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Evaluation of cultural landscape focusing on natural heritage by integrating DEMATEL and ANP methods; Case study: Coastal Shore of Karun River in Ahvaz

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ABSTRACT

The natural heritage-based cultural landscape relies on a prominent example that embodies the most distinctive natural phenomena, forms or forms, and current important ecological trends, biological evolution, and human interaction with its natural environment. Therefore, the coastal route of the Karun River in the city of Ahvaz, as a rich natural heritage, includes all the pillars and, of course, the potential of the desired cultural landscape, which unfortunately has been neglected in recent decades. In this study, with the aim of achieving the most important criteria related to the cultural-natural landscape, to create a network diagram of inter-criteria relations, weighting and normalizing them through a combined method of multi-criteria decision-making technique DEMATEL-ANP. Preliminary results of the research using the DEMATEL method show that 13 out of 23 criteria are the most important criteria of the subject. Of these, 9 are effective (positive) and 15 are affective (negative) criteria, of which 66% of the "deep interpretation of natural landscapes" cluster (2 out of 3 criteria) have positive values. It is also the most important and influential measure of "habitat value" of the "yield and productivity" cluster. According to the ANP results, although the most important criteria for the cluster are "deep interpretation of natural landscapes", but the distinction in the cluster is "performance and productivity". Finally, the findings of the limit matrix obtained from the research confirm the natural approach in the trinity (natural, man-made and man-made) in creating a natural landscape based on natural heritage in a case study of the Karun River.

KEYWORDS:Cultural Landscape, Natural Heritage, Karun River Shoreline, DEMATL-ANP.

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1.INTRODUCTION

It seems that contemporary cities are no longer traditionally understood due to their complexities, and it is necessary to achieve a more accurate reading of the city by considering a better understanding of the city and its various layers. In the past, indigenous cities had a holistic view, in the sense that culture and nature were perfectly interconnected, but in the western partisan view, culture and nature are separated. According to Western partisan knowledge, the distinguishing feature of man and nature is "culture." In response, some have argued that the "cultural landscape" is part of nature itself, which has changed because of people's daily lives and has taken on cultural forms and roots. In this approach, which is a spectral view of the cultural landscape, the less human intervention in nature, the closer the landscape can be considered "natural landscape" and the more human intervention can be considered the landscape closer to the "cultural landscape". "Nature", "Man" and "History" are three elements that play a role in the cultural landscape more than anything. (Ashrati, 2014)

In the matter of the cultural landscape of the city, where the rate of human intervention is higher and is taking place in the context of a city, it is sometimes tied to the culture and history of the country. One of the prominent examples of the interior is the view of the shoreline of the Karun River in the city of Ahvaz. This river is called Karn, Karnak and Koohrang in the ancient inscriptions of the first human civilizations. It is the natural heritage of Iran. The coastal route of the Karun River, with its rich heritage of ethnic civilization and culture, is a diverse consensus of pure nature along with its industrial and urban symbols. Existence of identifying elements such as ten main bridges, old silos, hotels, amphitheater, central library, villas and other landmarks along with the presence of popular subcultures from all occupations has provided a novel background from a rich and diverse cultural perspective. Is. At present, increasing population and migration, and urban and machine life are increasingly destroying its nature. The coastline is the original identity of this city and its natural and artificial resources should be preserved as a precious heritage for the future. The central category of cultural landscape, its desirable dimensions and the location of the shoreline of the Karun River in the city of Ahvaz, in the role of a natural heritage of the body are the importance and necessity of this research. Paying attention to the coastal route of Karun River as the identity card of Ahvaz city is now more and more exposed to destruction due to the increase in population and movement of people, and this issue may have destructive effects if it continues in the not too distant future. Fertilize the body of the city. In the field of cultural landscape based on natural heritage, identifying causal relationships between human, natural and man-made elements of cultural landscapes along the Karun River coast is of particular importance and the researcher examines the effective dimensions in creating it optimally. Due to the importance of the issue and the necessities, the main purpose of this research paper is to identify and explain the assessment of effective criteria in creating a cultural landscape based on the Karun River strip in Ahvaz as a valuable domestic natural heritage that achieves the most important landscape criteria. Cultural-natural by creating a network diagram of inter-criteria relations, weighting and normalizing them through the combined method of multi-criteria decision-making technique DEMATEL-ANP and finally providing the necessary restrictions and solutions to improve and apply the cultural landscape- Natural in it, is one of the micro-objectives of the present study.

2 .Theoretical foundations of research
1-2-Cultural landscape

In its interaction with natural systems over time, man creates an artificial landscape that is a platform for the emergence of cultural values and biological characteristics, and thus they can be called cultural landscape. Since 1970, with the formation of the International Scientific Committee on Cultural Landscape by ICOMOS and IFLA, identification, increase of awareness, study and education in the field of support, protection, restoration, supervision and management of cultural landscape began (Androudi and Sahrakaran, 2012: 93- 94). On a global scale, basic definitions of cultural landscapes are now provided by the World Heritage Center, and various sites have been inscribed on the World

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Heritage List as cultural landscapes. In the common definition of the World Heritage Convention and UNESCO in 2006, the cultural landscape is a land or area that reflects the interaction of man and nature. These landscapes represent the evolution of human society and their habitats over time. Evolution that is affected by continuous natural changes as well as successive social, economic and cultural forces (internal and external). In fact, the cultural landscape is formed and continues in a range of time and place (Behbahani, 1389: 109). The cultural landscape is an evolved, multi-layered concept that combines different definitions of human, environment, culture, history, and indigenous communities (World Heritage Center, 2009: 17), as defined by the World Heritage Center: " Wealth is a legacy of the past; what we live with today and what we leave for future generations Natural and cultural wealth are immovable sources of life and spirituality (UNESCO World Heritage Center, 2007; Jokili You, 2002, 1).

The cultural landscape is basically the result and style taken from the natural landscape by the cultural community. In other words, culture as a representative, the natural environment in the role of mediator and cultural landscape is the result of the interaction of the two. Influenced by the applied culture, which changes over time, the landscape undergoes development, goes through stages, and probably reaches the end of the development cycle (Sawyer, 1963, 343). In addition, cultural perspective is a relative concept and expresses a perspective on which the interventionist has been able to leave a part of his cultural characteristics (Khademi, 1393: 30). Cultural landscapes include tangible physical patterns and signs, but more importantly, they also reflect intangible and social values (Taylor et al., 2014: 2). In addition, the idea of cultural landscape is easy and restrained, so that the study of cultural landscape includes natural and man-made components of the environment and the processes of their change over time. These components and their relationships must be examined both physically and functionally and associatively (Longstart, 2008: 1). In order to understand the cultural landscape, it is necessary to study both the natural and cultural components of the place as a whole (Eshrati, 2009: 25). The quality of soil, plants and animals were among the needs of nature shaping and human responses and adaptation to the factors of nature in the form of human activities, was a constructive cultural landscape (Mukhles, Farzin and Javadi, 1392: 31).

Human intervention in a natural landscape is not limited to the physical and objective aspects, but also includes the mental aspects. With this view and considering that during the thousands of years of human life on the planet, many beautiful landscapes have been changed or mixed with special meanings, it is not easy to distinguish the natural landscape from the cultural perspective (Ebrahimi Dehkordi, 1392: 1) Since the heritage forms the component of identity to any place and gives that place a special character, it is considered the treasury of human experience (Jokiletto 12, 2002, 1) Cultural landscapes include those cultural properties that represent the common works of man and nature. These works show how the cultural patterns of the people of a land affect the specific natural context of that land with the aim of organizing the flow of life in various levels, scales and areas. In this regard, cultural landscapes contain valuable signs of identity and special cultural and natural advantages of a cultural and territorial area (Allah Dadi, 1394: 3). Slowly reflect their history and identity in body and landscape only as a reflection of their atmosphere. Because beauty is not considered with a text, but rather, it is referred to as the manifestation of cultural processes (Robertson, 2003).

2-2-Cooperation of nature and culture

In recent years, the concept of "cultural landscape" has been increasingly used. Cultural landscape is a landscape that has been formed more or less under the influence of human beings. However, care must be taken in defining it, because the cultural perspective has many meanings. (Droudian, 1394: 82-87) Landscape is a kind of output and cultural product (Taylor, 1998) On this basis, all landscapes can be considered cultural (Khademi, Mahdavi Moghadam, 1393: 30) Cultural landscape reflects opinions, value Our hidden desires, aspirations and even fears become visible in a mold (Taylor, 2014: 38). The first definition of a cultural landscape was provided by Carl Sawyer. A cultural landscape is a natural

landscape formed by a human group. Culture plays a role and nature plays an intermediary role and the cultural landscape is the product of it (Flower, 2003: 17). It was designed by Carl Sawyer in 1925. (Einifar, Eshrati, 1396) Carl Sawyer considers the natural landscape to include three factors: geology, climate and vegetation, which form different forms of natural landscape with the addition of the cultural factor. Due to time to the natural landscape, the natural landscape plays a mediating role and forms various forms of the cultural landscape. According to Phillips, the separation of nature from culture and the separation of people from the environment that surrounds them is shaped by Western thought and its teaching over the centuries. Belief in this kind of separation closes human eyes to the connection and interaction between nature and culture (Phillips, 1998: 36).

Nature and culture always work together in landscapes. Some landscapes may be considered natural landscapes, as no human impact is known. Hence, all other landscapes are cultural landscapes in which man always prevents dynamic natural events (Custer and Wells, 2005). Cultural landscape can exist in rural or urban areas or be the result of an art project. It may or may not have aesthetic value. However, when man describes its origin, this alone leads to a new human view of that landscape, and thus acquires aesthetic or symbolic value. The same value can give preference to landscapes that are not the result of artistic work, but are known by artists and have since been stabilized in a beautiful way (Droudian, 1394: 82-87). But these landscapes alone are due to culture. , Have not become a cultural landscape as they are today. Since the conditions of nature and culture are always intertwined, we can in fact speak from a perspective alone, if we deal with it in frameworks in which the effects of nature, such as the effects of culture, can be identified. When we substitute the general concept of landscape for the concept of cultural landscape, we also make it clear that we are not going to create a hierarchy between natural landscape and cultural landscape. Landscape protection is important to us in the sense of a whole, because it makes no sense to preserve more "natural" or more "cultural", but their coexistence in the landscape is important. Landscape protection, in the sense described above, can well be related to the purpose of preserving historical monuments. Both are about protecting a situation. While in the protection of nature in the same sense, "protection of change" should be in the center of attention unlike before (Droudian, 1394: 82-87). The theoretical conceptual framework of the research is now given in Table (1):

Table no.1- Introduction of cultural landscape criteria based on natural heritage

Criterion code	Criterion cluster	Criterion	Approach type
1	Temporal feature	Historical landscape	human made
4		Contemporary landscaping	human made
20	Typology	Dominant landscapes (historical, industrial, religious, etc.)	human made
6		Alternative landscapes (remnants of the past, emerging, excluded)	human made
3		Indigenous landscapes (built by residents using local resources) / Formal landscapes (imposed by the public, officials)	human made
17		Fixed landscape / dynamic landscape (presence of people in landscapes, means of transportation and traffic, effects of urban space renovation, new buildings)	human made
15	Performance and efficiency	Useful productivity of social groups of people (leisure, recreation, sports, etc.) / utilitarian functionalism	humanity
10		Mixing user and activity	humanity
21		Ritual uses (display of accent, dialect, dress, ritual, etc.)	humanity
9		Habitat value (existence of special plant, animal and animal species)	Natural
18	Multi-layered	The beauty / ugliness of landscapes (strongly related to the	humanity

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	meaning	perception of injustice and unequal power relations in landscaping)	
2		Construction process based on the needs and desires of individuals (attention to different age groups, gender, ethnicity, etc.)	humanity
19	Semiotics and aesthetics	Induction of multiple concepts at a glance	humanity
23		The relationship between perspective and ideology	humanity
7		The collective personality of the landscape (derived from the environment and society) and (= memory)	humanity
22	In-depth interpretation of landscapes	The duality of vision: "the pleasure of beauty" or "malice"	Natural
14		The place of nature in the "language of the indigenous culture of the region"	Natural
5		Being natural (wild nature, adventurous nature)	Natural
13	Form	Physical or cultural-natural form (= style)	human made
8		Landscape composition (elements); Spatial structure and landscape function	human made
12		Landscape unity (coherence) and logical order (= integrity and fluidity)	human made
16	Environmental conditions	Safety, security	humanity
11		Comfort and facilities	human made

Source: Adapted from the article (Gharayi and Ain Ali, 148: 1398-149), (Mansouri and Atshin Bar 1393: 15) and (Ilovan et al., 2019: 85-86)

3 -Research background

Einifar and Eshrati (2016) in an article entitled "Holistic approach to culture and nature in the cultural perspective" Case study: Bam (seek to develop a holistic model for recognizing and categorizing cultural perspectives. The main question is that what components are effective in explaining the relationship between culture and nature in the cultural landscape and how can the logical relationship between them be explained? This theoretical model makes it possible to categorize the cultural landscape in different scales. In this study, the theoretical foundations and ideas of researchers have been used.

Mansouri and Atshin Bar (2014) in an article entitled "Towards a cultural landscape in the city?" They seek to analyze the cultural landscape of Valiasr Street in Tehran at its intersection with public spaces and evaluate its developments. The present article refers to spaces whose body is the result of the combination of street and public space. This new space has an upgraded perspective that results from the overlap of street and public space qualities with the audience, so such a perspective can have cultural landscape identifiers. In the present study, the theoretical foundations and ideas of researchers have been used.

Wen-yin Zhou et al. (2018) in an article entitled "Culture is a new nature: comparing the restorative capacity of cultural and natural landscapes" to new questions such as "Is the cultural landscape a restorative environment for mental stress? The restorative potential of the landscape "What is culture compared to natural landscape? And what factors determine the renewable potential of cultural or natural landscape?" For this purpose, the present study conducts a test to compare the restorative capacity of cultural and natural landscapes in China and examines 15 landscape features on the restoration quality of these two types of landscapes. The results show that there is no significant difference in restoration between cultural and natural landscapes. More water features and flat land are significant promoters of cultural landscape reconstruction. Abundant colors, usually indicating a higher diversity of plant species, are critical to increasing the natural landscape restoration capacity. In this research, the focus is on the mentioned components and its findings.

Ziaei (2017) in a study entitled "Evaluation of place identity with a cultural landscape matrix" has examined the urban identity in cultural places. This article states that the identity of a particular place consists of a combination of social and cultural characteristics of society. The increasing growth of contemporary cities, along with recent changes in traditional urban spaces, has created a gap between the physical characteristics of urban environments and their cultural identities. Therefore, more attention should be paid to the cultural and social aspects of the urban design process. This study has selected the city of Mashhad as a case study and considers the solution of the coherent relationship between urban development and cultural environments in providing a green environment connecting them. In the present study, the focus is on the concepts and components introduced from the research sample of the project.

Apak and Cheetah (2017) in an article entitled "Using the DEMATEL-ANP Integrated Approach to Decide on Production Strategy" discusses how to apply the DEMATEL method and the Analytical Network Process (ANP), both of which The methods of decision models are multi-criteria. The process used to determine the most appropriate production line options at the lowest cost. In the present study, this process has been used with a focus on how to make a multi-criteria decision-making process.

Hemmati and Amiri (2016) in a study entitled "Karun lip: pathology of an urban edge, the interaction of Ahvaz city with Karun river" with the aim of investigating how and why the relationship between Ahvaz city and Karun river throughout history and the formation of Karun urban edge And its pathology, first in two parts, expresses the relationship between the city and the river in the past and then analyzes the approaches and actions that have been taken towards it in recent decades. The researcher explicitly states that by changing the pattern of contemporary urban development with the aim of economic separation of the city from the river, the Karun River has practically become a canal, while new methods have emerged from the new form of economy based on tourism, boat transportation And small tourist boats are still possible and could cause the Karun city edge to flourish again. In this study, Karun River studies have been considered as a case study of the present study.

4 -Research method

This study aims to determine the best strategies for creating a cultural landscape appropriate to the various capabilities of the Karun River natural heritage using multi-criteria analytical decision-making techniques. In this study, using DEMATEL method (DEMATEL) as one of the multi-criteria decision making methods to identify the pattern of causal relationships between the studied variables, in combination with ANP method by developing AHP to solve complex problems and make the best decisions by considering relationships. A cluster is produced (Saati, 2001: 21) by separating the criteria of cultural landscape from the perspective of natural heritage and prioritizing them.

In general, in this study, the relationship between the criteria is determined by the DEMATEL method and priority arrangements are obtained by ANP. The process of this study is as follows; In the first part of the study, the DEMATEL and ANP methods, which are the main topics of the study, are explained and the basic features and differences of each method are revealed. In the second part, the study area of the research is introduced. In the third part, the operational part of the research, the relationships between the criteria are determined based on the table of criteria of cultural landscape with emphasis on the category of natural heritage and the weight of the criteria is expressed, the findings are presented and the results of sensitivity analysis are included at the end. Is. In the fourth and last section, the results of the research are concluded.

5 .Analysis tools
DEMATEL

Demitel can effectively construct the structure of a relationship map with clear interrelationships between sub-criteria for each criterion. It can also be used to create causal diagrams that can visualize the causal relationship of subsystems (B.-Kazkan and Seifcheh, 2011). According to Gabus and

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Fantella in 1972, DEMATEL can be used to measure qualitative aspects and related factors, often in social issues as well as in other challenging issues involving human interaction techniques in the model.

This method, using the judgment of experts in identifying the factors in a system and applying the principles of graph theory, extracts the effective or influential relationships (causal, reciprocal) elements of the elements and provides a hierarchical and systematic structure of them. Give. So that the "intensity of the effect of relationships" determines the number as a numerical score. This method is used to determine the effectiveness and efficiency of the criteria of a system (which in the method literature is called that factor). This method often does not operate independently but as a subset of other methods, especially ANP.

The DEMATEL method, which is one of the decision models, is designed to obtain the relationship between criteria and evaluate these relationships. Accordingly, it is necessary to have a set of criteria that are evaluated by a group of experts and affect each other. After determining the criteria and decision makers, evaluations can be done using the following steps. This method can be summarized in the following steps:

Step 1: Create a direct relationship matrix; a group of experts determines the direct relation matrix (X) by pairwise comparison between criteria. At this stage, respondents are asked to apply the direct effect of each factor or element i on each factor or element j, denoted by aij. Scales 0, 1, 2, 3, and 4 are assumed to indicate a range from "no effect" to "very high effect".

Step 2: Matrix normalization; Direct connection matrix normalization: C = X * s relation is used for normalization. First, the sum of all rows and columns is calculated. The inverse is the largest row and column number s.

Step 3: Calculate the total relationship matrix; the total communication matrix is calculated from the relation F = C × (I-C) -1. In this respect, the matrix I is unique.

Step 4: Draw a causal diagram; in this section, the sum of the row and column elements of the complete correlation matrix (F) is calculated.

Step 5: Calculate the impact and effectiveness of each factor; the analysis is as follows:

 -The sum of the elements of each row (D) for each factor indicates the extent to which that factor influences other factors in the system. (Impact of variables). The higher the value of this variable, the more effective that factor is.

 -The sum of column elements (R) for each factor indicates the extent to which that factor is affected by other factors in the system. (Impact of variables)

Therefore, the horizontal vector (D + R) is the amount of influence of the desired factor in the system. In other words, the higher the D + R factor, the more it interacts with other system factors.

 -Vertical vector (D - R) indicates the influence of each factor. In general, if D - R is positive, the variable is a cause variable, and if it is negative, it is a cause.

Also, to determine the internal relations between the factors, we take the threshold value from the total communication matrix (F) and then we set the number zero to any value of the F matrix less than this threshold value, otherwise we put the number 1. The cells that have the number 1 show the standard relation of the row on that column.

ANP

ANP is a method that considers the relationships between decision criteria and eliminates the need for modeling by following one direction for the decision problem. This is a general form of analytic hierarchical process used in multi-criteria decision analysis and developed by (Saati, 2001). The ANP method can be summarized in the following steps:

Step 1: Build a research network diagram; In this step, the problem should be divided into standard levels and if there are sub-criteria and options, the relationship between them should be determined. A very important point in this step is the existence of inter-standard relations. These relations can be

identified in several ways. We can find out the inter-standard relations by asking experts or by using methods such as DEMATEL method or ISM method. Receipt.

Step 2: Formation of a pairwise comparison matrix; At this stage, the elements of each level are compared in pairs at a higher level than other related elements and matrices of pairwise comparisons are formed. Also, at the end, a pairwise comparison of internal relations should be formed. These pairwise comparisons should be answered by Mr. Saati's 9-item spectrum.

Step 3: Calculate the incompatibility rate; In this step we calculate the ANP incompatibility rate. If this rate is less than 0.1, it indicates matrix compatibility.

Step 4: Formation of the initial super matrix; Using the weight of the obtained pairwise comparisons, the initial super matrix is formed. The initial super matrix is the same weights obtained in step 2 of the pairwise comparisons.

Step 5: Create a rhythmic super matrix; after creating the initial super matrix, a rhythmic super matrix must be created.

Step 6: Create a Limit Super matrix: The rhythmic super-matrix must be infinitely multiplied so that each row converges to a number, the weight of which is the criterion or sub-criterion or option.

6 .The study area

Karun Bozorg, a river called Kern, Karnak and Koohrang in the inscriptions of the first ancient human civilizations and flowing from its origin in the heights of the Middle Zagros to a wide bed in the estuary, is the largest and longest river in Iran and the Middle East. The Karun River in southern Iran is one of the most civilization-building rivers in this region before Islam, and the city of Ahvaz, whose history dates back to before the Sassanid era, was formed along this river. (Hemmati and Amiri, 2016: 22)

Figure no.1: Right image; Study area, Rudkarun, Ahvaz. Source: Google Earth December 2020. **Figures no.2, no.3 and no.4:** Left image from top to bottom, east bank of Karun river; West Kianpars coastline (Government Park); Buffalo Abad area on the southeast side of the Karun River.

Karun river with a length of 22 km and passing through the center of Ahvaz city along the northeast-southwest, is considered as one of the largest natural elements dominating the public appearance of the city and is a valuable factor visually, psychologically and environmentally. It is considered decisive in shaping and designing the city. (Strategic Development Plan (comprehensive) of Ahvaz, 2011). The coastal route of Karun River with almost all elements in the definition of cultural landscape with emphasis on natural heritage is considered as a rich cultural-natural landscape in Iran, which has been registered in the list of natural heritage of Iran for the past ten years.

 Examples of features of Karun River in the framework of the present study are the antiquity and size of Karun River along with its natural habitat despite the plants, animals and animals specific to its geographical area (buffalo area on the subject), historical and symbolic bridges along the route. Karun referred to it as a man-made phenomenon during the beginning of industrial modernism in Iran. Also, today, Karun River, as a natural organ of the city with various functions in the role of a strong urban edge, benefits from the high presence of people from various subcultures of Khuzestan province in its coastal strip.

7 .Data analysis
Step 1: In the first step of the DEMATEL method, the direct relation matrix (X) is obtained as a 23 * 23 matrix based on the number of 23 research criteria. According to the method, the diagonal values of

the matrix are considered zero. Adjust the matrix of experts in the same way, and as a result the matrix is directly related to its mean matrix. Matrix X (= A).

Step 2: The normalized matrix The direct relation (C) is obtained by the normalized matrix (A) from the previous step. For this purpose, the number of all rows and columns of the normal matrix is calculated. In the present study, the maximum number of rows is 53 and the number of columns is 41. Based on the equation (S = maks (maks Σxij, maks Σxij), the normal value of s is calculated as follows:

(S=41, 53) = max 53

According to the third equation ($C = A * S$), all values of matrix A are multiplied by the normal value of s and matrix C is obtained.

Step 3: In the third step, the total relation matrix (F), which includes both direct and indirect relations, is obtained using the equation F = C + C2 + C3 + ⋯ = C (I − C) −1. 23 * 23 units are used for calculation in the matrix.

Step 4: The effect index is found in the total relation matrix (F) with the help of the whole rows and columns. While Di represents the values of the whole row, Ri represents the values of the whole column. The total value of Di + Ri indicates the participation of factors in the problem. The number of factors and their effectiveness are shown in Table (2).

<div align="center">

Table no.2 - The role of factors

Value Interval $Di+Ri$	Factor Number
≥**1**	1
1<**Di+Ri** ≤**2**	3
2<**Di+Ri** ≤**2.5**	6
2.5<**Di+Ri** ≤**3**	4
>**3**	9

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High weight indicates that there is a greater success factor in the model. Values are between 0.67593-92565/3.

While some criteria are closely related, some are different from others. Important criteria are shown in Table (3). In order to better understand the analysis of this distribution, values higher than 2.5 are the basis of importance that there are 13 significant criteria in the model. Weights indicate the effect of criteria. If the value is positive, criterion i is an effective criterion, and if the value is negative, criterion i is an influential criterion. According to the information obtained, while 8 criteria have positive values and affect others, 15 criteria have negative values and are affected by other criteria.

<div align="center">

Table no.3 - The main criteria

Value Interval	Criterion number	Role Value ($Di+Ri$)
Di+Ri>3	9	3/92565
	5	3/76596
	2	3/75642
	21	3/68482
	22	3/62751
	1	3/56919
	3	3/42818
	12	3/36719
	7	3/24922
2.5<Di+Ri≤3	16	2/93715
	15	2/95342
	6	2/83854
	20	2/75813

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There is no positive correlation between the magnitude of importance and the direction of effects, in other words, the importance of the status of a criterion cannot guarantee effectiveness or impact. In this study, based on the results of Tables (2) and (3), 13 criteria with the separation of the importance of 9 main and primary criteria in the evaluation range **Di** + **Ri**> **3** and 4 main and secondary criteria in the range <**Di** + **Ri**≤**3** 2.5 They are one of the 23 most important research criteria.

The criterion of "deep interpretation of natural landscapes" is more effective than other criteria, so that 66% (2 out of 3 criteria) of it is in the table of main factors. 50% (2 out of 4 criteria) "Performance and productivity" and 50% (1 out of 2 criteria) "Time feature" and "Multilayer meaning" and 34% (1 of 3 criteria) "Semiotics and aesthetics "And" form "and finally 25% (1 of 4 criteria)" sorting "are in the table of main criteria.

Step 5: Determining the threshold value by the researcher in this study. In order to determine the appropriate threshold value, the values of the total relation matrix (F) are shown in the scatter plot. The threshold value of the present study is considered to be 0.085 and 43 relationships between criteria are selected.

Table no.4 - Effective Success Criteria

Criterion number	$Di-Ri$	Criteria Cluster
9	1/28659	Performance and efficiency
5	1/08384	In-depth interpretation of landscapes
20	0/93485	Typology
22	0/76456	In-depth interpretation of landscapes
2	0/52384	Multi-layered meaning
7	0/26542	Semiotics and aesthetics
18	0/13581	Multi-layered meaning
17	0/08654	Typology

Table no.5 - Effective criteria

Criterion number	$Di-Ri$	Criterion number	$Di-Ri$
10	-0/01648	8	-0/42671
13	-0/03579	21	-0/51649
16	-0/09458	12	-0/56149
15	-0/16649	6	-0/75196
1	-0/19475	14	-0/84975
23	-0/26481	4	-1/26795
19	-0/28349	3	-1/44925
11	-0/34856		

The matrix (E) is obtained by converting the values below the threshold value to zero. The effect map of the criteria is obtained through the threshold value. Accordingly, there are 43 relationship arrows between 23 criteria with high threshold values. Based on the observations, criterion number 9 (habitat value (presence of plant, animal and special animal species)) has the greatest impact on the criterion with the highest value in the model. Criterion 20 (dominant landscapes (historical, industrial, religious, etc.)) is the most important criterion with the highest value in the model.
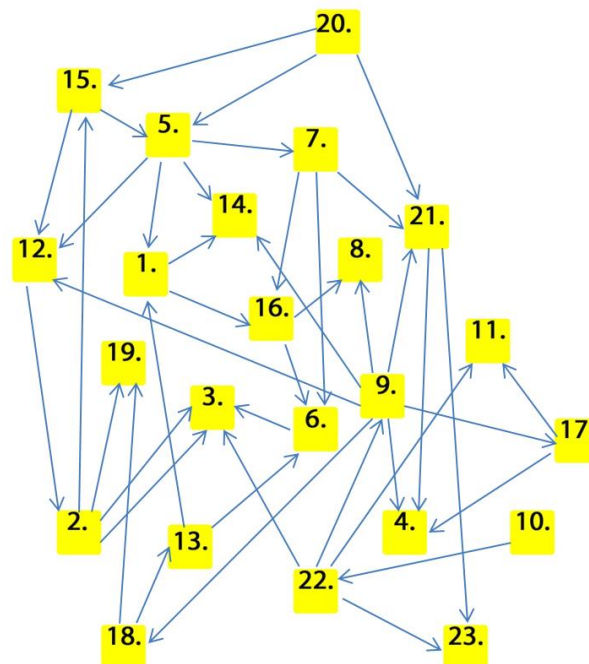
Figure no.5 - Criteria impact map

The "limit matrix" is calculated as the last step of the ANP calculation by ANP Solver software. The significant values obtained in this step are used to classify internal criteria.

Table no.6 - ANP limit matrix results

Criterion number	Criteria definition	ANP limit matrix value
5	Being natural (wild nature, adventurous nature)	0/264
16	Safety, security	0/249
10	Mixing user and activity	0/226
7	The collective personality of the landscape (derived from the environment and society) and (= memory)	0/128
18	The beauty / ugliness of landscapes (strongly related to the perception of injustice and unequal power relations in landscaping)	0/088
21	Ritual uses (display of accent, dialect, dress, ritual, etc.)	0/068
14	The place of nature in the "language of the indigenous culture of the region"	0/021

8 .Sensitivity analysis

Sensitivity analysis on the importance of clusters is a common method. The weight of the clusters during the research operation is assumed to be equal. However, because there are clusters that cannot be related, the weights in the calculation have changed. The weight of the "Deep Interpretation of Natural Landscape" cluster ID for this operation is changed and the weight of the modified criteria is controlled. In order to determine the weight of the modified criteria, three different weights are used. The weight changes of the clusters are shown in Table (7).

Table no.7 - Sensitivity analysis

Criterion cluster	Case	Analysis 1	Analysis 2	Analysis 3
Performance and efficiency	0/187	0/145	0/149	0/153
Environmental conditions	0/189	0/161	0/176	0/179
In-depth interpretation of landscapes	0/192	0/235	0/227	0/221

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According to the ANP results, 3 out of 7 criteria are above average. These criteria chosen by the researcher must be taken into account during the changes. These criteria are related to the clusters of "performance and productivity", "environmental conditions" and "deep interpretation of natural landscapes". Then the calculation matrix, limit matrix solutions and list of criteria are shown in Table (8).

Table no.8 - Limit matrix sensitivity

Criterion code	Criterion code	Case	1	2	3
Semiotics and aesthetics	7	0/095	0/098	0/112	0/124
Multi-layered meaning	18	0/124	0/128	0/132	0/133
Environmental conditions	16	0/154	0/145	0/159	0/139
Performance and efficiency	21	0/188	0/162	0/186	0/248
In-depth interpretation of landscapes	5	0/206	0/196	0/202	0/251
In-depth interpretation of landscapes	14	0/217	0/211	0/219	0/258
Performance and efficiency	10	0/225	0/237	0/245	0/262

Each time the threshold value increases, some factors or relationships are removed from the map, so the sensitivity analysis takes these changes into account.

9-Discussion and findings
According to DEMATEL findings, some of the most important criteria relate to three of the eight clusters: "deep interpretation of natural landscapes", "multilayered meaning" and "species". Of the three clusters, two are among the most important. These are described in order, the construction process based on the needs and desires of individuals (according to different age groups, gender, ethnicity, etc.), naturalness (wildlife, adventurous nature), duality of vision: "the pleasure of beauty" Or "malicious intent", dominant landscapes (historical, industrial, religious, etc.), the beauty / ugliness of landscapes (strongly related to the perception of injustice and unequal power relations in landscaping) and the fixed / dynamic landscape (presence of people in landscapes, tools Transportation and traffic are works of urban space renovation (new buildings). Other important clusters of "yield and productivity" with the criterion of "habitat value (existence of specific plant, animal and animal species)" and "semiotics and aesthetics" with the criterion of "collective landscape personality (derived from the environment and society) and (= Memory) "can be mentioned. 13 out of 23 criteria are the most important criteria of the subject. Of these, 8 are effective (positive) and 15 are affective (negative) criteria. 66% of the "deep interpretation of natural landscapes" cluster (2 out of 3 criteria) have positive values. The most important criterion among all the introduced criteria and the most influential criterion is "habitat value (existence of specific plant, animal and animal species)" from the "yield and productivity" cluster. These are the most important and unavoidable issues that should be emphasized when evaluating the criteria of cultural landscape from the perspective of natural heritage.

Comparison of identified clusters and nodes, supra matrix and matrix limit is obtained by ANP method. Providing a compatibility index helps to evaluate the paired matrix to make sense. All indices of the node comparison matrix below the threshold value are 0.1. According to ANP findings, "user mixing and activity" is the first criterion weighing 0.264 in the type of criterion. The average weight of the criteria is calculated to be 10,000. The "Performance and Productivity" cluster has the highest weight in the model with a rate of 0.332. The "multilayer meaning" cluster has the lowest weight, 0.088. The "form", "time feature" and "sort" clusters do not normally affect the model. Although the most important criteria for the cluster are "deep interpretation of natural landscapes", the distinction in the cluster is "performance and productivity". As a result of the findings of the limit matrix obtained from the research, the natural approach in the trinity (natural, human and man-made) in creating a

natural landscape based on natural heritage in the case study of the Karun River confirms. The level of importance of the criteria belonging to the "natural" approach is higher than other criteria.

10-Conclusion and presentation of suggestions

The obtained operational model has a structure that can be used to determine the importance of various criteria from the controversial category and from a floating angle of cultural landscape with its natural framework by researchers and city executives. This model may present different results in different sections and regions. This study proposes the DEMATEL method as a tool for evaluating multi-criteria models, based on which the criteria of "habitat value (existence of specific plant, animal and animal species)", "dominant landscapes (historical, industrial, religious, etc.)" And "construction process based on the needs and desires of individuals (attention to different age groups, gender, ethnicity, etc.)" of the three clusters in the model is important and should be considered. Any negligence in these three clusters may divert the cultural landscape from the goal of preserving its natural heritage. Although in a cultural context we seek human effects and interaction in the environment, but the priority to the elements of nature along with having a natural approach to man-made and human is very important for the success of any urban project in this research framework.

Since the most weight in the results of the ANP limit matrix is the criterion of "naturalness (wildlife, adventurous nature)" of the cluster "deep interpretation of natural landscapes", it continues to emphasize the natural identity of the environment as well as the preservation of nature's texture and elements. It seems. Therefore, all stakeholders and city officials related to rare natural phenomena should formulate their work priorities, preserve and restore these natural environments along with the presence of human activities and human elements.

At the end of the research, the researcher points out that the prioritization of cultural landscape criteria is not contrary to the combined view of nature and man-made concepts in the cultural landscape category derived from the theoretical literature of the present study, but simultaneously considering all criteria in a single unit. The results have been interpreted by focusing on the selected structure and multi-criteria decision-making.

11 -Limitations and suggestions of future research

In research, sorting and selection of criteria is usually done. Combined qualitative and quantitative methods provide a choice between some criteria or easier interpretation of them by considering a variety of criteria in situations where the data are complex, but since the basis of the present study is based on the choice between criteria and structure The selection is formed, does not need to sort all the criteria. Therefore, in future research, it is recommended to increase the number of criteria and sort between them. It is also suggested that the Fuzzy DEMATEL-Fuzzy ANP methods be used to provide clearer solutions to the complex problems that researchers may encounter. Research can also be applied to different areas and lead to a common conclusion. To be.

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