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Assessment of Geomorphotourism potentials in Awramanat region using the scientific value and added value Methods (Model's Reynard et al.)

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ABSTRACT

Rapid and increasing development of tourism industry in recent years has attracted the attention of many people in the world to it which is divided into important and various subsections such as tourism based on rare and intact geomorphological phenomena (geotourism and Geomorphotourism). Some studies have been conducted over the last two decades to assess the quality of geologic and geomorphologic heritage. In this study, while investigating the geomorphological potentials of Awramanat region, it has been noted the ecological, aesthetic, cultural, economic and historical criteria in the capacity of the region by using scientific value and added value methods (model's Reynard et al.). Results show that among two criteria of scientific value and added value, scientific value of Awramanat region's Geomorphosites has gained more scores comparing to added value and also the criteria of being rare with the score of 0.76 and being specialized with the score of 0.71 are truly the maximum amounts. Protection criterion (0.65) and ancient geography (0.51) have obtained the lowest score. Considering the fact that some properties of Awramanat region are unique in local and international scale and to some extents even in global levels and the indices of being rare and being intact proves this case but unfortunately it is weak with regard to welfare and communicational facilities to some extent. At the end it is recommended that more attention is given to Awramanat region because little attention has been given to the economical capacity of the above region and it shows a little percentage.

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INTRODUCTION

Considering very strong relationship between the "Geo", environment and social and cultural processes, many peoples have relatively little knowledge about geological heritages [22]. Geotourism refers to that kind of tourism maintaining geographical, environmental, cultural, aesthetical and locational heritage of visited location or upgrading it and bringing with itself welfare for citizens [34]. The word "Geotourism" has been composed of two parts, the first part which is "Geo" meaning land and the second part "Tourism" meaning travelling. It was first posed academically by Tom Hues from England in 1977, and today is divided to subsections such as Geomorphotourism [24]. Potentials and phenomena visited in this science are called geosites or Geomorphosites. Geomorphosites are geomorphological systems which have scientific and historical aesthetical special values based on human's understanding and usage. [10]. They are always accompanied with the two scientific value and added value. A Geomorphosite is raised by landforms and geomorphological processes. It isn't only influenced by geological, geomorphological, historical and/or social factors, but also by aesthetic, scientific, cultural, - economical values based on human understanding on geological effectual factors. Especially, Geotourism Geomorphotourism necessitates using geo- sciences such as natural geography, geology, geomorphology and etc. and besides the advantages they have with regard to direct and indirect income by attracting tourists are very effective for employment of geology students and also the inhabitants of regions having geological and geomorphological sites.

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Many studies have been conducted for investigating and evaluating the issues related to geotourism and geomorphologic locations: Reynard *et al.*, (2007) proceeded to investigate Geomorphosites of Belino valley and Locomageno region in Switzerland and also Terint region by using scientific and value added methods. Pellegrini *et al.* (2010) proceeded to evaluate the relationship between geotourism and geomorphological risks in their book under the title of role of geotourism and geomorphology in developing tourism. Leman *et al.* (2008) proceeded to evaluate touristic potential of geomorphological sites by introducing a new method for investigating geoparks in their book titled geology heritage in east and southeast of Asia. Many various studies have been conducted in Iran in this respect, some of which are referred to in what follows. Khodaverdizadeh *et al.* (2008) proceeded to assess recreational value of rural tourism of Kandovan village in east Azarbayejan by using conditional valuation method (CVM). Karami *et al.* (2007) proceeded to investigate geotourism potentials in developing of Kandovan village. Rahmani *et al.* (2008), Mokhtari *et al.* (2010), and also Bahrami *et al.* (2011), evaluating ecotourism potentials of geomorphical sites of Asyab-e- Kharabeh region by using Peraloung method and evaluating geomorphic site of Pol-e-Dokhtar marshes in Lorestan by using scientific value and added value methods respectively.

In this vein, considering the importance of above subject in global level and among different countries, we should announce that Iran also has beautiful nature and various climates and also rich regions in unique phenomena of geo science and investigating these attractions seem necessary for more recognizing and using them.

One of the most qualified and suitable regions is Awramanat region in west side of Iran country that by recognizing its geomorphoturistic and using scientific and added value methods while protecting natural resources of this region, concentration of capitals for improving economical situation of the region has been increased and also the number of visitors with the aim of tourism in the region and providing employment and high income for the inhabitants are increased. Finally better and more suitable application of geomorphological phenomena will result in sustainable development in the region, providing facilities for attracting tourists, suitable communicational roads, and the possibility of residence and entertainment for tourists considering the importance and Geomorphosites development that in present study we attempted to assess the potentials of this unique region considering such objectives.

Study Area:

Awramanat region has been located in southern part of Shahou Mountain in Zagros ranges between Kermanshah and Kurdistan provinces. This region besides having mountainous favorable weather, Rivers full of water, cultivable plains, evergreen grazing lands, palatable inorganic drinking water and a very calm environment can attract many tourists because of its unique urban and rural architecture. Awramanat region is among natural virgin and marvelous limitations having very various and widespread natural and human potentials. Approximate limitations of this region in present study includes Paveh, Ravansar, Javanrood, and Sarvabad provinces having unique phenomena such as religious – cultural sites, caves and lakes and rivers and streams and fall, protected region, virgin forest and grazing lands etc. The exact location of this area has been represented in figure 1.

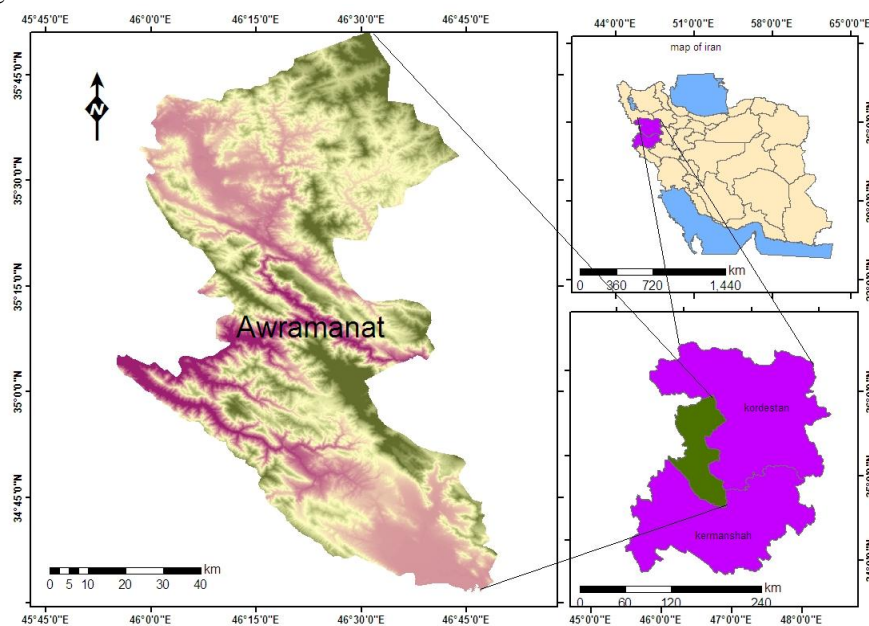


Fig. 1: Geographical position of Awramanat Area

MATERIALS AND METHODS

Systematic framework of study method in this research is such that the method has been of descriptive-analytical type and field observations and investigations have been used as well. First using direct observation, field observations and library studies we proceeded to gather necessary data and information and then using scientific value and added value methods (Reynard model has been described completely in the section "findings and discussion") scored the existing Geomorphosites .

Findings And Discussion:

For identifying geomorphic location by this method, there are some cards called Geomorphosites evaluation cards which are composed of two scientific and added value sections each of which having sub criteria. The range of qualitative assessment of data is between 0 to 1 according to which 0 means valueless and 1 means high value.

Scientific value: this assessment section is based on limited definitions in geomorphology by Grand Gerard (1999). Criteria included evolution, uniqueness, being rare and paleo geography value (table 1)

Table 1: Applied Criteria for Assessing Scientific Value (Reynard et al., 2007)

evaluation	Sub criteria
The manner of protecting the site includes correct and incorrect protection. Incorrect protection may be due to natural (erosion) or human factors.	Protection
Existing a unique site including superior forms and phenomena comparing to other similar sites in the region, district and country (exemplified sites).	Representativeness
It is used for identifying exceptional and unique phenomena in a region.	Being rare
The importance of a site is due to its climate and earth history which proceeds to study geographical situation of earth in the past. (A site with one glaciation period).	Ancient geography

Added value: added value may include one or several category of values which are as follows: ecological, aesthetics, cultural and economic effect (table 2). As a geomorphologies' I cannot expect that evaluation elements include a vast spectrum of fields (biology, history, and economics). This section has been based upon bibliography information and simple criteria. The objective is not merely to provide complete analysis of sites in all economical, ecological, artistic or historical dimensions but to establish a clear relation between geomorphology and other natural or cultural aspects.

In ecological value, the criterion of ecological effects raise the importance of Geomorphosites in connection with development of an ecotourism with plant cover or animal presence and protected site include those sites which have previously been presented in national, regional and local table of contents due to ecological reasons (marsh or alluvium sites). Calculation of ecological value is equal to arithmetic mean value of two criteria of ecological effects and protected site (relation 1).

$$\text{Relation 1: ECOL} = \frac{Ecl + PS}{2}$$

In aesthetics value, interesting to see locations based on ability to observe them (a site covered by forest with very difficult accessibility has lower score comparing to a site with easy accessibility because interesting to see locations are more accessible) and regarding structure this criterion results from landscape understanding and indicates landscapes with colorful contradictions (contradictions due to lithological changes), landscapes with vertical expansion (hills), landscapes with spatial unique structure (glacier arc hills which have closed a valley and cut rivers) gain higher scores than uniform locations(alluvial plains and large plateau). Aesthetics value is equal to arithmetic mean value of two criteria of interesting to see locations and structure (relation 2).

$$\text{Relation 2: AEST} = \frac{VF + STR}{2}$$

Cultural value has been composed of 4 criteria: religious importance, this criterion depends on those locations having religious, archetypal or mystic value (very non uniform stones in the past have been considered as religious locations).historical importance is a very vast understanding of history, consequently it includes ancient history, pre historic and present periods. Besides this criterion has not just the duty of recording one subject in relation with political history but also has been noted in tourism and history science. Artistic or literal importance is related to the presence of artistic works in a special location (painting and sculpture) or in books and poems and the importance of historical earth refers to the role of special locations in developing earth knowledge which discusses about reformation history and gradual evolution of earth and life in it from its formation until now. Experience has shown that generally geomorphists have one or two cultural criteria. For this reason quantitative trend of cultural value is different, and in effect the highest score in four criteria is selected instead of the mean value of the four criteria.

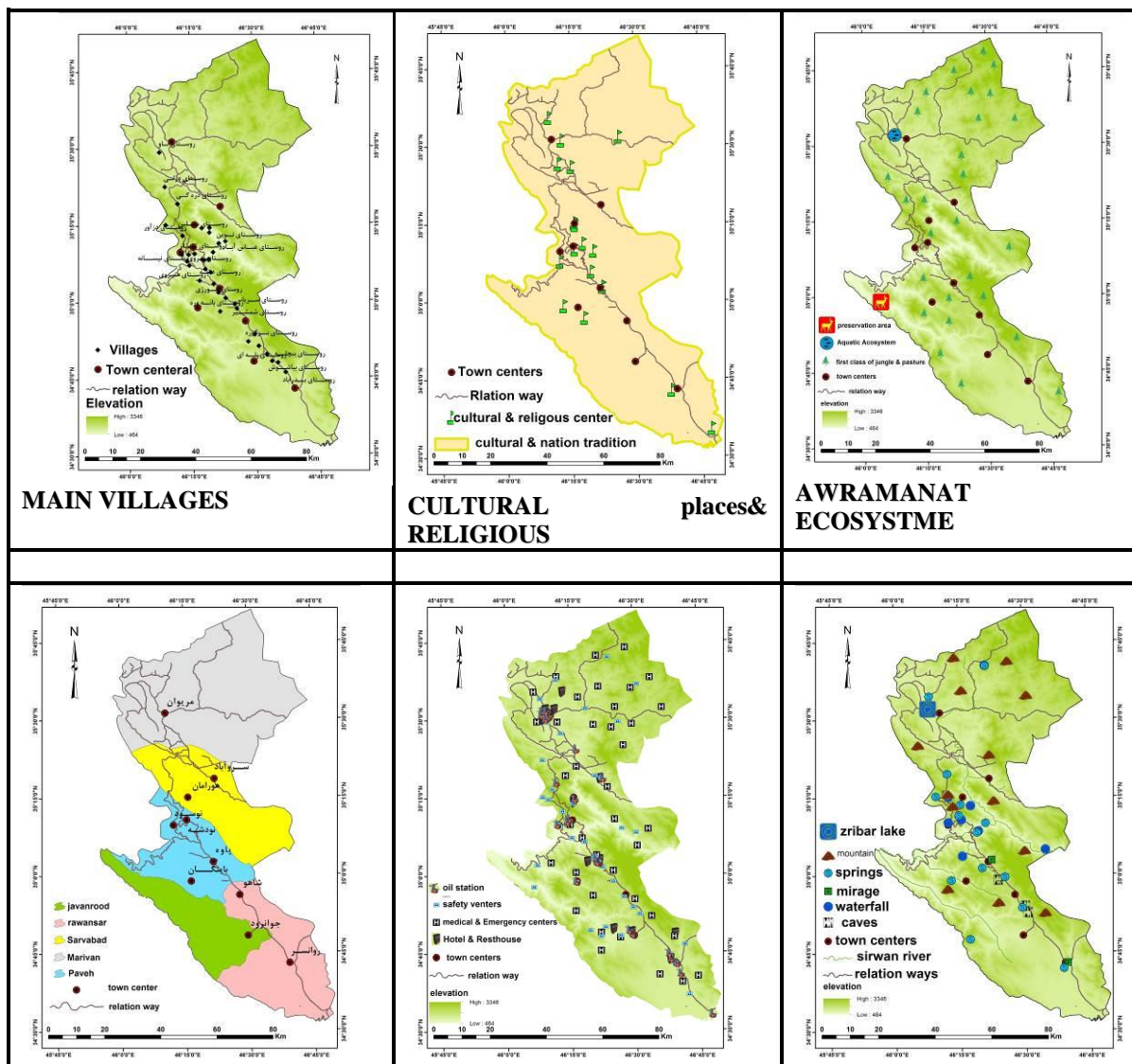
Economical value is obtained by qualitative evaluation and if possible through quantitative assessment of existing productions in Geomorphosites (number of observers). In spite of this the only actual income from existing productions in Geomorphosites are calculable and investible (number of entering in a touristic location) and not potential and indirect income such as presence of a hotel around a touristic cave (Ahmadi *et al.*, 2012).

Table 2: criteria used to evaluate added value (Reynard *et al.*, 2007)

INDEXES	VALUES
A : (ECOLOGICAL INFLUENCES) (PRESERVATION LOCATION) B :	(ECOLOGICAL VALUE)
A : (VISUAL POINT) B : (STRUCTURE)	(AESTICAL VALUE)
A : (RELIGIOUS IMPORTANCE) B : (HISTORICAL IMPORTANCE) C : (ARTICLE IMPORTANCE) D : (GEOHERITAGE IMPORTANCE)	(CULTURAL VALUE)
(ECONOMICAL PRODUCTIONS)	(ECONOMICAL VALUE)

Phenomena and existing potentials in Awramanat region:

The presence of very much and vast potentials of Geomorphosites (such as falls, streams, caves and lakes, glaciers, rivers etc.) in Awramanat region can be considered as the most important parts which make their investigation necessary in one hand and their protection and using essential in another hand. These potentials beside social phenomena (cultural-religious) and also virgin ecosystem of the region can be one of the great source of income and attraction of tourists in Awramanat region. The most important phenomena and referred attractions in this region have been represented in following figure (Taheri,2008; Fazelnia, 2010)



MAIN TOWNS	SERVICE & WELFARE CENTERS	GEOMORPHOTOURIS TPHENOMENA
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Fig. 2: Geomorphotourists Indexes Of Awramanat Area



Fig. 3: 1- ghorighale cave – 2- zeribar lake -3- balut jungle – 4- rawansar mirage -5- bell spring -6- paveh city and khaneghah village -7- seyed obidollah tomb– 8- sirvan river

Final Assessment:

- Considering field observations and the outcomes resulting from evaluations, some scores have been devoted to each criteria (table 3 and 4). By assessing the scores, it is possible to compare two scientific and added value criteria. By observing the results we can infer the potentials and special capacities of the region easily. As a result tourism planners and related authorities can prepare and adjust their priorities according to them. Comparing the enhanced amounts from scientific and added value calculation (table 3 and 4) shows that scientific value (2.65) has gained higher value than added value (2.51) and this value has influenced other criteria. Beside it the maximum share has been devoted to aesthetics value (0.72) considering many interesting to see locations and ecological value is also placed in following standing. Finally cultural value with lower score has the last grade among criteria that considering uniform culture of the region and the presence of many customs and ceremonies and special feasts in the region and also language and religion and special of the people in this region, there is a need to consider virgin and rich culture of Awramanat region. What is observed obviously is that this region is rich in Geomorphotourism and natural virgin and beautiful phenomena so that the presence of highest scores for natural dimension and specially for cave parts (3.6) and lakes(3.7) and streams and falls etc.in this region indicate high potentials of Awramanat region in tourism section based on natural and environmental phenomena. Therefore beside virgin and forested ecosystem, grazing lands and protected region and also cultural and religious places and local customs, language and culture of Awramanat region can be converted to the greatest and best source of attracting tourists and beside they can increase income , employment and welfare of local people in Awramanat region.

In economical dimension considering uniqueness of the region, economical criterion has no proportionate score with other criteria specially aesthetics and uniqueness criteria. This material shows that in spite of special beauty of Awramanat region, unfortunately authorities don't pay close attention to this region in income raising and tourist attraction and economical cycle dimensions. Shortage of residential centers and welfare and communicational facilities in the region has lowered the tendency of tourists to visit Awramanat region. Therefore considering performed investigations, exact and proportionate planning for attracting tourists is necessary to improve economical criterion score.

Finally we can assert that Awramanat values and criteria has shown its uniqueness and being rare very well and indicate the necessity of exact planning , attention and proper and basic management in all sections of tourism especially establishment of welfare and residential centers.

Table 3: SCIENTIFIC VALUE OF AWRAMANAT AREA GEOMORPHOSITES

INDEX GEOMORPHIC PLACE	PRESERVATION	INDICATOR	SCARCE	ANCIENT GEOGRAPHY	TOTAL
WATERFALLS(3)	0.8	0.6	0.8	0.4	2.6
SPRINGS(10)	0.6	0.7	0.9	0.5	2.7
MIRAGE(2)	0.6	0.7	0.7	0.7	2.1
CAVES(2)	0.9	0.9	0.9	0.9	3.6
MOUNTAINS(10)	0.4	0.6	0.6	0.3	1.9
LAKE(1)	0.9	1	1	0.8	3.7
RIVERS(4)	0.3	0.7	0.9	0.6	2.5
GLACIER(2)	0.4	0.8	0.8	0.4	2.4
JUNGLE	0.5	0.7	0.7	0.6	2.5
PRESERVATION LOCATION(1)	0.9	0.6	0.8	0.5	2.8
RELIGIOUS PLACE(5)	0.7	0.7	0.6	0.3	2.3
CULTURAL PLACE(10)	0.8	0.6	0.5	0.2	2.1
MEANS	0.65	0.71	0.76	0.51	2.65

Table 4: Added Value of Awramanat Area Geomorphosites

INDEX GEOMORPHIC PLACE	(ECOLOGICAL VALUE)		(AESTICAL VALUE)		(CULTURAL VALUE)				(ECONOMICAL VALUE)	TOTAL
	(ECOLOGICAL INFLUENCES)	(PRESERVATION LOCATION)	(VISUAL POINT)	STRUCTURE	RELIGIOUS	HISTORICAL	ARTICLE	GEOHERITAGE	(ECONOMICAL PRODUCTIONS)	
WATER FALL	0.6	0.4	0.9	0.7	0	0.3	0.2	0.3	0.5	2
SPRING	0.6	0.3	0.9	0.6	0	0.3	0.1	0.1	0.7	2.02
MIRAGE	0.7	0.3	0.7	0.5	0	0.1	0.3	0.4	0.2	0.90
CAVES	0.8	0.8	0.9	0.9	0	0.6	0.4	0.8	0.4	2.55
MOUNT	0.9	0.6	0.9	0.8	0	0.3	0.2	0.5	0.8	2.65

S										
LAKE	0.9	0.7	0.9	0.9	0	0.5	0.4	0.9	0.7	2.85
RIVERS	0.8	0.5	0.8	0.6	0	0.1	0.1	0.6	0.8	2.35
GLACIER	0.8	0.2	0.7	0.6	0	0	0.1	0.4	0.5	1.77
JUNGLE	0.8	0.4	0.6	0.8	0	0.3	0.1	0.3	0.8	2.27
PRESERVATION LOCATION	0.7	0.9	0.5	0.7	0	0.2	0.2	0.4	0.6	2.22
RELIGIOUS PLACE	0	0.8	0.5	0.7	0.9	0.5	0.7	0.3	0.2	2.20
CULTURAL PLACE	0	0.6	0.5	0.6	0.9	0.3	0.9	0.3	0.3	2.05
MEANS	0.63	0.54	0.73	0.7	0.15	0.29	0.30	0.44	0.54	2.15

Conclusion:

Today one of the new methods in introducing and identifying tourism attractions is geotourism and Geomorphotourism that generally follows the principles of sustainable tourism. The main property of Geomorphotourism is the presence of virgin and beautiful phenomena and attractions that for studying and introducing them, the words geosites and Geomorphosites are used. Based on human recognition of geological and Geomorphosites influencing factors, geosites and Geomorphosites find aesthetics, historical, cultural, historical earth and economical values.

Studies and investigations show that in previous years developed methods for assessing Geomorphosites have generally concentrated on their scientific quality but recently upgrading geological and geomorphological heritages has been developed.

The result of final evaluation of Awramanat region showed that based on added value and scientific value methods, this region has received high score (2.56) due to have scientific value in criteria of being rare and uniqueness and is of high potential and capacity to attract tourists. This region has special conditions in terms of geomorphologic and can provide the tourism authorities of Kurdistan and Kermanshah provinces with a lot of opportunities and therefore there is a need for more attention to Awramanat region and proving welfare and recreational facilities in this region. The outcomes resulting from study (table 3 and 4) shows that added value and scientific value methods can proceed to identify the geomorphological potentials and inform relevant authorities by better and more efficient planning. Although many tourists come to visit this unique location from inside country and also from foreign countries, economical and cultural criteria have not gained a very high score. It is in spite of the fact that beautiful and unique landscape and high potential of attracting tourists and capital all could not act economically and culturally in proportionate manner with aesthetics and being rare criteria due to less attention of planners and incorrect management of this region.

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