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Comparative analysis of Nature Park Shumen Plateau and Shumen City Park as green spaces**Teodora Koynova¹**¹*Faculty of Natural Sciences, University of Shumen, 115 Universitetska str., Bulgaria*e-mail: teodorakoynova@gmail.com

Abstract: *The green areas play a significant role in keeping the urban population healthy. Consequently, there has been a growing interest in the urban and peri-urban parks lately. The Nature Park Shumen plateau and Shumen City Park are an important green area for residents of Shumen city. The aim of this study was to make comparative analysis of the qualities of the Nature Park Shumen Plateau and the Shumen City Park as green spaces.*

For quality assessment 10 criteria were used. The criteria were grouped in four categories - Green space placement, Green space use, Environment and Biodiversity. Five-point Likert scale was used to determine satisfaction with each of the 10 criteria. Nine experts did the evaluation of the criteria.

In category “Green space placement”, the Nature Park Shumen Plateau and the Shumen City Park had very similar evaluations however there were big differences in the individual criteria. According to the category “Green space use, both parks showed rather similar results. Concerning the category „Environment”, the Nature Park Shumen Plateau received slightly higher assessment and the category “Biodiversity” was ranked as twice higher.

The results show that the Nature Park Shumen Plateau and the Shumen City Park possess good quality as a green area, as the Nature Park Shumen Plateau was higher assessed compared to the Shumen City Park.

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Keywords: *Nature Park Shumen Plateau, Shumen City Park, quality of green spaces, assessment of green area*

Introduction

The world is becoming an increasingly urban place. Since 2008, more than half of the world's population has been living in cities [1], [2], [3]. As a result, people spend less time in nature. Therefore, it is important to have enough quality green spaces within urban and peri-urban areas [4], [5]. According to Centers for Disease Control and Prevention, green spaces are “open, undeveloped land with natural vegetation” and include parks, forests, playing fields, and river corridors, for example. Forests close to urban areas provide people with opportunities for recreation [6], [7].

In recent decades, considerable evidence has accumulated suggesting that the availability of green areas is important for human health and improve people's quality of life [8], [9], [10], [11]. For this reason, more and more attention has been paid to the urban and peri-urban parks, especially because of their numerous environmental and social services, such as noise abatement, stress reduction, aesthetic value [12], air filtering, microclimate regulation, rainwater drainage, recreation and social interaction [5]. Spending time in such spaces reduces stress and has a relaxing effect [13]. Urban and peri-urban parks provide opportunities for more active lifestyle [1], [10], [12]. They also offer huge benefits to children's physical, mental and social development [1], [10], [14].

There are no accepted standards for measuring the quality of green space. Various attributes, such as general condition and maintenance, specific features and fitness for purpose can be applied [8]. Some authors are based on the opinion of visitors to the parks and natural areas [11], [15], [16]. It can be used single questions for general perceived quality of green space or more complex questions to assess the quality of green space as an impact on the health and well-being. Other use expert assessments like checklists, in situ observations, and Geographical Information System (GIS) analysis [11].

The aim of this study was to make comparative analysis of the qualities of the Nature Park Shumen Plateau and the Shumen City Park as green spaces.

Materials and Methods

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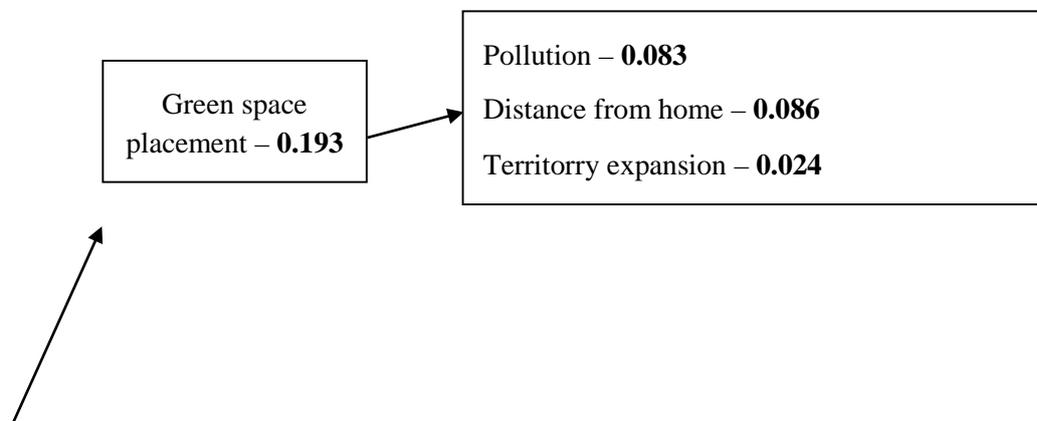
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Study areas

We have analyzed two parks – the Nature Park Shumen Plateau and the Shumen City Park. Nature Park Shumen Plateau is located in the Shumen Plateau, next to Shumen city, northwest. Since 1980 it has been declared as a protected area. It has a surface of 3930,7 hectares and the average altitude is 427 m a.s.l. Shumen City Park is situated in the center of the city. It has a surface of 7 hectares and the average altitude is 220 m a.s.l. The population of the city is 80 855 people [17].

Methodology

The comparative assessment of the quality of green spaces was based on the criteria proposed by [1]. There are 10 criteria grouped into four categories (Figure 1). To determine satisfaction with each of the 10 criteria was used a five-point Likert scale. Nine experts did the evaluation of the criteria. Each criterion of both parks was calculated using the mean of the values.



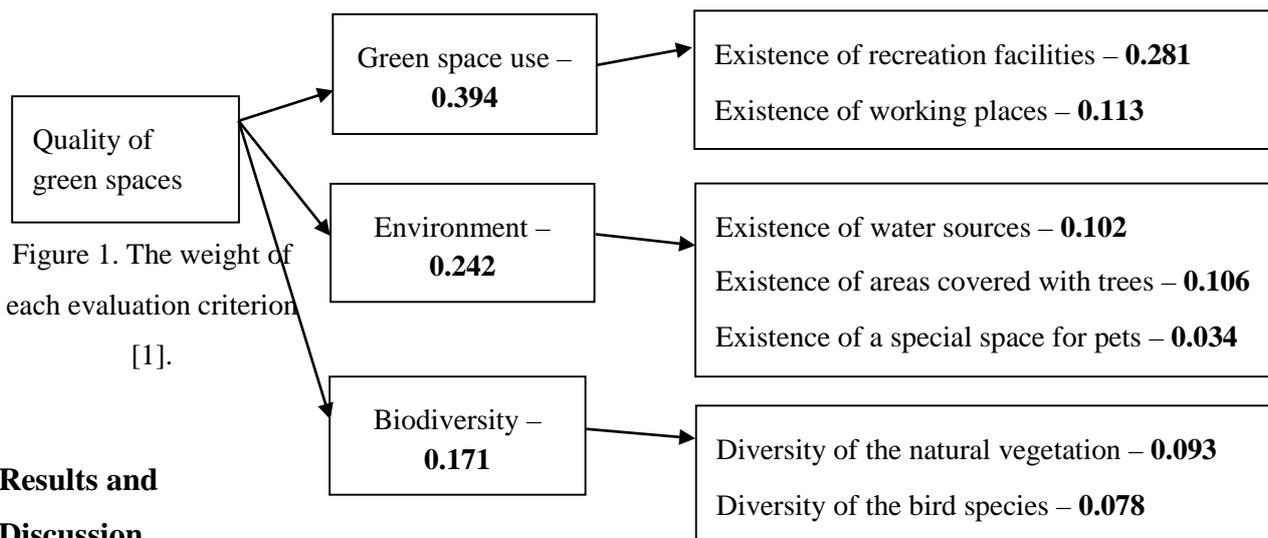


Figure 1. The weight of each evaluation criterion [1].

Results and Discussion

We have made comparative analysis of the Nature Park Shumen Plateau and the Shumen City Park as green spaces. The results are shown in Table 1.

Table 1. Expert evaluation of Nature Park Shumen Plateau and Shumen City Park as green spaces.

| Evaluation | NP | CP | Category | NP | CP | Criterion | NP | CP |
|-------------------------|-------|-------|-----------------------|-------|-------|------------------------------------|-------|-------|
| Quality of green spaces | 0.735 | 0.638 | Green space placement | 0.082 | 0.093 | Pollution | 0.060 | 0.016 |
| | | | | | | Distance from home | 0.005 | 0.074 |
| | | | | | | Territory expansion | 0.017 | 0.003 |
| | | | Green space use | 0.325 | 0.331 | Existence of recreation facilities | 0.234 | 0.234 |

| | | | | | |
|--------------|-------|-------|---------------------------------------|-------|-------|
| | | | Existence of working places | 0.091 | 0.097 |
| Environment | 0.171 | 0.139 | Existence of water sources | 0.065 | 0.045 |
| | | | Existence of areas covered with trees | 0.097 | 0.088 |
| | | | Existence of a special space for pets | 0.009 | 0.006 |
| Biodiversity | 0.157 | 0.074 | Diversity of the natural vegetation | 0.085 | 0.016 |
| | | | Diversity of the bird species | 0.072 | 0.059 |

NP – Nature Park Shumen Plateau; CP – Shumen City Park

In category “Green space placement”, the Nature Park Shumen Plateau and the Shumen City Park have very similar evaluations. However, as can be seen there are big differences between them as regards their individual criteria in this category. Nature Park Shumen Plateau is peri-urban park and according to experts, is located in unpolluted area. As part of the Shumen Plateau, there is an opportunity to expand the territory. Shumen City Park is its opposite - located in the center of the city, surrounded by large boulevards. Therefore, successive territory expansion is not possible. The distance from home plays a major role in the frequency of visits to the parks. Although the Nature Park Shumen Plateau is very close to the city, Shumen City Park has a higher rating. People who live closer to the park tend to visit more often. Their visits are, however, shorter than those who live further away. People who spend more time traveling to the park usually stay longer and engage more often in active recreation and socialising [18], [19]. However, when parks are well-equipped and have attractive features, distance is no longer so important [20], [21].

According to the criterion of “Existence of recreation facilities“, both parks show the same result, which is close to the maximum. There are enough places for walking and recreation, for jogging and cycling. These activities play a significant role in the health and well-being of people [22], [23]. The fact that green spaces provide them for free and are easily accessible makes the parks even more valuable [24], [25]. Tourism and recreation activities are popular in protected areas [26]. In Nature Park Shumen Plateau is located one of the emblematic monuments of the city of Shumen – „Monument to 1300 Years of Bulgaria“. Other very attractive place to visit there is Shumen fortress and astronomical observatory.

Both parks have plenty of playgrounds for children and relaxation spots. For this reason and because of the proximity of the Shumen City Park to the city center, this makes it a favorite place for mothers and their children and for retirees. It is important the urban environment to have enough green areas that are distributed equitably within the city and to be easily accessible to provide a healthy environment for all members of the community [27]. Both parks offer good number of work places like restaurants and cafes.

As regards the criterion „Environment”, the Nature Park Shumen Plateau receives higher assessment. This is due to the existence of more water sources and more areas covered with trees. About 90% of the territory of Nature Park is forests [28]. Forests play a significant role in the provision of ecosystem services. They create a healthy living environment and restore ecosystems [12], [29]. Both parks do not have special space for pets.

With the ecosystem services it provides, biological diversity has important contributions to society [30], [31]. Green areas with great biodiversity are preferred for recreation [32], [33]. Many studies testify to the richness of flora and fauna of the Nature Park Shumen Plateau [28], [34], [35], [36], [37]. This is also confirmed by the experts in our study, which give almost the maximum assessment – 0.085 out of 0.093 possible. The diversity of plant species in the area is determined by the unique combination of conditions in terms (topography, water resources, climate and soil) [37]. There are described 786 species of plants [35], [37] of which 19 species of orchids [35] and 378 species of medicinal plants [36]. Shumen City Park does not have such a natural vegetation variety. Consequently, his assessment is only 0.016.

The number of bird species is used to measure the diversity of the fauna. According to this criterion, the Nature Park Shumen Plateau is again with almost maximum evaluation. As opposed to the diversity of the natural vegetation, on this criterion the Shumen City Park is highly rated. [38] reported that it is inhabited by 345 invertebrate species and over 240 vertebrate species. Birds are the most widely represented group in the park with 150 species.

The results show that the Nature Park Shumen Plateau and the Shumen City Park possess good quality as green spaces. The overall assessment of the Nature Park Shumen Plateau is 0.735 and of the Shumen City Park is 0.638. Green spaces are long-term investments. The perception of green space is a sign of how people assess their environment [10]. Their assessment is valuable and should be taken into account in terms of monitoring the quality of environments and supporting environmental decisions. Therefore, in addition to the expert assessment of green space quality, it

is important to make an assessment of the perception of people [11]. Their maintenance of good quality is significant and should be integrated within local development strategies and frameworks. Investment in green space has great value and local government can make such on behalf of citizens and their welfare [39].

Conclusions

Quality green areas provide positive health, social and environmental benefits for all population groups. The Nature Park Shumen Plateau has a considerably higher evaluation on the criteria „Pollution “, „Territory expansion “, „Existence of water sources “and „Diversity of the natural vegetation”. The Shumen City Park is assessed higher on the criterion “Distance from home”.

The results show that the Nature Park Shumen Plateau and the Shumen City Park have high evaluation as a green area. However, the Nature Park Shumen Plateau has better qualities as a green space. Therefore, local government should stimulate the population to spend more time in Nature Park

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