N. (2017). Ecological Abilities Assessment for Tourism Development using GIS (Case Study: Sarein City). *MSc Thesis, Mohaqegh Ardabili University*, Ardabil. [In Persian]
40. Saghaei, M. (2009). Spatial text of tourism in villages around metropolises (Case study: Mashhad metropolis*). Ph.D. thesis on geography and rural planning*, Ferdowsi University, Mashhad. [In Persian]
41. Shirafkan Lamsso, M., & Masoomzadeh, S. (2017). Study of impact of exchange rate on tourism balance of payment in countries with top tourist attractions (Vector Error Correction Approach). *International Journal of Tourism & Hospitality Reviews*, 4 (1), 10-20. https://doi.org/10.18510/ijthr.2017.412
42. Sokhanvara, A., Çiftçioglua, S., & Javid, E. (2018). Another look at tourism- economic development nexus. Tourism Management Perspectives, 26, 97-106. https://doi.org/10.1016/j.tmp.2018.03.002
43. Soltani, Z., & Nouri, S.H (2010). Environmental Power Assessment of Khansar City for Tourism Development Using Gis, *Geographical Research Quarterly*, 99, 77-100. [In Persian] https://www.sid.ir/fa/ journal/ View Paper.aspx?id=139808
44. Tohidy, F. (2011). Economic Impact of Tourism Industry. International Journal of Business and Management. 6(8), 206- 215. https://doi.org/10.5539/ijbm.v6n8p206
45. Wu, C.C., & Tsai, H.M. (2016). Capacity building for tourism development in a nested social-ecological system A case study of the South Penghu Archipelago Marine National Park. Taiwan, Ocean & Coastal Management, 123, 66-73. https://doi.org/10.1016/j.ocecoaman.2016.02.001
46. Yaakup, A., Che' Man, N., Hosni, N., Haron, H.W., & Sulaiman, S. (2006). A GIS Approach in Evaluation of Metropolitan Green Area: A Case of Sungai Pulai Wetland. Urban Forestry Conference: Managing Urban Green For Sustainable Cities, Kuala Lumpur, 6-7 June, 2006. http://eprints.utm.my/id/eprint/615/

47. Yazdani, M., Zarate, P., Zavadskas, E.K., & Turskis, Z. (2018). A combined compromise solution (CoCoSo) method for multi-criteria decision-making problems. Management Decision, https://doi.org/10.1108/MD-05-2017-0458
48. Yuxi, Z., & Linsheng, Z. (2020). Identifying conflicts tendency between nature-based tourism development and ecological protection in China. *Ecological Indicators*, 109, 1-13. https://doi.org/10.1016/j.ecolind.2019.105791

Journal of Research and Rural Planning
Volume 11, No. 2, Spring 2022, Serial No. 37, Pp. 1-22
eISSN: 2783-2007 **ISSN: 2783-2791**
http://jrrp.um.ac.ir

Original Article

ارزیابی توان توسعه گردشگری روستاهای مقصد گردشگری با استفاده از GIS (مطالعه موردی: حوزه نفوذ گردشگری شهر مشهد)

حمیده محمودی[۱]- حمید شایان*[۲]- حمدالله سجاسی قیداری[۳]- طاهره صادقلو[۴]- مسعود مینایی[۵]

۱- دانشجوی دکتری جغرافیا و برنامه‌ریزی روستایی، دانشگاه فردوسی مشهد، مشهد، ایران.
۲- استاد جغرافیای روستایی، دانشگاه فردوسی مشهد، مشهد، ایران.
۳- دانشیار جغرافیا و برنامه‌ریزی روستایی، دانشگاه فردوسی مشهد، مشهد، ایران.
۴- استادیار جغرافیا و برنامه‌ریزی روستایی، دانشگاه فردوسی مشهد، مشهد، ایران.
۵- دانشیار GIS و RS، دانشگاه فردوسی مشهد، مشهد، ایران.

چکیده مبسوط

۱. مقدمه

مناطق روستایی استان خراسان رضوی، به جهت شرایط محیطی جذاب و همچنین پاسخگویی به نیازهای گردشگران شهری برای تفریح و اوقات فراغت از اهمیت بالایی برخوردار هستند. همچنین روستاهای این منطقه به جهت نیازمندی به تنوع معیشتی، به گردشگری و توسعه آن به عنوان یک راهبرد اساسی گرایش پیدا کرده‌اند. از سوی دیگر ضروری است هجوم گردشگران به مقصدهای روستایی، مورد توجه قرار گیرد. زیرا اغلب فشار ناشی از حضور گردشگران، فراتر از ظرفیت و توان‌های اکولوژیکی روستاها می باشد و در بلند مدت می تواند اثرات منفی و زیانباری را برای مقاصد روستایی به همراه داشته باشد. لذا هدف از این پژوهش نخست، ارزیابی توان اکولوژیک حوزه نفوذ گردشگری شهر مشهد، یافتن ارتباط بین توان اکولوژیک و ظرفیت‌های گ ردشگری روستایی در منطقه است و در درجه دوم، یافتن همسویی بین ظرفیت‌های گردشگری روستایی با توان اکولوژیک در مناطق روستایی حوزه نفوذ گردشگری شهر مشهد می باشد. لذا سوالات اصلی بدین صورت مطرح می‌گردد که وضعیت توان اکولوژیک روستاهای گردشگر پذیر منطقه چگونه می‌باشد؟ و رابطه بین توان اکولوژیک روستاهای گردشگرپذیر و ظرفیت‌های گردشگری منطقه چگونه است؟

۲-مبانی‌نظری

عوامل متعددی در توسعه گردشگری نقش دارند که ارتباط و تعامل بین آنها، سبب توسعه گردشگری می‌شود. در این بین سه عامل اصلی در توسعه گردشگری عبارتند از: گردشگران، مردم و ویژگیهای منطقه، عدم توجه به هریک از این سه بخش در برنامه‌ریزی‌ها موجب لطمه وارد آمدن به فرآیند توسعه گردشگری خواهد شد و برعکس توجه به آنها موجب ایجاد مزایایی برای آنها می‌شود. این مزایا به طور کلی به عنوان بازده سه‌جانبه برای جامعه میزبان (بعد اقتصادی و اجتماعی) برای منطقه(حفظ‌محیط‌زیست)، و برای گردشگر (اوقات‌فراغت و گردشگری)خلاصه می‌شوند، که دلالت بر توالی مزایای مرتبط دارد. در این حالت میدان رقابتی بین مکان‌های گردشگرپذیر به وجود می‌آید و در نتیجه مکان‌هایی که از نظر جذب گردشگر موفق خواهند بود که ظرفیت‌های گردشگری خود را ارتقا داده و با کیفیت بالا در اختیار گردشگران قرار دهند که این همان ظرفیت گردشگری در مقصد است. علاوه بر امکانات و ظرفیت‌های گردشگری، یکی از انوع قابلیت گردشگری در مقصد می‌توان به توان محیطی منطقه اشاره کرد. توان‌های محیطی یک منطقه گردشگرپذیر ممکن است از نظر محیط طبیعی از جمله آب‌وهوا، مناطق جنگلی و... بسیار غنی باشد و یک محیط بکر و طبیعی و زیبا را در اختیار گردشگر قرار دهد. توانهای محیطی به مجموعه توانایی‌ها و استعدادها و قابلیت‌های محیطی گفته می‌شود که در محیط طبیعی- اجتماعی و اقتصادی وجود دارند. این توانها شامل شکل زمین، جهت و جریان آبها، جنس خاک و رویش گیاهی در محیط طبیعی است. با توجه موار مطرح شده می‌توان گفت که پایه اساسی این مطالعه، ظرفیت‌سازی و توان اکولوژیک در گردشگری می‌باشد.

*. نویسندهٔ مسئول:
دکتر حمید شایان
آدرس: گروه جغرافیا، دانشکده ادبیات و علوم انسانی، دانشگاه فردوسی مشهد، مشهد، ایران.
پست الکترونیکی: Email: shayan34@um.ac.ir

۳-روش تحقیق

تحقیق حاضر با توجه به هدف و مساله تحقیق، از روش‌شناسی توصیفی- تحلیلی و از روش کتابخانه‌ای- اسنادی بهره گرفته‌است. لذا مطالعه از لحاظ هدف، از نوع تحقیق کاربردی است. توان‌اکولوژیکی در ۵ متغیر(ویژگی‌های توپوگرافی، اقلیم، هیدرولوژی و منابع آب گردشگری، پوشش گیاهی و تکتونیک و فاصله تا گسل) و ظرفیت‌های گردشگری در ۴متغیر (جاذبه‌های گردشگری، امکانات رفاهی روستا، دسترسی‌پذیری و امکانات زیرساختی روستا) می‌باشد. جهت عملیاتی سازی مطالعه، حوزه نفوذ گردشگری شهر مشهد به‌عنوان منطقه موردمطالعه انتخاب گردید. برای به دست آوردن تعداد روستاهای نمونه از فرمول n0 استفاده شده است. با توجه به فرمول مورد نظر تعداد روستاهای نمونه با توجه به تعداد ۱۶۷ روستای گردشگری در محدوده مورد مطالعه، تعداد ۲۲ روستا به عنوان نمونه به دست آمد.

۴-یافته‌های تحقیق

ب‌رای به دست آوردن توان اکولوژیکی در منطقه مورد مطالعه وزن شاخص های تحقیق با استفاده از مدل FAHP و نظرات ۱۵ متخصصان حوزه‌های گردشگری و محیط زیست به دست آمده است که بیشترین وزن متعلق به فاصله تا آبشار (۰/۳۴۶۹) و کمترین وزن متعلق به فاصله تا گسل (۰/۰۰۸۹) می‌باشد.

بعد از به دست آمدن توان اکولوژیکی هر روستا با توجه به قرارگیری هر روستا در هر طبقه توان اکولوژیکی مقدار توان هر روستا با استفاده از نرم افزار GIS به دست آمده است. بالاترین توان متعلق به روستای‌های دهسرخ، کنگ و پیوه‌ژن و کمترین توان نیز متعلق به روستاهای زیارت، دربهشت و سرغایه می‌باشد.

برای رتبه‌بندی روستاها از نظر ظرفیت‌های گردشگری از مدل cocoso استفاده شده است. در این مدل وزن با استفاده از روش FDAHP محاسبه شده است. بالاترین وزن متعلق به دو شاخص جاذبه‌های طبیعی روستا و حومه (۰/۰۸۶) و کیفیت راه روستا (۰/۸۳۰) می‌باشد. بعد از انجام ۵ گام اصلی مدل CoCoSo مقدار Ri برای هر یک از روستاهای نمونه به دست آمد که بالاترین رتبه متعلق به روستاهای پیوه‌ژن، ویرانی و رادکان می‌باشد.

برای بررسی میزان رابطه بین توان اکولوژیکی و ظرفیت گردشگری، با توجه به نرمال بودن هر دو متغیر از همبستگی پیرسون استفاده شده است مقدار توان اکولوژیکی در روستاهای نمونه با آماره پیرسون ۰/۶۴۱ با مقدار ظرفیت گردشگری دارای رابطه‌ای مستقیم با شدتی قوی می‌باشد.

۵-بحث و نتیجه‌گیری

گردشگری رویکرد مناسب برای توسعه اجتماعی- اقتصادی، به ویژه در مناطق روستایی و راه حلی برای کاهش اثرات منفی زیست محیطی محسوب می‌گردد، لذا نباید محیط زیست را تنها به عنوان ابزاری برای توسعه اقتصادی تلقی کرد بلکه باید برای فراهم کردن زمینه‌های گردشگری و راهی برای شهرگزیری، ابتدا به ارزیابی توان توسعه گردشگری در منطقه پرداخت چرا که ارزیابی توان گردشگری از جمله راهکارهای مناسب کاهش اثرات منفی و افزایش اثرات مثبت آن می‌باشد. بر اساس نتایج این مطالعه پیشنهادات عبارتند از:

- ✓ افزایش ظرفیت‌های گردشگری روستاها با توجه به میزان توان اکولوژیک منطقه؛
- ✓ با توجه به اهمیت کیفیت راه و در مجموع دسترسی پذیری در گردشگری به روستاهایی چون خواجه‌حسین‌آباد، زیارت و میامی که در این زمینه وضعیت آنها مناسب نیست، توجه بیشتری شود.
- ✓ شناسایی دقیق پتانسیل‌های طبیعی بالقوه در مناطقی که دارای توان اکولوژیک بالایی هستند و سرمایه گذاری و برنامه‌ریزی اصولی.
- ✓ همچنین به دلیل جذابیت بسیار زیاد منابع آب در صنعت گردشگری، و وجود منابع آبی اندک در منطقه نمونه و متأثر بودن کیفیت و حجم خروجی این منابع از این صنعت گردشگری لذا به منظور حفظ این منابع باید با توجه به خصوصیات آنها برنامه خاصی ارائه شود.

کلیدواژه‌ها: توان اکولوژیکی، ظرفیت گردشگری، روستا، حوزه نفوذ گردشگری، مشهد.

تشکر و قدرانی

پژوهش حاضر برگرفته از رساله دکتری نویسنده اول (حمیده محمودی)، گروه جغرافیا، دانشکده ادبیات و علوم انسانی، دانشگاه فردوسی مشهد، مشهد است.

Use your device to scan and read the article online

How to cite this article:
Mamoodi, M., Shayan, H., Sojasi Qiedari, H., Sadeghlou, T. & Minaiei, M. (2022). Spatial analysis of tourism development potential of tourism destination villages (Case study: Mashhad tourism sphere of influence). *Journal of Research & Rural Planning, 11*(2), 1-22.
http://dx.doi.org/10.22067/jrrp.v11i2.87483

Date:
Received: 25-09-2021
Revised: 04-11-2021
Accepted: 10-02- 2022
Available Online: 10-02-2022