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Analyzing the geotourism and geomorphological capabilities of pristine natural areas of East Azerbaijan Province using quantitative indicators

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Abstract

Background and Objective: Tourism as a modern phenomenon has an economic nature and has a special role and importance for countries that have this capacity. Geotourism is a combination of the words "geo" meaning earth and "tourism" meaning tourism. The purpose of this research is to evaluate geotourism potentials and its management in the tourist area of East Azerbaijan province.

Methodology: The research method in this study is based on three models: Kobalikova, Kirchner and GEM. In the Kobalikova and Kirchner model, the criteria are classified into five groups: scientific and intrinsic values, educational values, economic values, conservation values and other values, which cover almost all features of geotourism. The GAM model is a method of physical evaluation of primary geomorphosites to assess the sustainable planning and management of natural heritage sites and their transformation into tourism destinations. This method consists of two main and complementary values. The main values include scientific and educational values, aesthetic and scenic values, and conservation values, and the complementary values include performance values and tourism values.

Results and Findings: The results of the evaluation based on the Kobalikva and Kirchner model showed that the geomorphosites of Arasbaran forests and the village of Shtebin received the highest score and the Aladagh region received the lowest score. Therefore, based on the validation of the models, it can be concluded that the forests of Arasbaran and the village of Shtebin received the highest score and have great potential for development. Finally, it is suggested that artificial intelligence be used in future studies to evaluate the geotourism areas under study and achieve more accurate results.

Keywords: "Geotourism potential", "geomorphological", "virgin natural areas", "East Azerbaijan".

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Extended Abstract

Introduction

Tourism is one of the most important and rapidly growing industries in the world, which is very important in the economic growth of countries and can bring economic benefits to local communities, and has more components that play a significant role in the tourism product and experience (Currie and Falconer, 2013).Today, tourism in its various forms has attracted the attention of governments, non-governmental organizations, and economic activists and has played an important role in directing economic activities and helping to increase the income of local communities (Chin et al, 2014). Geotourism potential assessment of regions is a process for identifying and predicting the potential of the regions under assessment so that the findings can be used in planning for improvement or approval of the regions [Coratza and Giusti, 2005]. The increasing and accelerating growth of the tourism industry has led many experts to call the 20th century the century of tourism. According to tourism experts, a revolution in tourism will occur at the end of the 20th and the 21st centuries, a revolution whose ripple effects will affect the economies of most parts of the world (Kazemi, 2007). An important and significant mission of geomorphology is to identify stable forms of ruggedness and areas where the likelihood of sudden or gradual hazards resulting from natural and human processes for habitation and land use is lower (Goudie, 2004).

Methodology

Kirchner Evaluation Model

In this model, which was proposed in 2016, the aforementioned model is divided and examined into 5 groups. And it includes almost all the characteristics of geotourism. The first group is the scientific-intrinsic value, which is based on the geological integrity and pristineness of the area and the description of the surrounding geotourism and geomorphosite, in other words, it is based on geomorphology and geology. The second group is educational values, which emphasize educational issues. The third group is economic value, which is based on principles such as benefit to the local community, visitor satisfaction, and diversity and marketing. The fourth group is conservation value, which includes the preservation of natural resources and the principles of conservation. The next group includes aesthetic, this sub-criterion actually reflects the fact that geotourism, in addition to natural issues, considers the aesthetic and cultural aspects of the place in its evaluations. The value of each of these indicators is between 0 and 1.

GAM Assessment Model

GAM is a method of physical assessment of primary geomorphosites for assessing the sustainable planning and management of natural heritage sites and their transformation into tourism destinations. This method consists of two main and complementary values. The core values include scientific and educational values, aesthetic and scenic values, and conservation values, and the complementary values include functional values and tourism values. The core values include scientific and educational values, aesthetic and scenic values, and conservation values, and the complementary values include functional values and tourism values.

Kobalikwa Geotourism Potential Assessment Model

In this model, the criteria are divided into five groups. It covers almost all the characteristics of geotourism. The first group of criteria (scientific and intrinsic values) is based on geological principles, integrity and pristineness of the place and definitions of geotourism with a geomorphological and geological perspective. The second group of criteria (educational values) is based on the fact that all definitions of geotourism emphasize educational issues, and the educational content consists of environmental issues, protection

and respect for host communities, and active evaluation and interpretation of its principles. The third set of criteria (economic values) is based on principles such as tourist satisfaction, benefits to local communities, and diversity and marketing. Sustainability, land use planning and conservation of natural resources, and some conservation principles, form the basis of the fourth set of criteria (conservation values). The last group of criteria originates from the fact that geotourism, in addition to natural issues, also considers aesthetic and cultural aspects in its evaluations. The value of each criterion in this model varies between zero and one. In the above integrated model, each of the indicators has sub-indices whose scoring range is between (least importance) and (most importance) (Ebrahimpour et al., 1401).

Results and Findings

Using the GAM model, the value of a geomorphological site is evaluated based on various indicators. Below, data analysis is presented for several sites in East Azerbaijan Province, including the colorful mountains of Aladag, Zanuzaq village, Paigham valley, Ashtbin village, Arasbaran forests, and Sahanda mountain. According to Table 6, scientific and educational values: Ashtbin village and Arasbaran forests have high scores. .Aesthetic and scenic values: Arasbaran forests and Shtebin village are superior in this respect. Conservation values: Arasbaran forests and Shtebin village are in a better position in environmental protection. Performance values: Shtebin village scores high in terms of accessibility and tourism services. Tourism values, Arasbaran forests and Ashtabin village are superior in attracting tourists and tourism infrastructure. According to the results obtained, Ashtabin village has the highest rank with an average score of 0.79. Arasbaran forests are in second place with an average score of 0.78. Aladag colored mountains and Sahand mountain are in lower ranks with an average score of 0.49. These results show that the village of Ashtabin and Arasbaran forests have high potential for developing geotourism, while Aladag colored mountains and Sahand mountain need to improve infrastructure and promote tourism. The evaluation with the Kobalikva and Kirchner model shows that Arasbaran forests with a score of 0.85 and the village of Shtebin with a score of 0.84 have the highest average score, while the colorful mountains of Aladag have the lowest score with a score of 0.57. This assessment can be used for sustainable development planning and protection of these areas. It also shows that the forests of Arasbaran and the village of Shtebin have high potential for sustainable development. These areas not only have high scientific and educational value, but can also play an effective role in economic and cultural fields. The high score of these areas shows the need to pay attention to the development of tourism, educational and research infrastructure in these areas. On the other hand, the low score of the Colorful Mountains of Aladag indicates that the area needs more attention and investment. This situation may be due to a lack of adequate infrastructure or a lack of attention to the accessibility and environmental characteristics of the region. In order to improve the situation, it is necessary to consider appropriate programs for the restoration of natural resources, sustainable development, and promotion of educational and cultural values of this region.

Conclusion

The present study investigated the potential of geotourism capacities and its management using the Kobalikova, Kirchner and GAM models. Using the Kobalikova model, the value of a geomorphological site is evaluated based on various indicators. Below, data analysis is presented for several locations in East Azerbaijan Province, including the colorful mountains of Aladag, the village of Zanuzaq, the Paigham Valley, the village of Shtebin, the forests of Arasbaran, and the mountain of Sahand. There are some specific characteristics. For the sustainable development of Shtebin village, the development of tourism and cultural infrastructure can be effective. In the research conducted, the Aladag Colored Mountains with

a low score indicate the need for more investment and infrastructure improvement. The area may suffer from a lack of proper infrastructure or lack of attention to accessibility and environmental features. To improve the condition of the Aladag Colored Mountains, programs for natural resource restoration, sustainable development, and promotion of educational and cultural values are necessary. Overall, all three regions have different potentials for sustainable development, but they require proper planning and investment so that they can be used more effectively. For the progress and sustainable development of the regions, it is suggested that tourism infrastructure be developed in areas with low potential, such as the colorful mountains of Aladag and Mount Sahand, as well as promoting educational and cultural values in all regions and implementing conservation programs to prevent environmental degradation. This research can contribute to the sustainable development of tourism areas and pave the way for attracting tourists and protecting the environment. By developing tourism infrastructure such as creating accommodation facilities, restaurants, shopping malls, and information centers in the study areas and promoting educational and cultural values, creating educational tours, information boards, and cultural programs, as well as environmental protection, implementing conservation and management plans to prevent environmental degradation in the colorful mountains of Aladag and other areas.

Declarations

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Authors' Contribution
Authors contributed equally to the conceptualization and writing of the article. All of the authors approved the content of the manuscript and agreed on all aspects of the work declaration of competing interest none.

Conflict of Interest
The authors declare no conflict of interest.

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