Int. J. Hum. Capital Urban Manage., 8(3): 431-442, Summer 2023

International Journal of Human Capital in Urban Management
(IJHCUM)

Homepage: http://www.ijhcum.net/

ORIGINAL RESEARCH PAPER

Determination and prioritization of eco-park components for sustainable urban development

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ARTICLE INFO

Article History:
Received 04 December 2022
Revised 28 March 2023
Accepted 09 April 2023

Keywords:
Eco-park ecosystem services
Entropy technique
Ex situ conservation
Sustainable urban development
TOPSIS

ABSTRACT

BACKGROUND AND OBJECTIVES: Environmental sustainability is an important program of the United Nations to achieve sustainable urban development. It is important to understand the complicated relationship between the urban ecosystem and the natural environment to solve the environmental problems of cities. Owing to its ecological origin, the establishment of ecological parks plays an essential role in sustainable urban development as it aims to support the spiritual needs of citizens, advocate the life of other species, and minimize the manipulation of nature. This study aims to identify and prioritize important ecological, physical, economic, and social criteria in the eco-park of north-central Iran. Due to its topographic features and specific climate, it provides different habitats for wildlife and has ability to protect biodiversity in the urban ecosystem.

METHODS: There are currently intentions for biodiversity compensation in urban planning due to public opinion and species extinction problems. However, scarce studies are available to reinforce this fundamental concept in urban management. This study aimed to determine and prioritize Alborz eco-park components in north-central Iran. In this research, the indicators were selected by fuzzy Delphi, using multivariate decision-making, entropy technique, and TOPSIS.

FINDINGS: Based on the TOPSIS method, among environmental-ecological criteria, the highest rank belonged to the ex situ conservation of animals in the urban climate and biodiversity enhancement (relative closeness to ideal solution = 0.621). Eco-park establishment along the Chalus road and Hemmat superhighway was the design and physical criterion with the highest score (relative closeness to ideal solution = 0.696). From the socio-economic view, increasing the understanding of human-nature unity was the highly scored criterion (relative closeness to ideal solution = 0.767).

CONCLUSION: The eco-Park is not only about conservation but also about large-scale restoration of nature. The implementation of this new generation of parks in response to local environmental concerns regarding location, physical aspects, design, and wildlife conservation will help transition to sustainable urban development. The north-central eco-park of Iran can be used as a model for the development of sustainable urban ecosystems.

DOI: 10.22034/IJHCUM.2023.03.10

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
39	3	6

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Note: Discussion period for this manuscript open until October 1, 2023 on IJHCUM website at the "Show Article.

INTRODUCTION

Research on urban ecology shows the effect of the increasing unplanned expansion of cities on biodiversity and essential ecosystem services (Verrelli, *et al.,* 2022) because urban ecology examines both the negative effects of urbanization and provides strategies for reduction and adaptation (Osmond, 2022). With the expansion of urbanization worldwide, wildlife research in the urban ecosystem is essential for planners and authorities of biodiversity protection in the urban environment so that the applied planning is practical for both humans and wildlife (Collins, *et al.*, 2021). Eco-city is a type of ecologically-based environmental life initiated in the light of global pollution and destruction, proclaiming the principle that human habitats can be sustainable and ecologically habitable (Chang *et al.,* 2016). Therefore, urban planners, designers, and ecologists should concentrate on urban green space strategies that explicitly protect social and ecological sustainability (Mersal, 2017). Nowadays, improper human management affects the environment and ecosystems on the globe, and ecosystems have been disregarded for decades (Vaverkova *et al.,* 2018). Nonetheless, ecological concepts can be used as the basis of the design approach to significantly contribute to reducing the environmental effects of whatever is made by humans (Masnavi and Vamenani, 2020). As defined by the World Health Organization, Urban Green Space (UGS) accounts for a part of the "green infrastructure" of the city ecosystem and an important part of public open areas of the mental health domain in each city. UGS is generally areas of natural or semi-natural ecosystems converted into urban spaces by human influence (Bilgili and Gökye, 2012). The concept of eco-cities is based on effectively harnessing the potential of urban ecosystems to create prosperous, healthy, proportionate and productive cities. The aim of this attitude is to transform cities into conventional structures with efficient function and sustainable productivity (Yang, 2013). A city is also the product of a complicated association between the environment and human activities (Sénécal, 2007), where citizen's general sentiments toward land use and their satisfaction are an important social reference for sustainable urban management and planning, with an indirect positive effect on the urban environment available to users (Yang *et al.,* 2022; Dutoit *et al*., 2018). At the global level, however, biodiversity compensation is used to balance negative effects on biodiversity and Ecosystem Services (ES) arising from utilization. In this reasoning, municipalities should have the capacity in terms of structures and organizational resources to devise a strategy that delivers the right outcomes for nature and people in urban planning (Hanson and Olssona 2023). This is because urban and suburban ecosystems contribute to biodiversity and ES provision and are considered to be important for Sustainable Urban Development (SUD) (European Commission, 2015). Meanwhile, rapid urbanization has become one of the most important environmental sustainability challenges in urban areas, and lack of urban planning has made ecosystem degradation more pronounced in developing countries. Accordingly, researchers should use ecological efficiency in urban development and sustainable use planning promotion (Das *et al.,* 2023). In such an insight, the landscape is considered a mosaic of connected elements that increases the connection between urban habitats (Guo *et al*., 2007). Urban landscapes require new interventions, of which an important case is planning for their biodiversity conservation. The development of green sanctuaries, green routes, intra-urban green spaces, and natural parks are ecological approaches for biodiversity conservation inside cities (Bryant, 2004). The idea of ecological networks in Europe and green routes in the USA was raised in the early 20th century and has acted to connect green systems or cities to natural and forest areas (Johnson and Hill 2002). An eco-park criterion is the ecological-environmental index, which considers ecological principles and stabilizes the adaptation of the structure and framework of the city body on natural infrastructure to create concepts in which speculation and utilization of their potential capacity's direct planners and city builders to create urban landscapes compatible with the city nature (Darwen and Green 1996). A major function of the ecological index is ex situ conservation, which examines species according to their natural environmental patterns in terms of the space surrounding them in nature. Because these species are excluded from their natural ecological processes, their exposure to danger necessitates management by humans in artificial and natural simulated conditions in a natural habitat. Ex situ management may be applied inside or outside the species'

geographical range, but it has to be in a controlled or modified environment (Jain and Kharkwal, 2004). It is believed that this kind of ability is an undeniable approach in the conservation and management of living systems (Van der Ryn and Cown, 2007; Bennett and Wit 2001), improving the quality of life by the correct utilization of environmental benefits, building a desirable green space for upbringing and educating children, social integration, and welfare protection (Balram, 2005; Yang *et al.,* 2022; Power, 2006). The study area is the Alborz eco-park located in north-central Iran. This eco-park constitutes the mounds and heights of Hesar and the eastern landscape of Karaj city, which is known as the respiratory filter of the east city. The park locality in the Karaj-Chalus road, which is a major access road to the north of Iran and one of the busiest roads in the country, has created special conditions for this eco-park that affects its visitors. The virginity of the area and the free observation of wildlife in Iran for the first time, has made the ecological functions of this area of paramount importance. The establishment of this comprehensive wildlife eco-park utilizing natural resources, green hillside, natural water resources, valuable strains of indigenous animals, and diverse plant species next to each other undoubtedly exemplifies natural resource protection in the nature destruction crisis in Iran. This study aimed to evaluate the environmental and socioeconomic aspects and design-physical dimensions of the eco-park, prioritizes its components and describe its functions as the new generation of urban parks. The current study was carried out in Karaj, Iran in 2022.

MATERIALS AND METHOD

Survey design and data collection

Field surveys were conducted in the study area from October 2021 to June 2022. The examinations included data collection from the specialized builder team, executor organizations, different geographical maps, slope and direction maps, and regional recreation maps (Fig. 1). In addition, specialized texts, library content and various national and international articles, related to eco-parks, were evaluated to

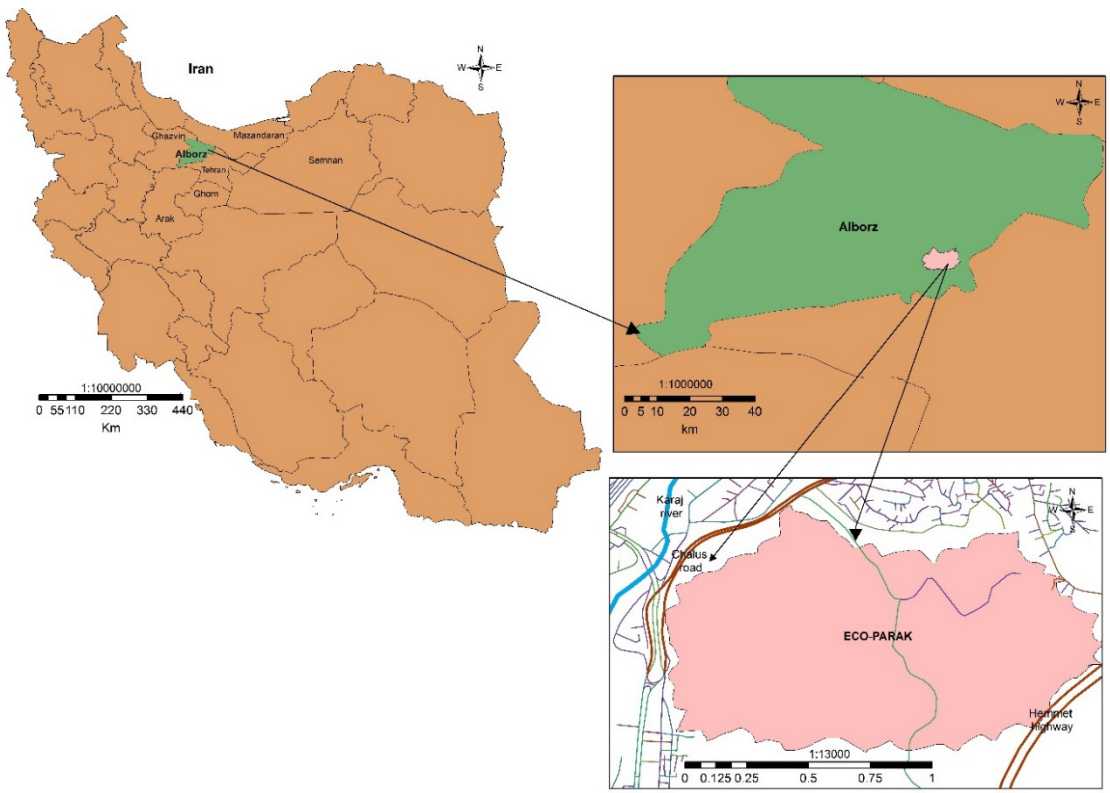

Fig. 1: Geographic location of the study area

extract the primary requirements of eco-park design, the indicators, and criteria. The final criteria were identified and selected based on the analysis of data obtained from elite experts in the field, national and international articles, and specialized texts concerning eco-parks.

Based on the indices provided by International Union for Conservation of Nature (Leverington *et al*., 2010), the obtained criteria were classified into three socioeconomic, environmental-ecologic, and design-physical domains and used for designing structured questionnaires. To evaluate the eco-park elements from the visitor's viewpoints, personal and socioeconomic information of the eco-park visitors, and the desirability of its elements were enquired. Cochran's sampling formula for unlimited statistical population size was used in this study and the number of respondents was 384. To obtain the expert opinion about the eco-park and rank the criteria, an expert community consisting of five prominent university professors, 26 senior experts in public and private management classes with a work experience of over 10 years, was selected. Given the novelty of the research topic, a snowball sampling method was used to conduct the research about people with specific traits who might otherwise be difficult to identify (Goodman, 1961). The importance of each criterion was assessed by the above expert community, using the Fuzzy Delphi Method (FDM) (Habibi *et al*., 2015) in the Likert scale. The final ecological, economic, social and physical design criteria were identified, and the entropy technique was used to calculate their weights. Further a high-power prioritization method, known as TOPSIS (Technique for Order Preference by Similarity to Ideal Solution), was used for prioritization of the selected criteria. All analyses were performed and tabulate by SPSS v. 16 and EXCEL software.

RESULTS AND DISCUSSION

Analysis of visitor questionnaires

Based on the results of visitor questionnaires 51.3 and 48.7% of visitors were female and male, respectively. It shows the approximate gender equality of visitors, and represents the security of female visitors in the eco-park contrary to most urban parks in Iran. Moreover, the majority of the respondent (78%) selected family as the preferred type of travel plan (Fig. 2) and considered the environment of the eco-park to be more attractive for families. In the line with Lee and Graefe (2010), this finding indicates that the promotion of inter-generation family recreation in a nature-based tourism destination can effectively provide the ground for the healthy development of the youth. In particular, participation in nature-based recreation often provides opportunities for families to grow together and preserve their solidarity.

The results further indicated that Alborz, Tehran, and Qom were the provinces of residence for 74.5% of the respondents. After Alborz and Tehran provinces, Qom with 17% ranks third, and Semnan province with about > 7% was the visitors' place of residence. These percentages represent the acceptability of the eco-park by the residents of desert cities in north-central Iran. The statistical results for the desirability of park tourism elements of major Karaj eco-park

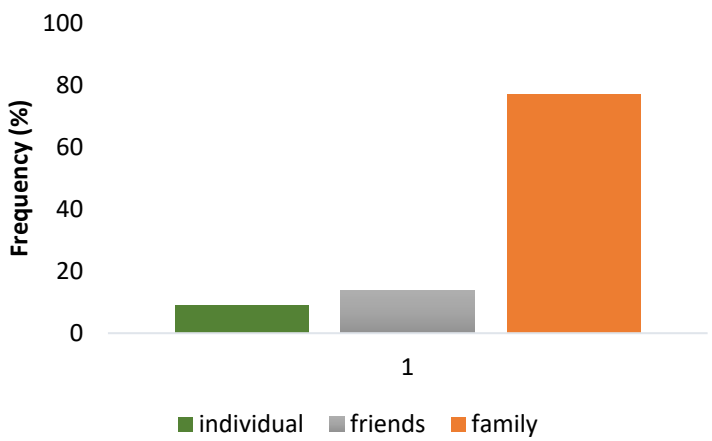

Fig. 2: Frequency percentages of the travel types preferred by the eco-park visitors

Fig. 3: Frequency percentages of major desirability elements of the eco-park from the visitors' point of views

attractions from visitors' opinions (Fig.3) indicated that wildlife and safari attractions (53.9% of opinions) and then natural attractions were the most important tourism attractions. The presence of virgin and mountainous areas and free wildlife observation are the major desirable elements from the visitors' point of view. Based on the visitors' experiences in Sheikh Mujib safari park in Bangladesh, the uniqueness and virginity of the safari was the most tourism attractions (Bhuiyan *et al.,* 2021). The safari tourism is developing in nature-based parks of many countries because tourists are satisfied with the natural attractions such as virginity, uniqueness and cleanness.

Analysis of expert questionnaires

The preliminary results of expert opinions are represented in (Table 1). These opinions were then fuzzified based on the spectrum of triangular fuzzy numbers equal to the 5-point Likert scale. The threshold was set to 0.7 in the FDM. Thus, variables were approved with a minimum consensus of 70% without the need for repetition. Three indices and 18 criteria were accepted based on the results in (Table 2). The weight (W_j) of each index, calculated by the entropy technique are given in (Table 3). The decision-making matrix was first converted to a normalized matrix, and then *dj* and *Ej* were calculated for each index.

The final environmental-ecological criteria, prioritized by the TOPSIS technique using the weights obtained from the entropy method, are given in (Table 4). Based on the scores obtained from the TOPSIS technique, the priority belongs to ex situ conservation of animals in the urban climate and biodiversity enhancement. The first priority of biodiversity enhancement in the urban climate indicates that ecological functions are more important in the north-central eco-park of Iran due to the natural origin, ex situ conservation of wildlife, and biodiversity. The studied eco-park, which was established to enhance biodiversity in urban environments, increases peoples' understanding of the environment and its conservation. According to (Gunnarsson *et al,.* 2015), it confirms the idea that biodiversity per se affects human perception, and urban planning should provide city-based green spaces rich in species, greenness, and diversity, with natural sounds, in the form of eco-parks. It is a place where collective space is designed with an ecological approach, leading to its sustainability by paving the ground for linking natural heritage and culture because the spatial features of UGS fragments influence the ecological aspects of green space (Chen and Jim 2008; Soltanifar and Jafari, 2018).

Conservation of endemic animals and plants is the second ecological index priority, which recalls the importance of ex situ conservation of endemic animals in the eco-park, because the habitat and climate can be simulated in region-specific eco-parks. For example, the endangered Asian zebra is climatically adaptable and is currently under ex situ conservation in Alborz eco-park. The third priority is

Table 1: The prioritization results of indices based on expert opinions according to the Delphi

Row	Index	Criterion	Consensus rate				
			Totally disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
1	Environmental-ecological	Ex situ conservation of animals in urban climates and biodiversity enhancement	0	0	0	8	22
2		Reduction of noise pollution and increasing visual beauty	0	0	1	19	10
3		Protection of natural topography and the original ecosystem tailored to animals	0	0	2	14	14
4		Indicative and unique location (natural stone outcrops of landscape)	1	1	6	14	8
5		Reduction of pollutants and air conditioning	0	0	5	14	11
6		Protection of endemic animals and plants	0	0	0	11	19
7		High open and wide natural view	0	0	7	15	8
8	Design-physical	Designing fencing areas for the free movement of animals	0	0	0	10	20
9		Safari feasibility to watch eco-park animals	0	0	0	9	21
10		Green landscaping in the regional natural slope	0	0	8	17	5
11		Eco-park establishment at heights, view, and perspective of the city	0	1	6	13	10
12		Eco-park establishment along the Chalus road and Hemmat superhighway	2	0	6	14	8
13		Compatible uses, construction of roads and buildings, and no destruction of the environment if possible	0	0	4	10	16
14	Socioeconomic	Increasing the understanding of man-nature unity	0	0	3	17	10
15		Regional development and increasing occupation	0	0	9	14	7
16		Increasing the quality of life with the proper utilization of environmental benefits	0	0	10	13	7
17		New leisure in the natural environment for all classes	0	0	7	14	9
18		Usability by intercity passengers	0	0	7	16	7

the open and wide view of natural beauty reflecting the urban landscapes from topographies. This can refer to the theory of Aldo Leopold, the ecologist and environmental protection activist, who described the ecological beauty in the light of human ethics to positively affect changes in the human perspective. His viewpoint was based on environmental ethics and believed “whatever serves to preserve the integrity, stability, and beauty of societies is right, and whatever is against this is wrong (Bell, 2012).

Among the physical criteria, ranked by the TOPSIS (Table 5), the first priority belongs to the eco-park establishment along the Chalus road and Hemmat superhighway ($CL_j = 0.696$), which indicates the good location and accessibility of the Eco-park. Access roads influence the number of visitors. The second priority is assigned to compatible uses and no destruction of the environment ($CL_j = 0.681$).

Table 2: The results of fuzzy Delphi

Row	Index	Criterion	Triangular fuzzy values			Average defuzzified	Status
			Lower	*Middle*	*Upper*		
1	Environmental-ecological	Ex situ conservation of animals in urban climates and biodiversity enhancement	0.683	0.933	1.000	0.872	Approved
2		Reduction of noise pollution and increasing visual beauty	0.575	0.825	0.992	0.797	Approved
3		Protection of natural topography and the original ecosystem tailored to animals	0.600	0.850	0.983	0.811	Approved
4		Indicative and unique location (natural stone outcrops of landscape)	0.483	0.725	0.908	0.706	Approved
5		Reduction of pollutants and air conditioning	0.550	0.800	0.958	0.769	Approved
6		Protection of endemic animals and plants	0.658	0.908	0.000	0.856	Approved
7		High open and wide natural view	0.508	0.758	0.942	0.736	Approved
8	Design-physical	Designing fencing areas for the free movement of animals	0.667	0.917	1.000	0.861	Approved
9		Safari feasibility to watch eco-park animals	0.675	0.925	1.000	0.867	Approved
10		Green landscaping in the regional natural slope	0.475	0.725	0.933	0.711	Approved
11		Eco-park establishment at heights, view, and perspective of the city	0.517	0.767	0.933	0.739	Approved
12		Eco-park establishment along the Chalus road and Hemmat superhighway	0.483	0.717	0.900	0.700	Approved
13		Compatible uses, construction of roads and buildings, and no destruction of the environment if possible	0.600	0.850	0.967	0.806	Approved
14	Socioeconomic	Increasing the understanding of man-nature unity	0.558	0.808	0.975	0.781	Approved
15		Regional development and increasing occupation	0.483	0.733	0.925	0.714	Approved
16		Increasing the quality of life with the proper utilization of environmental benefits	0.475	0.725	0.917	0.706	Approved
17		New leisure in the natural environment for all classes	0.517	0.767	0.942	0.742	Approved
18		Usability by intercity passengers	0.500	0.750	0.942	0.731	Approved

According to (Williams *et al,*. 2015), urban living areas should be designed and managed based on nature-friendly criteria, and a sustainable human habitat should be planned based on ecological balance. In terms of environmental problems, basic changes in urban infrastructure, such as eco-park development, should be made in metropolises suffering from heat islands caused by vegetation scarcity or settlement

Table 3: The weight (W_j) of ecological indices with the entropy technique

Row	Index	Criterion	E_J	D_J	W_J
1	Environmental-ecological	Ex situ conservation of animals in urban climates and biodiversity enhancement	0.999	0.001	0.017
2		Reduction of noise pollution and increasing visual beauty	0.998	0.002	0.028
3		Protection of natural topography and the original ecosystem tailored to animals	0.997	0.003	0.037
4		Indicative and unique location (natural stone outcrops of landscape)	0.990	0.010	0.125
5		Reduction of pollutants and air conditioning	0.996	0.004	0.053
6		Protection of endemic animals and plants	0.998	0.002	0.020
7		High open and wide natural view	0.995	0.005	0.058
8	Design-physical	Designing fencing areas for the free movement of animals	0.998	0.002	0.019
9		Safari feasibility to watch eco-park animals	0.999	0.001	0.018
10		Green landscaping in the regional natural slope	0.996	0.004	0.052
11		Eco-park establishment at heights, view, and perspective of the city	0.994	0.006	0.078
12		Eco-park establishment along the Chalus road and Hemmat superhighway	0.988	0.012	0.157
13		Compatible uses, construction of roads and buildings, and no destruction of the environment if possible	0.996	0.004	0.051
14	Socioeconomic	Increasing the understanding of man-nature unity	0.997	0.003	0.040
15		Regional development and increasing occupation	0.995	0.005	0.064
16		Increasing the quality of life with the proper utilization of environmental benefits	0.995	0.005	0.068
17		New leisure in the natural environment for all classes	0.995	0.005	0.060
18		Usability by intercity passengers	0.996	0.004	0.055

Table 4: The ranking results of environmental-ecological indices by the TOPSIS method

Row	Index	Distance from the negative ideal d_j^-	Distance from the positive ideal d_j^+	Relative closeness to the ideal solution CL_j	Rank
1	Ex situ conservation of animals in the urban climate and biodiversity enhancement	0.003	0.002	0.621	1
2	Reduction of noise pollution and increasing visual beauty	0.004	0.006	0.398	7
3	Protection of natural topography and the original ecosystem tailored to animals	0.006	0.007	0.453	5
4	Indicative and unique location (natural stone outcrops of landscape)	0.03	0.031	0.484	4
5	Reduction of pollutants and air conditioning	0.009	0.014	0.399	6
6	Protection of endemic animals and plants	0.004	0.003	0.562	2
7	High open and wide natural view	0.018	0.018	0.501	3

Table 5: The ranking results of design-physical indices by the TOPSIS method

Row	Index	Distance from the negative ideal d_j^-	Distance from the positive ideal d_j^+	Relative closeness to the ideal solution CL_j	Rank
1	Designing fencing areas for the free movement of animals	0.003	0.002	0.618	3
2	Safari feasibility to watch eco-park animals	0.003	0.003	0.489	5
3	Green landscaping in the regional natural slope	0.009	0.007	0.569	4
4	Eco-park establishment at heights, view, and perspective of the city	0.015	0.037	0.294	6
5	Eco-park establishment along the Chalus road and Hemmat superhighway	0.053	0.023	0.696	1
6	Compatible uses and no destruction of the environment if possible	0.009	0.004	0.681	2

Table 6: The ranking results of socioeconomic indices by the TOPSIS method

Row	Index	Distance from the negative ideal d_j^-	Distance from the positive ideal d_j^+	Relative closeness to the ideal solution CL_j	Rank
1	Increasing the understanding of man-nature unity	0.013	0.004	0.767	1
2	Regional development and increasing local occupation	0.012	0.006	0.667	3
3	Increasing the quality of life with proper utilization of environmental benefits	0.02	0.009	0.695	2
4	New leisure in the natural environment for all classes	0.019	0.036	0.347	5
5	Usability by intercity passengers	0.009	0.016	0.359	4

construction far from green cities and ecological standards (Gozaloa and Gonzalez, 2018).

Increasing the understanding of man-nature unity and new leisure in the natural environment is the first socio- economic priority of the eco-park (Table 6). for all classes were assigned to the first and fifth priorities by experts. The urban environment affects citizens' audiovisual comprehension and developing eco-parks seem to be important to improve the man-nature unity (Gunnarsson *et al,*. 2015). This implies that higher scores belong to UGS aesthetics, thus, urban planners should pay special attention to understanding citizens' sense of naturalism by developing parks and green spaces rich in plant and animal species. The second priority belongs to increasing the quality of life with the proper utilization of environmental benefits. Natural and artificial UGSs have positive effects on people's welfare (Benma *et al.*, 2018). (Dempseya *et al,*. 2018) reported a significant relationship between measurements of UGS and park distances from citizens' residence areas, suggesting that proper utilization of natural and environmental resources in the form of eco-parks increases citizens' quality of life in the social health dimension. The experience of natural environment in the urban structure underpins positive emotions and correct behaviors that satisfy specific spiritual social/human needs (Priskin, 2013). The third socio-economic priority is the regional development and increasing the local occupation (Table 6). As stated

by (Prakash, 2013), there are economic aspects that favor a better ecotourism perspective in eco-parks relative to protected areas and other urban parks, which can manifest the pattern of urban ecotourism attractions managed by the local community. Urban eco-parks are located in a specific topography as a local capital and possess the positive support of local people for biodiversity conservation and ecosystem management by combining joint possession and management. Furthermore, the economic income of tourism can create changes in local attitudes toward urban green coverage and wildlife, as eco-parks encourage local protection of resources in the form of economic ecotourism and local development.

CONCLUSION

The importance of the environment and the improvement of the urban ecological dimension have been reconsidered by urban researchers and managers, because they have realized the indispensable link between cities and natural environments. Owing to the increasing green attitude among citizens, they prefer to live in a high-quality urban environment in which the environmental dimensions are precisely planned and managed by environmental managers and experts. Eco-parks can provide a way to improve their quality of life. The results of this study demonstrate the advantages of eco-park establishment in the urban ecosystem considering the dynamic indices of the urban environment, i.e., developing the city's natural landscape with an ecological approach. The distinctive features of this eco-park seem to form a relatively diverse ecosystem providing various habitats and vegetation for the regional wildlife. For example, biodiversity enhancement in urban ecosystems and conservation of biological reserves, such as the Iranian zebra, which is protected in this eco-park. The species is classified as endangered by the IUCN, and only 600 individuals have remained in the wild. Environmental-ecologic criteria, such as endemic plant vegetation, developing artificial urban forests to increase urban green landscape and reduce urban air pollution received high scores. From the socio-economic view, increasing the understanding of human-nature unity, increasing the quality of life and increasing occupation were the highly scored indices. Thus, based on the sustainable urban development, the eco-park establishment is useful, practical, and influential urban management for preserving and developing natural urban spaces to improve sustainable living conditions of cities. Therefore, it can be concluded that developing a new generation of urban parks tailored to regional environmental issues by considering the location, physical aspects, design, and wildlife conservation can be helpful to achieve the sustainable development of urban environments. Given the drought problems and species extinction in Iran, such eco-parks increase ecological productivity in urban ecosystems. Finally, the north-central eco-park of Iran can be used as a model for the development of sustainable urban ecosystems.

AUTHOR CONTRIBUTIONS

M. Malekian conceived the ideas. Z. Nourzadeh performed the literature review, collected the information and analysed the data. M. Malekian helped in designing structured questionnaires, manuscript preparation and editing.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to the management of Alborz eco-park complex and, in specific, Mr. Shirdel Nouri for his Kind cooperation.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

PUBLISHER'S NOTE

ABBREVIATIONS

CL_j	Relative closeness to the ideal solution
CIFOR	Center for International Forestry Research
d	The difference between the real proportion of the trait in the community and the estimated value
dj	The decision-making matrix
d_j^-	Distance from the negative ideal
d_j^+	Distance from the positive idea
Ej	*The* entropy
ES	Ecosystem Services
Ex-situ conservation	The conservation of species outside their natural habitats
FDM	Fuzzy Delphi Method
IUCN	International Union for Conservation of Nature
L	Lower number
M	Middle number
n	The statistical sample size
S^2	The variance of the measured trait
SPSS	Statistical Package for the Social Sciences
SRM	Sustainable Rangeland Management
SUD	Sustainable Urban Development
TOPSIS	Technique for Order Preference by Similarity to Ideal Solution
UGS	Urban Green Space
W_j	The weight of each index
z	The confidence factor with values of 95%

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HOW TO CITE THIS ARTICLE

Noorzadeh, Z.; Malekian, M., (2023). Determination and prioritization of eco-park components for sustainable urban development. Int. J. Hum. Capital Urban Manage., 8(3): 431-442.

DOI: 10.22034/IJHCUM.2023.03.10

URL: https://www.ijhcum.net/article_704138.html