

**Assessment and Prioritization of Urban Tourist Attractions
Based on Analytical Hierarchy Process (AHP)
(A Case Study of Birjand, Iran)**

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In evolving urban tourism, some particular factors play important roles. Cities with a plethora of tourist attractions and facilities often attract a large number of tourists. Therefore, for urban tourism development, it is essential firstly to identify resources and attractions and then to assess and prioritize them. In this study, using Analytical Hierarchy Process (AHP), we have examined various tourist attractions of Birjand in cultural-historical, man-made and natural dimensions. An EC software has been used to analyze and prioritize the city's tourist attractions. The findings show that cultural and historical attractions of Birjand have a higher priority for development and planning than the other ones.

INTRODUCTION

At the outset of the 21st century, tourism will be an indispensable reality in the behavior and conduct of man to gratify his curious soul, given the established technological, cultural, political, social and economic structures. Visiting other places either in reality or with virtual technology (through movies, CDs, internet and books) for different purposes will be among the requirements of the 21st century, leading to a movement which has made national and international borders irrelevant and gone beyond states and nations. As a major component of post-structuralism economy theory, tourism is virtually bringing about deconstructive ideas in all areas (Papeli Yazdi and Saghai, 2006:7).

Therefore, many countries see tourism as a necessity and seek to utilize all their potentials and resources to achieve their interests and benefits. Recently, visitors are paying more attentions to urban spaces than other tourism areas. Urban tourism is of a dual nature, where cities are considered as the main origins for tourists on one hand and seen as destinations on the other hand. Cities have many rich attractions and tourism facilities, which play a key role in appearance and development of the cities. Tourism nowadays is an important business enterprise, which calls for an assessment of the competing scene, defining and setting objectives and judging among various options for investment, establishment and use of the proper structure for commercializing the urban tourist products (Dinari, 2005:11). Proper

decision making for planning in urban tourist attractions should be included all factors which affect decision making and on the basis of this, the best option is chosen (Inskeep, 1998:120).

The important thing in attractions-based planning and development is the way in which the criteria such as economic, socio-cultural, infrastructural, environmental, institutional, legal and geographical ones are prioritized. These criteria should be considered for making decisions about different attractions. In cases where various criteria aren't at the same level of importance (i.e. however the urban attractions have better potential for development considering their economic and socio-cultural conditions, but are in a weaker position in terms of infrastructure and legal and institutional criteria), decision making should take place considering different criteria. In such situations, multi-criteria assessment methods can be used (In these methods, it is supposed that each criterion is a separate aspect). Among the numerous multi-criteria assessment methods in urban planning field, the followings are being used more over the past decades:

- Check-list of criteria
- Goal-achievement matrix
- Assessment of resource cost
- Social cost-benefit analysis
- Planning balance sheet analysis
- Optimization technique
- Analytical hierarchy process

This study uses the multi-criteria assessment method of analytical hierarchy process (AHP). This method is chosen because of its advantages over the other multi-criteria assessment methods such as using the criteria and sub-criteria and numerous variables that are considered for better decision making in comparison with other methods.

This case study focuses on the tourist attractions in Birjand, a provincial capital in the east of Iran. Birjand has special cultural, artistic and religious places among other areas in Iran. The city has been hometowns of many well-known artists in different fields such as music, theater and visual arts. This city has a large number of historical monuments and natural sceneries around it. Its unique mountainous environment is a main attraction for tourists. Tourism features of Birjand make it an ideal hub for the tourism industry in the east of Iran.

LITERATURE REVIEW

The tourism literature has increased in the past few decades. Studies have been done in the field of consumption and spatial distribution of tourists on the basis of variables and different methods. Raveh and Shavell (1999) studied Jerusalem Orshalim and Tel Aviv. The percentage of visits, average length of stay and the average number of visits were used to classify tourist attractions. On the basis of these variables, four classes of tourist attractions were determined.

Cooper (1981), who investigated the spatial behavior of tourists on the Channel Island of Jersey, identified the differences in the spatial patterns of tourists according to two variables: stage in life cycle and socio-economic status. He found that low-income tourists tended to visit only the major tourist attractions, whereas higher income tourists visited lower-order (less visited) attractions, as well. Chadeaud (1981) investigated the time-space patterns of pilgrims and tourists to Lourdes and presented detailed maps showing the activity spaces of organized groups and individual tourists; the former were more concentrated and the latter were more dispersed. Chadeaud offers two explanations for this finding: (1) tourists in organized groups tend to be older and therefore, it is hard for them to walk along the city and (2) organized groups tend to consist. More of the pilgrims whereas a larger share of the individual visitors are tourists and not just pilgrims. Debbage (1991), who examined the spatial behavior of tourists in a resort in the Bahamas, found that differences in the spatial behavior of tourists resulted from differences in their personality structures, based on Plog's (1987) tourist typology. Prentice (1993) found that the more affluent sectors of English society are more eager among visitors to heritage attractions and

in general, the visitors of these attractions tend to be older. Light and Prentice (1994) reported similar findings regarding heritage attractions in Wales. Dietvorst (1994), in his study of Enkhuizen, a small historic town in Netherlands, identified several distinct tourist spaces based on differences in the main purpose of the visit to the town. Montanari and Muscar" (1995) outlined nine typical time–space profiles of tourists to Venice derived from a mix of the main purpose of their visit as well as other trip characteristics such as length of stay and previous visits to the city. Pearce (1998) analyzed the characteristics, structure and functioning of three tourist districts in Paris. In his analysis, he presented the differences of visitor patterns between international and French tourists. Jansen-Verbeke and Lievois (1999) highlighted both the theoretical and applied potential of the analysis of different time–space use patterns of urban tourists, using the historical city of Leuven in Belgium as a pilot study.

Yet another study focusing on the differential consumption of tourist sites is Bowman's (1991) research on groups of Christian pilgrims of different denominations in Jerusalem. Bowman's study was followed up by Shachar and Shoval (1999), that identified segmented tourist spaces based on the different national and religious groups visiting the city. More recently, Shoval (2001) re-examined their findings using a statistical model consisting of 10 variables representing tourist and trip characteristics of visitors to Jerusalem. He concluded that religious difference was the only reasons explaining the differential consumption of tourists in Jerusalem and that the most influential variables explaining the spatial consumption of individual tourists are those related to the character of the trip, such as length of stay in the city, main purpose of visit and number of visits to the city.

In conclusion of this section, the literature are not abundant with researches on the subject of this paper and the existing ones in most cases did not analyze the situations in focus to supply in tourism industry and multifunctional tourist cities.

METHODOLOGY

Since this study deals with prioritization of the tourist attractions in Birjand for planning and development, a survey of the current status of the city and its tourist attractions was done. Then criteria and indicators of tourism attractions were determined by eight-strong focus group of tourism experts consisting of local tourism department officials. Then, the tourist attractions of Birjand were assessed, using analytical hierarchy process (AHP) and EC(It is a specialized software to calculate complicated matrix and score criteria and locations for easier decision making.) (Expert Choice) software. Finally, the city's tourist attractions were prioritized.

Duration: the present study started in October 1, 2008 and lasted 5 months.

Location: since the study dealt with prioritization of tourist attractions in Birjand, the study was conducted within the general area of the city.

The Conceptual Framework of Analytical Hierarchy Process

The analytical hierarchy process starts with identification and prioritization of decision making elements, which includes goals, criteria or indicators and options to be used in prioritization. The process of identifying elements and their interrelationships leads to a hierarchical structure. The hierarchy makes it possible to summarize decision making elements in every level (Bowen, 1993:333).

Therefore, the first step in the analytical hierarchy process (AHP) is to make a hierarchical structure based on the subject in question. It should show the goals, criteria, options and their interrelationships. The other four phases in the analytical hierarchy process include the calculation of the weight (the significance index) of criteria and sub-criteria, the calculation of the weight (the significance index) of options, calculation of the final points of the options and examination of the logical consistency of judgments.

Phases of the Group-Based Analytical Hierarchy Process

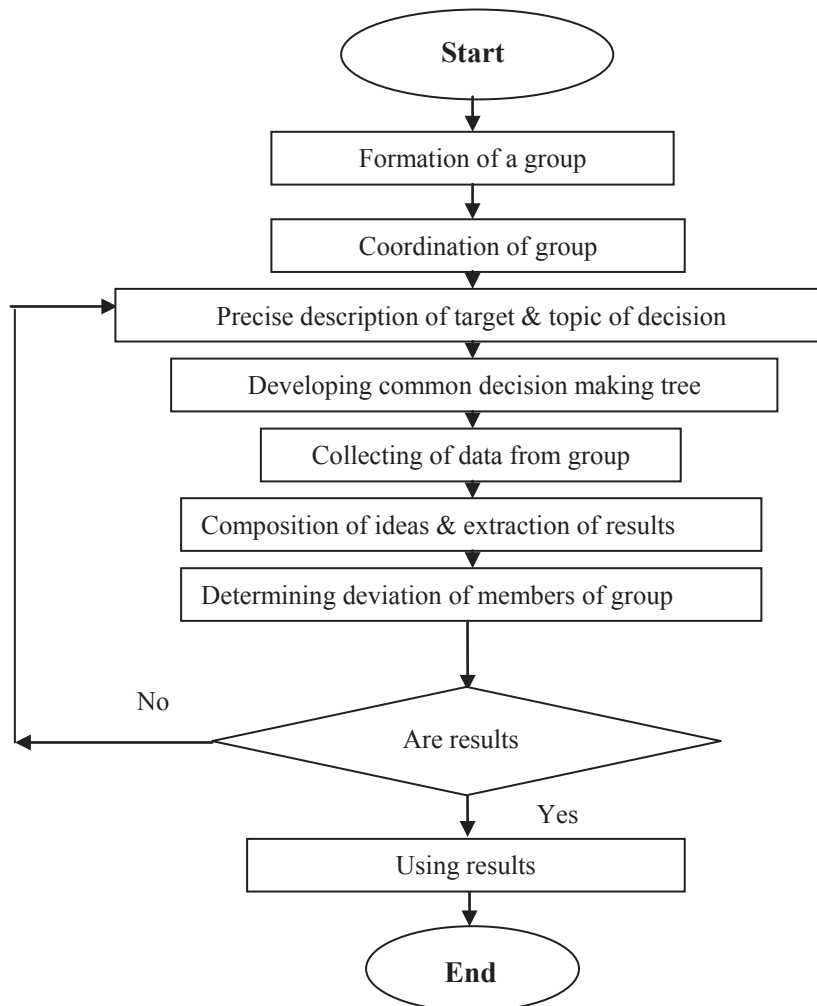
The analytical hierarchy process is a multi-factorial decision making method, developed by Thomas L.Saaty in 1980. This method is based on pairs of comparisons. It would be a good method if the decision

maker faced several qualitative and quantitative factors. The group decision making process using AHP is presented in diagram 1.

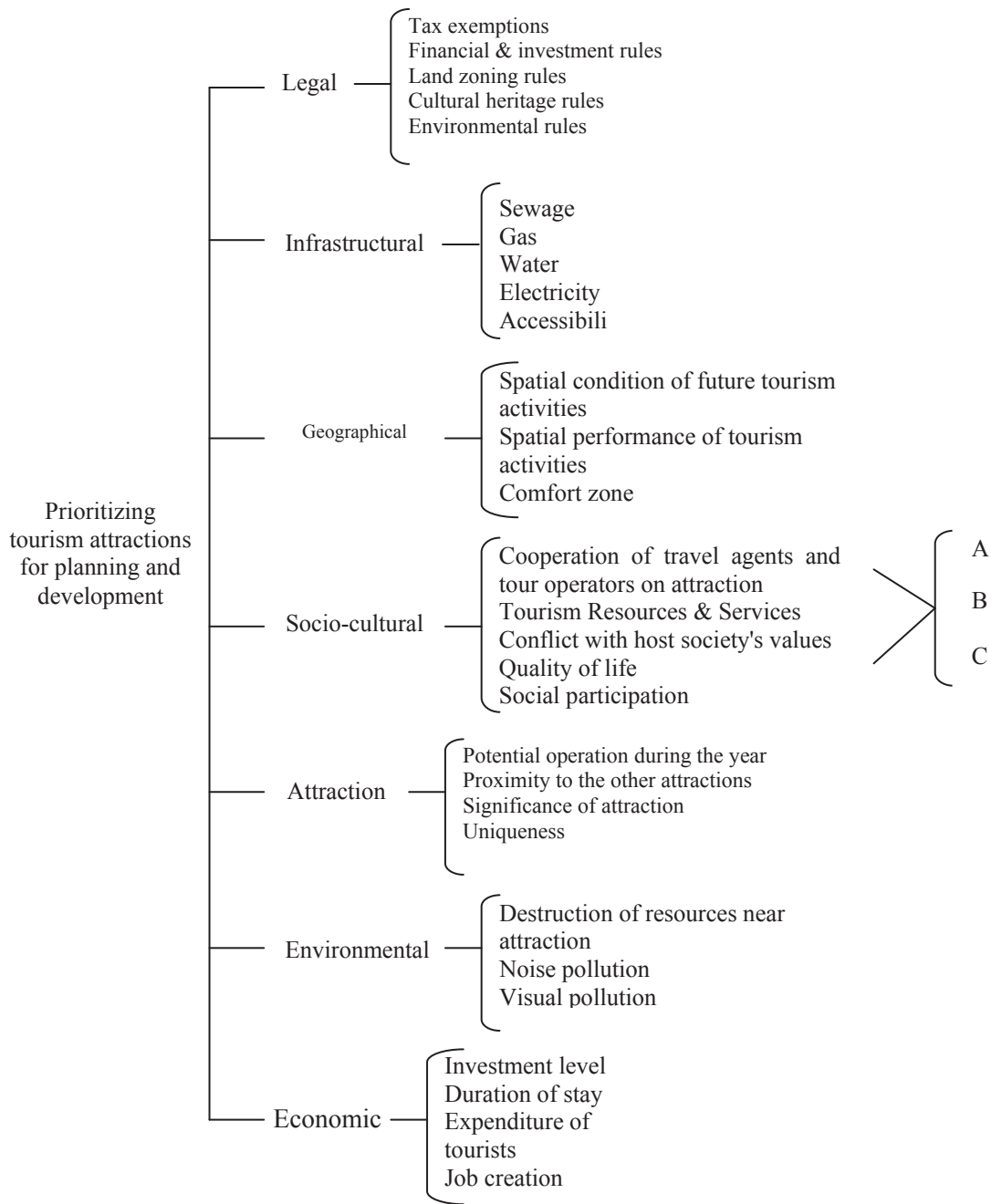
The process of ranking and prioritization of options using group-based AHP includes steps as follows:

- 1- Formation of the focus group: Since decision making in organizations and companies are generally difficult and complicated, using different ideas can reduce the probability of mistakes in decision making and expedites the procedure. This study includes eight-strong individuals focus group made up of local tourism experts and officials in Birjand. Vice President and expert of cultural, tourism and handicraft organization ,Vice President of environment organization, one of transportation expert from municipality, one tourism master student of Southern Khorasan University, one tourism expert and one tour guide of a tourism agent.
- 2- Building a hierarchical structure: We have started building a hierarchical structure related to the topic (diagram 2). It is a four level hierarchy including targets, criteria, sub-criteria and options. The most important part of the analytical hierarchy process is to classify criteria into a hierarchical structure. In this part, the analytical hierarchy process turns difficult and complicated problems into simple form, compatible with the mind and nature of human beings by analyzing them. In other words, the analytical hierarchy process simplifies complicated questions by breaking them down into hierarchically ordered criteria.

GRAPH 1
GROUP DECISION MAKING PROCESS USING AHP



GRAPH 2
THE HIERARCHICAL ANALYSIS PROCESS OF PRIORITIZATION OF THE INTENDED TOURIST ATTRACTION



Source: (Writer, 2008)

A – Historical-cultural attractions: Kolah farangi citadal, Akbarieh garden, Akbarieh garden, lifestyle, Rahim abad garden, Lanai, Birjand citadal, Archaeological and Anthropological museum, Forg fort, Charderakht Jama Mosque, Band Darreh, UK Consulate (Manzarieh garden).

B – Man made attractions: Mosalla Lanai, traditional architecture

C – Natural attractions: Gezik spa, mountains, deep valleys, desserts and seasonal rivers

FIGURE 1
DISTRIBUTION OF ATTRACTION IN BIRJAND



3- Determining the significance index for criteria and sub-criteria: Once the focus group agrees on a hierarchy, the parallel comparison matrices should be established on every level. To assign significance index of criteria and sub-criteria, they are compared in binary sets. For example, to see whether economic criterion matters more or environmental one, the judgment is made according to the Table 1, which includes 9 quantities and assigns the superiority intensity of the I criterion compared to the J criterion as a_{ij} . All of the criteria are compared in binary sets. There are two ways for establishing pairs of comparisons as follows:

- Judgment based on consensus
- Personal judgments

In the first method, the group should reach a consensus in the case of each element of the matrix. It should first compare the seven key decision criteria on a binary basis and reach a consensus on each member (a_{ij}) of the matrix. When there is a significant disagreement among the members over one member of the matrix, then the hierarchical analysis process allows each decision maker to insert its own point for the element in the matrix and convert personal judgment to group judgments (for every pair of comparison) using geometrical average (Ghodsipour, 2006: 108).

TABLE 1
SAATY'S 9-INDEX COMARATION FOR BINARY COMARATION OF CRITERIA

Point (degree of importance)	Definition	Explanation
1	Equal significance	The two criteria are of the same significance in materializing the goal
3	Slightly equal significance	Experience indicates in materializing the goal, I is of more significance than J
5	High significance	Experience indicates the significance of I is much more than J
7	Much higher significance	Experience indicates the significance of I is much more than J
9	Absolute significance	I is proved to be of much higher significance than J
2, 4, 6, 8	-	When there are intermediate cases

Source: (Zebardast, 2001: 28)

Here, binary comparisons are registered in a $n \times n$ (here 7×7) matrix, which is called binary comparison matrix of criteria $A=[Q_{ij}]n \times n$. Elements of the matrix are all positive. Using the reversed

condition principle in the hierarchical analysis process (if significance of I with regards to j is K, then the significance of j with regards to I equals 1/k), in each binary comparison, there will be two numerical values of a_{ij} and $1/a_{ij}$.

To calculate the significance index of criteria, following four methods are used:

- Least squares method
- Logarithmic least squares method
- Eigen vector method
- Approximation method

Because the present matrix has a large dimensions, EC (Expert Choice) software is used to normalize the matrix and calculate the weights of the criteria. In addition, the same steps taken above to obtain the significance index of criteria will be followed to assign the significance index of the sub-criteria. The final results are presented.

4 - Assigning the significance index of options: After determining the significance index of criteria and sub-criteria, the significance index of the options should be determined too. In this step, preference of each criterion is judged against each sub-criteria and the judgment is made against the criterion itself in the case that criterion has no sub-criteria. The basis for this judgment is the same 9 quantity comparison method designed by Saaty. The only difference is that there is no discussion of which option is important in comparing options with each of the sub-criteria. What counts here is which and how much the option is preferable. Therefore, Saaty's 9 quantity comparison method is set as the basis for judgment among options in the decision making group according to the Table 2.

TABLE 2
SAATY'S 9-INDEX COMARATION FOR BINARY COMARATION OF OPTION

Point (degree of preference)	Definition
1	Equally preferred
3	Slightly preferred
5	More preferred
7	Very much preferred
9	Totally preferred
2, 4, 6, 8	Intermediately preferred

Source: (Zebardast, 2001: 29).

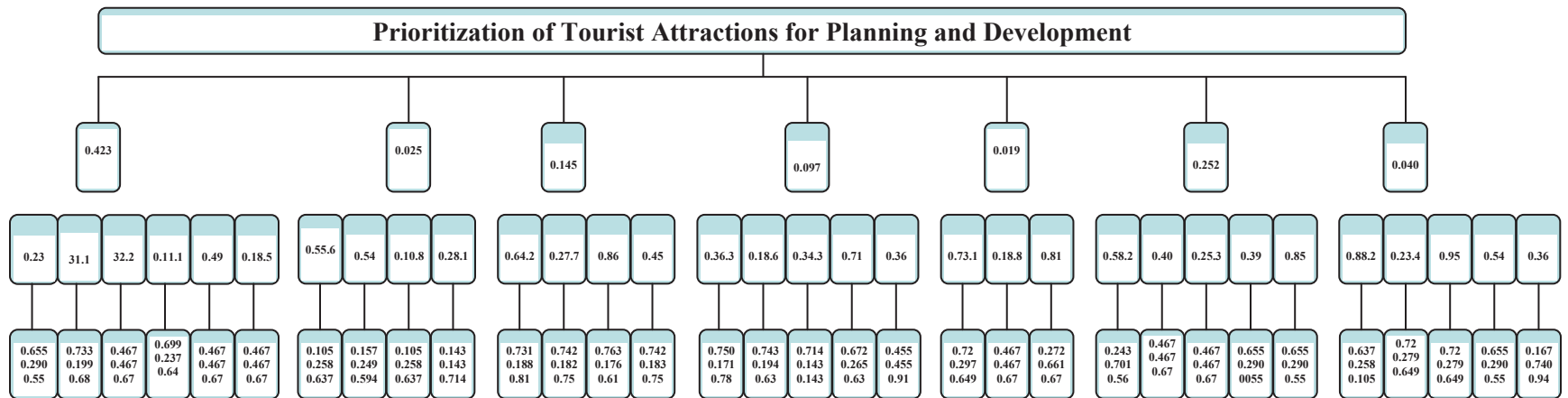
5 – Assigning the final point (priority) for options: So far, the significance indices of criteria and sub-criteria in relation to the target of study and the significance index of options in relation to each of the sub-criteria were determined. Now, the significance indices are combined to determine the final point for each of the options. For this purpose, there are two combination modes in EC software which provide the same result in 0.092 of times: Ideal mode and Distributive mode.

In this study, the distributive mode is used. Its use is suggested in such cases as follows:

- The prioritization is intended rather than selection of an option which holds the highest ranking,
- The allocation of resources are intended,
- The selection of options with different numerical values for each target (for example where the elements are not the same).

The significance index of criteria and sub-criteria as well as the options' points with regards to each of the criteria are represented in diagram 3.

GRAPH 3
FINAL POINTS OF OPTIONS WITH REGARD TO CRITERIA AND SUB-CRITERIA



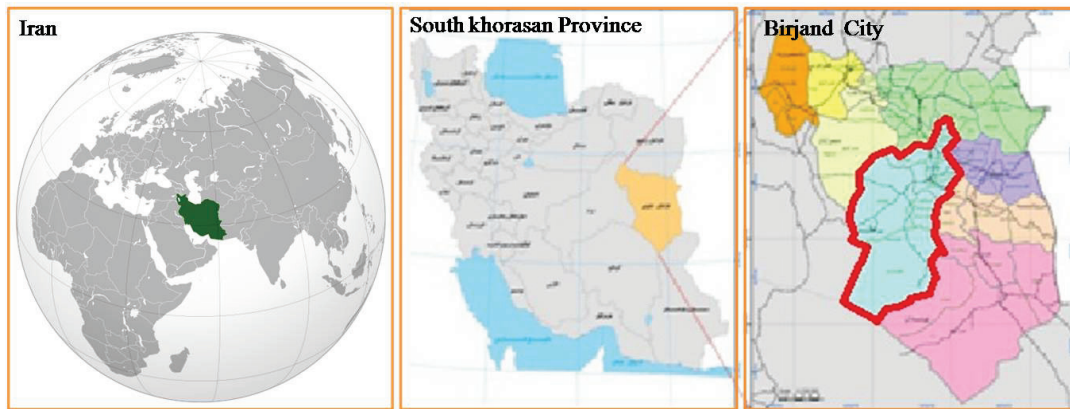
Source: (writer, 2008)

The advantage of the hierarchical analysis process is that it provides checking consistency in judgments for assigning significant index for criteria and sub-criteria. In the other words, how much consistency has been achieved in binary comparisons of criteria (matrix A)? When the significance of criteria is evaluated against each other, inconsistencies are probable in judgments. That is, if A_1 is more significant than A_j and A_j is more significant than A_k , despite all these efforts, people's sentiments and preferences would be inconsistent. What measure can be found that reveals the inconsistencies in judgments? (Ghodsipour, 2006: 67). A mechanism used by Saaty (1998: 32) to check inconsistencies in judgments includes calculation of an inconsistency index, which equals the inconsistency index divided by incidence index. The judgment is acceptable if the inconsistency index equals or is smaller than 0/1. Otherwise, the judgment has to be revised.

$$I.I = \frac{\lambda_{\max} - n}{n - 1}$$

The inconsistency index in this study is .08, which indicates the correctness of calculations and result of prioritization as calculated by the EC software.

**FIGURE 2
LOCATION OF BIRJAND**



Prioritization of Tourist Attractions in Birjand Based on AHP

Distributive mode

Inconsistency rate = 0.08

A: 0.535

B: 0.365

C: 0.100

Abbreviation	Definition
A	Historical- cultural attractions
B	Man made attractions
C	Natural attractions

Source: (Writer, 2008)

Findings: Prioritization of Tourist Attractions in Birjand

In the present study, firstly the focus group and the target group were formed the tourist attractions in Birjand were classified in to three groups A, B and C according to Inskeep's model. In the second step, on the basis of important criteria and sub-criteria in prioritizing tourist attractions in Birjand, the focus group started to set up a hierarchical structure. Then 7 key criteria and 32 sub-criteria (diagram 1) were selected by the group. For a logical decision making in AHP, 40 matrices were considered for assessing criteria and sub-criteria in relation to the target and for assessing sub-criteria in relation to prioritization of

attractions. The focus group assigned points to each of them. The data obtained were analyzed using the EC software.

The statistical analysis shows category A including cultural-historical attractions, ranks first for development and investment with 0.535 points. The category B including man-made attractions, ranks second with 0.365 points, while the category C including natural attractions, ranks third with 0.100 points (table 3).

An analysis of the data showed the economic criterion with 0.423 points has the highest weight for prioritization of the tourist attractions in Birjand, while the geographical criterion has the lowest weight with 0.019 points (table 3).

TABLE 3
WEIGHTS OF CRITERIA FOR PRIORITIZING TOURIST ATTRACTIONS IN BIRJAND

Geographical	Environmental	Social-cultural	Legal-institutional	Tourist product	Infrastructural	Economic	Criteria
0.019	0.025	0.097	0.04	0.0145	0.252	0.423	Weight

Source: (writer, 2008)

Given the relevant criteria for prioritizing the tourist attractions in Birjand, the weight and significance of each sub-criteria has been shown in Chart 3.

In Table 4, the weights of the most significant sub-criteria with regard to the main criterion in prioritizing tourist attractions in Birjand have been shown.

Table 4: Weights of the most significant sub-criteria with regard to the main criterion in prioritization.

TABLE 4
WEIGHTS OF SUB-CRITERIA GIVEN TO THE THE KEY GIVEN TO THE KEY CRITERION IN PRIORITIZATION

Infrastructural	Geographical	Tourist product	Social-cultural	Legal-institutional	Environmental	Economic	criterion
Access	comfort zone	uniqueness	social participation	environmental lows	air pollution	job creation	sub-criterion
0.582	0.731	0.642	0.363	0.582	0.556	0.323	Point

Calculation of the Inconsistency Rate

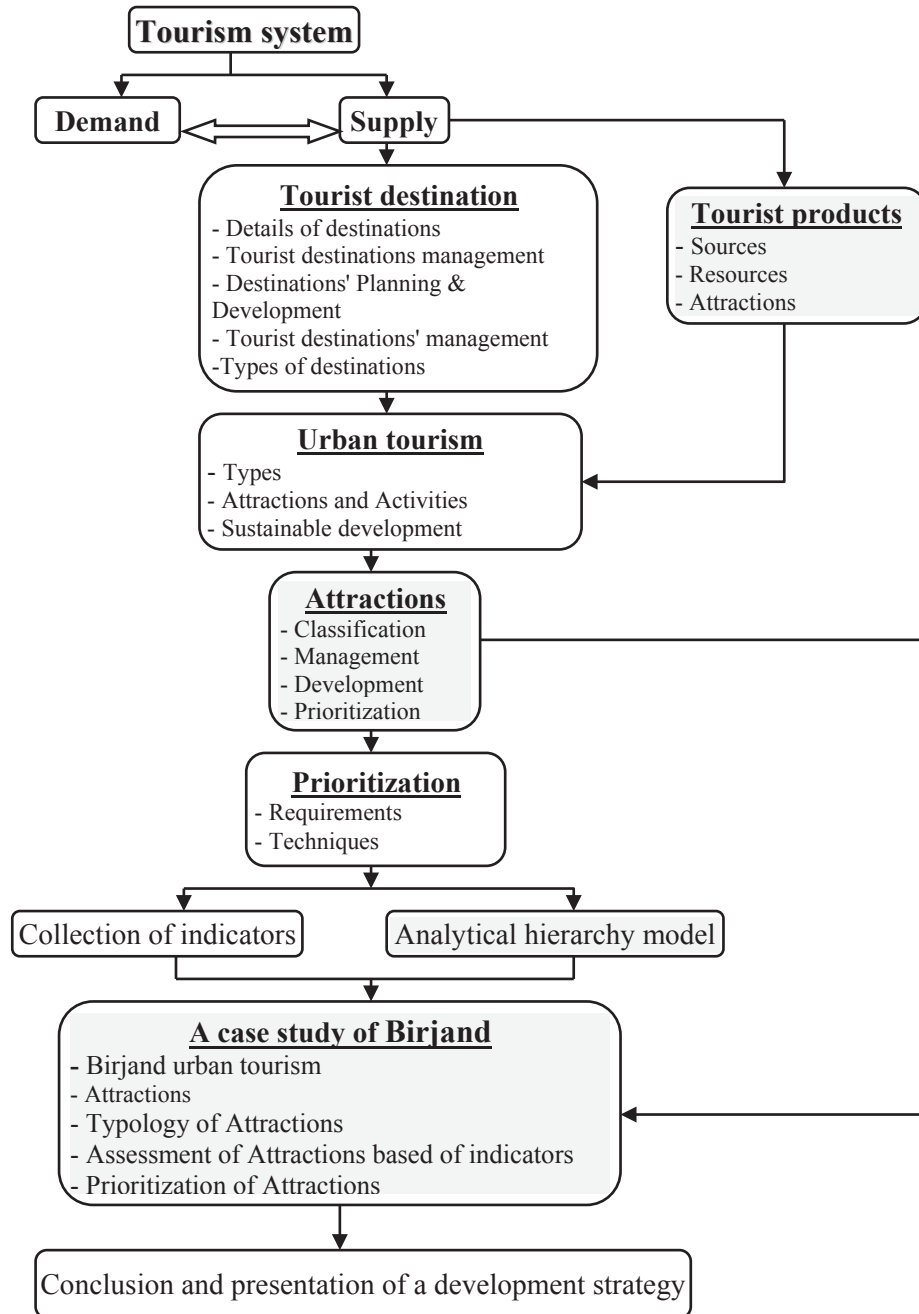
In each step of the analytical hierarchy process, in order to carry out a binary comparison of criteria and sub-criteria in relation with the objective of the study and also binary comparison of sub-criteria in relation with the prioritization of the tourist attractions in Birjand, the decision making group calculated the inconsistency rate for each matrix. If it is higher than 0.1, an assessment matrix should be reformed and will be assigned points. In this way, the group would reach a logical convergence in prioritization. The final consistency rate in the analytical hierarchy process is 0.08, which indicates the correctness of data, findings and intellectual convergence in the decision making group regarding the prioritization of the tourist attractions in Birjand.

CONCLUSION

The area brings together 45 tourist zones with 345 tourist attraction subfields, for each of which, projects have been defined in line with their resources, capacities and limitations. The hierarchy process of tourist attractions is getting important based on the strategic-structural requirements with performance levels (transnational, national, regional, provincial and local), the type of tourist attractions (cultural-historical, man made and natural) and the hierarchy of categories of tourist

attractions (pole, district, field and point). In the hierarchy of tourist attractions, there is a group of conditions and factors which act quite differently according to the time-location circumstances. Therefore,

**GRAPH 4
THE STUDY PROCESS**



considering to structural and strategic requirements and paying attention to the special time-location circumstances according to the existing standards, can contribute to the maximum realization of tourism potentials. The findings of the study clearly indicate that in Birjand the main tourist attractions at the international and national levels are cultural attractions such as local music and dance, Akbarieh garden,

lifestyle, Rahim abad garden, Lanai, Birjand citadal, Archaeological and Anthropological museum, Forg fort, Charderakht Jama Mosque. The key influential criteria in assessing and prioritizing the tourist attractions in Birjand are economical, infrastructural and tourist products respectively. In addition, the priorities for development and investment in the tourist attractions in Birjand are respectively as follows:

- The cultural-historical attractions
- The man made attractions
- The natural attractions

Among the cultural-historical attractions, priority for planning and investing should be given to local music and dance. Among the man made attractions, special attention should be paid to Mosalla Lanai. Among the natural attractions, high mountains with a spectacular landscape can attract lots of tourists. But firstly, some resorts should be invested. Also Akbarieh garden, lifestyle, Rahim abad garden, Lanai, Birjand citadal, Archaeological and Anthropological museum, Forg fort, Shoukatabad, Charderakht Jama Mosque have the priority for investment among the other attractions. The abundance of tourist attractions and the geographic location of Birjand in relation to other cities in the province can play an important role in multilateral development of the provincial capital. Unfortunately, lack of a scientific approach for knowing the tourist attractions and resources means the potentials have failed to materialize. The executives and planners are often not aware of the performance level of the tourist attractions, thus facing to deviations during estimations and planning is normal.

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