

Research Article

**Peri-urban forests: an exploratory study of users' recreational activities:
The case of the El Meridj-Est recreational forest in Constantine, Algeria**

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Abstract

Peri-urban forests are wooded areas under the influence of urbanization and are becoming increasingly attractive as recreational areas for urban populations. This study focused specifically on the El Meridj-Est recreational forest, located in Constantine, the capital of eastern Algeria. This study selected this forest as the main case study because of its distinction as the region's most frequented woodland site. This research aimed to understand the practices of 350 users of this forest and to identify the determining factors behind the high affluence at El Meridj. This study also examined their individual and family perceptions, expectations, and concerns, adopting a methodological approach combining detailed qualitative and quantitative social survey techniques. This study fills a research gap in the field of peri-urban green space management with regard to social interactions and recreational activities in these spaces. It also highlights the importance of taking local specificities into account when studying recreational spaces. These results, potentially generalizable to other similar geographical and cultural contexts, offer practical perspectives for the management and conservation of peri-urban forests while minimizing the negative impacts of anthropogenic pressures leading to the degradation of these natural environments.

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Introduction

Modern society is evolving rapidly with scientific advances and major industrial discoveries, leading to an exponential increase in the world's population, exceeding 7 billion individuals in 2014 (Gherraz, 2021). By 2030, more than 60% of this population will live in cities (Nóblega-Carriquiry et al., 2023), which are already responsible for almost 75% of global CO₂ emissions (Kefale et al., 2023). Population growth and peri-urban expansion, accompanied by distinct phenomena linked to the unequal distribution of individuals, are causing major landscape upheavals on a global scale (Salbitano et al., 2017). They have

endangered human well-being and that of nature (Sarabi et al., 2023).

To meet these challenges, contemporary society has set itself new objectives aimed at ensuring human survival in the best possible conditions, while promoting coherent development in harmony with the environment (Clergeau and Machon, 2014). Natural activities and spaces have had a profound impact on territories, with the new planning challenge emphasizing the greening of cities, public gardens, green facades, urban parks, urban and peri-urban forests have gained considerable importance in recent years (Van Uffelen, 2013). Several research studies have highlighted the importance of urban and peri-

urban forests during the global COVID-19 pandemic (Oprica et al., 2022). The economic and societal confinements of 2020 and 2021 have been associated with risks to the physical and mental health of confined people. In this situation, the importance of spending time in forests has become more evident than ever, and contact with public green spaces is now considered to have a more important role in the mental and physical health of individuals than before the pandemic (Ugolini et al., 2021). A recent study of 1,000 European cities even showed that greening these areas could save up to 43,000 human lives every year (United Nations Economic Commission for Europe, 2021).

However, these forests are also a habitat for many terrestrial species worldwide, including in Africa. Unfortunately, their decline due to human activities represents a serious threat to their survival and persistence, thus contributing to the growing loss of biodiversity (Cueva et al., 2022). Urbanization of cities encroaching on natural territories disrupts ecological balances, alters the landscape, and creates obstacles that impede the free movement of wildlife. As a result, certain species populations become isolated, reducing their genetic diversity and making them more vulnerable to environmental change and natural disasters (Maseko et al., 2023).

As a result of this context and the social phenomena that also have direct effects on natural environments, forest frequentation needs to be regularly re-evaluated quantitatively and qualitatively through sociological surveys carried out at various territorial scales to understand the extent of the social function that has developed alongside increasingly stressful lifestyles (Zhang et al., 2022), and to know the practices and perceptions of users in wooded areas, but also to plan developments intended for them (Papillon, 2014). In addition, visitor monitoring can identify conflicts between visitor groups, potentially problematic areas in recreational spaces and future trends (Cassford and Muhar, 2023).

This is the background to the present research, which is of crucial importance in the study area, where there is a lack of landscaped urban green spaces with a total ratio of only 5.39 m² per inhabitant (The Environment Department, 2022), well below the 9 m² recommended by the World Health Organization (Yang et al., 2023). This care has led to increased pressure on the use of peri-urban forests.

In Algeria, Constantine is a wilaya that plays a leading role in the country, historically, geographically, and economically (Benghadbane and Khreis, 2019). It is a cultural, educational, and industrial epicenter that deserves special attention in terms of scientific research. However, there is very little research focusing on the assessment of social interactions and recreational activities in the peri-urban forests of this region. It is in this context that the contribution stands out, highlighting an in-depth analysis of forest use carried out specifically in a peri-

urban area known as "El MERIDJ-EAST". As a result, this study aimed to take stock of users' practices and to assess their level of satisfaction in relation to various aspects. The reason for choosing this forest is based on previous research, which confirms that this natural area, "El MERIDJ-EAST", is the most popular public green space and leisure area in the wilaya, with 31% of the population using green spaces in 2009 (Ali Khoudja, 2010) and an updated percentage of 51% of the population of Constantine in 2022, ahead of the El Baaraouiaa El Khroub forest (Benmechiche et al., 2022).

This article focuses on the practices of forest users, and why they choose this peri-urban woodland area over others. So, who are the users of the EL MERIDJ forest? What are their main activities? Is proximity the main determinant of outings organized in this natural area, or are there other reasons? Do not the perceptions, satisfactions, and individual and family concerns of users determine a wide variety of visits?

The importance of this research lies in the fact that this management, which was traditionally planned for the long and very long term, is now being disrupted by spatial and social developments that are not synchronized with natural biological cycles. There is a significant gap between the slow regeneration of forests and the often rapid evolution of social demands (Wartmann et al., 2021). Understanding these evolutions is crucial to consider holistic management that benefits human societies, ecosystems, and biodiversity (Tarasewicz and Jönsson, 2021).

The geographical location of the Wilaya of Constantine: the nerve center of eastern Algeria (Figure 1). Constantine is located 431 km from the capital, Algiers, 245 km from the Algerian-Tunisian border, 89 km from Skikda to the north, and 235 km from Biskra to the south. Its strategic location, equidistant from the coastline to the north and the Aures massif to the south, provides a link between the southern and coastal towns (Gherraz, 2021).

The forest heritage of the wilaya of Constantine

The socio-spatial and forestry characteristics of the research area were presented using maps and figures to grasp its particularity in terms of forest areas. The forest cover of the wilaya of Constantine extends over almost 27,000 ha with a rich and varied flora spread over the twelve communes (Figure 2). It is classified into two forest categories: natural forests and recreational forests (Conservation des forêts, 2023). Constantine's forests are veritable green jewels, fragile ecosystems that require special attention to avoid any harmful or destructive action (Haichour and Benabdeli, 2022).

Presentation of the El Meridj-East study area

The study area is an integral part of the Constantine state forest and stands out as the region's most popular recreational woodland (Figure 3). Occupying

a historical area of 2,220 hectares 76 ares 75 centiares (in accordance with the Senatus consult of 1883), this area was originally made up of eight cantons, including EL Meridj, which originally encompassed

an area of 320 hectares 47 ares 06 centiares. However, subsequent plot adjustments have reduced its current size to 202 hectares. It is located 07 km east of the city of Constantine.

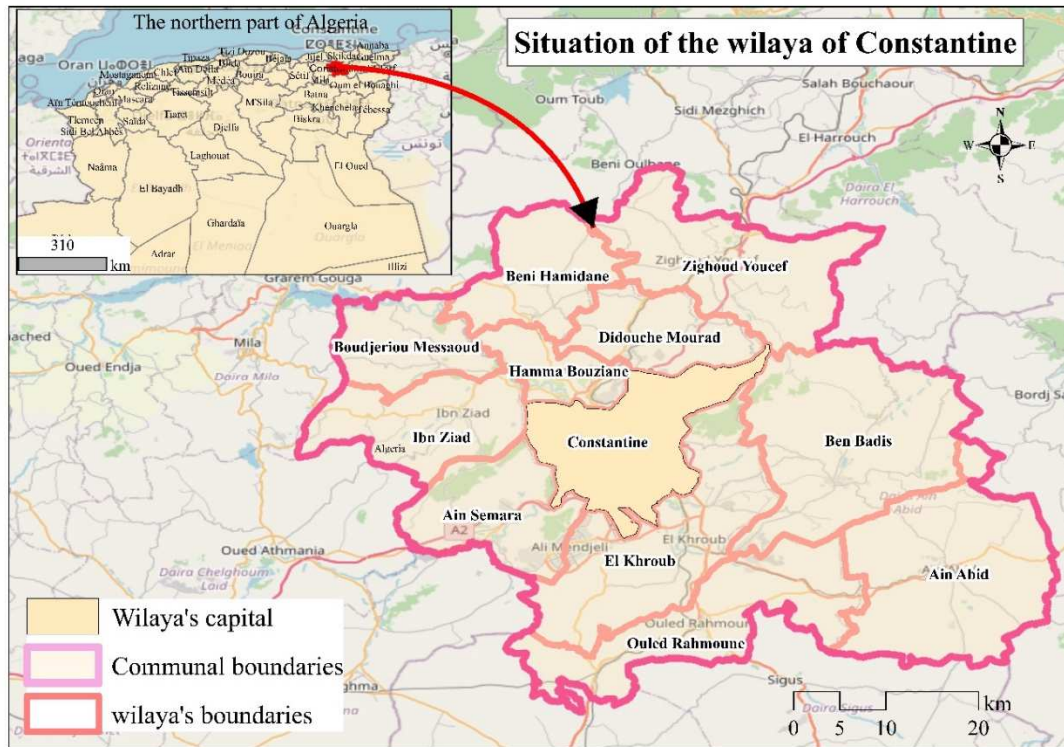


Figure 1. Location of the wilaya of Constantine.

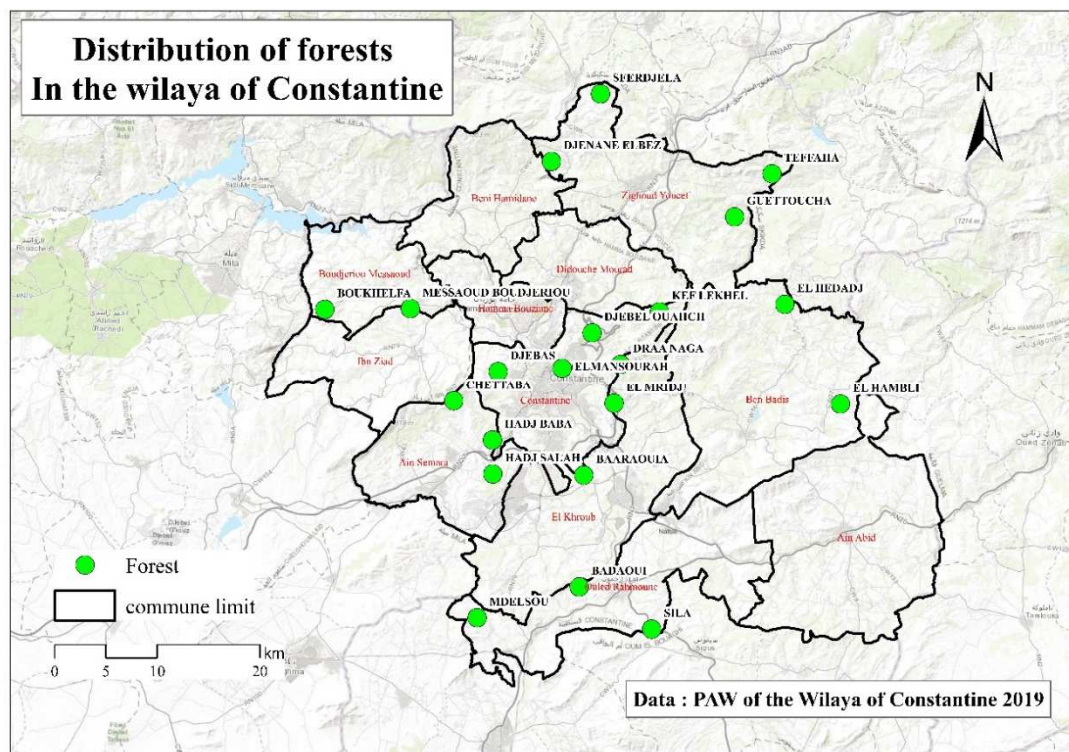


Figure 2. Forest distribution in the wilaya of Constantine.

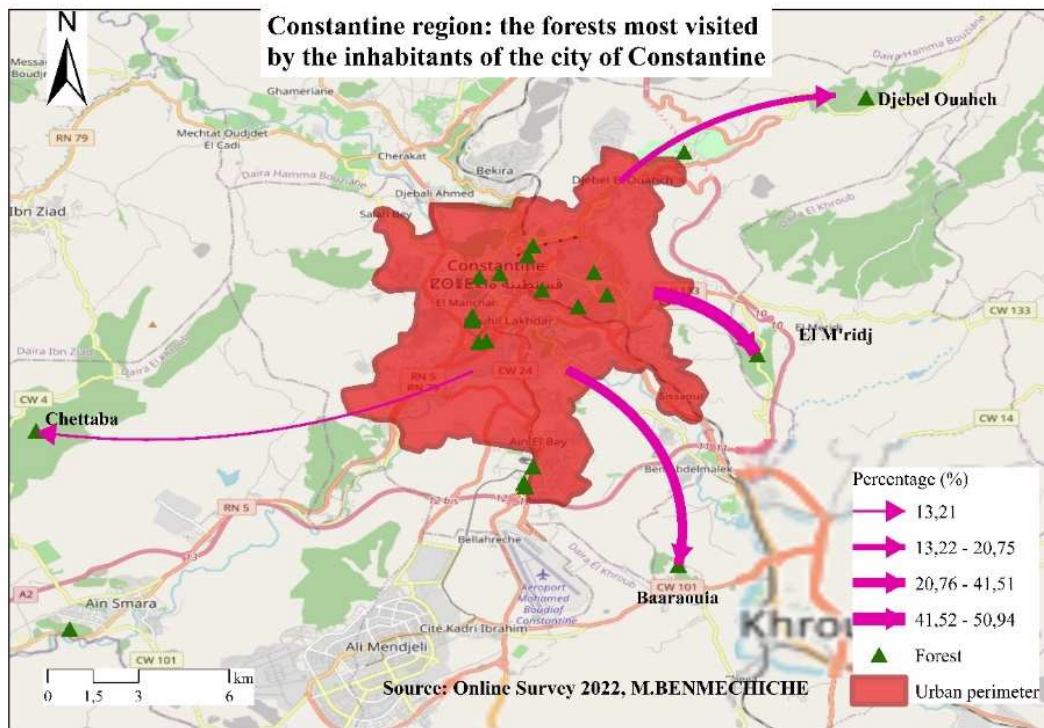


Figure 3. The forests most frequented by the inhabitants of the Constantine region.

This area, part of a peri-urban context between the communes of Constantine and El Khroub, is of particular interest due to its strategic location within the wilaya of Constantine. It is bordered by agricultural land to the north and east and by the east-west freeway to the east (Conservation des forêts, 2023). With a planned developed area of 30 ha, this zone is accessible from the East-West freeway to the east and crossed by a communal road linking the two major towns in the wilaya of Constantine, attracting many visitors from the region and beyond, particularly at weekends and on public holidays. As a state-owned forest, referenced in section 08, islet 06, El Meridj-East plays an essential role in preserving local biodiversity and ecosystems. The area's vegetation is characterized by a diversity of species, including both coniferous and deciduous trees. Among the most remarkable species are Aleppo pine, cypress, eucalyptus, and holm oak, as well as a few specimens of ash and cedar (Conservation des forêts, 2023).

Comprehensive analysis of the ecological components and amenities of the El Meridj-East recreational forest

As part of the academic study, this study focused on the physical components of the study forest, carefully examining its remarkable features for a better understanding of the user behavior analyzed later in this research. The diagnosis of these components was carried out during several field trips, offering a direct approach and in situ observation of its various features. This field methodology enabled us to collect precise

and detailed data, as well as objectively assess the elements studied while comparing what actually exists in the forest with all that was proposed in the forest redevelopment plans in 2012 at the level of the forest conservation authority of the wilaya of Constantine. This leisure area includes water features in the form of two half-drained lakes, a waterfall, and an artificial river (Figures 4 and 5). It also features play and relaxation equipment, bronze fountains, animal statues, sewage systems, water supply systems, outdoor lighting, and reception facilities (hut, separate sanitary facilities, multi-service kiosk, and restaurant).



Figure 4. Essential components of El Meridj forest.

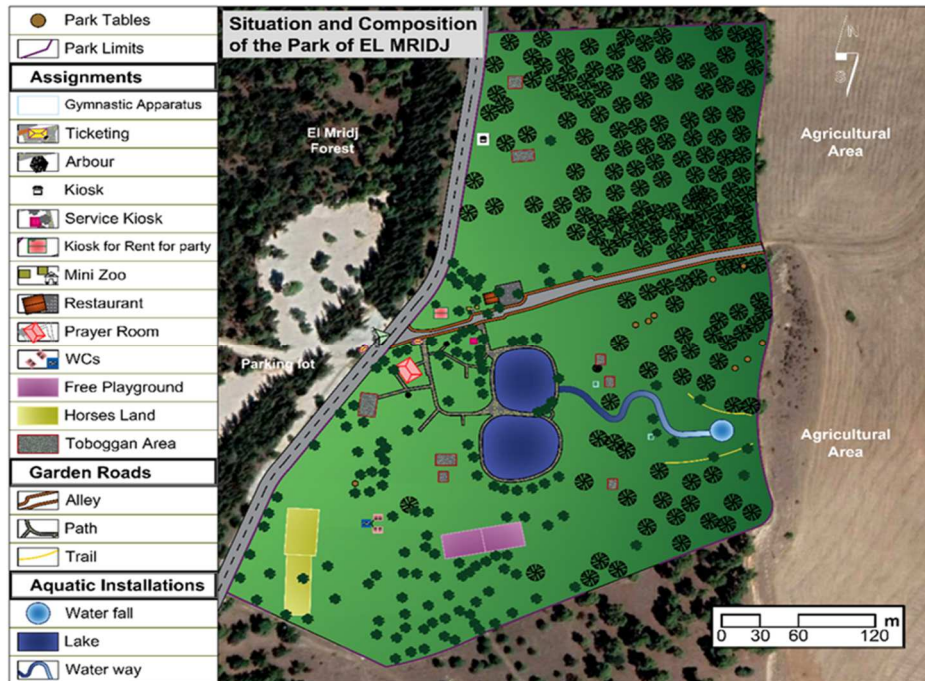


Figure 5. Location plan and composition of the El Meridj-East recreational forest.

Materials and Methods

The methodology employed in this study was carefully designed to address the research problem, utilizing both traditional and modern survey approaches. This study sought to gather comprehensive insights by employing a social survey method, integrating both questionnaire administration and face-to-face interviews.

Data collection

To conduct the survey, a total of 70 respondents representing diverse households, encompassing a total of 350 individuals, were selected. It is noteworthy that the average family size in Algeria is approximately 5 people per household, as reported by the Office National des Statistiques in 2021. A strategic decision was made to conduct part of the survey within the forest, targeting users randomly selected on-site. This face-to-face approach aimed to establish a higher level of certainty regarding the authenticity of each respondent as a genuine user of the forest ecosystem.

During the face-to-face interviews, participants were individually engaged to fill out questionnaires. This personal interaction allowed for in-depth discussions on the subject, providing a platform for users to express their opinions and motivations in detail. The interactive nature of this approach facilitated the development of ideas, enabling us to not only listen to participants but also raise awareness regarding the value of the ecosystemic services provided by the forest. To prevent bias and ensure diversity in responses, interviews were conducted separately to avoid obtaining similar answers. The

tangible contact with the realities of the users and on-the-spot interviews held significant value, contributing to the richness of the gathered data (paper questionnaire).

The second phase of the survey was conducted online, spanning from the beginning of December to the start of February. A quantitative questionnaire tailored for forest visitors was distributed through social networks such as Facebook and LinkedIn. Participants were encouraged to share insights into their leisure activities within the forest. The online approach allowed for efficient data collection from a large number of individuals, overcoming field-related challenges.

In the final phase, all questionnaire responses were meticulously entered and processed using the "Sphinx Survey" software. Sphinx Survey is a powerful tool designed for survey data analysis and management. Its primary purpose is to facilitate a systematic and comprehensive examination of collected responses, allowing for a nuanced understanding of the survey data. The software employs advanced features that streamline the processing of responses. One of its key functionalities is the capability for flat sorting, which involves organizing responses in a straightforward manner. This allows researchers to identify patterns and trends within individual variables, providing a detailed snapshot of the dataset. Furthermore, Sphinx Survey excels in cross-sorting, a feature that enables the comparison of results based on different combinations of variables. This is particularly valuable in our study, where we aim to explore the intricate relationships between various factors influencing perceptions and

behaviors toward forest ecosystems. Cross-sorting enhances our ability to draw meaningful connections between different aspects of the survey data.

The software's visualization tools play a crucial role in presenting the analyzed data. By transforming raw data into graphical representations, the Sphinx Survey facilitates a more accessible interpretation of results. Researchers can generate charts, graphs, and other visual aids that contribute to a clearer presentation of findings.

In conjunction with survey tools, this study seamlessly integrated ArcGIS 10.8 software, serving as a critical technical asset to expound upon the complex dynamics inherent in the Constantine forest landscape. By harnessing its advanced Geographic Information System (GIS) capabilities, ArcGIS provided an exhaustive platform for spatial analysis and mapping, significantly amplifying the research's depth and breadth. The software played a pivotal role in presenting a geospatial perspective to specific data, allowing for an enriched understanding of the studied phenomena. The research used ArcGIS to create a detailed cartographic representation, providing a nuanced view of the spatial distribution of forest heritage in Constantine. This technical approach not only enhanced the exploration of forest ecosystems but also identified frequented areas, revealing patterns of human interaction and enriching ecological analysis within the wilaya with a full spatial context.

Results and Discussion

Examination of the results revealed that 64.3% of respondents, representing their families, were women, while men made up the remaining 35.7%. These results suggest a clear prevalence of the female population, indicating that they are proportionally more numerous than men, even if they are rarely present alone. Forest use is, therefore, not evenly distributed. The age of those interviewed varies between (16-29) and (30-49), with a percentage of 40% for the former and 48.6% for the latter. Users aged between 50 and 64 are less numerous than the others, with a percentage of 11.4%. For people aged 64 and over, advancing age determines a decrease in outings, with a percentage of 0%. These results reflect the large presence of the young population in the forest, but advancing age implies the appearance of difficulties that are reflected in the lower levels of use, as shown in Figures 6 and 7. Understanding the age distribution among forest users is crucial, as it can significantly impact their preferences and needs. Different age groups may harbor distinct expectations and experiences when interacting with a forest or green space (Zhao et al., 2022).

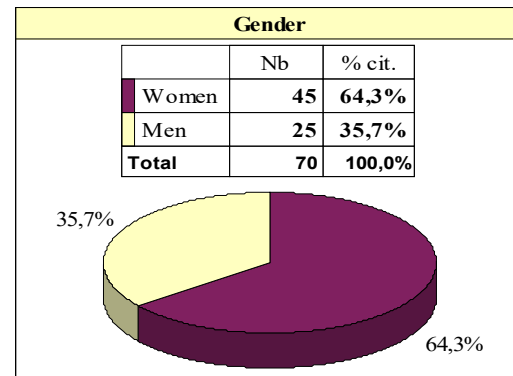


Figure 6. Gender profile of interviewees.

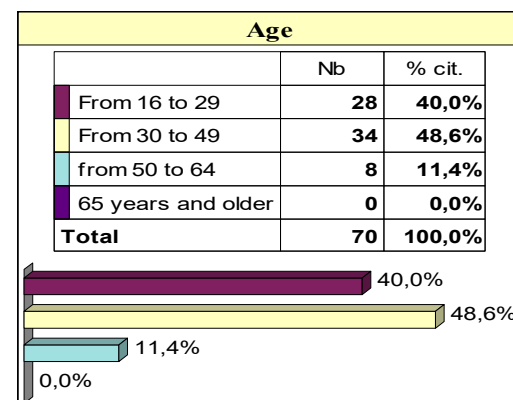


Figure 7. Age categories of interviewees.

Face-to-face social survey- online social survey- statistical data- processing results

Quality maintenance- A quantitative questionnaire- All the information collected to understand users' recreational behavior- Data analysis using Sphinx plus statistical software. From a socio-professional point of view, the most widespread class of interviewees is senior management with 31.4%, the majority of whom are doctors-pharmacists and university lecturers, followed by other employees with 27.1%, students with 18.6%, respondents with no activity with 15.7%, most of whom are housewives, and 0% for the retired and blue-collar class, see (Figure 8). Comparing population figures by SPC¹ shows a strong relationship between intellectual level and presence in the forest, which fully confirms certain findings and analyses that were made as part of the sociological surveys carried out by INSEE² on recreational uses of peri-urban forests, clearly showing correlations between levels or types of frequentation and the profession of users (Papillon, 2014). Executives, higher intellectual professions, and certain elites frequented woodland and forest areas more often, where they had imposed their references in the face of the uses and "consumption" of these areas by the more working-class classes. According to the researchers, blue-collar

¹ SPC : Socio-professional class

² INSEE: French National Institute for Statistics and Economic Studies

workers were less frequent visitors to the woods and seemed less attracted to the natural environment than the elite.

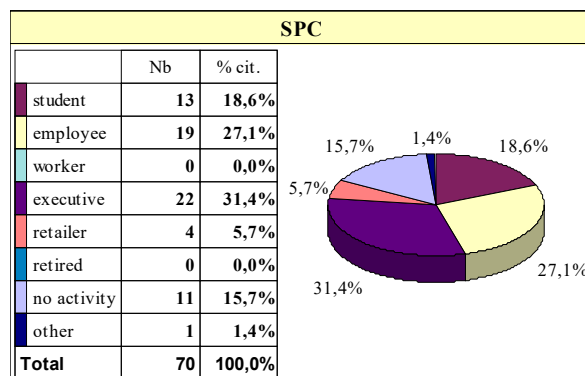


Figure 8. Socio-professional category of interviews.

As confirmed in a previous survey of users of green spaces in France, city dwellers in large conurbations, both in the provinces and in Paris, go to the forest less often than rural dwellers. Logically, city dwellers are more likely to visit "parks and green spaces in the city" (Granet and Dobré, 2021). In contrast, in this study forest, all of the users surveyed live in urban areas, the majority of them in the new town of Ali Mendjeli (42.9%). These city dwellers express a clear lack of natural spaces in their town, prompting them to use the forest as an alternative to urban green spaces, which today represent major environmental and social challenges that urban planning should not ignore, especially in newly-created towns such as Ali Mendjeli. An equally significant 32.9% of users come from the city of Constantine despite the presence of several colonial gardens that may not be conducive to their roles. Some users also tell us that they may need a change of environment to avoid monotony and routine. Only 14.3% of users live in the same commune where the forest is located, which may be interpreted as the presence of another peri-urban forest, "Baraouia", in the commune of Elkhroub, which is also very attractive in Constantine. 1.4% of users questioned came from Jijel, another wilaya in Algeria (Figure 9), so most regular users and some visitors are not local residents of this forest but rather people from nearby urban or peri-urban areas who are looking for a natural environment in response to the lack of green spaces in their towns. With the answers to this question, the attractiveness of the forest has already been indirectly measured.

Knowledge about gardens, parks, and forests in Constantine

The answers to this question show that public green space is a fairly important place for respondents in terms of their well-being and quality of life: 52.9% perceive it as a garden, 47.1% as a park, it represents nature for 44.3% and a leisure space for 44.3%, it also represents a forest for 37.1%, 10% gave other answers,

or it represents for them a soothing, relaxing and restful space (Figure 10).

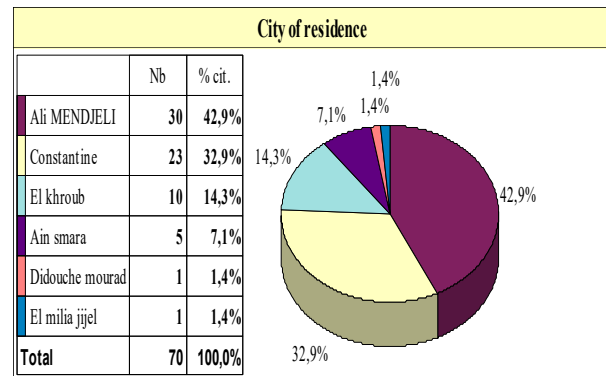


Figure 9. Interviewers' city of residence.

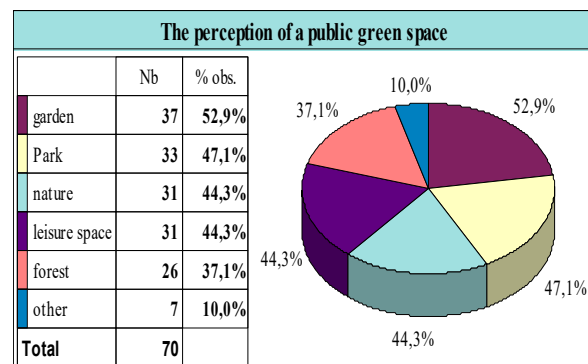


Figure 10. The perception of a public green space.

52.9% of respondents said they had no public green spaces near their homes, indicating limited access to parks and public gardens. This can be interpreted by a variety of factors, such as the non-availability of free land for the creation of local green spaces or urban planning policies that do not sufficiently encourage their development (Figure 11).

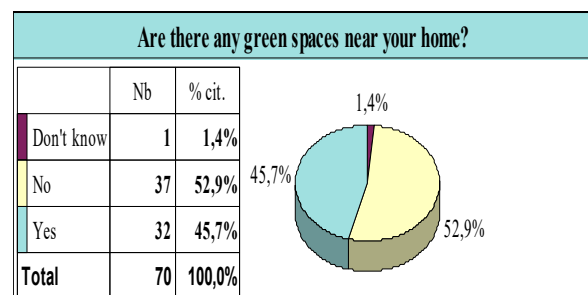


Figure 11. Presence of public gardens.

The entire survey population (100%) prefers large-scale nature areas such as parks and forests for a variety of reasons. According to respondents, these large green spaces offer more room to relax and escape from hectic city life. They also attract because of their natural diversity, offering a variety of flora and fauna to explore. On the other hand, the feel-good factor directly affects their choice of open spaces; as all

respondents seek privacy and to feel comfortable and free, they also look for more activity options such as hiking, picnicking, and running. So, for these reasons, people may find something to suit their interests in large-scale green spaces, preferring them to squares and small gardens (Figure 12).

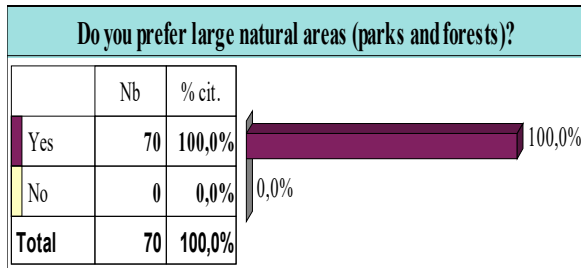


Figure 12. Preference for large green spaces.

Use of the EL MERIDJ-EST recreational forest

Figure 13 shows that 72% of respondents have been frequenting the forest for a very long time, meaning that they have visited the forest regularly over an extended period, with a sizeable number of respondents having frequented it since childhood and for many years. This could indicate that forest use in adulthood is often correlated with use in childhood: those who had the opportunity to go to the forest as children will go to the forest more often as adults. It is interesting to note the diversity of responses received regarding the frequency of forest visits. Of those interviewed, 35.7% visit the forest with no defined frequency, 5.7% visit regularly every week, 28.6% visit once a month, and 30% visit only once a year or less frequently. This diversity of frequency reflects the different interests and preferences of users, as well as the variability of social or seasonal situations. The frequency of visits serves as an indicator of stability, which sheds light on the understanding of user behavior (Figure 14).

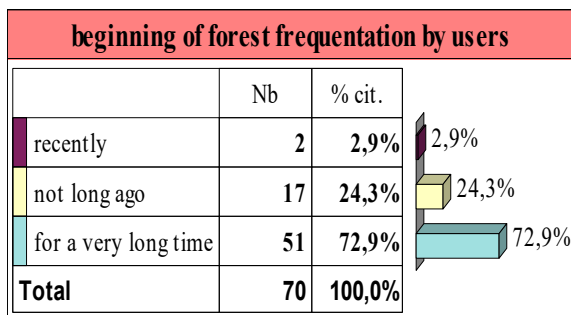


Figure 13. Beginning of forest frequentation by users.

As soon as the weather is fine (95.7%) in spring and summer (34.3%), the interviewees come to enjoy the good weather. These seasons, which are generally considered pleasant for enjoying nature, attract more visitors. The presence of special events or activities during these seasons, such as guided hikes or educational programs, also contributes to the

attractiveness of the forest. So, favorable weather directly determines forest visits (Figure 15).

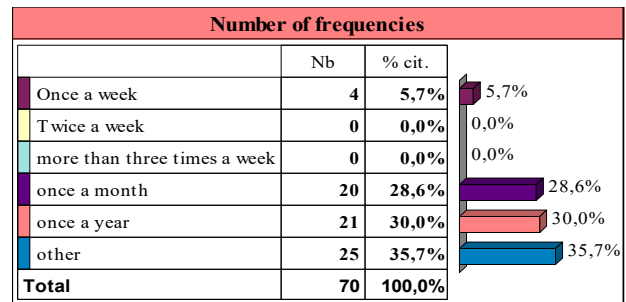


Figure 14. Frequency of visits to the forest.

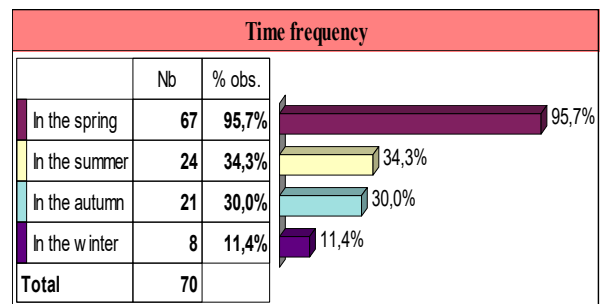


Figure 15. Time frequency.

The majority of visitors (65.7%) spend a considerable amount of time in the forest, with visits lasting more than 2 hours, while (31.4%) of the sample spend between one and 2 hours. Despite a lack of precision in terms of time spent in the forest, the inclusion of three headings ensures that the data is not distorted and also highlights the major social trends that emerge from the analysis of the survey results. According to these results, it is important to monitor the amount of time spent in the forest to avoid over-frequentation to the detriment of the ecosystem. Managers need to take measures to regulate visiting time, such as setting capacity limits or implementing rotation systems to enable all visitors to enjoy the space (Figure 16).

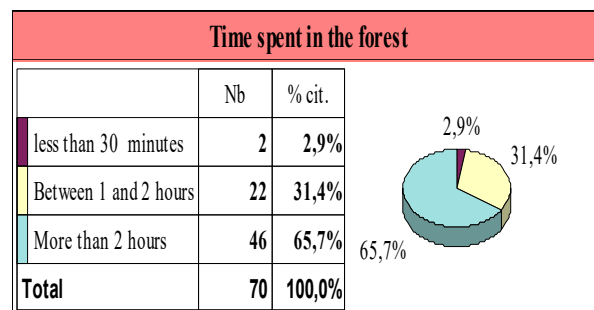


Figure 16. Time spent in the forest by users.

A relatively high proportion of users say they come "most often with family" (87.1%), while the remaining (12.9%) come with friends, who are mostly men, and much less often walk alone (0%) (Figure 17). During the interviews, users explained that the forest has become a family area par excellence, particularly

following its redevelopment in 2012. The examination of this variable reveals similar results to a comparable study carried out in forests in France. In accordance with the survey of visitors to outdoor leisure centers in the Paris region, conducted under the supervision of the Comité régional du tourisme between 2008 and 2010, this study can better define the profile of the visitors. The vast majority, whatever the time of year, come in company, mainly families (Bertrand and Prédali, 2019).

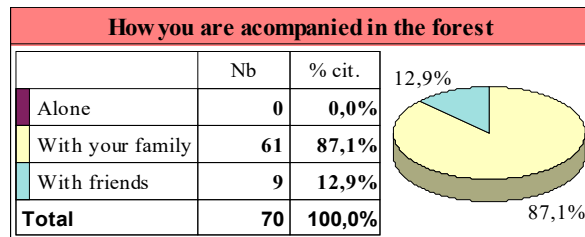


Figure 17. How you are accompanied in the forest.

This study noticed in the field that women and men do not frequent the forest in the same way, but to confirm this, this study refined across-analysis with sphinx software, where it was possible to cross-reference several questions (for example, to find out the type of company in the forest according to gender). Women go there more often with family (72.1%), while men go there more often with friends (88.9%) (Figure 18).

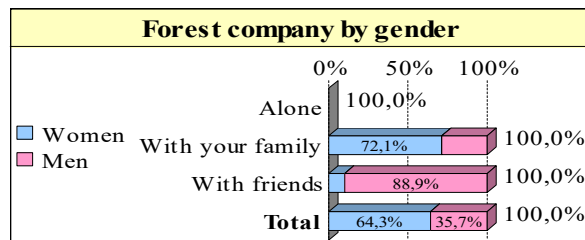


Figure 18. With whom accompanied in the forest (gender).

In some highly urbanized areas of developed countries, the attractiveness of green spaces and woodlands has been measured by distance. Pedestrians are more inclined to visit green spaces within 250 meters (for 30 hectares) or 1000 meters (for more than 30 hectares). Motorists generally travel up to 5 kilometers, but outings exceeding 15 minutes are mainly reserved for weekends (Granet and Dobré, 2021), so these measures have never been addressed as a priority by woodland managers in the city of Constantine. The aim of this study was to determine whether proximity to the forest influences user attendance, as well as to identify other factors that might influence this high recreational attendance. One of the main questions asked in the survey was how long it takes users to reach the forest from their homes. Given that this parameter is an effective indicator of the attractiveness of woodland areas.

58.6% took less than 30 minutes to reach the forest, 25.7% took around an hour, and 7.1% took more than an hour. So, the longer it takes to reach the forest, the lower the percentage of users or respondents (Figure 19), and the further away the forest user's home is. Except for that 8.6% who take just under 15 minutes to get there (a negative correlation where the time variable to reach the forest increases, the number of users decreases), However, these quantitative figures confirm the general trend in the use of peri-urban woodlands in large foreign cities, where the level of use is at least partly linked to the spatial or temporal proximity of the woodlands.

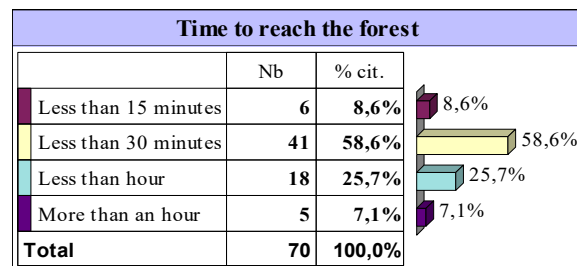


Figure 19. Time to get to the forest.

In this research, three headings were used to determine the approximate time spent in the forest, given that users rarely check precisely how much time they spend out, so despite a lack of precision, taking into account three headings enabled us to avoid distorting the data. Analysis of the responses shows that 65.7% of those questioned say they stay "more than 2 hours" in the forest, 31.4% stay between "1 and 2 hours" and only 2.9% make a short visit of "less than 30 minutes" (Figure 20). These figures show the opposite situation to that of recreational and state-owned forests in developed countries, where the presence of local parks and natural areas alleviates the pressure of frequentation in these peri-urban forests, as they can be seen in this research. In this case study, these long-duration visits can lead to a number of negative consequences, such as ecosystem disturbance, degradation of air quality, and the risk of fire. This calls for urgent action on the part of the organizations concerned to ensure that recreational outings in the forest are properly managed. A correlation analysis carried out with Sphinx between the travel time variable and the duration of time spent in the forest variable showed that the duration of visits does not respond to any logic linking it to travel time but to the choices and activities of users. In other words, Ya shows zero correlation between the two variables.

All forest users come by car (100%) (Figure 21). The majority of these users have a profile corresponding to those who own a private car or who have access to a car to get to the site. This indicates that the forest is located in a remote area where it is difficult to get around other than by car, as no public transport is available to get there. Thus, owning a car

or other means of transport is a major determining factor in the use of El Meridj.

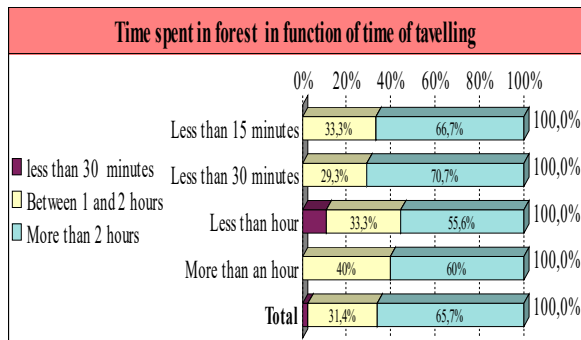


Figure 20. Time spent in the forest in a function of time of traveling.

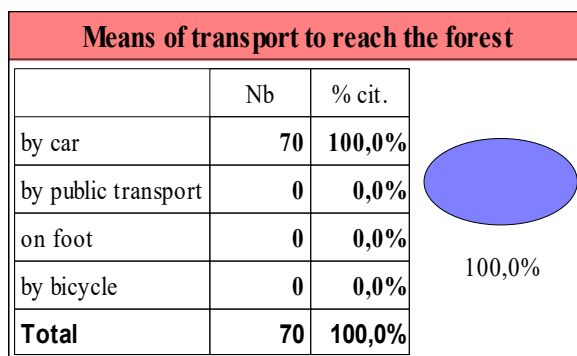


Figure 21. Means of transport to reach the forest.

In this case, it is necessary to propose shuttle and car-sharing services as well as the inclusion of forest

accessibility in future tramway circuit extensions to encourage more sustainable transport. These proposals are also being implemented in several developed countries, where strategies dedicated to leisure traffic are being drawn up, notably in Switzerland and France. This is due to the persistent problem of total absence, as in our case, or lack of public transport serving leisure areas (Lorenzi and Schild, 2002).

What brings you to ElMeridj forest (usage)

To better understand the meaning of the forest outing, this study was interested in understanding the motivations of the interviewees. The answers will help us to identify users' expectations and adapt the services and activities on offer accordingly. In addition, individual preferences may be further influenced by factors such as visibility, accessibility and safety of forests, isolation, and lack of nearby public gardens (Wajchman-Switalska et al., 2021). Respondents were provided with a list of purposes for their visit, accompanied by intensity scales, enabling us to measure the importance of each objective for users.

Data presented in Figure 22 show that 50% of users find "walking" in the forest important, a popular and varied activity that includes walks, strolls and observations of plants and animals. All these activities fall into the broad category of "walking" in the forest. 40% of respondents consider the purpose of "picnicking" to be important. They said that the presence of picnic areas and other related infrastructure is important in meeting their needs. This variable has also shown statistical significance in other previous research.

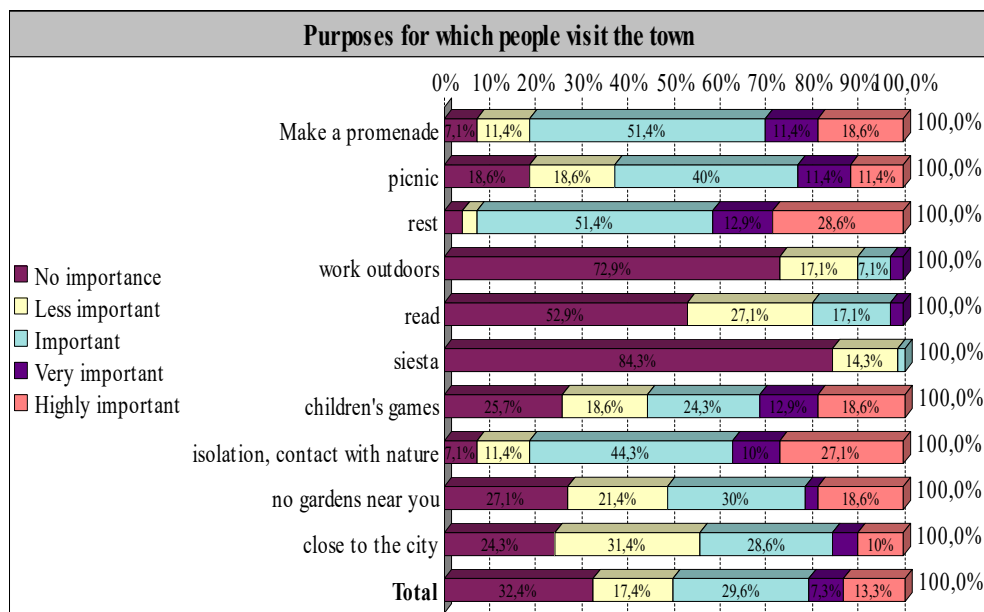


Figure 22. What brings people to the forest.

Same, a study carried out in the city of Cáceres in Spain also found that the variable in question had a significant percentage of forest use, reinforcing the

consistency of results between different research studies (Rey Gozalo et al., 2019). 51.4% of respondents consider the purpose of "resting"

important, indicating that many visitors seek to use the forest as a place to relax. For 26.6% of respondents, this purpose is extremely important, showing that relaxation and tranquillity are a top priority for a quarter of visitors, offering a refuge from the hustle and bustle of urban life. A large proportion of users (72.9%) and 52.9% declare that outdoor work and reading are unimportant. However, 7.1% of respondents, such as scientists or students, attach importance to these activities for conducting fieldwork as part of their work or research.

It seems that among those interviewed, 25.3% consider the purpose of "enjoying children's play" to be unimportant. However, 24.3% consider it important, and (8.6% consider it extremely important). During interviews on this topic, respondents raised concerns about the degraded condition of children's play areas in the forest, which limits their use and compromises the experience of users, particularly children. 44.3% of respondents attach importance to the aspect of isolation and contact with nature in their choice to frequent the study area. A further 10% consider this reason to be very important, while 27.1% rate it as extremely important. This suggests a need to detach oneself from the hectic pace of urban life and recharge one's batteries in a natural environment far from the hustle and bustle of the city. To assess users' level of awareness, this study sought to gather information on their awareness of the services provided by forests, the need to protect them, and their knowledge of forest biodiversity. The results are considered positive, with the vast majority of respondents (92.9%) aware of the need to protect forests for the environment (Figure 23) and an equally large proportion (98.6%) aware of the biological diversity present in forests and the importance of preserving it to ensure the sustainability of ecosystems and the survival of species (Figure 24).

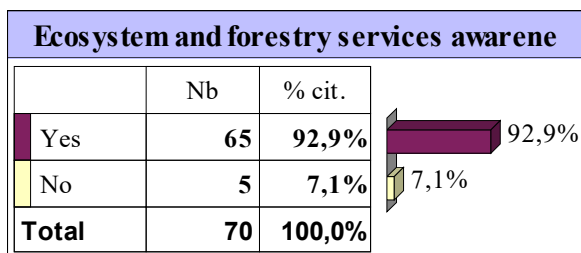


Figure 23 Users' awareness of forest services.

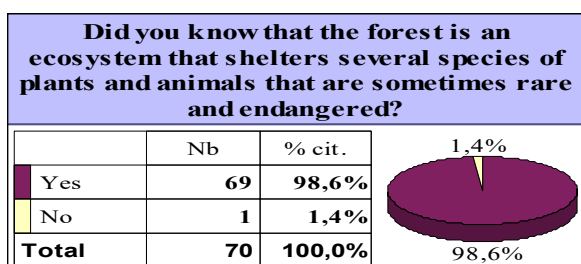


Figure 24. Users' knowledge of forest ecosystems.

Conclusion

The El Meridj peri-urban forest, established as the most visited site in Constantine's forest system, offers a rich diversity of cultural ecosystem services, including recreational, physical, and educational activities, firmly solidifying its position as a premier destination for nature-based tourism in the Wilaya of Constantine. This study meticulously identified various variables, such as the absence of nearby urban green spaces, plant density, the forest's expansive size, and proximity to the city. The significance of these factors was thoroughly discussed, leveraging both quantitative and qualitative statistical data. Representing one of the pioneering research endeavors in Algeria, this study comprehensively examined and evaluated the recreational use of peri-urban woodlands. The outcomes of this research present a promising opportunity to address the persistent challenge of non-functional urban green spaces in Constantine. By using these findings as a guide, practitioners can explore innovative solutions to rejuvenate and enhance the functionality of green spaces, aligning urban development with community needs and enhancing the overall quality of life for residents. Consequently, this study makes a substantial contribution to addressing tangible urban challenges. Future urban planning and research practices should adopt a perspective that considers the impact of intensive natural environment use on wildlife. Regular studies in this context can assist in identifying animal and plant species most susceptible to human activities, facilitating adjustments in Algerian policies and practices to accommodate evolving ecosystem needs.

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