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The role of tourism in rural development: Evidence from Iran

Mehdi Nooripoor · Madineh Khosrowjerdi · Hamid Rastegari · Zeinab Sharifi · Masoud Bijani

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Abstract Tourism can play an important role in diversifying the rural economy and its expanding in rural areas contributes to the sustainability of the population and the economy of these areas and provides the basis for achieving sustainable rural development. Therefore, the aim of this study was to investigate the relationship between tourism and rural development in Doroodzan region of Marvdasht Township, Iran. This study was carried out using a survey method and the data were collected using a questionnaire from 150 head of households in the villages of the region. The validity of the questionnaire was verified by rural development specialists and the reliability of the instrument was confirmed by Cronbach's alpha test, which was obtained between 0.71 and 0.88. The results of the data analysis showed that the status of socio-cultural, environmental, economic and rural development in general was rated as moderate. Also, the status of tourism development in the study area has been relatively low from the

M. Nooripoor (✉)
Department of Rural Development Management, Faculty of Agriculture, Yasouj University, Yasouj 7483175918, Iran
e-mail: mnooripoor@yu.ac.ir

M. Khosrowjerdi
Faculty of Agriculture, Yasouj University, Yasouj 7387141469, Iran
e-mail: mkhosrojerdi07@gmail.com

H. Rastegari
Faculty of Agriculture, Yasouj University, Yasouj 8148917181, Iran
e-mail: h.rastegary69@gmail.com

Z. Sharifi
Faculty of Agriculture, Yasouj University, Yasouj 8581748311, Iran
e-mail: zeinabsharifi@ymail.com

M. Bijani
Department of Agricultural Extension and Education, College of Agriculture, Tarbiat Modares University (TMU), Tehran 1497713111, Iran
e-mail: mbijani@modares.ac.ir

viewpoint of the respondents. The results also showed a positive and significant relationship between tourism development and socio-cultural, environmental and economic development (r = 0.60, 0.36, and 0.66 respectively). Especially, the intensity of this correlation was relatively higher for economic development. In order to predict the dependent variable (rural development), the multi-layer perceptron neural network was used. The purpose of this analysis was to assess the ability of tourism development to explain the variance of rural development. The results of this phase, showed that tourism development variable was able to explain 26.2% of the variance of dependent variable (rural development). At the end, according the findings some practical recommendations has been presented.

Keywords Rural development · Rural tourism · Artificial neural network · Doroodzan · Iran

Introduction

Tourism is one of the most important activities of contemporary human beings, which constantly changes the political, economic, cultural, man-made and lifestyle of human beings by creating tremendous changes in earth's image. The World Tourism Organization proposes tourism as a means by which the goals of the third millennium can be achieved. Eighty percent of the 56 countries that have adopted poverty alleviation strategies have listed tourism as an option for economic growth, employment and poverty reduction. Many of them, such as Ethiopia, Tanzania, Uganda, Ghana, Nigeria, Mozambique, Kenya, Cambodia and Honduras, have believed tourism as much weight and importance as agriculture and small industries (Buzinde et al. 2013). The reliance on tourism as an economic generator is increasingly important in isolated, remote, and so-called isolated islands that have experienced stagnation in traditional industries (Khosrowjerdi and Nooripoor 2017a). The entry of tourists into these areas is affecting different sectors and services, thus increasing the employment rate and causing the dynamics and movement of the dispersed and scattered population of these areas (Currie and Falconer 2013). Because of its unique characteristics, tourism has developed the concept of industry and has its own technology. Simply mentioning, the tourism industry, as an industry set, provides the driving force for the wheel of vital industries to move accelerate and pave the way for local and national development. The economic benefits of commodity investment in the tourism industry could have had a positive effect if realistic policies were adopted. Accordingly, the tourism industry is one of the metropolitan areas of economic activity that has formed one of the main source of income not only in the most popular tourist destinations of Europe, such as France, Austria, Italy and Spain, but also in some developing countries such as Egypt (Caroline 2009). In fact, tourism is one of important and fast growing sectors in the world that significantly influences the growth of the economies of the countries, which its economic benefits include local communities, as well (Osman and Sentosa 2013) Meanwhile, rural tourism has attracted much attention from governments, nongovernmental organizations and economic activists, as it plays an important role in directing economic activities and helping to increase local communities' income (Chin et al. 2014). Rural tourism can have different effects on economic dimensions (such as increasing income and beneficial employment, and the prosperity of economic activities, falling unemployment, poverty and inequality, optimizing the use of resources and facilities, etc.), social (such as increasing the participation of villagers in The process of development, preventing the migration of villagers to cities, etc.) and the environmental (such as the optimal use of natural resources, environmental protection and natural landscape of rural areas, etc.) in rural environments (Moradi et al. 2011; Baloochi and Khorasani 2013; Fallah Haghighi et al. 2019).

The importance of the tourism industry in rural development is due to the fact that utilizing the natural and human resources appropriately, in addition to economic growth, it helps to promote the agricultural sector and the production of local handicrafts, and to take steps to improve the environmental conditions and conservation of the local cultural heritage and local customs in the villages (Khosrowjerdi and Nooripoor 2017b). This is more important in villages where agricultural activities, due to climatic conditions or other conditions, are less likely to benefit from optimal agriculture or desirable income (Shahidi et al. 2009; Fallah Haghighi and Bijani 2019) and one of the

main strategies for developing rural areas is to pay attention to this kind of tourism in order to remove rural environments from isolation and exclusion and to create balanced development, since by influencing on three dimensions of economic, social and environmental sustainability, not only attracts the participation of local communities in the development of the national economy with the potential of preserving and protecting natural and environmental resources, but also provides environmental sustainability (Eftekhari et al. 2011; Sabzali Parikhani et al. 2018; Najafi Alamdarlo et al. 2019). In fact, rural tourism development can be considered as one of the possible solutions to the problems and problems in rural areas (Ghaderi and Henderson 2012). The areas in which tourism has expanded a lot in recent years is Doroodzan region of Marvdasht Township in Fars Province. The area has the potential of attracting tourists in different seasons due to its natural, cultural and historical attractions, and every year there are countless tourists entering this area. Therefore, it can play a major role in regional economics and empowerment of local people. Considering the fact that so far scientific studies have not been carried out on the role of tourism development in rural development in this region, the aim of this study was to investigate the role of tourism development in rural development in Doroodzan region of Marvdasht Township. According to the supposed aim, some objectives were also considered for this study including:

- Identifying the extent of tourism development in the study area,
- Also, identifying the extent of development of socio-cultural, environmental and economic aspects of the study area, and
- Finally, to identify the relationships between rural tourism development and rural development (including socio-cultural, environmental, economic and total).

Theoretical fundamentals and research background

Rural tourism issues have been expanding since the 1950s, and in the 1960s and 1970s, more attention was paid to rural tourism economics for farmers and local communities. In the 1970s, rural tourism was discussed seriously in rural areas of the Alps. This type of tourism is very similar to ecotourism, with the difference that it takes place in a rural setting and its goals are wider. For the first time in the Alps region (France, Germany and Italy), rural tourism was introduced as an option for development, due to the increasing influx of tourists and exerting a lot of pressure on developing rural areas which its goals was to solve the problem of youth migration and lack of economic development, especially the destruction of natural resources and cultural heritage of those areas (Ataei et al. 2016; Nooripoor et al. 2019). In a general definition, rural tourism is a variety of activities and types of tourism in and around various rural environments which has different values and effects on the natural and human environments of the village. Based on this, rural tourism can include various fields of tourism activities such as settlements, events, festivals, sports and various recreation, which are formed in the rural environment (Soteriades 2012). Rural tourism in the classical definition is a type of tourist activity that generates additional income for those who have the main job (agriculture and industry) (Szabo 2005). In addition, some also consider rural tourism to be closely linked to farm tourism and to institutionalize the value of agriculture in the rural community, which does not include national park and protected wildlife areas (Opperman 1996). In the field of rural development, rural tourism is one of the concepts and forms of development in which its available resources in rural areas are used. These resources could include historical and religious monuments, natural attractions, lifestyles, agricultural fields, and so on (Khosrowjerdi and Nooripoor 2016). In rural tourism, the rural population benefits a lot by increasing the level of productivity in rural areas, creating employment, maintaining native culture and attracting the participation of local people. In other words, rural tourism policies have a positive impact on rural non-farm income (Hwang and Lee 2015). Several studies have been conducted on rural tourism, including the following: Anderson et al. (2015) stated that the natural environment plays an important role in attracting tourists to rural areas. However, the lack of participation of villagers in tourism decisions prevents the development of rural tourism. Lepp (2008) and Lorio and corsale (2010) also showed that tourism provides a suitable platform for families to have a diverse economic and agricultural

complementary activity, which will increase the ability of families and their life. In another study by Cave and Wolf (2012), the existence of health services and facilities, the availability of suitable spaces and places for parking, waste collection systems and cleanliness and rural health have been considered as important factors in rural tourism development. The results of research (Yang 2012; Butnaru 2011; Bashar and Puad 2010; Krasteva 2011) have also shown that the existence of various recreational facilities, the possibility of cultural visits in villages, and the provision of accommodation and hospitality services, including factors attracting tourists to rural areas. The holding of various rural festivals, the holding of cultural festivals, the introduction of local food and souvenirs and the possibility for tourists to participate in agricultural activities related to agriculture, horticulture, livestock or fishing in the villages are other factors that attract tourists and development of rural tourism. Liu (2006) discussed tourist tourism in rural areas as a case study in Kedah area in Malaysia, and the results of the study showed that tourism has generated commercial income for many organizations associated with this industry. Nevertheless, limitations have also created for rural environment. Baros and David (2007) highlighted the most important benefits of tourism activities by increasing job opportunities, developing amenities, empowering, developing transport infrastructure, and expanding public industries with new jobs and creating demand for goods at the area level which all could be observed in the background of an entrepreneurial activity. Yarkova and Stoykova (2008) showed that with the arrival of tourists to rural areas, knowledge and awareness of villagers increased and the level of ethnic tensions and existing conflicts was reduced. In addition, the findings of Benedek and Deszi (2008) showed that there is a meaningful relationship between the development of rural tourism and the increase of social participation, the sharing of knowledge and information, the exchange of hidden experience among the villagers. Akca (2006) believes that the development of rural tourism can have profound effects on the environmental, economic, social, and psychological capabilities of people living in rural areas. Shams et al. (2011) in a study titled role of tourism in rural development concluded that the role of tourism did not have much positive effects on the rural economy and the environment in that region. However, economic development in the villages is undeniable due to the construction of many high cost roads, but socially has a positive impact, including improving health, education, more interaction with neighboring areas, reducing immigration, and so on. Anabestani et al. (2012) also examined the economic, social, physical and environmental impacts of tourism development in rural settlements from the viewpoint of tourists and villagers (Case Study: Dasht Arjan of Fars, Iran). The results of this study showed that tourism development has provided positive changes in the economic, social, environmental and physical dimensions of the villages of the region. Therefore, by summarizing the above, it can be concluded that tourism development can play a significant role in rural development. Accordingly, the conceptual model for the present study is shown in Fig. 1, which two main variables including "tourism development" and "rural development" its center of gravity.

Materials and methods

Research method

The present study is non-experimental in terms of the degree of control, and descriptive-correlation, in terms of how data is collected and ultimately in terms of generalizability, is a survey. The main instrument for collecting data was a questionnaire. The questionnaire consists of two main sections according to the objectives of the study. The first part of the questionnaire is about the status of rural development from the point of view of the respondents, which has been measured in three dimensions including development socio-cultural (14 items), environmental (15 items) and economic (15 items), and the second part is related to the development of rural tourism, which has been evaluated with 13 items. The accuracy of the indicators and checkpoints in the questionnaire (face validity) was confirmed by the faculty members of the Department of Rural Development in Yasouj University and experts. To test the reliability of the research instrument, a pre-test or a guide was studied outside the sample. After conducting the study, the reliability of the questionnaire was estimated using Cronbach's alpha and based on the results, Cronbach's alpha coefficient for the studied variables was estimated from 0.71 to 0.88. The statistical population in this

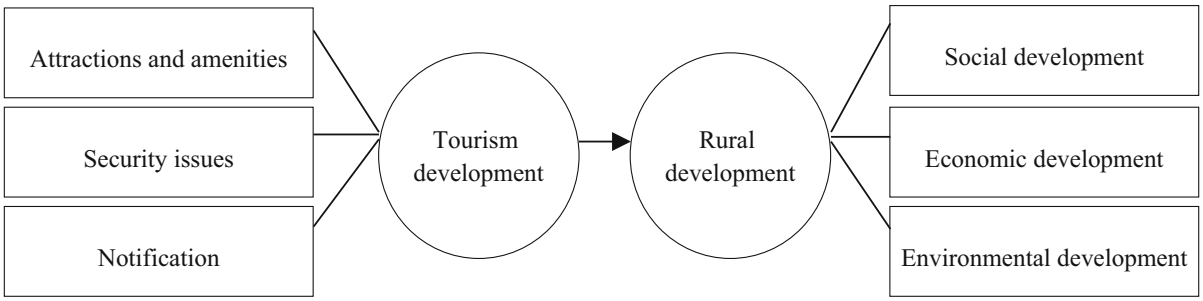

Fig. 1 Conceptual framework of the research

research includes the households head of 8 villages (Doroodzan, Hesar, Qasr khilil, Shahrak, Jeshnian, Dareabad, Fotohabad and Hesamabad) in Doroodzan region of Marvdasht Township (N = 3662) which 150 heads of households were selected using the Cochran formula, taking into account the significance level of 0.01, standard deviation of 0.25, and the acceptable level of error of 0.05, as the research sample, which was proportional to the number of households in each village stratified sampling with proportional allocation was used to determine the required sample for each village. In this research, $SPSS_{24}$ software was used to analyze the data. For this purpose, descriptive statistics including mean, standard deviation and frequency and inferential statistics including correlation coefficients and multi-layer perceptron artificial neural network were used. An artificial neural network is referred in the following.

Artificial neural network

Artificial neural networks are an approach to artificial intelligence and the development of intelligent systems whose main ideas are derived from the human biological system. The neural network identifies the system based on the input and output data of the sample (Jha and Chockalingam 2009). The normal structure of an artificial neural network is usually composed of the input layer, the middle or hidden layers, and the output layer. The input layer is a transmitter layer and a device for data acquisition. The output layer contains the values predicted by the network and the hidden layer is the data processing location. The number of layers and the number of neurons in each hidden layer is typically determined by the test and error method (Asghari Moghaddam et al. 2008).

Artificial neural networks are used to identify, classify and predict problems in which relations are usually linear or nonlinear (Ghanian et al. 2015). The most important feature of this network is the ability to learn, so that without prior knowledge of the relationship of parameters, it is taught by repeating the samples (Ivkovic et al. 2009). Figure 2 shows the structure of a neural network with a hidden layer.

The first applied network in the history of artificial neural networks and the common network used in them is the multilayer network of perceptron with the post-propagation learning method (Asghari Moghaddam et al. 2008). To distinguish the neural network from conventional statistical methods, there is nothing be stated that is as important as its definition. For example, the conventional linear regression model can collect information through the least squares method and store them as regression coefficients. From this perspective, this method is a neural network. In fact, it can be argued that linear regression is a special case of neural networks, with the difference that linear regression has an irregular model structure and assumptions that precede the learning of information. The above definition requires minimal model structure and hypotheses. A neural network can estimate a wide range of statistical models without the need to assume a specific relationship between dependent and independent variables. If the linear relationship between the independent and dependent variables is more appropriate, the results of the neural network should be closer to the estimation of linear regression model. If the nonlinear relationship is more appropriate, the neural network will automatically estimate the correct structure of the model. The cost of this flexibility is the uninterpretable of the synaptic weights of a neural network. Therefore, if the purpose of the research is to describe a process that creates relationships between

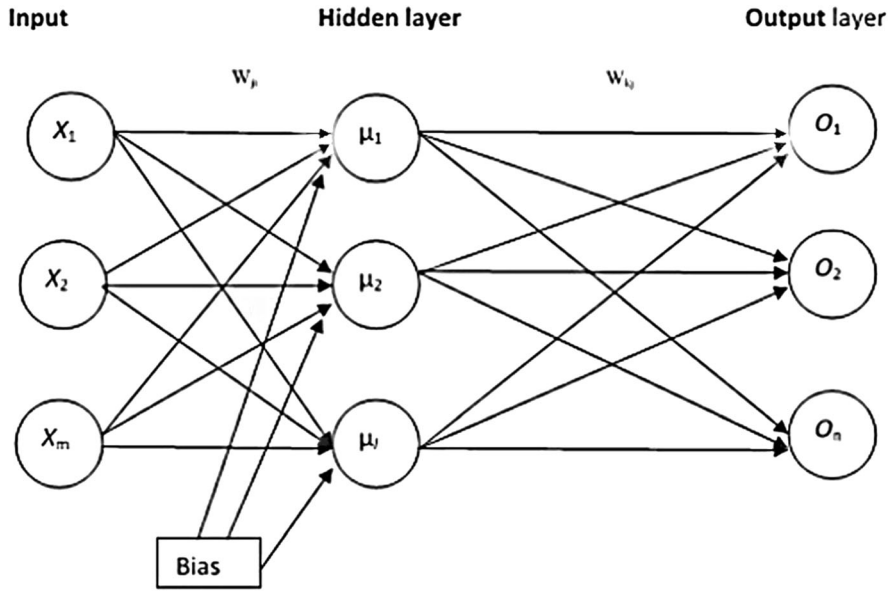

Fig. 2 The structure of a neural network with a hidden layer (Chong 2013)

independent and dependent variables, it is better to use traditional statistical models and if interpretive capability is not important, the results of the research can be achieved faster by using the neural networks. In the present study, a multilayer perceptron method is used to construct a predictive model in which to predict one or more dependent variables.

Introduction of the study area

Figure 3 illustrates the location of the study area. Doroodzan Region of Marvdasht Township has an area of 1025 square kilometers, a population of 37,879 people and 9960 households. The weather in this area is cold in mountainous areas and moderate in other regions. The soils of this region are completely fertile and sedimentary, and its constituent materials are formed by the river and the disintegration of the rocks of the region, which are very suitable for agriculture. Considering the climatic and geographical conditions of this region in mountainous highlands and low height plains, there is a variety of vegetation, including Persian turpentine tree, wild almond, Hawthorn, Mountain figs, and in the plains rangeland plant such

Fig. 3 Geographical location of the study area

as spear thistle, camel thorn, wild safflower and etc. In addition, the historic dam of Doroodzan (Dariush) is located in this area, which was built on the Kor River, which is considered as one of the main sources in supplying agricultural, industrial and drinking water in Shiraz and Marvdasht and the other cities around the river. Therefore, the residence in this area has a long history and returns to the Achaemenid period. The unique beauty and charm of this area have created a great atmosphere that attracts tourists who spend their leisure time at fishing lakes on the edge of the lake. The lake is enclosed in mountains covered with oak trees, Persian turpentine tree, wild almond, Hawthorn, and Montpellier maple and farms and agricultural lands are another part of the vegetation of the region that has created a beautiful landscape. The Doroodzan Dam area has protected areas, national parks, mountains, lakes, rivers, fountains, and suitable vegetation in plains in terms of tourist attractions.

This region is known as the tourism destination area by the Cultural Heritage and Tourism Organization in Marvdasht Township.

Analysis of the findings

The demographic characteristics of the respondents

The findings of the descriptive analysis of the individual characteristics of respondents indicate that the average age of the respondents was about 38 years old and most of them were in the age range of more than 38 years. In terms of education, the highest prevalence is for those who have high school grades (over 33%). In sum, the average level of education of the respondents was 9 years of study. The average number of household members was 4.42, which is about 26.5%. In terms of family income, which was obtained on a monthly basis, the highest incomes were 10,000,000 Rials (29.1%). Totally, the average household income (monthly) was 12,480,000 Rials. The average number of respondents in the family is 1.4, which is over 70%, and the average income from the source of tourism is 940,000 Rials. In addition, most respondents were male (139) and their main occupation was freelance and agriculture, respectively, as well as most respondents did not have any other subordinate job.

The status of socio-cultural development of the study area from respondents' point of view

Analysis of the responses collected in terms of the socio-cultural development from the respondents' point of view shows that in general, this dimension of development was considered moderate and low with a mean score of 2.43 out of 5. However, given the fact that there are various indicators in the field of socio-cultural dimension, the prioritization of the relevant indicators is based on the answers provided. The results of the viewpoints of respondents in terms of socio-cultural development indicate that the item of "communication and association of villagers with adjacent villages" with a mean score of 3.17 and coefficient of variation of 0.24 has been ranked 1, while the item of "holding educational classes such as computer class, etc. " with a mean score of 0.32 and coefficient of variation of 2.12 has been ranked the last (Table 1). Therefore, in terms of socio-cultural development, "communication and association of villagers with adjacent villages" is in a better position than other items.

The status of environmental development of the study area from respondents' point of view

Analysis of the responses collected in terms of the environmental development from the respondents' point of view shows that in general, this dimension of development was considered moderate and low with a mean score of 2.67 out of 5. However, given the fact that there are various indicators in the field of environmental dimension, the prioritization of the relevant indicators is based on the answers provided. As shown in the Table 2 the item of "The use of wood around the village for the fuel " with a mean score of 4.32 and coefficient of variation of 0.19 has been ranked 1 and is located in better situation and most respondents opposed using wood around the village as fuel which reflects the people's awareness of environmental issues in the studied villages whereas the item of " Asphalt of lanes and streets" with a mean score of 1.12 and coefficient of variation of 1.05 has been ranked the last (Table 2).

Table 1 The status of socio-cultural development of the study area from respondents' point of view (n = 150)

Row	The items	Mean*	SD	CV	Rank
1	communication and association of villagers with adjacent villages	3.17	0.76	0.24	1
2	Sympathy and solidarity to the people of the village	3.16	0.90	0.28	2
3	Participating in ceremonies and the local celebrations	3.45	1.02	0.29	3
…	…	…	…	…	…
12	Participating in the rural development schemes such as building school	1.74	1.15	0.66	12
13	Enjoyment of educational facilities in the rural areas (stationery, books, etc.)	0.86	1.19	1.39	13
14	holding educational classes such as computer class, etc.	0.32	0.67	2.12	14
Total		2.43	1.04	–	–

*Weight of the items are from no = 0 to very high = 5

Table 2 The status of the environmental development of the study area from respondents' point of view (n = 150)

Row	The items	Mean*	SD	CV	Rank
1	The use of wood around the village as fuel	4.32	0.83	0.19	1
2	The use of fertilizers and pesticides in the field	3.71	0.87	0.23	2
3	Access to sanitary pipe water	3.69	1.02	0.27	3
…	…	…	…	…	…
13	Local authorities' attention to environmental sanitation	1.84	1.12	0.61	13
14	making slope to the passage and guidance of surface water	1.68	1.06	0.63	14
15	Asphalt of lanes and streets	1.12	1.18	1.05	15
Total		2.67	1.02	–	–

*Weight of the items are from no = 0 to very high = 5

The status of economic development of the study area from respondents' point of view

Analysis of the collected responses on the status of economic development from the viewpoint of respondents shows that in general, this dimension of development was considered moderate and low with a mean score of 2.19 out of 5. However, given the fact that there are various indicators in the field of economic dimension, the prioritization of the relevant indicators is based on the answers provided. The results of the respondents' view point in terms of economic development showed that the item of "The use of multipurpose machines such as tractor and tiller" with a mean score of 3.79 and coefficient of variation of 0.19 has been ranked 1 while the item of "Enjoyment of village from the bank and cheap credit" with a mean score of 0.3 and coefficient of variation of 1.67 has been ranked the last (Table 3). As it was stated, the area is very suitable for agriculture due to its fertile land and sufficient water, therefore, considering that the use of agricultural machinery and mechanized equipment is located in the first priority which indicates the agricultural prosperity of this area.

Total condition of development of the studied area

In this study, by summarizing and calculating the mean score of the three introduced dimensions, namely socio-cultural, environmental and economic, the total condition of the development of the studied area was also determined. As Table 4 shows, the development of the region is totally in moderate and low position with a score mean of 2.43 out of 5.

The status of development of tourism in the studied area from the respondents' point of view

Analysis of the collected responses in terms of the development of tourism from the viewpoint of respondents shows that in general, tourism development was considered low and very low with a mean

Table 3 The status of the economic development of the study area from respondents' point of view (n = 150)

Row	The items	Mean*	SD	CV	Rank
1	The use of multipurpose machines such as Tractor and Tiller	3.79	0.72	0.19	1
2	The use of mechanized seeding implements such as seed sprayers and so on	3.54	0.84	0.23	2
3	The use of tillage mechanized implements such as plow, disk and pruning	3.42	0.93	0.27	3
…	…	…	…	…	…
12	Paying for child's education in a non-public university	1.49	1.09	0.73	13
13	Enjoyment of village from support services of government	0.96	0.85	0.89	14
14	Enjoyment of village from the bank and cheap credit	0.30	0.50	1.67	15
Total		2.19	0.93	–	–

*Weight of the items are from no = 0 to very high = 5

Table 4 Total condition of development of the studied area

Development dimensions	Mean*	SD
socio-cultural	2.43	1.04
environmental	2.67	1.02
Economic	2.19	0.93
Total	2.43	1.00

*Weight of the items are from no = 0 to very high = 5

score of 1.57 out of 5. However, given the fact that there are various indicators in the field of economic dimension, the prioritization of the relevant indicators is based on the answers provided. The results of Table 5 showed that the item of "Services in the road such as a car repair shop and so on " with a mean score of 1.60 and coefficient of variation of 0.04 has been ranked 1 while the item of "Introducing various attractions of rural tourism using photographs, brochures and postcards by the involved organizations" with a mean score of 0.68 and coefficient of variation of 1.18 has been ranked the last.

Investigating the relationship between tourism and rural development

In this study, correlation analysis was used to investigate the relationship between tourism and rural development, the results of which are presented in Table 6. Due to the fact that the variables were measured by a questionnaire and the measurement scale was interval, Pearson correlation was used.

Table 5 The status of development of tourism in the studied area from the respondents' point of view (n = 150)

Row	The items	Mean*	SD	CV	Rank
1	Services in the road such as a car repair shop and so on	1.60	0.06	0.04	1
2	The number of tourists visiting the village	1.86	0.62	0.33	2
3	Security required for tourists and public security in the village	3.06	1.23	0.40	3
4	Peoples' Welcomed from the presence of tourists in the village	2.80	1.23	0.44	4
…	…	…	…	…	…
11	Holding tourism exhibitions to introduce more and better villages and attractions	0.63	0.72	1.14	11
12	The attention of relevant institutions to educate local people to better serve the tourists	0.68	0.79	1.17	12
13	Introducing various attractions of rural tourism using photographs, brochures and postcards by the involved organizations	0.68	0.80	1.18	13
Total		1.57	1.00	–	–

*Weight of the items are from no = 0 to very high = 5

Table 6 The correlation matrix between tourism and the dimensions of rural development

	Socio-cultural development	Environmental development	Economic development
The correlation coefficient (r)	0.44**	0.36**	0.66**
Description of correlation	Medium	Medium	High

*Statistically significant at the 5 percent level

**Statistically significant at the 1 percent level

According to Table 6, the correlation coefficient between tourism development and socio-cultural, environmental and economic development is 0.6, 0.36 and 0.66, respectively, and thus all are significant at 0.01 level. Therefore, according to Pearson correlation test, with 99% confidence, it can be concluded that there is a positive and significant relationship between tourism and socio-cultural and environmental development at a medium level and there is a positive and significant relationship between tourism and economic development at a high level. It is worth noting that Davis's model was used to describe the correlation between variables. Based on this model, the correlation coefficients are described as the following slight = 0.09–0.01, low = 0.1–0.29, medium = 0.30–0.49, high = 0.50–0.69, very high = 0.70–0.99 and 1 = complete (Rasouli Azar et al. 2009).

The results of the research in Table 7 show that in Doroodzan village there is a positive and significant relationship between tourism and socio-cultural development at a medium level (r = 0.46, p = 0.04), there is a positive and significant relationship between tourism and environmental development at a high level (r = 0.61, p = 0.004), as well as a positive and significant relationship between tourism development and economic development at a high level (r = 0.54, p = 0.012).

Pearson coefficients and significant level calculated in Hesar village indicate that there is a positive and significant relationship between tourism and socio-cultural development at a high level (r = 0.68, p = 0.001), between tourism development and

Table 7 Correlation matrix between tourism and dimensions of rural development in the studied villages

Village	The correlation coefficient (r†)	Description of correlation	Village	The correlation coefficient (r†)	Description of correlation
Doroodzan	Socio-cultural* (0.46)	Medium	Qasr khilil,	Socio-cultural (0.29)	Low
	Environmental** (0.61)	High		Environmental (0.13)	Low
	Economic** (0.54)	High		Economic (0.14)	Low
Shahrak	Socio-cultural (0.33)	Medium	Jeshnian	Socio-cultural (0.39)	Medium
	Environmental (0.06)	Slight		Environmental (− 0.05)	Slight
	Economic (0.05)	Slight		Economic (0.40)	Medium
Dareabad	Socio-cultural (0.05)	Slight	Fotohabad	Socio-cultural (− 0.02)	Slight
	Environmental (− 0.05)	Slight		Environmental (− 0.35)	Medium
	Economic (0.22)	Low		Economic (− 0.24)	Low
Hesamabad	Socio-cultural** (0.52)	High	Hesar	Socio-cultural** (0.68)	High
	Environmental** (0.60)	High		Environmental** (0.54)	High
	Economic** (0.54)	High		Economic** (0.61)	High

†The Pearson correlation coefficient

*Statistically significant at the 5 percent level

**Statistically significant at the 1 percent level

environmental development at a high level (r = 0.54, p = 0.013) and a positive and significant relationship between tourism development and economic development at a high level (r = 0.1, p = 0.004) (Table 7).

In addition, the calculated Pearson coefficients in Hesamabad village (Table 7) show that there is a positive and significant relationship between tourism development and socio-cultural development at a high level (r = 0.52, p = 0.019), there is a positive and significant positive relationship between tourism development and environmental development at a high level (r = 0.60, p = 0.005) and also a a positive and significant relationship between tourism development and economic development at the high level (r = 0.54, r = 0.014). Therefore, it can be argued that the greater the rural tourism in the region is, the more socio-cultural, environmental and economic development increase.

It needs to mention that in the rest of the villages there is no significant relationship between tourism and the dimensions of rural development (socio-cultural, environmental and economic).

Determining factors affecting rural development

In order to predict the contribution of independent variables (rural tourism) in explaining the dependent variable (rural development), the multilayer perceptron neural network has been used. The purpose of this analysis is to evaluate the effect of the independent variable on the explanation of the variance of the dependent variable. In Table 8, the networked neural network data is used. Table 8 shows the results of artificial neural network analysis and the summary of the performed process, of which 100 people in the training group and 50 in the assessing group and 1 in the process have been excluded.

Table 8 Summary of the performed process

		Number	Percent
Sample	Training	100	66.7
	assessing	50	33.3
Valid		150	100
Excluded from the process		1	
Total		151	

Based on the obtained results, the total number of units in the input layer is equal to the sum of the number of independent variables. Since an independent variable has been entered in this network, the number of input layer neurons is equal to one neuron (Fig. 4). The number of Output Layer in This research is one unit which is the rural development variable. The automatic selection structure selects 2 units in the hidden layer.

Table 9 shows the ability of artificial neural network to explain variance of dependent variable. According to this table, the variable of tourism development has the ability to explain 26.2% of the variance of dependent variable (rural development).

Conclusions and suggestions

Rural tourism is one of the branches of the tourism industry, some of which are considered as part of the tourism market and others as a policy for rural development. Nowadays that villagers encounter problems such as unemployment, low productivity, urban migration and marginalization, rural tourism development can be effective in addressing these problems and, as a panacea leads to the revival of the villages. As discussed, this paper investigates the relationship between tourism and rural development in Dorodzan region of Marvdasht city. The results of data analysis in relation to the status of socio-cultural, environmental and economic development in three levels of low, medium and high showed that the status of socio-cultural, environmental, economic and, in general, rural development from respondents' viewpoint are evaluated moderate. In addition, the status of tourism development in the studied area has been evaluated low from the respondents' point of view.

The result of Pearson correlation coefficients showed that the relationship between tourism development and socio-cultural development is positive and significant at 1% level. This result is consistent with the findings of Baros and David (2007), Akca (2006), Yarkova and Stoykova (2008), Benedek and Deszi (2008), Butnaru (2011), Shams et al. (2011), Yang (2012), and Anabestani et al. (2012) based on the positive and significant relationship between the variable of tourism development and social

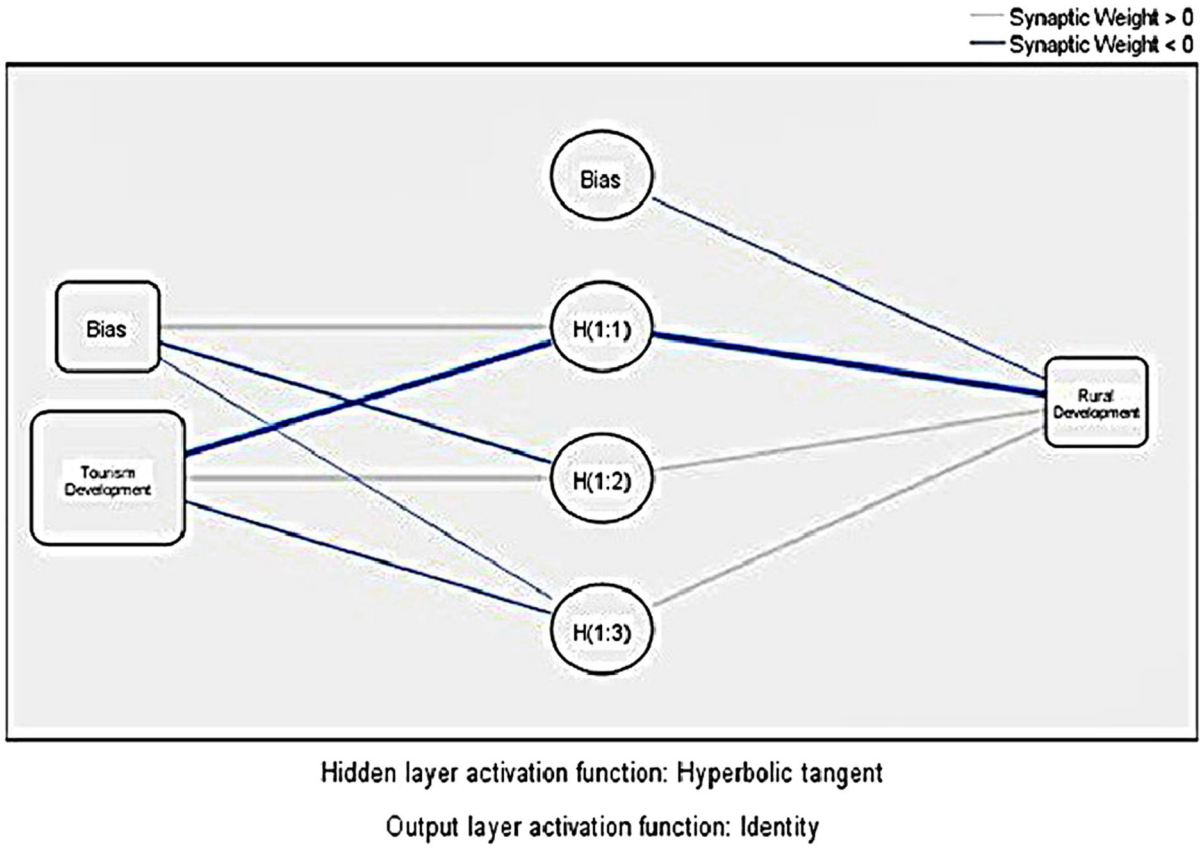

Fig. 4 Structural architecture of multilayer perceptron neural network

Table 9 The ability of the multilayer perceptron neural network model to predict the dependent variable

Model	Multiple correlation coefficient (R)	The coefficient of determination (R^2)
Tourism development	0.517	0.262

development (including holding cultural festivals, introducing local food and souvenirs and the possibility of participation tourists in agricultural activities related to agriculture, horticulture, livestock or fishing in villages, increasing knowledge and awareness of villagers, reducing the level of ethnic tensions and conflicts, increasing social participation and residents' social and psychological capabilities in the village). The results also showed that the relationship between tourism development and environmental development is positive and significant at 1% level. The findings of Anderson et al. (2015) and Anabestani et al. (2012) also showed that tourism development has made positive changes in the environmental and physical condition of tourist villages, whereas it is inconsistent with the findings of Shams et al. (2011) that the tourism did not have a positive effect on the environment of the villages. In addition, the Pearson correlation coefficients showed that the relationship between tourism development and economic development is positive and significant at 1% level, which is in line with the findings of Akca (2006), Baros and David (2007), Baros and David (2007), Yarkova and Stoykova (2008), Bashar and Puad (2010), Butnaru

(2011), Krasteva (2011), Cave and Wolf (2012), Yang (2012), and Anabestani et al. (2012) that the development and expansion of rural tourism can have profound effects on economic development and is not consistent with the findings of Shams et al. (2011) that the tourism did not have a positive effect on the rural economy. In addition, the results of Multilayer Perceptron Neural Network Analysis for the ability of independent variable (rural tourism) to predict the dependent variable (rural development) showed that the tourism development variable has the ability to explain 26.2% of the variance of dependent variable (rural development).

According to the research findings, the following suggestions could be recommended.

Since the educational items placed the last priorities among the items of socio-cultural development, it seems that villagers have high expectation from their village council to pursue educational facilities and training classes from organizations and institutions.

Considering that the studied villages are in unsuitable condition in terms of infrastructure (such as Asphalt of lanes and streets). Therefore, it is suggested that the responsible authorities in the village provide their correspondence with the higher authorities regarding appropriate and effective measures in obtaining facilities in order to improve the condition of the asphalt (including the execution or providing fund).

Since the studied villages are in the low level in terms of support services of government, it is suggested that the centers of service be established and strengthened in the central villages.

The findings of the tourism sector showed that the items including "The attention of relevant institutions to educate local people to better serve the tourists" and "Introducing various attractions of rural tourism using photographs, brochures and postcards by the involved organizations" are weaker than the other items. Therefore, it is suggested that local people be trained by the relevant institutions in order to provide better services to tourists as well as educating and informing people about how to deal with tourists. In addition, advertising through the provision of brochures, photographs and postcards from the rural attractions of the region and the distribution of them in the Province can contribute to the development of tourism in the region.

The results of this study showed that there is a positive and significant relationship between tourism and rural development, which indicates the importance of the role of tourism in rural development. Therefore, any attempt to develop tourism in the region, including government participation and investment in the field of development of tourism activities, encouraging the private sector to invest in tourism in the villages of the tourism destination of the region and attracting the participation of experienced local forces in tourism to promote and educate interested young people in tourism activities can be very effective. Hence, the progress of rural development could be achieved through improving the tourism and attracting its funds.

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Compliance with ethical standards

Conflict of interest The authors also do not have any financial interest or any other conflict of interest.

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