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Ecological impacts of a city forest and level of public awareness for recreational use of Nigde Atatürk city forest

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Abstract

Aim: To explain the impacts of city forests on urban ecology and reveal the level of public awareness of Nigde Ataturk City Forest among the residents of Nigde.

Methodology: Extensive field observations were performed in addition to literature review. A semi-questionnaire study was conducted by using random sampling method in order to measure the level of public awareness.

Results: The city forests play a crucial role in enhancing the urban environmental quality and have numerous ecological benefits for the city. It was found that the participants had insufficient awareness about the benefits of Nigde Atatürk City Forest as regards the ecology and social life of the city.

Interpretation: Urban forests add many economic, ecological, aesthetic and social values to the cities. Urban users should be informed about the benefits and use of urban forest.

Key Words: City Forest, Ecology, Nigde Ataturk City Forest, Recreation

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Introduction

The rising growing population and opportunities of employment and facilities of modern life style of cities urges people to migrate to cities. Therefore, rural areas are rapidly changing into urban areas. Those cities where urbanization process has not managed in a controlled manner, has led to serious economic, psychological and ecological problems over time. People need areas which can be physically used by them, while struggling with the burdens of city life. They can relax mentally in such places and can improve their quality of life. The ecological benefits provided by such areas to the city are great. In some cities, these needs can be met due to abundance of natural environment, while in others it is possible to meet them by means of artificially constructed natural environment.

Today cities are facing great environmental stress such as noise, poor air quality and traffic density. Increasing green areas in a sustainable way has a huge potential to mitigate the negative impacts of urbanization, make cities more attractive to live in, stop unplanned urbanization and decrease demand for transportation (De Ridder *et al.*, 2004).

Recreational activities performed in order to get pleasure in relation with nature are becoming more and more popular in cities. Urban parks serve the same environmental and recreational functions as forests and green spaces, albeit in a smaller scale (Morancho, 2003). However, it is difficult to find the diversity of life that forests encompass and the cultural and economic assets they deliver to the cities. The parks to some extent, but help if they are not planned in line with a system and remain merely as green urban patches they will not have much impact. Within this context, city forests are large-scale patches of green that address creative needs of city dwellers.

From a general perspective, forest is an ecosystem symbolizing the mutual web of relations that is jointly formed by trees and other plants, animals, microorganisms and environmental factors such as soil, air, water, light and heat. Forest is a mutuality of life in which the forest trees higher than 5 m are dominant and are close to affect each other, and constitute unique conditions of climate and habitat (Ozturk *et al.*, 2010). Forest as such is defined as a partnership of life, a mutuality of life, an ecosystem and even as a huge living organism comprising numerous plants and animals (Akyuz *et al.*, 2014).

City forests, on the other hand, are areas found naturally within and nearby cities or established artificially, which provide urban structure with aesthetic and functional contributions, and also offer recreative facilities as well as more comfortable environmental conditions to city dwellers, contributing to physiological, psychological, economic and social development of urban dwellers while affecting urban ecology considerably. City forests are accessible at short distances and this increases their

usage rates. According to Konijnendik (2003) and Tilki *et al.* (2008), city forests "are forested areas planned within or around the city in order to meet the recreational needs of city dwellers". City residents with time have gradually understood the importance of city forests better as the main component of cityscape, urban infrastructure and quality of life. Municipalities have initiated highly assertive forestry programs together with various shareholders. Though this process has been well achieved in industrialized countries, it is still in its infancy in the industrialising countries (Kuchelmeister, 2000).

Turkey is facing a rapid urban sprawl particularly over the last 30 years, deprived of necessary infrastructure. From 1965 to 1975, Turkey was first among western countries in terms of population growth rate and urbanization. In this period, while the population of the country rose by 25%, the rate of urbanization was twice this figure, i.e., 51%. People continuously emigrated from rural areas towards the cities, therefore all big cities grew by 8% each year. Due to large-scale environmental and health problems at present, it is becoming an obligation to create considerable ecological and aesthetic settings and enhance urban life quality (GulandSezer, 2009).

City forests increase urban life quality by bringing various ecological, cultural and economic benefits to the city. They create a microclimatic environment, with positive effects on the urban climate. Their functions are paramount in terms of enhancing air quality, feeding water resources, preventing soil erosion and protecting biological diversity. Apart from these benefits, they are places where a relation between nature and humans can be built for the urban dweller longing for the nature in the urban environment. Furthermore, they are meeting spots for people from different status. The reason why ancient communities established their settlements near forested areas was the need for food, accommodation, and firewood as well as the sense of protection, security and peace they give against enemies. With all these benefits, it is seen that in addition to profound importance of city forests as part of urban open-green space system, they are also important for psychological and sociological development of urban dwellers.

The main purpose behind establishing of city forests is to formulate plans towards enhancing the life quality of urban dwellers, such as meeting the recreative needs of urban people and enabling people who live under intense pressure of the city to be in touch with nature along with facilitating positive impacts on urban ecology. In this respect, it is important that during the process of establishing city forests and managing their use in a sustainable way, the culture of urban dwellers and their expectations from their use of forest are figured out and incorporated into the process. This approach will increase the public satisfaction and enable their integration with the city.

This study aimed to reveal the effects of city forests on urban ecology, scrutinize the contributions of Nigde Ataturk City Forest, established in the city of Nigde in 2007 and finally find the awareness level of inhabitants of Nigde about the city forest.

Materials and Methods

Nigde Ataturk City Forest was selected as the research area. It is located 6 km from the city center (Table 1). Nigde Ataturk City Forest covers an area of 50 ha. It has cedar (*Cedrus* sp.), black pine (*Pinus nigra*), almond (*Prunus* sp.) trees together with multiple broad-leaved species of various heights. The area is rich in wildlife. Approximately, 75 tons of carbon is stored by Nigde Ataturk City Forest, which corresponds to 275 tons of CO₂ in the atmosphere (City Forests Book, 2009). There are facilities like playgrounds, watchtowers, pergolas, sitting benches, covered and uncovered picnic tables, ornamental ponds, fountains, walking grounds, walking tracks, a restaurant, information building and WC.

In this study, a survey was conducted using random sampling method in order to assess the level of public consciousness. The semi structures questionnaires were prepared for the field study. Keeping in view the aim of this study in view, we tried to determine the impact of city forest on the users in Nigde city center. The population of Nigde city center was taken as the sample on which the survey was performed. According to 2014 population census, 149.696 people in Nigde province live in the city center. The number of female and male inhabitants living in the city is quite close to each other (Anonymous, 2015).

The formula given below was used in the survey study

$$n = \frac{Z \cdot Z \cdot N \cdot P \cdot Q}{N \cdot D \cdot D + Z \cdot Z \cdot P \cdot Q}$$

$$n = \frac{1.96 \times 1.96 \times 149.696 \times 0.95 \times 0.05}{149.696 \times 0.05 \times 0.05 + 1.96 \times 1.96 \times 0.95 \times 0.05}$$

$$n = \frac{27315.927296}{374.422476}$$

$$n = 72.9548 = 73$$

n: Sample size, Z: the value of Z according to 95% confidence interval (1.96), N: Ground mass size, P: the probability of the existence of the feature intended to be measured within the ground mass (95%), D: error acceptance rate (5%), Q: 1-P (Kalipsız 1981, Karasar 1991, Ozdamar 2003, Akten, 2003, Sandal and Karademir, 2013).

Following the calculation, it becomes apparent that the survey must be applied to 73 people. In order to increase the reliability of the study, the questionnaire was conducted on 100 people.

Results and Discussion

This study aims to reveal the ecological impacts of city forests and the level of public awareness on the recreational use of Nigde Ataturk City Forest. 50% of the participants who took part in the survey were aged 26-45 years, 50% were females, 60% were married, 48% were university graduates, 57% were employed and 38% had salaries between \$ 178 and \$ 536. This result indicates that most of the participants have the ability to use a recreative area in terms of characteristics like age, economic level, and level of consciousness. Nevertheless, using a recreative area is principally possible through recognition of that area. The study showed that Nigde Ataturk City Forest is not an area the city inhabitants use intensely for their recreative needs. The survey revealed that in Nigde city center 80% of the participants did not consider Nigde as a green city. They think that green spaces in the city center are inadequate. Out of 89%, only 25% are aware of the city forest as a part of urban open-green space system. Nearly, 68% stated that they do not take advantage of Nigde Ataturk City Forest. This might be because public awareness has not developed much on the issues like using the city forest and building a relationship. This is because of the inadequacy of forested areas due to the physical conditions of the city. Moreover, the concerns of privacy, which the people brought from their past and harsh conditions of summer and winter have pushed people towards adopting a self-enclosed lifestyle. This situation keeps the public, who are not familiar with the concept of city forest, from using the city forest, established at a later date. The city forest currently consist of young trees and the density of trees is low, which does not create a feeling that there is a forest when observed from outside. Furthermore, the area is mostly used by men or university students studying at Nigde, which restricts families from using this area. It was also observed that the use of Nigde Ataturk City Forest becomes intense during holidays (weekend holidays, national holidays, etc.). More families use the area during these days. The reason for this might be to allow the visitors think that family use of the area is lower on other days and monotype users will be higher (men only, young people only, etc.). Among the answers given to the question "what restricts your use of city forest", the biggest percentage mentioned security weakness (21%), pollution (20%) and existence of monotype users (19%). There are security guards in the area, but the city forest is reached by transportation. This adds to its isolation and a monotype user domination. The sense of security disappears, therefore, limited use of area is regarded natural.

The answers the participants gave to the question "what is your reason to go to the city forest" was mainly as picnic spot (23%), city forest offers an opportunity to have relaxation (18%) and there is no other place to go in Nigde city center (17%). One possible reason for this is that there is not a wide variety of activities within the forest area that will attract the attention of

Table 1 : List of Green Areas in the City Center of Nigde (Niğde Municipality Directorate of Parks and Gardens. 2015)

Name of the park	Total area (m ²)	Name of the park	Total area (m ²)
Faculty of Education Park	1461,61	Saglik Park	2402,56
Fatih Park	578,79	OzlemSirinNatura Park	3009,59
Kayali Park	2981,74	Sultan Park	3920,83
Kemal Aydogan Park	1512,08	Yildirim Park	361,97
MuhsinYazicioglu Park	4160,27	Caglayan Park	2470,00
NasrettinHoca Park	1056,70	UyduKent Park	719,98
Ozbelde 1. Park	993,67	Vali Yazicioglu Park	2262,94
Ozbelde 2. Park	1156,09	Kale Parki	16964,82
Ozbelde 3. Park	5985,56	KucukEv Park	1441,59
Ozbelde 4. Park	2399,66	Pasa Mosque Park	616,79
Ozbelde 5. Park	2398,17	Esenbey Garden	429,57
Suman Park	779,47	Kesikbas Garden	690,67
Serif Ali Mosque Park	1978,50	Old Zaire Bazaar Park	2470,40
Topcu Park	791,45	Meliksah Park	1696,83
Ozbelde 6. Park	29220,98	Kilicarslan Park	3074,48
Pinar Park	655,20	Abilayhan Park	4017,78
Vali Park	785,00	19 Mayıs Park	2525,60
Hospital Park	3531,72	Aşyan Park	1093,02
HaciBektas Park	3045,87	Selcuk Park	2290,39
Mevlana Park	7111,17	Nig-Kur Park	1289,68
Piri Reis Park	1086,51	Karanfil Park	1334,68
Selaleli Park	640,07	SarayArkası Park	1559,98
YunusEmre Park	2259,65	Binevler Park	2772,11
Swimming Pool	1910,32	Ahmet Yesevi Park	601,66
CifteMinarei Mosque Park	6923,65	AleaddinKeykubat Park	1459,36
Murat Cami Park	3065,97	EskiMezbaha Park	1752,06
MuzafferEcemis Park	10583,13	Ata Sanayi Park	5643,59
Sayginevler Park	2701,63	İlhanlı5.Sokak Park 1	319,21
UcgenVallet Park	1148,92	İlhanlı5.Sokak Park 2	2125,59
SabihaSahenk Sport Center Garden	4322,58	İlhanlı5.Sokak Park 3	3493,18
23 Nisan Park	1619,05	Ddy Gar Build Park	16414,95
66 EvlerFuzuli Park	1065,19	Dedelibag Park25	17,09
Bazaar Park	6128,94	Insel Mosque Park	3441,81
Dortayak Mosque Park	610,35	FotoUnal Park	981,97
HudaventHatun Park	7672,28	Memnune Park	6227,04
Kilimci Park	534,60	Sehitler Mosque Park	1939,20
SuleymanSah Park	524,95	Rahman Mosque Park	4981,12
Aga Yusuf Park	1618,85	MaresalFevziCakmak Park	13372,26
30 Agustos Park	5589,71	Nar Mosque Park	1576,43
YesilkentGuney Park	2852,50	Nar Garden	650,19
YesilkentGuney Park	3545,37	Tepebaglari Green Area	9445,30
Melle Park	39841,04	City Forest	2970,00

public. The fact that there are no different recreation areas in the Nigde city center to be utilized as open-green space is another reason for the preference of the area during holidays. The participants mostly answered the question “which activities would you like to be brought to the city forest” as plant compositions (21%), open sport areas (20%) and cafes and restaurants to be used in all seasons (19%). The participants chose these answers because the forest does not give the sense of a true forest, it is young, it does not appeal to the young since there are no open

sport areas integrated into the area and finally enclosed spaces established within the forest are few and should be increased in a way that will be suitable for family budgets of inhabitants of Nigde in harsh winters.

Most of the participants are of the opinion that city forests are natural green areas located within or around the city area which can offer recreative areas to people (46%). Furthermore, 52% of the participants stated that city forests are areas where the

inhabitants of the city can relax and go for a walk at weekends. Majority (58%) of participants think that these places are used as picnic spots, which indicates that awareness on diversity of city forest uses among the public has not yet developed adequately. The participants also state that city forests are developed to afforest the city (49%) and they do not exist naturally within the city (47%), but are established later, probably not a well-developed forest area or an organized recreation area in the same location prior to the addition of Nigde Ataturk City Forest to the city in 2007. A great majority of participants do not agree with the notion that city forests are areas established in order to stop the expansion of city (54%) and they do not think city forests are established so that they can be used in the industry sector of the city (69%) or are plantation areas created for the firewood (85%). This situation results from the fact that the forest area is still quite young, and no forest products can be obtained from the area yet. This result also shows that the level of consciousness is rather low among the public about the industrial benefits of forests.

Most of the participants think that city forests provide city with clean air (75%), control winds over the city (46%) and bring visual richness (60%) to the city, which shows that the public is aware of some ecological and aesthetic benefits city forests bring to the city. Again, the participants think forests are places in which urban dwellers can build mutual communication (46%). This is an indication that the awareness of forests being a social setting is gaining ground. However, most of the participants are not of the opinion that the areas of city forests are habitats for wildlife and native plants (38%) and they prevent noise (41%).

It was concluded that the participants of the survey had inadequate levels of consciousness on the benefits of city forest to the ecology and social life of the city. They also had insufficient knowledge on various uses of forest. The presence of urban forest in a city adds many economic, ecological, aesthetic and social values to the city. A healthy city forest that can be used properly in a recreative way and that has spread to a large area gives the city a green character, regulates the urban climate, increases the quality of air and weather, protects soil and enriches biological diversity. When considered from this point of view, it is crucial that Nigde Ataturk City Forest needs to be improved considering the characteristics of city forests listed above, and the public be made more aware of the use of such areas in terms of bringing the public and nature together. Additional activities brought to such a forest area will increase the intensity of use of this area. Apart from its recreational use, area can also be improved so that it can be used towards education. Moreover, celebrations, charity sales and exhibitions can be organized on special occasions in designated places within its borders. The fact

that Nigde Ataturk City Forest is located on one of the main entrance points of the city, increases the value of the area. Creating a developed perception of forest will serve as a significant factor that will give city a distinctive character at the entrance to the city.

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