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Spatial Planning of Rural tourism with MAPPAC technique. Case study Khur and Biabanak County, (Iran)

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ABSTRACT

Reviewing the concepts of space and tourism industry, tourism is in an old, deep, unbreakable bound with spatial and physical dimensions. In this way, the lack of systematic and scientific ranking process in spatial locating of rural tourism spots and also improper distribution of infrastructures are the critical deficiencies in this field. The research intends to introduce the hidden potentials and unique capabilities of Khur and Biabanak County, Iran. And prioritize their tourism spots. So tourism planners would be able to recognize proper space distribution. First, the weights of each criterion were calculated by a pairwise comparison questionnaire of AHP method, and MAPPAC technique was used for ranking. AHP was done in Expert Choice software and MAPPAC in MS Excel. Results showed that villages such as Bayaze, Jandagh, Mehrejan, Garmeh, and Iraj which are also older have a higher rank.

Keywords: Tourism, MAPPAC Technique, Khur and Biabanak County, AHP, Spatial Planning

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Introduction

Considering the numerous problems that developing countries faced in achieving top technologies and development these days, tourism could be an appropriate alternative to succeed (Bojanic, 2011, 310). The purpose of tourism development in national and regional level is to equilibrate regional inequality while the main purpose in local level is to balance structural changes and improve local economy (Kauppila et al, 2009, 226). Creating and developing new spaces through tourism development will arrange groundwork for employment and remuneration. The concept of space and spatial analysis as a framework for tourism locating are so important because an appropriate tourism space would influence the region and boosts its economy and its cultural development (Shamaei et al, 2011, 25). Tourism development in any spaces, cities or villages is depending on attractions. Bearing in mind financial provision, constructional evaluation and maintaining policies for tourism spots are very important before any kinds of planning (Salehi fard, 2011, 161). Tourism activities have a great deal in regional planning in recent decades. One of the main problems in spatial development, especially tourism development is the weaknesses of mutual based hierarchy in tourism regions. Therefore, leveling based on tourism infrastructures and available services must be prepared.

Khur and Biabanak County is located in a boundary line of country's central desert and it has great historical and cultural backgrounds. These features bring the region into an excellent term of historical-archeological, social-cultural, and especially desert tourism. The geographical location and historical-cultural background make the tourism activity in this region considerable, and attracted many local and foreign tourists in recent years. But, which villages should visit as there is always the matter of time limitation. In other words, which villages have a better situation in terms of tourism infrastructures and facilities? Therefore, it is necessary to apply systematic approach, using multicriteria evaluation model to combine all the effective factors and make known tourism priority of the region. The objectives could be defined as follow:

To identify and evaluate tourism development potential specially in the field of desert tourism and historical-cultural tourism,

- To rank rural settlements, according to tourism attractions and infrastructure,
- To prioritize rural settlements in order to optimize servicing in tourism activities.

1. Statement of problem

It is acknowledged that tourism industry in Iran has not met the expectation of making money and improving economic condition which the ignorance of rural tourism is one of the reasons (Ghafari et al, 2011, 98). Iran is among the 10 top countries in natural sites. However, according to the available statistics, this opportunity has not been considered appropriately (Abolhasani

nejad, 2003, 2). Tourist attracting procedure needs a deep evaluation and understanding about the space. And lack of ranking and leveling of infrastructures and services are among the obvious and basic shortages which are tangible in so many plans and tourism development projects in our country. Environment as a main pillar of tourism industry has an important role to attract tourist in a space outlook. In order to develop rural societies, problems and structural-functional deficiencies need to be introduced (Ghafari et al, 2011 98). So it could be mentioned that it is essential to determine the preferable tourism spots and ranking them. It causes better servicing and acquires economic and social justice (Shamaei et al, 2011, 24). Khur and Biabanak County is among the regions which has a variety of plants, animals, geomorphological, historical and cultural attractions especially for desert tourists, but it has not been engaged for sustainable development so far. To take an efficient step toward appropriate planning and management, spatial model must be provided. And providing strategies, solutions and also identifying the groundwork of rural tourism development could revolutionize tourism development in this region.

2. Literature review

Few articles have been published up to 1990s in the field of leveling tourism regions. But in a few decades, researchers tried tourism leveling in a regional, national, international scale. In national scale tourism researchers have done the researches in a regional divisions and offer solutions with identifies main tourism spots. Tourism master plan provided by Plan and Budget Organization could be mentioned as one of them (Shamaei et al, 2011, 24). A list of studies that have been done so far in this area is listed in the following table (table 1).

3. Theoretical background

Rural tourism development would be worthy for those kinds of villages which have enough tourism potentials, markets, human resources and enough investment to support tourism section and also the ability to attract public and private sectors.

The situation must response to the following questions before planning procedure:

- Are there enough resources for developing tourism?
- Are there enough markets in a place which could attract tourists to?
- Are there enough efficient human resources to service tourists?
- Do we need tourism to achieve economic development?
- Are we able to compete with neighbor countries through current tourism projects?
 (Ghaderi, 2004, 5).

Table1a. Studies done in leveling tourism regions (2011/2010)

author	year	title	Topic and findings
NahidSajadyan, MahyarSajadyan	2011	Capabilities of rural ecotourism in Mazandaran (zoning, management, maintenance and development)	Analyzing and categorizing the cities of Mazandaran province in terms of rural ecotourism potential
Sayed Amin Ghafari, Mahmud Moradi, DavoudNikbakht	2011	leveling and spatial planning of rural tourism in the central part of the Boyer Ahmad city	Analyzing the natural, historical and cultural potential in rural regions, as well as the way of distribution of spatial tourism services in rural regions and areas
Ali Shamaei, JafarMousavand	2011	Leveling the cities of Isfahan province in terms of tourism infrastructure by using TOPSIS and AHP model	leveling tourism infrastructure based on some of the factors in urban tourism
Eftekhari, Pour Taher	2011	Prioritization of tourism potential in the rural areas of city Nir	Planning of tourism activities in the study area
Zarabi, Mohammadi, Baba khanzadeh	2011	The analysis of local tourism attractions and facilities in Owramanat	Review and identify tourism attractions of the study area and evaluate tourism facilities
Farzin, Nad Ali Pour	2011	Competition advantage factors of tourism destinations (Chabahr region)	Prioritization of the competition advantage factors of tourism destinations in Chabahr region
AmadKhatunAbadi Mehdi RastGhalam	2011	Evaluation of four pillars in rural tourism using SWOT, tourist villages of ChaharMahal and Bakhtiari province	The study of rural tourism status in tourism villages of Chahar Mahal and Bakhtiari Province
MehrdadKarami, Mehdi Modiri	2010	Identifying tourism potential regions, a step towards achieving regional development	The study of feasibility of regional tourism development by studying the potential and infrastructure of a region

Source: the authors.

Table1b. Studies done in leveling tourism regions (2009/1998)

author	year	title	Topic and findings
MasoudTaghvaei, SayedRaminTaghvaei	2009	Spatial planning in tourism development (Chahar Mahal and Bakhtiari, HoorBazoft)	Select a top regional tourism spots and line up functional interactions between them
Ali ZangAbadi, FarahnazAbolhasani	2008	leveling spatial analysis and planning of residential centers by tourism development indicator	A survey to determine the status of development of residential centers to determine the status of units and to provide a qualitative and quantitative to improve centers
Sarah I. Leberman& Peter Mason,	2002	Planning for leisure and tourism at the local level: Applied Research in New Zealand	Criticize of local planning process and provide a practical model for recreational and tourism planning in New Zealand
Victor B. Teye	1999	Tourism planning and tourism planning challenges in Ghana	Criticize and review tourism development planning in Ghana and choosing goal achievement factors
Wen-Ching Hong	1998	Rural tourism: A case study of regional planning in Taiwan	Description and classification of rural tourism in Natva province which is located in center of Taiwan

Source: The authors

Tourism destinations are very important in tourism marketing procedure. They are major assets in tourism industry. In a condition of unplanned human activities, some hazards and accidents may also occur. Yet, like many other forms of planning, recreation and tourism planning are not simple and clear processes, and some problems can be revealed especially at local levels (Leberman & Mason, 2002, 4). Planning as a scientific tool will help tourism activists to find the best development strategy and to get it in the path of the other section's economic development (Zangi Abadi et al, 2008, 28). Gunn believes that the term "tourism destination planning" refers to a kind of planning for a place where have the essential facilities, attractions, infrastructure and human resources able to attract tourists (Gunn, 1994, 87). The purpose of tourism planning is to identify and supply the needs of tourists (Sajadian et al, 2011, 61). Rural tourism planning and management is a complex matter, because resources are very vulnerable. Natural and man-made attractions, amenities, facilities, marketing, information services, and transportation are all different in rural tourism products. In addition, rural region is a multi-purpose source and tourism is just one of the demands. However, there are two important features in rural tourism: first, the diversity and dispersion of supply and demand and second is the uncertainty feature of demand. These two features will complicate the process of planning and management. Because of the following reasons, take a systematic and integrated approach in rural tourism management and planning appears to be necessary:

The reduction of agricultural activities as a dominant land use and shifting in demands necessitate the policies to allocate resources effectively in other ways such as tourism. Today it is accepted that tourism could be a stimulus for economic and social revitalization for rural regions. Due to the small scale and scattered nature, long-term planning is required to develop rural communities.

Rural resources are fragile so they must meet tourists according to their natural and socio-cultural capacities. Characteristics which can attract tourists to the region are not recognized and it is only achieved from continuous management and planning.

Tourists have high expectation of qualities and diversities of products. And also tourism industry has a long term responsibility toward environment. So, mutual responsibility could only be provided by efficient planning and management. Integrated and comprehensive planning to eliminate deficiencies of existing tourism facilities and services for visitors and locals are necessary (Rezvani, 2008, 159-160). For better planning and marketing of tourism destinations, the concept of tourism destinations should be clear first. In general we can say that the definition of tourism destination contains some elements which could provide a condition to attract and satisfy tourists from the combination and interaction with each other. Each region has some specific attractions and some have natural attractions that cause the extemporaneous development of tourism. Systematic analysis, implementation and updating tourism packages are necessary. And the evaluation of criteria is very important. It includes innate features of a place, organizational and institutional features like space, current capacity measured by tourist's perceptual studies and data analysis. A tourism region leveling is a criterion for determining the center of region and also for determining necessary infrastructures. Nowadays, despite the advancement of computer and statistical techniques in geographical studies, using different is the most common leveling criterion. In this regard, determining and establishing a hierarchy from tourism regions is necessary and could be an effective framework for dedicating appropriate services and proper performance. In Iran, after finishing the imposed war by Iraq and beginning the first and second development plans, urban tourism in the theoretical and empirical fields was considered, so that in recent years a lot of academic research has been devoted to the study of urban tourism (Shamaei et al, 2011, 24). As previously mentioned, few studies have been undertaken in this area up to now for example there is a research under the title of leveling and spatial planning of rural tourism in the central part of Boyer Ahmad city which is done by Ghafari et al in 2011. The research is done in order to level and determine rural spaces for tourism development, using documentary method, Guttmann model and statistical techniques. In another research under a title of leveling Isfahan province in terms of tourism infrastructure, Shamaei et al (2011) do the leveling process for a region according to some tourism attraction factors by using AHP and TOPSIS models. As there are a lot and various effective criteria in this field, using multi-criteria decision model is taken in order to enhance the accuracy of the calculation and criterions assessment.

4. Methodology

This study is an empirical research and descriptive-analytical method is used to survey. Considering the purpose of research, effective criteria and indicators to select tourism destination were identified first. After an evaluation from relevant experts and scholars in this field, the indicators reanalyzed and their validity was verified. Following this step, necessary data was collected from accomplished field studies according to the criteria, local authorities and experts' ideas and the existing information sources (census of villages and census of population and housing in the years from 1996 to 2006). After completing the pairwise comparison questionnaire by experts, the weight of each criterion is identified. And (MAPPAC) technique was used for ranking. In this research, Expert Choice software was used to implement the Analytical Hierarchy Process (AHP) and Excel software was used for ranking techniques using MAPPAC.

5. MAPPAC Technique

MAPPAC technique was introduced by Matarazo initially. Then it was used in various fields. MAPPAC technique is a method for ranking multi-purpose MODM. In this method, all the criteria, in a binary form are generated on the relations between P (preference) and I (indifference) and the rankings that are already done.

The major feature of MAPPAC technique is the presentation of multi-criteria ranking index based on measurements near the ideal solution for classification options (Matarazzo, 1986; Martel and Matarazzo, 2005; Erdal Dincer, 2011: 7). This technique has three basic assumptions (Matarazzo, 1990; Erdal Dincer, 2011: 9):

- · Value of v_{ij} for each a_j parameter is determined based on criterion performance K_i .
- \cdot The quantity of each v_{ij} can be determined by each K_i criterion for each item of a_j
- · The quantity of v_{ij} from each v_{ij} could be initialized in the range of [0, 1].

The value of v_{ij} is determined for each K_i which indicates the function of a_j based on K_i . A numerical weight a_i for each a_i which indicates the importance of a_i is determined by $\sum_{i=1}^n a_i = 1$ (equation 1).

A function of 7 is created for each K_i and in order to determine the value of $v(v_{ij})$ for each v_{ij} , the following is used: 0£ $v(v_{ij})$ £1. Based index priority is calculated between each pairs of v_g and v_g based on any pairs of v_g and v_g and v_g are criterion with (Matarazzo, 1991; Erdal Dincer, 2011: 10).

(Equation 2):

 π_{ef} is determined by the following, (equation 3):

$$\pi_{sf} = \sum_{i < j} \pi_{ij} (\alpha_s, \alpha_f) \frac{\omega_i + \omega_j}{m - 1}$$

And a general value π_{e} is determined by following equation for the item α_{e} . (Equation 4):

$$\pi_s = \sum_{\alpha_f \in A \backslash \alpha_s} \pi_{sf}$$

Then, α_e is selected with a biggest π_e and it is also selected as an optimal item. π_e is recalculated with a biggest allocated value of π_e which is selected as a best second alternative not including the optimal option of A and the remaining value of α_e . This process is repeated until the ranking of all alternatives then a similar process begins with the selection of the least optimal choice of A, the choice is removed from A and π_e is recalculated again. And the remaining value of α_e with a lower value of π_e is selected as a best second alternative the process continues until the rank of all the alternatives have done. The ascending and descending ranking combine in order to achieve a weak ranking of A.

6. Geographical location of the study area

Khur and Biabanak County is located in Isfahan province. It has three towns called Biabanak, Mehrjan, Nakhlestan and 25 villages and 201 farms in the southeast hinterland of Dasht-e Kavir (a large desert in Iran). It is bounded in the north by the Semnan Province, by Yazd in south and in east by Khorasan province. It is 400 kilometers far from the capital of province. It has an extent of 11600 square kilometer. The county has the population of 21000. And 8000 of them live in a center of the county (census of villages 2006). Khur and Biabanak County is considered as one of the most attracting tourism areas because of its abundant tourism attractions (table 2). In this research we try to rank rural settlements in terms of tourism leveling process.

Table2: Khur and Biabanak tourism attractions

Type of attraction	item	cases				
Natural attractions	geotourism	Mountains - salt - marsh sand - sand hill	Playa Khur in East and North East Khur, Jinn sand, pebbles Ashtian, sand dunes in rural Mesr springs spa (Spa Village) and Bazyab mineral spring saline lakes, saline desert and sprin, subterranean Klaghv with therapeutic properties.			
	Plant species	Old trees	Ayraj cypresses, Ardyb, Khnj (to see the traditional architecture of the mentioned villages, cypress trees and village houses view to cypresses, ancient olive trees Byazh, Jandagh			
		Mastic communities - bitter almond, Qych, Artemisia, Ashnan,				
		tamarisk, reeds, Haloxylon				
	Animal species	Hubreh, partridge, rabbit, fox, whole, cheetah, wild cats, lizard (18 species)				
	castles	Byazh Castle, Ayraj Castle, Garmeh castles, Jandagh castle				
	caravansary	Anarak, Rabat behind Badam, Ali Abad, Rabat Khan, Moshajari (the old way)				
Historical	houses	Ebrahimi in Anarak, Yaghma in Jandaq, Mazyar in garmeh, and				
attractions		Hussain Khan and Karbasi in Byazeh, and Haji Hussein Agha,				
attractions		Pazarv in mhrjanHashemZaye in Byazh Divan Khane in				
	Water reservoirs and	Byazh subterranean, Khur, Farm Nobahar,				
	subterranean	Syden Subterruncun, Midry Farm Hobalidi,				
Social and	handicrafts	Palm Related industries (cradle, Aquarius, Libra), or camel			
cultural	Ethics and		nd Khur) New Year celebrations, a			
attractions	traditions	, ,	rning (Byazh), ritual ceremonies			
	Observations of stars in the last and the first night of each month, seasonal springs,					
Others	deserts and some types of queries (paste, salt, black), sacrifice and beheading of a					
	palm tree, a camel and agricultural practices					

Source: the authors.

7. The choice of tourism destinations, effective Indicators and criteria

As a consequence of progressive use of computer and statistical techniques in geographical studies, using different indicators in the various fields of tourism areas is the most common leveling criterion these days. In this regard, it is necessary to determine a hierarchy of the regions which would be able to provide an effective framework for appropriate services, distribution and function (Shamaei et al, 2011, 24). Tourism destinations are always ranked according to health and motivational factors. And the highest factors among the ranking factors are safety, tranquility and non-infected environment. Since these criteria exist more or less in rural areas, they will be considered as tourism attraction factors (Rezvani, 2008, 66). Edwards divided and distributed effective variables in tourism attractions in a rural area into two separated factors: public and socio-cultural (Edwards, J. et al, 2000, 28). Salehi Fard (2011) and Ghaderi (2004) described tourism attractions and resources in terms of man-made attractions, cultural attractions and natural attractions. Lamsdn considers four elements for a tourism destination and its classification (Table 3).

Table 3: Lamsdn classification elements for tourism destination

features	description	cases
Primary attractions	major attractions which attract tourists and makes the difference from one destination to another	Acropolis in Athens, the pyramids of Egypt, the TajMahal in India
environment framework: visual identity	Physical design of a destination including: beach resort, the historical sites and business places. The main elements including: the infrastructures, road and rail networks, open space and community facilities	The beach of Boston Wharf area of London, Venetian channels, Roman Quarter in Paris
Supportive services	facilities such as accommodation and lodging, communications, and transportation, beverage and food, entertainment and amenities	Essential for all cases
Socio- cultural dimensions	Cultural characteristics, the bridges between the past and the present, comfort and tranquility, the warmth and solidarity between tourists and the host community	Mass traffic in Delhi India, music in Havana Cuba, intimacy in Greece islands

Sources: Heydari, 2008, 184.

To locate a tourism destination, following matters should be considered: proximity to the other recreational sites, the attractiveness of the location, climate condition, beautiful environment, having enough land for future development and extra buildings, access to freeways and recreational places, adequate public facilities and transport infrastructure, such as water, electricity and telephone, immune environment of the region, residents hospitability, residents good attitudes toward tourism, adequate and professional human resources (Heydari, 1387, 185; Ghaderi, 1383, 57).

Since rural tourism is a complicated and multi-lateral activity which involves different types of farm-based trips, ethnic, educational and ecotourism trips, efficient and

harmonized planning and management in rural tourism is a complicated matter (Sajjadian et al, 1390, 61)

Investigating the presented indicators in the survey, the index of the table (4) has been derived. Finally, despite the vast extent of criteria and indicators and the absence of some of indicators in the Census of Population and Housing (1385), data and information were collected by field study methods. (Table 5)

Table 4: Influencing indicators and criteria in tourism destination

Natural and environmental attractions	Social and cultural attractions	Historical and archaeological attractions Infrastructure services		Human factors		
Desert attractions	Certain customs	Payab	Villages with castles	Post office	road	Literacy rate
Diversity of plant species	Language and dialect	Historical houses	villages with subterranean	Office of Telecommunications Distance from populated centers		Employmen t rate
Old trees	Handicrafts	Houses with historical context	Villages with Spring	Public Internet Access Electricity		
Diversity of animal species	Festivals	Shrine	Villages with motor shaft	Access to public Vehicles Water Supply		
Tourism camping	Lifestyle (economy)	Other Muslim religious places	Water reservoir	Shop and Stores	Health centers	
Agricultural tourism	Food			Restaurants	Pharmacy	
	Certain customs			Resorts	Health cliques	

Source: the author

8. AHP model developing and weights determining of criteria

After developing a hierarchical structure, pairwise comparisons between criteria and relative subsets was done by using the scale of relative importance. 16 experts who were familiar with the region were invited to perform the procedure. Copland method was used to combine the ideas (Atai, 2009: 266). Expert Choice software was used in order to derive the weights of criteria and subsets which are based on the pairwise comparison. (Momeni&Sharifi, 2011). Results are illustrated in Table of Decision Matrix. In the first step of the ranking, Base and Ideal values were determined for each of the criteria by MAPPAC technique; After calculating the values of Ideal and Base, normalized decision matrix was figured out. Then, a value function for each Kis

considered and to determine the value of υ (v_{ij}) for each vij, following is used: 0£ υ (v_{ij})£1. Basic priority indicator $\pi_{gh}(\omega_e, \, \omega_f)$ between each pair of ω_e and ω_f is calculated based on each pair of K_g and K_h by equation 2. Ranking the rural settlements of the study area in terms of tourism development has been calculated as follows.

Table 5. Ranking results of Khur and Biabanak County with MAPPACK

village	rank	village rank		village	rank
Byazh	1	Jafarabad	11	Abadan	18
Jandagh	2	Haftooman	11	Neyshabur	19
Mehrjan	3	Golestan Aroosan	11	Aroosan Kure Gaz	20
Garme	4	Ebrahim Abad	12	Jegarag	21
Iraj	5	Farahzad	12	Mohammad Abad Kure Gaz	22
Mesr	6	Hossein Abad	13	Aziz Abad	22
Farkhi	7	Qadrabad	14	Quarry Complex of Marmarit	23
Ardib	8	Nasr Abad	15	Abgarm	23
ChahMalek	9	Amir Abad	16	Hajrag	24
Khanj	10	Bazyab	17	Behin	25

Reviewing the history of residency in the city of Khur and Biabanak and also considering undertaken spatial analysis in this study, it is clear that rural settlements with archaeological origin ranked higher than others like Byazh, Jandagh, Mhrjan, Garme and Ayraj; This is due to the historical and cultural attractions in these settlements; And it would be more attractive to tourists, especially those who are interested in cultural and historical attractions. Villages with these features could be good destinations for tourists interested in historical and cultural attractions. But the point is the capability and potential of region to attract tourists and providing services for them. Because of climatic conditions and a vast expanse of the area and the far distance to other destinations, the shortages of amenities and facilities for tourists are strongly felt. Considering the total conditions, the requirement allocation for infrastructure facilities and services is identified from the selected indicators. The results can be a proper criterion for allocating funds and facilities to the region.

Conclusion

To get hold of a great opportunity in the tourism industry opening up before in the near future, Bangladesh's tourism sector must start taking all the preparations from this moment. At the same time it must not also ignore the increasing prospect of the domestic market of this sector. As mentioned earlier, it is not enough that the country possesses a potential for becoming a covetable tourist destination. To turn that possibility into reality, marketing is a pre-condition. Marketing strategy of the tourism sector must have a clear attitude for implementing the strategy. Tourism sector should simultaneously utilize its assets and abilities in the real life scenario of the country to add value. High quality products at a low price, arrangement for entertainment, development of infrastructure, security, accommodation, aggressive promotional campaign etc. are also required. Growth of the tourism industry largely depends on national and global condition. Pricing strategy of the tourism sector is very important for which all categories of tourists including high-income

group and low-income group may get the opportunity to tour. Product differentiation technique should be used to attract tourists and fulfill their demands. Tourism industry should be comprised of accumulating all courses of action for which efficiency and effectiveness in the strategic marketing is being required.

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