

Article

The Impact of Visitor Profile on Effective Management of Protected Areas: A Case of Atatürk Arboretum

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Abstract: Protected areas are important for education and scientific research, in addition to making a significant contribution to the economy in terms of tourism and recreation. One of the most important factors in the effective management of these areas are the visitors. In this article, the effect of visitors on the effective planning and management of arboretums, which is one of the protected areas used for scientific research, education, and observation concerning various species of plants, was investigated. This study focused on the visitors to Atatürk Arboretum, segmented into specific subgroups by applying cluster analysis according to their activities. The data were obtained via conducting face-to-face questionnaires with the visitors ($n = 383$) in the area. The cluster groups were characterized by the perceived importance of their desired benefit, and socio-demographic and behavioral characteristics. The socio-demographic characteristics of the visitors were determined using descriptive statistics, and the relations among visitor characteristics were determined through linear regression analysis. The visitor segments which differed from each other significantly were identified as *recreationalists* and *photographers and learners*. This study has practical and managerial implications for understanding the role of visitors in the management of the arboretum. The study revealed that the arboretum was visited for reasons outside of its establishment purposes. These findings might directly help the arboretum managers in improving more effective visitor and resource management strategies.



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1. Introduction

Protected areas are widely recognized as a cornerstone of biodiversity, natural resource management, and sustainable development [1], and they are considered to be the most effective means of conserving and managing natural heritage [2]. Ecosystems meet a range of essential services and needs, such as watersheds and fertile soils for human well-being, as well as the protection of wild areas that contain natural resources and important cultural values, including forest products that local communities depend on to live [2]. Protected areas could be an efficient and effective tool to protect biodiversity, to address the importance of climate change issues, and to maintain critical ecosystem services [1]. Although protected areas were essentially conceived to conserve landscapes and wildlife, they are now expected to achieve an increasingly diverse set of conservation, social and economic goals [3]. In other words, protected areas serve the dual function of the conservation of nature and nature-based tourism/outdoor recreation [4]. In recent decades, the number and extent of protected areas has been increasing at the global level [5]. At present, approximately half of all economic activities related to protected-area tourism are natural area activities [2]. For example, forest recreation is a specific form of an activity in the open air that supports physical activity and psychological wellbeing [6]. Protected areas are the most important destinations for both domestic and foreign visitors for many

touristic and recreational activities [2], and play a vital role in securing human prosperity and enjoyment, comfort, and health [1]. Protected areas are also important for ecological research [2], recreational research [5], and educational activities, and contribute significantly to local economies through sustainable and ecological forms of tourism [2].

Nature-based tourism in protected areas has grown to be an important economic activity worldwide, and it currently makes up a large part of the international tourism industry [7]. The protected area approach is the most important internationally recognized instrument for the protection of ecosystems and species [8]. The management of protected areas is necessary to facilitate the supplies of recreational ecosystem services and perform different functions related to recreational activities [3,9]. The profile of visitors or tourists is very important in the management of protected areas. The understanding of visitor preferences on resources, social conditions (e.g., behavior of visitors) and management conditions (e.g., forest economy) of the natural environment is crucial when developing an efficient strategy for the protected area management [6]. Visitor profile also plays an important role to facilitate the supply of recreational ecosystem services and to promote environmental awareness. It is necessary to improve the efficiency of protected areas to achieve the objectives of biodiversity conservation and the maintenance of ecosystem services, and to promote sustainable development [9].

Arboretums or botanical gardens, as protected areas, are points of attraction in terms of recreational activities for domestic and international visitors. These areas aim to both conserve the environment and educate their visitors. Information about visitors' interests and motivations is required to inform the development of appropriate interpretation strategies [10]. However, it is difficult for resource managers to keep track of detailed visitor profiles and to develop an action plan for better management [11]. Resource managers also face serious issues, in terms of both supply and demand, in managing increasing visitor numbers. Supply refers to the limited number of accessible, resilient sites and the ongoing lack of human and financial resources to manage them. Demand refers to the high level of community concern for the environment and the high level of interest in experiencing it [12]. One strategy to help overcome such problems is the use of market segmentation strategies.

Market segmentation refers to the process of dividing the market into homogeneous segments, profiling and analyzing extracted segments. In this process, an appropriate marketing strategy is also developed and formulated for each segment [13]. Market segmentation is the first stage of creating a marketing strategy, which is the process of dividing markets into groups of potential visitors who have similar needs and/or characteristics [14]. Market segmentation is considered a powerful marketing tool in protected area tourism, since protected area tourism management planners are informed about the interests of visitors in order to make their decisions [15]. This requires identifying the most interested groups with specific goods and services and to guide marketing efforts in the most effective manner [16]. The separation of visitors according to their activities ensures that both the economic contribution and demands of the segments, as well as the environmental profiles, are estimated. This will provide useful results for the establishment of policies for the activities offered to decision-makers [17]. The basic variables used for visitor segmentation are: geographical (e.g., country, region, and population climate), demographic (e.g., gender, age, income, race, socioeconomic status, and family structure), psychographic (e.g., personality and travel motivations), and behavioral (e.g., activities, benefits, frequency of use, and loyalty) criteria [4,18,19]. The selection of these variables greatly depends on the study aim and type, and the managerial demands of the considered destination [13].

The segmentation of visitors according to their characteristics and visit purposes helps resource managers strategically plan the site. Segmentation based on visitor activity also helps resource managers to understand demand. At the same time, more precise conclusions can be reached about how natural resources are used. Protected area managers have to make action plans by considering all users of the resource [17]. For this reason,

market segmentation helps to identify different consumer groups by dividing resource users into different homogeneous groups based on certain activities [13].

Segmentation studies in protected areas mainly relate to visitor activities. For example, Mehmetoğlu [18] segmented nature-based visitors at two wilderness areas in northern Norway according to trip activities. He also examined whether segments differed in terms of trip motivations, travel behavior, and socio-demographic characteristics, and three different groups were identified (i.e., culture–pleasure, nature, and low-activity-oriented). Beh and Bruyere [20] identified three segmented cluster groups—escapists, learners, and spiritualists—in national reserves in north-central Kenya based on the motivations of visitors. A factor–cluster approach was used to identify visitor segment profiles based on their motivations. Mckercher et al. [21] examined segmented cluster groups of visitors in Hong Kong, identifying six activity-based cultural tourism segments: cultural generalists, icon culturalists, Chinese heritage culturalists, Tsim Sha Tsui Nodal culturalists, colonial culturalists, and Sino-Colonial culturalists. The study identified that the cultural generalists were the largest segment, comprising 25% of the sample.

Konu and Kajala [22] also segmented protected area visitors based on leisure motivation factors. They identified four significantly different motivation-based segments: social self-developers; exercising nature explorers; nostalgia appreciative seekers of mental well-being; and nature-oriented relaxation seekers. Benson et al. [23] identified five segmented cluster groups based on activities in Yellowstone National Park in which visitors participated: do-it-all adventurers, windshield visitors, value picnickers, creature comfort seekers, and backcountry enthusiasts. They investigated how benefits vary according to the types of visitors who participate in different activities while at the park. Similarly, Barić et al. [13] segmented visitors based on activities practiced by specific subgroups of visitors to Paklenica National Park, Croatia. The segments were characterized by the perceived importance of desired benefits, travel behavior, environmental commitment, and socio-demographic characteristics. They identified two distinct and managerially relevant segments: active and passive.

Marques et al. [24] identified the diversity of domestic visitors to Portuguese Protected Areas using benefit segmentation. They used the principal components, hierarchical and K-means cluster analyses. Five distinct visitor segments were determined based on the motivation of the visitors. Three segments were nature-focused and two focused on activities or events. Wang et al. [25] examined the effects of socio-demographic factors, personal factors, spatial attributes of residence, satisfaction with park features and the sources of motivation for visiting small urban green spaces in Shanghai. The results showed that relaxation and rest (36%), physical exercise (23%), and meeting friends (21%) were the three most widespread reasons for visit. In addition, the results indicated that socio-demographic factors and spatial attributes of residence affected the frequency of park visitation the most.

Korpilo et al. [26] used a web-based public participation GIS approach to gather data on visitor behavior in Helsinki's Central Park. The results indicated three types of behavior: runners and cyclists, mountain bikers, and walkers and dog walkers. All user groups were mainly motivated by positive attraction towards the environment such as scenic view, exploration, and viewing flora and fauna. Schipperijn et al. [27] investigated the factors influencing the use of greenspace in Denmark. They found the most important reason for visiting green space for 87.2% of the respondents was to enjoy the weather and get fresh air. Kičić et al. [28] researched the socio-demographic characteristics, visiting behavior, and recreational activities of visitors in Forest Park Grmoščica in Zagreb. The study determined that the types of visitors in the forest park are cyclists, joggers, visitors who spend time in Forest Park Grmoščica with their families, and pet walkers.

These examples demonstrate how segmentation studies generally focus on dividing visitors into subgroups (nature visitors, cultural visitors, etc.). Additionally, there are several studies on the values of ecosystem services, such as recreation in woodland or protected areas. For example, Lupp et al. [29] assessed the recreation value of urban woodland

using the ecosystem service approach in two forests in the Munich Metropolitan Region. In 1987, one of the forests was chosen to host an arboretum for the public and for life science faculties. They demonstrated methods to describe recreational demand by collecting data from interviews and using camera traps in the two forests for visitor counting.

As a highly popular form of nature-based tourism, an arboretum is a botanical collection composed exclusively of trees, or containing living collections of woody plants, and intended at least in part for scientific study [30]. Despite the relatively few studies [13,18,29] devoted to activity-based segmentation of visitors to a protected natural area, in many of the aforementioned segmentation studies, visitors' activities were used as a segment descriptor. For example, Benson et al. [23] showed that protected area activities could be useful indicators for the identification of visitor characteristics.

In our study, the visitor profile of Atatürk Arboretum, which was established to contribute to forestry education and scientific research, was identified. The main purpose of this study is to segment and profile the arboretum's visitors based on socio-demographic and behavioral variables. In addition to this, we aim to provide serious management implications from research findings and recommendations for developing more effective management strategies.

The importance of protected areas and living museums (in our case, Atatürk Arboretum, which is a part of a protected forest) in social life is increasing. For these protected areas to be successful, the services they offer need to be delivered to the target group at the right place and time.

2. Materials and Methods

Atatürk Arboretum is located between $41^{\circ}09'48''$ – $41^{\circ}10'55''$ north latitude and $28^{\circ}57'27''$ – $28^{\circ}59'27''$ east longitude, with an area of 295.2 hectares of forest, in the southeast of the famous Belgrade Forest in Istanbul. The lowest point by sea level is 65 m; the highest point is 166 m. The arboretum consists of 289.6 hectares of productive forest area, 3.5 hectare of water, and 2.1 hectare of settlements. All areas outside the 2.1 hectare residential area are state-owned [31]. Atatürk Arboretum is a part of the Belgrade Forest, which is a protected forest, managed within a plan by a forest management directorate. The arboretum is a green space under the Bahçeköy Forestry Management Directorate. It was established for educational and scientific purposes by Istanbul University, Faculty of Forestry (Figure 1).



Figure 1. The location of the study area.

Atatürk Arboretum is currently used for reasons outside of its intended purpose. Recently, while educational visits have declined, some activities such as walking, exploring

nature, taking photos, and enjoying leisure have come to the forefront. Due to the lack of green areas in Istanbul, the density of visitors to the arboretum is increasing day by day. Although the arboretum has different purposes, people mainly use it for recreational purposes. The arboretum provides recreational services to its visitors. However, these are limited to activities such as walking, bird-watching, feeling refreshed, etc. For example, picnicking is not allowed in the arboretum [31].

It was planned that the arboretum would serve as an open “nature laboratory” for forest faculty students and the relevant institutions within the Ministry of Forestry, such as forest engineers and landscape architects, research institutions, domestic and foreign scientists, and nature lovers, to conduct scientific research. It is a living museum that hosts several endemic and exotic plant species from around the world and Turkey [31].

There are two limitations of the study. First, we only considered the number of visitors (158,142) between 2015 and 2017 when constructing the sample. Second, the survey was conducted in fall, winter, and spring due to time constraints. The sample size consists of 383 visitors aged 16 and over (we started at the age of 16 because the arboretum is mainly for educational and scientific purpose and we want to include at least high school students) who visited the arboretum between 20 November 2017 and 20 April 2018. In this study, the quantitative data collection method was a structured questionnaire. Before the main survey, pilot surveys were conducted with 30 people who visited the arboretum. Factor analysis and reliability analysis were carried out to test the validity of the questionnaire and its reliability. As a result of the Kaiser–Meyer–Olkin (KMO) test and its significance value in factor analysis and Cronbach’s alpha result in reliability analysis, some variables in the questionnaire were removed and the questionnaire was modified to collect reliable and valid data. The questionnaire asked the visitors to rate the importance of the activities in which they actually participated in the arboretum, and to indicate the importance of their desired benefits as a reason for visiting the arboretum. Both ratings were operationalized using a 5-point Likert scale ranging from 1 (not at all important) to 5 (very important). Additionally, the questionnaire generated information about the behavioral and socio-demographic characteristics of visitors, such as the time they spent there, the desired benefit they obtained, occupation, age, gender, level of education, and income. All the questions asked were closed-ended. However, some questions which have an “other” option were asked in an open-ended manner in case the visitors could not find an appropriate answer among the provided options. Research data were collected via random sampling through a face-to-face approach using the self-administered questionnaire. As for the location, the survey was implemented near the entrance door of the arboretum and was applied to the visitors who completed a visit. One of every six arriving visitors were asked to participate in the survey. When groups were approached, only one visitor among them was randomly selected. The survey was conducted daily from 11.30 to 16.30, including weekends and holidays, at the arboretum (except Mondays, when the arboretum is closed for cleaning). The sampling location and period were recommended by the arboretum managers as the most appropriate due to the highest visitor flow.

Segmentation studies normally employ statistical methods, particularly cluster analysis, which is one of the multivariate analysis methods. Such analysis is frequently used to define customer segmentation with survey data [22]. In this study, cluster analysis was used for the activities performed by the visitors to obtain market segments with homogeneous properties. Cluster analysis enables the identification of individuals that have similar characteristics to each other and shows homogenous properties within clusters or groups [32]. In this study, the collected data were transformed, coded, and analyzed using the Statistical Package for the Social Sciences 20.0 (SPSS Inc., Chicago, IL, USA). Firstly, K-means cluster analysis, which is one of the non-hierarchical clustering analysis methods, was used to define the target visitor activity groups. Then, to determine the difference between cluster groups based on socio-demographic characteristics, the Chi-squared test of independence was used. Data were then analyzed using the Mann–Whitney U test.

Different cluster solutions were used to find the correct number of clusters. Trials with two, three, and four clusters were carried out.

3. Results and Discussion

Activities such as photography, nature photography, filming/advertising, walking, education, scientific research, bird-watching, and spending leisure were the most common ones performed by visitors based on our previous observations, all of which are allowed by the arboretum managers.

In this case, K-means cluster analysis was conducted to segment the arboretum visitors according to visitor activity. Table 1 shows the final cluster center solution and F values. Information about socio-demographic variables, such as gender, age, education, occupation, and income of the arboretum visitors, was obtained through surveys. The findings are presented in Table 2. The final cluster solution of two clusters was accepted to be the most suitable based on the results of the cluster formation and Z-scores. The first segment represented 35.8% ($n = 137$) of the total sample and is labeled *recreationalists* (Cluster 1). The activities related to this segment were walking, bird observation, and spending leisure. The second segment is named *photographers and learners* (Cluster 2). Cluster 2 represented 64.2% ($n = 245$) of the total respondents and includes those who were predominantly performing activities such as photography (engagement, wedding, etc.), nature photography, film/advertising, education, and scientific research (Figure 2).

Table 1. Mean values of clusters by activities.

Activities	Z-Scores		sd	F	Significance Level ** (p)
	Recreationalist	Photographers and Learners			
Photography (engagement, wedding)	−1.06098	0.54670	1	509.075	0.000
Nature photography	−1.06638	0.56829	1	555.139	0.000
Film/advertising	−0.60622	0.33463	1	92.399	0.000
Walking	0.26872	−0.17763	1	17.243	0.000
Education	−0.29064	0.14399	1	16.006	0.006
Scientific research	−0.27587	0.14181	1	15.02	0.003
Bird observation	0.43105	−0.21386	1	38.588	0.000
Spending leisure	0.45912	−0.27631	1	50.581	0.000

Significance level ** = $p < 0.01$.

Table 2. Differences between clusters according to socio-demographic characteristics.

Socio-Demographic Characteristics	Recreationalists (%)	Photographers and Learners (%)	Total Sample (%)	χ^2
Gender	Female	47.2	64	9.442 **
	Male	52.8	36	
Age	16–20	18.1	26.8	14.413 **
	21–30	62.2	51.8	
	31–40	7.1	15.8	
	41–50	10.2	3.9	
	51–65	2.4	1.8	
	66 and above	-	-	0.3
Education	High school	5.5	9.2	5.698 **
	College/University	82.7	76.8	
	Master's Degree	8.7	13.2	
	Doctorate	3.1	0.9	

Table 2. Cont.

Socio-Demographic Characteristics		Recreationalists (%)	Photographers and Learners (%)	Total Sample (%)	χ^2
Occupation	Unemployed	0.8	4.4	3.4	4.480
	Public sector	13.4	10.5	12	
	Private sector	19.7	19.7	19.8	
	Self-employed	6.3	6.6	6.3	
	Housewife	1.6	2.6	2.6	
	Student	57.5	55.3	54.8	
	Retired	0.8	0.9	1.0	
Household income (USD)	<243.54	8.7	8.1	8.2	4.213
	243.71–434.89	13.5	16.6	15.4	
	435.07–608.85	21.4	17.9	19.9	
	609.03–782.81	27	35	31.3	
	>782.98	29.4	22.4	25.2	

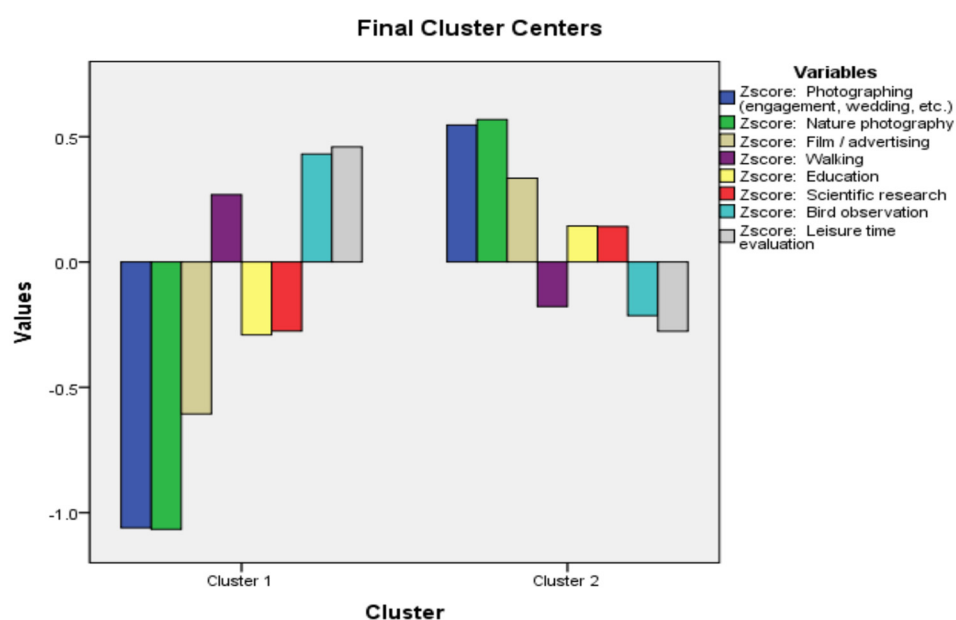
Significance level ** = $p < 0.01$.

Figure 2. Distribution of mean scores by clusters.

In our study, we asked the visitors about the arboretum services, which are the most common activities performed by visitors based on our previous observations, and which are also limited by the arboretum managers. According to the results for both cluster groups, walking, spending leisure, nature photography, and photography (engagement, wedding, etc.), were the most highly performed activities, whereas filming/advertising, bird observation, and scientific research were the least. However, in the case of education, *photographers and learners* (10.5%) performed better than *recreationalists* (3.9%).

Approximately 60% of respondents from both clusters considered the satisfaction level of the services offered in the arboretum to be “good”, about 35% to be “very good”, and about 5% to be “neither good nor bad”. There were no respondents who evaluated the arboretum as “very bad” during their visit. We asked the visitors about disturbing or negative factors that affected them during their visit in order to identify the conditions of the visiting place. According to these results, 39.7% of the respondents specified the low availability of a toilet, lack of a signboard, and the absence of a representative to introduce the arboretum as negative factors. Additionally, these negativities were accepted as the factors affecting the quality of the service received during the visit to the arboretum.

In the study, visitors were asked how they were made aware of the existence of the arboretum. Most of the participants in both clusters had heard of the arboretum from friends/relatives (57.4% of *recreationalists* and 51.8% of *photographers and learners*) and the arboretum's website (31% of *recreationalists* and 41% of *photographers and learners*). In terms of printed and visual media or brochures/promotional booklets, the response was relatively low.

Segment differences in socio-demographic characteristics are presented in Table 2. The results of the Chi-squared (χ^2) test of independence indicated no significant differences between segments in terms of occupation ($\chi^2 = 4.480, p > 0.05$) and household income ($\chi^2 = 4.213, p > 0.05$). However, there were statistically significant differences between the segments in terms of gender ($\chi^2 = 9.442, p < 0.05$), age ($\chi^2 = 14.413, <0.05$), and education ($\chi^2 = 5.698, p < 0.05$). When we compare both cluster groups in terms of gender, there were more female (64%) respondents than male in the *photographers and learners* cluster.

The recreationalist male (52.8 %) respondents were more numerous than female respondents. The overall age distribution showed a noticeable skew towards the age range of 21–30 years old, accounting for a high percentage compared to other age ranges (*recreationalists* = 62.2% and *photographers and learners* = 51.8%). When the education levels were examined, college/university had the highest rate (*recreationalists* = 82.7% and *photographers and learners* = 76.8%). In terms of the occupation of the participants, more than half of the participants were students. Additionally, when we focus on household income, *recreationalists* (29.4 %) and *photographers and learners* (22.4%) earning USD 782.81 and above had a high percentage. From the result of the analysis, we found that more than half of both cluster group visitors spent two to three hours in the arboretum. An inspection of mean scores indicated that watching and enjoying nature, resting and relaxing, and being far away from a crowded and stressful environment had the highest mean values for both clusters. It can be observed that feeling refreshed and spending time with friends had the lowest mean values for both cluster groups. When we compare both clusters, some characteristics had almost the same benefit for both clusters (Table 3). There is no significant difference between the clusters according to the Mann–Whitney U Test.

Table 3. Descriptive statistics showing the importance of the obtained benefits for each cluster.

Desired Benefit	Recreationalists	Photographers and Learners	Total Sample	Significance Level
	(Mean)	(Mean)	(Mean)	
Watching and enjoying nature	4.49	4.54	4.53	0.550
Resting and relaxing	4.45	4.35	4.41	0.417
Feeling refreshed	4.22	4.13	4.18	0.508
Being away from crowded and stressful environments	4.41	4.38	4.39	0.590
Spending time with friends	4.23	4.20	4.22	0.338

The findings of the study reveal that the arboretum is an attractive destination for a well-educated and relatively young population of nature-based visitors. The findings of this study are similar to [8,13,21] in the variables of age, education, and household income, and to the results of the study conducted by Konu and Kajala [22] in the variables of age, gender, and education level. This information might serve as a reliable input not only for protected area managers in developing more concrete marketing strategies, but also for other relevant local stakeholders involved in the planning and management of tourism in surrounded coastal settlements.

Meyer et al. [33] studied local recreation in an urban forest and a rural forest in southern Germany via surveys in winter and summer. They mapped the forest visitors' pathways and asked them about their perceptions of forest benefits. The visitors gave high ratings to benefits such as experiencing nature, escaping everyday life, and health. A weak relationship was found between recreational behavior and demand for specific forest

characteristics. In the study for the arboretum, the visitors to the arboretum were segmented into two clusters and the benefits each cluster analyzed separately. It was seen that both clusters gave high ratings to exploring and enjoying nature. Carvache-Franco et al. [34] carried out a survey in the Posets-Maladeta Natural Park located in Spain. They analyzed the data via exploratory factor analysis, confirmatory factor analysis and non-hierarchical segmentation of K-means. The results revealed that the existence of three segments of ecotourists: “reward and escape”, “nature” and “multiple motives”. These motivations of tourists are almost identical to the visitor motivations of this study.

Wang et al. [8] determined based content analysis of tourists’ perceptions and expectations for Wuyishan National Park. According to the results, the tourists are primarily concerned with the recreational and environmental functions and they were less concerned about scientific research and local livelihoods. The present study demonstrated that the arboretum visitors are less interested in scientific research activities, similarly to that of Wang et al. [8]. Auguścik [35] studied the tourist traffic in the Forest Arboretum of Warmia and Mazury in Poland. The study revealed that the arboretum was mostly preferred for rest and recreation combined with natural education as in Atatürk Arboretum. Hornoiu et al. [36] determined that the tourism activities were the most preferred by the young tourists in the protected areas, such as photography and landscape painting, studying the flora and fauna, cultural sightseeing, and special guided hikes. Some of these activities are similar to the visitors’ activities in the arboretum.

Insights into a different perspective on the desired benefits of an arboretum might assist the arboretum managers to develop more specific strategies for improving specific physical, social, and managerial characteristics, and thus enhance the opportunities for target activity groups to attain these desired benefits. Regarding the desired benefits of the visiting area, both clusters found the benefit of watching and enjoying nature to be “very important”. This finding is similar to the results of [13,18,34]. However, for *photographers and learners*, the benefit of being far away from crowded and stressful environments was the second most important benefit, whereas for *recreationalists* this benefit was the third most important. This could have practical and managerial implications for arboretum managers, who primarily expect sound scientific and site-specific recommendations, rather than coarse theoretical justification.

4. Conclusions

In this study, the visitor profile of Atatürk Arboretum, which was established to contribute to forestry education and scientific research, was identified. The study showed that market segmentation based on the activities of visitors can be seen as a reliable and stable approach that enables a deeper examination of demand.

The arboretum is an attraction point owing to its ease of access and the beauty of its landscape. The arboretum has a satisfactory income as the visitor potential exceeds the carrying capacity. In other words, it has a strong financial structure. However, the purpose of the visitors to visit the area and the establishment purpose of the arboretum do not overlap with each other. The arboretum is mostly visited for the activities such as filming/advertising, photography, etc., which are outside of its founding purpose. In fact, the arboretum is a living plant museum. It was established to serve as a laboratory to scientific research carried out by domestic and foreign researchers. In addition, it aimed to inform all students and the surrounding people about herbaceous-woody plant species and to contribute to the development of environmental protection awareness. The fact that the arboretum is gradually moving away from its establishment purpose stands out as a managerial problem.

This study has managerial and practical implications. The visitor segments can contribute to the knowledge and experience of the arboretum managers. The practical implications involve market segmentation offering benefits to the managers by allowing them to plan more efficient strategies.

According to these results, the following recommendations can be suggested for arboretum managers in an efficient resource management:

- The establishment purposes of the arboretum should be reviewed again and necessary arrangements should be made. The managers of sensitive areas such as arboretums face serious issues in managing the increasing number of visitors. Even though they constitute a significant part of the arboretum's revenues, activities such as filming/advertising or photography (wedding/engagement, etc.) should be prohibited for the health of the area. In addition to its main purposes, such as education and scientific researches, non-destructive activities such as walking, nature photography and spending leisure may be allowed in the arboretum.
- The arboretum managers should make necessary arrangements in the area and focus on eliminating disturbing factors and negative effects to provide better services. For example, having a guide to introduce the area or placing signboards will help visitors to access the services offered more scientifically and healthily.
- The arboretum managers should determine efficient resource management strategies. The managers should prepare resource management plans by considering conservation and the sustainable use of the resources for future generations.

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