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Understanding Factors Affecting the Use of Urban Parks Through the Lens of Ecosystem Services and Blue–Green Infrastructure: The Case of Gorky Park, Moscow, Russia

Diana Dushkova [1,2,*], Mina Taherkhani [2], Anastasia Konstantinova [2], Viacheslav I. Vasenev [3] and Elvira A. Dovletyarova [2]

[1] Department of Conservation Biology and Social-Ecological Systems, Helmholtz-Centre for Environmental Research (UFZ), Permoser Str. 18, 04318 Leipzig, Germany
[2] Agrarian and Technological Institute, Peoples Friendship University of Russia (RUDN University), Miklukho-Maklaya Str. 6, 117198 Moscow, Russia; m.taherkhani1390@gmail.com (M.T.); konstantinova-av@rudn.ru (A.K.); dovletyarova-ea@rudn.ru (E.A.D.)
[3] Soil Geography and Landscape Group, Wageningen University, 6708 PB Wageningen, The Netherlands; slava.vasenev@wur.nl
* Correspondence: diana.dushkova@ufz.de

Abstract: As a core and long-established part of urban blue–green infrastructure (BGI), public parks play a significant role in the sustainable development of cities. In particular, they make a major contribution to maintaining healthy ecosystems and providing multiple benefits that support human health and quality of life as a kind of nature-based solution (NBS). Still, planning, design, and management of public parks mostly rely on official standards and technical guidelines, whereas societal perspectives and the use of the ecosystem services (ES) approach (and cultural ecosystem services (CES) in particular) remain inadequately integrated. By assessing CES offered by Gorky Park in Moscow (Russia), the paper aims to bridge this gap and investigate the flow of CES and its relation to park infrastructure and the visitors' needs. For this purpose, non-participant observation, field notes, and photographs were used in different functional park zones. By investigating visitor activities and factors affecting them, a variety of CES provided by the park have been detected. As aligned with its original idea, the park was mostly used for recreation, leisure, sports, and socializing. Moreover, the CES related to aesthetic, educational, and cultural heritage values were also partially utilized. The park was mostly attractive to the younger generation (the highest number of visitors), whereas visitors over 60 years old were hardly represented. Notably, men were more interested in sports (especially, team sports), whereas women mostly preferred walking (alone, with family, and with friends), relaxation, playing and spending time with children, picnicking, etc., which indicated certain preferences for CES among the park visitors. An interdependent relationship between the CES supply and the park infrastructure was found: the more infrastructural components were identified, the greater variety of park activities and corresponding CES were detected at certain observation points, which could ultimately lead to overcrowding and overutilization of the ES capacity. Given that the Moscow government claims integrating ES into the planning and management of urban BGI as one of the priorities in the city's environmental policies, the related recommendations are provided. They address the recent challenges of creating integrated BGI, increasing demand for multifunctionality, and the conflicting interests of different visitor groups to maximize the benefits and diversity of CES delivered by the park.

Keywords: park use; visitors' activities; sustainable urban planning; green space; observation; blue–green infrastructure (BGI); Moscow

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1. Introduction

Ranging from urban parks and forests, botanical gardens, and street greening to pocket parks, residential yards, urban farms, green roofs, facades, etc., urban green spaces (UGS) are of strategic importance for the quality of life in an increasingly urbanized society [1–5]. Usually defined as land comprised of or partly/completely covered by vegetation and associated with natural, semi-natural landscape elements and engineered interventions, UGS provide multiple functions, benefits, and services, even though they have been designed primarily for a single purpose, e.g., recreation, air purification, etc. [2,6–9]. Along with blue spaces, UGS form a network of the city's blue–green infrastructure (BGI), where these elements work together to perform functional roles and provide multiple sustainability benefits [10,11]. In addition to regulating ecosystem services, such as air and water purification [12,13], urban heat mitigation and microclimate stabilization [14,15], and provision of habitat for biodiversity [11,16], UGS deliver a variety of cultural ecosystem services (CES) that are critical for the social and psychological well-being of citizens [5,6]. Several studies demonstrated that time spent in nature, and in particular in urban parks, can reduce stress and improve physical and mental health [9,17] as well as increase inspiration and aesthetic impression for citizens [3,5]. According to MEA [18] and CICES [19], CES encompass the non-material benefits derived from ecosystems, including spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences. UGS provide a sense of peace and tranquility, opportunities for recreation, sport, and education as well as contribute to creating cultural values [1,20,21]. Furthermore, urban nature offers a few other social benefits such as increasing social integration and cohesion, promoting natural connectedness, and increasing environmental consciousness [1,2,22].

Surveys among park visitors across countries confirm a significant correlation between the frequency and duration of park visits and perceived health status [21,23]. This was especially emphasized in many studies on the use of the UGS during and after the COVID-19 pandemic [24–26]. In these studies, the importance of UGS for both physical and mental health, dealing with the effects of the pandemic, has been highlighted.

In addition to the positive socio-psychological effects mentioned earlier, urban nature can also bring economic benefits to both municipalities and citizens. In particular, the cooling effect provided by UGS can prevent health risks, including reducing premature mortality [9,14]. Real estate located near an urban park or other UGS has higher value and, as a result, gives more tax revenue [2,27]. The aesthetic and historical values of urban parks and associated recreation opportunities enhance the attractiveness of the place and the whole city neighborhood, develop its touristic potential, and promote green city branding, thus generating job prospects and improving income levels [1,28]. However, as a trade-off, it can cause ecological or green gentrification, when, as a result of green urban development/regeneration, neighborhoods experience several structural, social, and symbolic upgrades that in turn leads to forcing residents to move away [27,28].

A growing number of studies highlight that a more thorough understanding of CES provided by UGS plays a crucial role in achieving socio-ecological sustainability. Therefore, CES have to be better acknowledged and integrated into environmental policy and urban planning [7,29]. CES delivered by UGS not only offer opportunities for leisure, recreation, environmental education, and mental health/well-being but also directly reflect the interaction between people and urban nature [24,30]. Among the existing UGS, urban public parks are especially recognized for their crucial role in providing a diverse range of CES that are vital for physical and psychological well-being as well as in supporting social interaction and integration and sustainability in urban areas [20,22,24,29,31–33]. Moreover, within the ongoing process of urbanization, cities become more multinationally and interculturally diverse. This, along with the intensified climate change and its consequences force urban

parks, as a core element of urban BGI to be better adapted to the new circumstances. In particular, it relates to the increasing demand for available, accessible, and multifunctional UGS (parks) that are capable of providing a variety of CES (and other ES).

Considering all the above mentioned, (re-)designing city parks in response to the climate change issues and according to the needs of different social groups is becoming highly relevant. Additionally, a variety of ecosystem disservices (e.g., pollen allergy, invasive plant or animal species) provided by UGS (specifically, parks) have to be taken into account since they might produce negative effects for park visitors and limit the use of the UGS/park. Altogether, it poses several challenges for policy, planning, design, and management of UGS and therefore determines the need for a critical assessment of city parks, rethinking their multifunctionality and compositional and structural diversity [34,35]. In proposing new sustainable/nature-based solutions and new ideas to replace traditional recreational infrastructure, it is necessary to understand the needs of users in different social and physical settings [30,36,37]. To address the recent challenges of growing demand for multifunctionality and conflicting interests of different park visitors as well as responsible stakeholders (urban planners, park managers, civil society, etc.), urban parks must be designed and managed to maximize the benefits and diversity of CES they provide [20].

There is a growing interest among researchers worldwide focusing on CES provided by urban parks and sociodemographic, cultural, spatial (both built infrastructure and BGI), and geographical variables influencing park visitation and usage/activities [3,5,38,39]. They underline that assessing these key parameters/variables of urban park use is important for understanding CES perceptions and future park planning and management. Nevertheless, the number of such studies is still insufficient compared to research on other ES of urban parks and UGS in general. Moreover, less attention has been given to how CES can be effectively integrated into urban planning and management of UGS, especially urban parks [40–42]. This can be explained by the range of challenges that urban planners and decision-makers encounter when working with CES (e.g., lack of rigor in identifying CES, difficulties in measuring CES, their interlinkage with other ES, role of users' perceptions, values, and contextual factors, transferring the CES into the landscape design, etc.) [31,41,42]. Moreover, the use of the ES approach in research, policy, and planning of UGS (and especially urban parks) in Russia is still rather limited [43]. In particular, the planning of BGI in Russia is mostly based on expert and official standards and guidelines, whereas the social dimensions, e.g., values, preferences, and perception of benefits arising from UGS, are hardly integrated [44]. To fill this gap, this study aims to assess CES offered by Gorky Park (one of the main public parks in Moscow) and to investigate whether the flow of CES (supply) depends on park infrastructure (built infrastructure and BGI) and aligns with the visitors' needs. Therefore, the following research questions are raised:

- How do visitors of different gender and age use Gorky Park throughout the week?
- What CES are in demand in the park/what park activities are most popular among park visitors?
- Is there a relationship between the CES supply and the park infrastructure?
- What is the potential for improving the park planning and design to address the needs of its users (through considering CES) and to promote sustainability?

In order to respond to these research questions, this paper is structured as follows: the methodology presents a general approach used in the study, including a description of the study area and the methods applied for data collection and analysis. The results section provides key findings of park usage among visitors (e.g., sociodemographic characteristics of park users, frequency and purposes of park visitations, types of activities, and CES perceived). The relation between CES and park infrastructure found in the research is reflected in the discussion, followed by providing several recommendations for park

planning and management to better integrate CES, as well as suggesting directions for future research.

2. Materials and Methods

2.1. Study Area

Moscow city (56 N; 37 E) is the capital of Russia and one of the largest urban areas in Europe. Green areas including urban forests, city and neighborhood parks, courtyards, and green lawns cover more than half of the city area [45,46]. Sustainable development of UGI is claimed to be among the main priorities by the Moscow government [47]. According to the recent Moscow city law on the protection and management of urban green spaces (https://www.garant.ru/hotlaw/moscow/1771389/ (accessed on 20 August 2024)), projects on development and re-design of UBGI should take into account the issues of ES demand and supply. Therefore, the assessment of CES becomes highly relevant to support the management of UGS and, first of all, city parks.

With an area of 375 hectares, Gorky Park is one of the most famous and visited green public spaces located near the Moscow center (Figure 1). Established in 1928 as the very first park of culture and leisure in the Soviet Union, it was designed in an avant-garde, constructivist fashion that was significantly ahead of other public spaces at that time. In particular, the main idea behind its establishment was not only to create a place for people to gather together (which was very much in line with the ideology of collectivism) but also to promote the new culture of leisure by providing places and opportunities to engage in sport and to educate the citizens on the physical, social, and mental benefits of sport exercises and leisure activities. This was a real shift in the public park concept and perception of parks as recreational places to support people's health and well-being through engaging in and promoting physical activity, experiencing nature, and relaxation. For this reason, one- to two-day holidays were provided to many employees from different Soviet cities and towns to visit Moscow and specifically Gorky Park to familiarize themselves with the new tradition of public parks and park activities, including outdoor recreation. The park continues to reflect the idea of Moscow as a "city for people" and still holds its innovative stance in various aspects. In particular, it was reconstructed and redesigned in 2010 to address the interests of the broader public, including the younger, progressive generation, families with children, and elderly people, by providing the space for world-famous concerts, performances, and plenty of opportunities for sport (biking, walking, skating, yoga, etc.) and recreation.

Nowadays, the park represents a unique multifunctional public green space that aims to provide equal opportunities for recreation, physical activity, leisure, and social interaction for all its visitors [29,48,49]. The Gorky Park area is divided into four parts—Vorobyovy Gory, Neskuchny Sad (Garden), MUZEON (Park of Arts and Garden), and Parterre (central part of Gorky Park). Each part is portrayed as a unified entity with its unique features. In this paper, we mainly focused on the central part of Gorky Park (Parterre) with a territory of around 119 hectares since it is the most popular (and thus most visited) area with a highly diverse infrastructure in comparison to the other parts of the park.

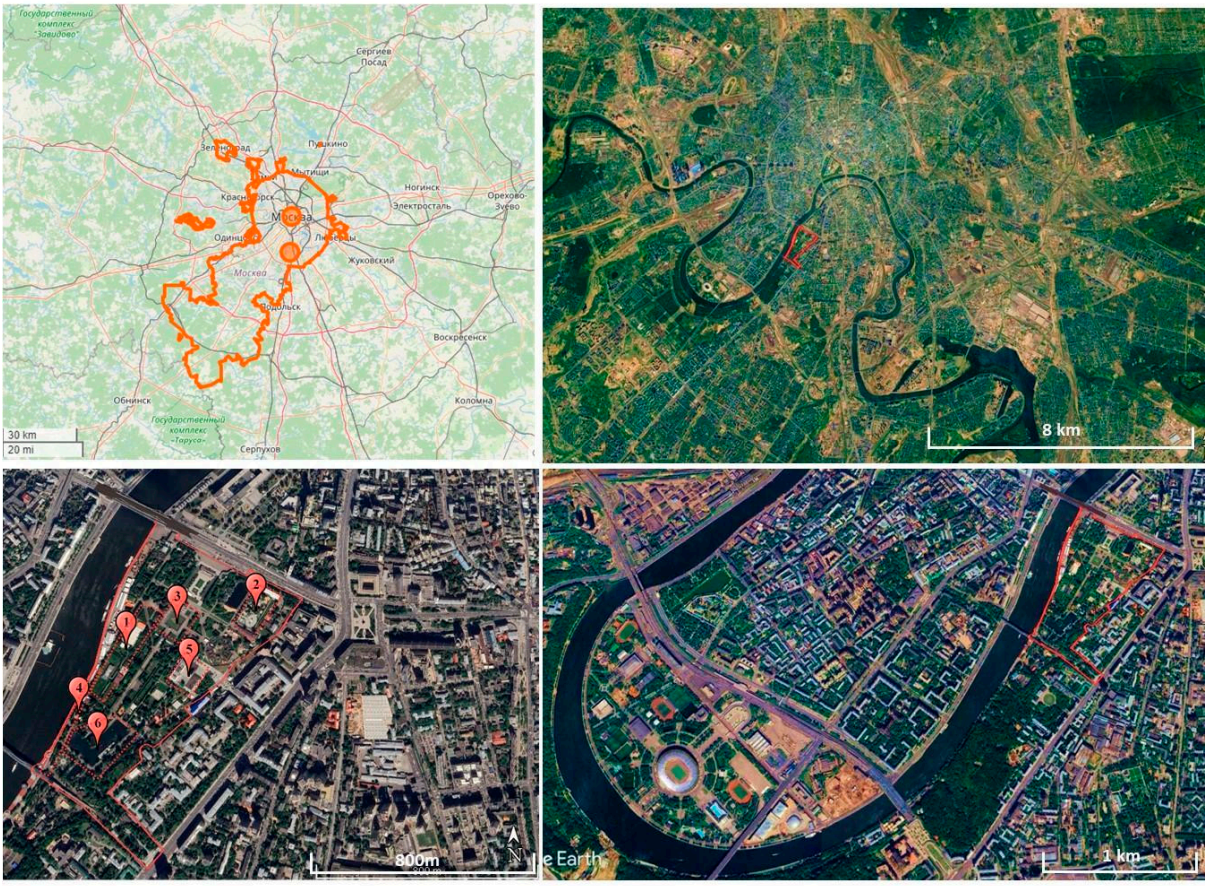
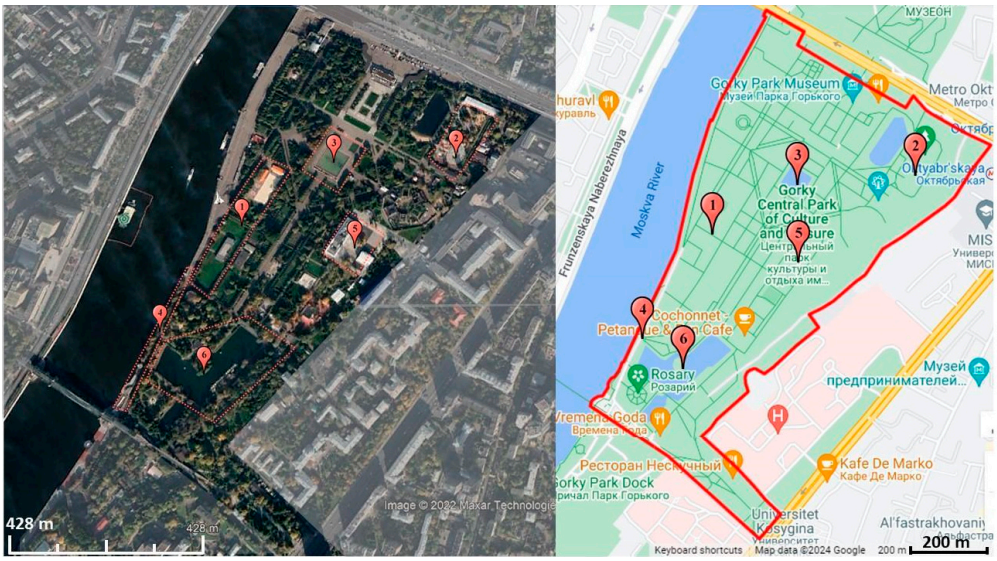


Figure 1. The location of Gorky Park (the numbers 1 to 6 indicate the location of the observation points) (source: authors).

For the purpose of research, six observation points within Gorky Park have been selected (Figure 2). They include (1) the sport center and the lawn area, (2) the Salout playground, (3) the central fountain, (4) the pedestrian riverside (Pushkin embankment), (5) the Garage Museum (Museum of Contemporary Art), and (6) the Golitsynsky Pond. The criteria for selecting these observation points were the presence of two or more elements of built infrastructure and BGI at the same time (Table 1) as well as their attractiveness/popularity among the visitors that were revealed through previous research [50].

It was necessary to rank these observation points in order to reveal the relationships between the park activities, the related CES utilized by the visitors, and the presence of built and BGI elements, and then to compare them with the observation results. The ranking was based on two categories of elements: (1) related to built infrastructure (e.g., walking paths, bicycle paths, etc.), and (2) referred to the BGI (e.g., pond, river, vegetation elements, etc.) (Table 1). The scoring and ranking evaluation was based on the presence (+1) or absence (0) of the particular infrastructure element at a certain observation point.



(**A**)



(**B**)

Figure 2. The location (**A**) and pictures (**B**) of the six selected observation points within the study area of Gorky Park (source: authors).

Table 1. The criteria for selecting the six observation points (P1–P6) for the study ("+" means that the element was present at the observation point, "−" indicates its absence) (source: authors).

The Elements of the Built Infrastructure	P1	P2	P3	P4	P5	P6	The Elements of BGI	P1	P2	P3	P4	P5	P6
Walking paths	−	+	+	+	+	+	Water infrastructure (fountain, pond, etc.)	−	−	+	+	−	+
Bicycle path	−	−	−	+	−	−	Natural elements (the river, forest etc.)	−	−	−	+	−	−

Table 1. *Cont.*

The Elements of the Built Infrastructure	P1	P2	P3	P4	P5	P6	The Elements of BGI	P1	P2	P3	P4	P5	P6
Playgrounds or sport fields	+	+	−	−	−	+	Tall and shady trees	+	+	+	+	+	+
The possibility of doing water-related activities	−	−	+	+	−	+	Shrubs and other vegetation elements (flower beds, flowers, etc.)	+	+	+	+	+	+
Benches/resting areas	+	+	+	+	+	+	Wide lawn area for resting	+	−	−	−	−	−
Cultural places (museums, historic sites, exhibition area, etc.)	−	−	−	−	+	−	Green and blue spaces together	−	−	+	+	−	+
Places for education and ecological awareness raising	−	+	−	−	+	−	Presence of animals, gaining knowledge about animals	−	−	−	−	−	+
Nature observation deck	−	−	−	+	−	−							
Symbolic elements or landmarks	−	−	+	+	+	+							
Total	2	4	4	6	5	5	Total	3	2	4	5	2	5

Observation Point 1: Sport facility and adjacent lawn area (Figure S1 in the Supplementary Materials). This includes the outdoor area that offers space for basketball and beach volleyball, football, badminton, etc. in the summer and ice skating in the winter. Trees and shrubs are planted on the edge of this area provide shade and create a green fence. The adjacent lawn area is used as a place for relaxation and gatherings with family and friends (for diverse types of social interaction). Additionally, it is one of the park sites that allow close contact with nature (e.g., walking barefoot through a grassy field, lying down, or sitting on the grass).

Observation Point 2: Salout playground (Figure S2 in the Supplementary Materials). It represents one of the modern playgrounds in the park with numerous plants and recreational facilities designed for different age groups according to their needs and preferences. Each site within the playground area is equipped with diverse elements that allow auditory, visual, and tactile sensory experiences. This creates opportunities, especially for children, to engage their senses by touching plants, feeling different textures, and discovering various sounds, thus encouraging them to explore nature. The observation point is located near the park entrance, close to the central fountain of the park. The playground adjoins a Green School that was established as a training center for activities related to agriculture and nature. The school provides educational courses for children and adults in natural science, gardening, and agriculture.

Observation Point 3: the central fountain (Figure S3 in the Supplementary Materials). Located near the main park entrance, on the major park axis, the central fountain is a symbol and one of the prominent elements of Gorky Park. Considered an important recreational place in the park, it attracts its visitors to take a rest and relax, especially during warm summer days, as well as to spend time with family and friends. Here, the landscape design is organized in a way that only trees of low and medium height are used for planting, located on the edge of the fountain area. As such, it does not affect the beautiful view of the major park axis and ensures good visibility of the fountain as an important symbolic park element. However, higher trees with a few benches under them also have been integrated at a distance to create a resting area with a magnificent fountain view.

Observation Point 4: Pedestrian Riverside (Pushkin embankment) (Figure S4 in the Supplementary Materials). It can be characterized as one of the most inspiring and multifunctional

park sites. The area is located along the right bank of the Moscow River and is considered a natural element on the edge of Gorky Park, including a part of a long walking path from the historic center of Moscow. This makes it suitable for pedestrians, runners, and cyclists to utilize the area. The path also includes several resting areas equipped with several benches and a beach for sunbathing on the riverbank that allows for different recreational activities and relaxation. Moreover, there are several points that provide public access to the scenic river. The snow-white rotunda of the Golitsyn Hospital with emerald domes situated along the path represents another symbolic element and distinctive landmark of Gorky Park that attracts many park users. A linear format was used for the planting of street trees in most parts of the path to improve the microclimate through shading and transpirational cooling.

Observation Point 5: The Garage Museum of Contemporary Art (Figure S5 in the Supplementary Materials). It is characterized as a "...place for people, art, and ideas to create history" (https://garagemca.org/en/about (access on 15 July 2024)). It is viewed as one of the modern elements of architecture in the park and the whole city. The area is represented by an open space with an amphitheater, a few benches, and a wide path with a resting area nearby. In terms of the vegetation elements, the area is designed with a limited number of plants, mostly single trees; however, there are tree lines on the edge of the open space, in front of the museum.

Observation Point 6: Golitsynsky Pond (Figure S6 in the Supplementary Materials). It is an attractive recreation point that provides opportunities for relaxation and water-based activities. Starting from the Pushkin embankment, the pond is surrounded by wooden pavements. The area is equipped with deck wooden chairs and benches to allow resting (e.g., sitting, lying, and sunbathing) and relaxing near the water. There are opportunities for boating (boat renting is available). An additional attraction point of the pond is provided by the small "Dancing Island". Various plants have been used for landscape design of the area. Bird diversity (19 species were detected, e.g., shelduck, swans, mallard/wild duck, warbler, songbird, pigeon, sparrow, etc.) attracts visitors in different seasons of the year.

2.2. Data Collection and Analysis

The research framework is shown below (Figure 3). After defining the research goal and questions, a study design (research method, study area and observation points, observation protocol, data analysis, etc.) was developed. Non-participatory method (i.e., systematically observing park users on-site) was used to characterize human–nature interactions and identify recreational and other CES-based activities of park visitors. As a scientific investigation in which the participants do not take an active part, non-participant observation of human actions and behaviors allows us to reflect on certain engagements in a particular recreational activity [51,52]. This method is selected since it does not require the researcher(s) to interact with the study participants when collecting data on attitudes and behaviors in order to avoid the influence of any kind of knowledge, and without relying on participant recall or self-report biases [3,53]. The method integrates two types of observations: unstructured and structured [53]. First, unstructured observations were undertaken in June 2022 to reveal the activity hotspots within the park and the variety of activities among the park users by collecting the field notes and considering the previous related studies in Gorky Park [29,50]. The unstructured observations were conducted on the same weekdays as the structured observations conducted afterward. The revealed categories of the park activities were used for the development of the template for the structured observations (Table 2). This template was prepared based on the classical approach [4,5,54] and included data on different types of park users' activities (revealed during the unstructured observation) and several socio-demographic criteria (age, gender, etc.) (Figure S7 in the Supplementary Materials). However, in this study, it was decided to

extend the number of activities according to 14 different categories of CES-based activities selected from the five categories of the "Common International Classification of Ecosystem Services (CICES) V5.1" [19] (Table 2) and an additional category for activities in regard to social relations (Table 2).

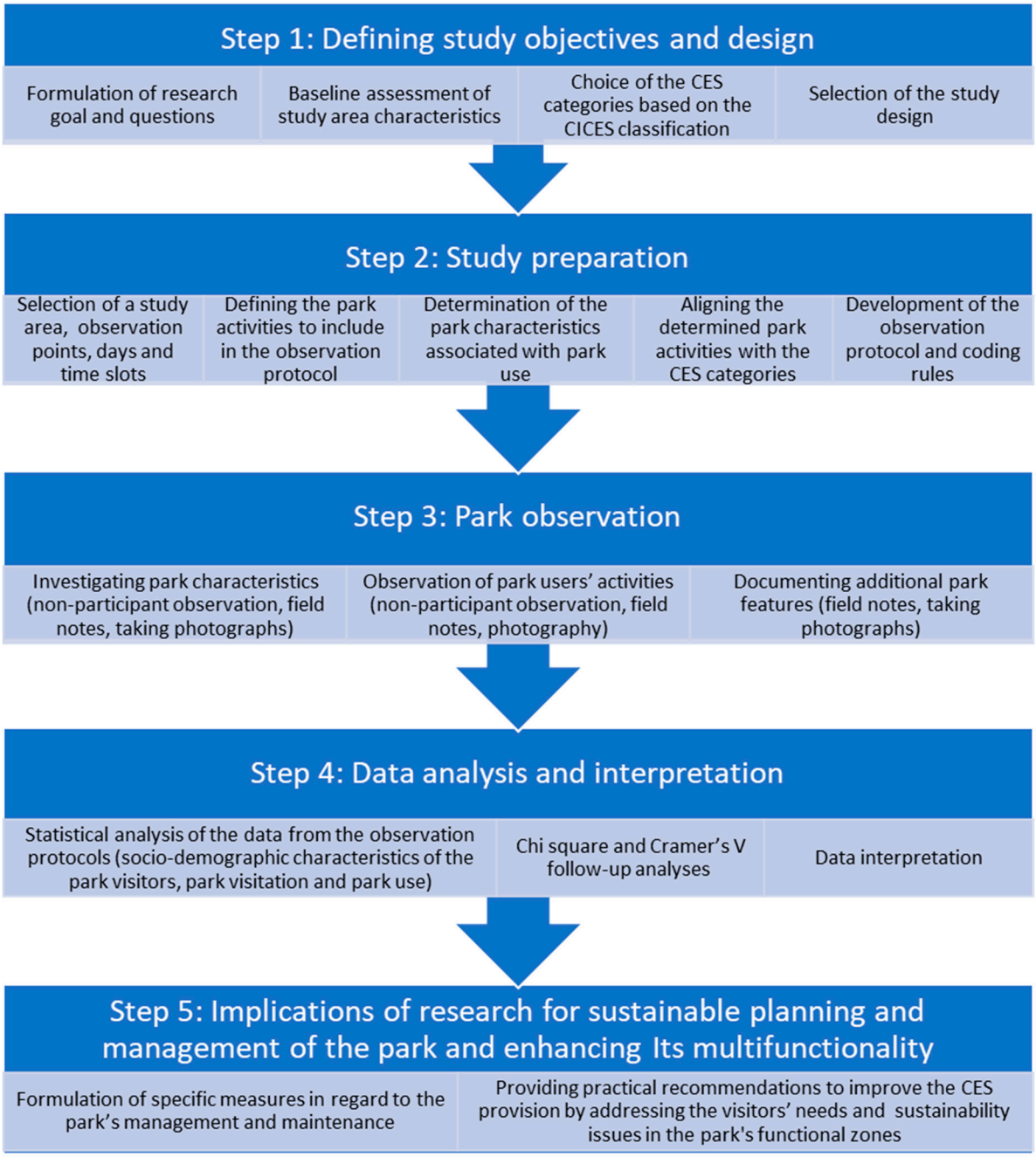


Figure 3. Research framework used in this study.

To address the challenges of the data interpretation, each observed activity was clearly defined based on the results of unstructured observation and the collected field notes.

The structured observations were conducted within two working days (4 and 7 July 2022) and during one day on the weekend (16 July 2022), at the same time in the morning (10:00 to 12:00), at noon (12:30 to 14:30), in the afternoon (15:00 to 17:00), and in the evening (17:30 to 21:30).

Table 2. Observed recreational activities translated into CES categories using CICES classification.

Observed Activities	Short Titles Used in Figures	CICES Categories	CES Categories Used in the Research
Sport	**R1**	3.1.1.1. Using the area for outdoor sport and recreation activities 3.1.1.2. Observing plants and animals as well as their habitat	Recreation
Walking (alone, with family, friends etc.)	**R2**		
Walking with a pet	**R3**		
Rest and relaxation	**R4**		
Playing and spending time with children	**R5**		
Picnicing	**R6**		
Sunbathing	**R7**		
Festivals–concerts–dancing	**R8**		
Water-related activities	**R9**		
Educational activities (gaining knowledge about plants and animals)	**E1**	3.2.1.2. Studying nature/raising environmental awareness	Environmental educational activities (educational values)
Visiting cultural places	**C1**	3.2.1.3. Natural, historical, and cultural elements related to regional identity and sense of place	Visiting cultural heritage sites (cultural values)
Photography	**A1**	3.2.1.4. The beauty of nature	Aesthetic appreciation of nature (aesthetic values)
Gaining inspiration from nature (drawing, playing music, writing, etc.)	**I1**	3.3.1.1. Nature (elements) as a source of inspiration for arts	Experiencing nature and gaining inspiration (inspiration)
Social relations (spending time with family, friends, etc.)	**S1**	3.5. Other	Social relations

The observed park visitors were divided into seven age groups: children 0–10 years old, teenagers and youths 11–20 years old, young adults 21–30 and 31–40 years old, middle-aged adults 41–50 and 51–60, and seniors/elderly—over 60 years old.

Along with the non-participant observation, field notes (according to [55,56]) were collected to provide more detailed information about the park settings, users, and cultural practices and phenomena associated with the research topic. Additionally, photographs were taken to be used as illustrations of certain park activities as well as for documentary purposes.

The data obtained were analyzed using descriptive statistics of socio-demographic characteristics among park visitors (e.g., gender and age) and park visitation attributes (e.g., distributions of visits during the observation period, types of activities, and CES categories) with the help of Excel 2019 and Origin 2022 programs. Moreover, the Chi-square and Cramer's V follow-up analyses were used to examine the relationship between the location of observation points, activity types, and CES categories. All analyses were conducted using IBM SPSS Statistics 26 software and findings were considered significant at $p < 0.05$.

3. Results

3.1. Characteristics of Park Visitors and Distributions of Visits in Relation to the Observation Points

The number of park users and their age and gender distribution are shown in Figure 4. The total number of park visitors during the working days varied from 11,133 (working day 1) to 10,041 (working day 2), and reached its maximum of 13,754 on the weekend (Figure 4A). The female visitors outnumbered male visitors on each observation day. The results revealed that the highest numbers of visitors were among the age group of 21–30 years old, whereas visitors over 60 years old were hardly represented. The dynamics

of visits according to the age groups were similar on the working days and the weekend (Figure 4B–D).

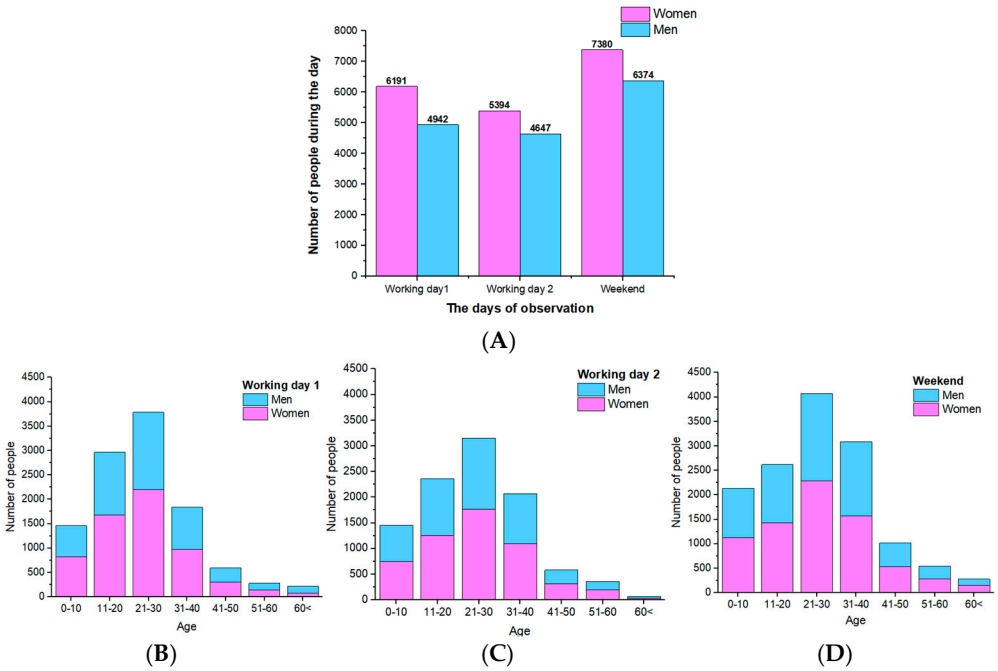


Figure 4. The number of people during the days based on the gender (**A**), the distribution of park visitors depending on their age and gender during working day 1 (**B**), working day 2 (**C**), and the weekend (**D**).

The analysis of daily park usage distribution among various age groups revealed that the highest number of visitors was reached in the late evening (19:30–21:30), and no differences between the observation days were detected (Figure 5 and Figure S8 in the Supplementary Materials).

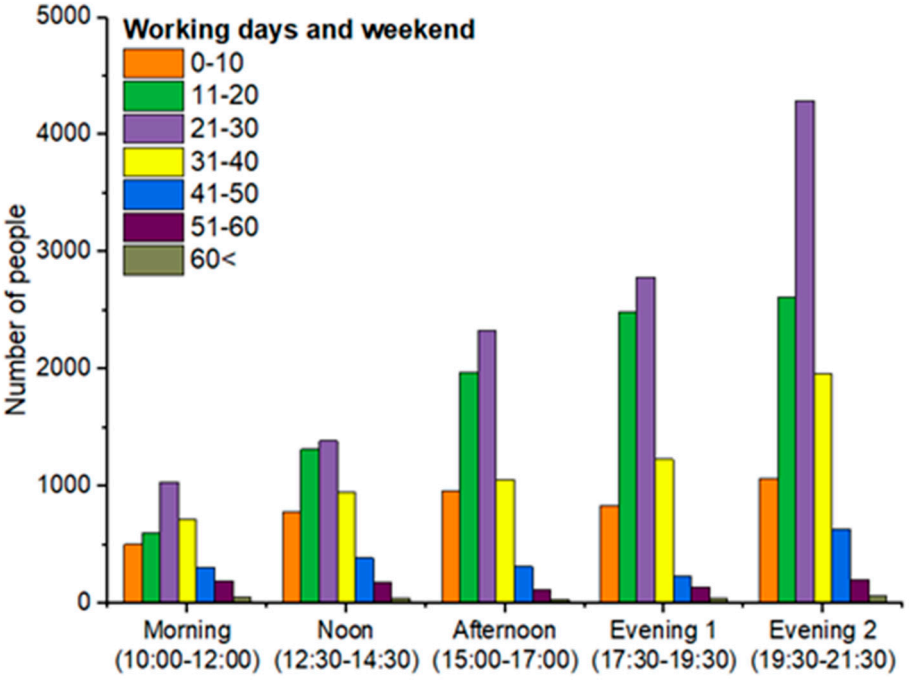


Figure 5. The distribution of park usage by different age groups at various time intervals throughout the days.

The statistical dependence between the observation point location and the age of visitors (Sig = 0.000) was detected as significant (Table 3), but the degree of relationship was weak (Cramer's V for the pair "age—research points" was 0.130). It means that the observation points and the infrastructure (both built and BGI elements) were more attractive for different groups of visitors and provided more opportunities for age-related activities. For example, observation point 3 (the central fountain) and point 6 (the Golitsynsky Pond) were mostly popular among younger age groups (0–10 years—25.9% at point 3 and 25.1% at point 6; 11–20 years—22.7% and 22.7%, respectively) (Table S1 in the Supplementary Materials). At the same time, point 4 (the Pedestrian Riverside) was more attractive for the older age groups (21–30 years—28.4%; 31–40 years—28.3%; 41–50 years—46.3%; 51–60 years—55.4%; over 60 years—82.1%). None of the following points: point 1 (the Sport facility and the adjacent lawn area), point 2 (the Salout playground), and point 5 (the Garage Museum of Contemporary Art) could be characterized as the most visited ones within any age group. However, it was noted that point 1 (the sport facility and the adjacent lawn area) and point 5 (the Garage Museum of Contemporary Art) attracted young people (11–20 years—29.5% and 24.0%; 21–30 years—35.7% and 35.6%, respectively) and point 2 (the Salout playground) attracted families with children (0–10 years—22.8%, 11–20 years—30.1%, and 31–40 years—23.4%).

Table 3. Chi-Square and Cramer's V follow-up results for "the age and the observation points".

Chi-Square Test				Cramer's V Follow-Up Test			
Value		**df**	**Asymptotic Significance (2-Sided)**		**Value**		**Approximate Significance**
Pearson Chi-Square	2937.007	30	0.000	Nominal by Nominal	Phi	0.290	0.000
Likelihood Ratio	2881.617	30	0.000		Cramer's V	0.130	0.000
Linear-by-Linear Association	43.526	1	0.000	N of Valid Cases		34,934	
N of Valid Cases	34,934						

3.2. Exploring Gorky Park Use: The Variety of Activities and Related CES

The variety of visitors' distribution in each activity on the working days and over the weekend is represented in Figure 6. Among the most popular activities were walking (e.g., walking alone, with family, friends, or with pet(s), etc.) (27.8%), rest and relaxation (20.1%), social relations (spending time with family, friends, etc.) (17.5%), and doing sport exercises (13.7%). Meanwhile, the activities that were least observed included gaining inspiration from nature (drawing, playing music, writing, etc.) (0.1%), environmental educational activities (gaining knowledge about plants and animals) (0.1%), sunbathing (0.5%), visiting cultural heritage sites (0.5%), festivals–concerts–dancing (0.6%) and picnicking (0.7%). Notably, there were a few gender differences in participation in the park activities: compared to women, men were more interested in sports (especially, team sports) while women mostly preferred walking (alone, with family, with friends, etc.), rest and relaxation, playing and spending time with children, picnicking, water-related activities, and taking photographs.

There were no specific variations among the activities during the particular day of the week except the fact that on the weekend the visitors were more active in sports, walking (alone, with family, with friends, etc.) as well as playing and spending time with children (Figure S9 in the Supplementary Materials).

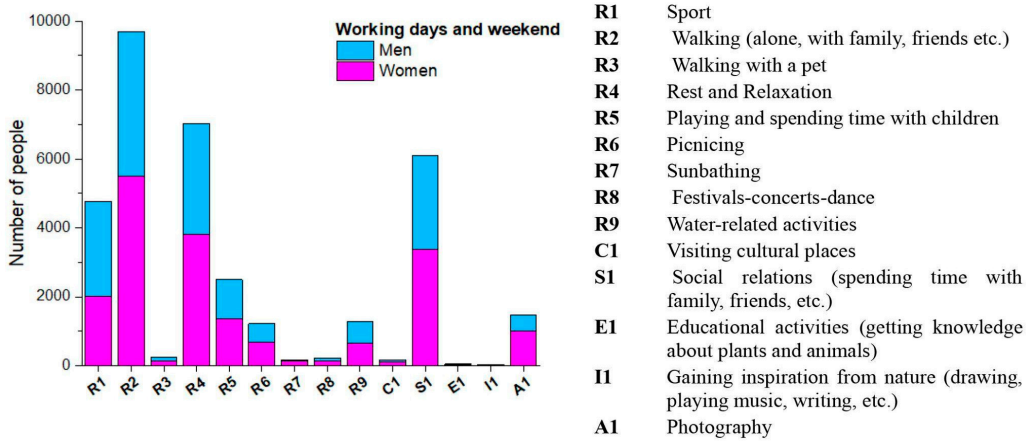


Figure 6. The variety of visitors' distribution in each activity (as a total number of park visitors within all observation days).

The distribution of the park activities during the various time slots (intervals) for all three observation days is shown in Figure 7 and Figure S10 in the Supplementary Materials. It was observed that during the day, the number of visitors increased gradually and reached its maximum by the evening. Walking (e.g., alone, with family, with friends) was the most common form of activity observed in all age groups and especially among the visitors of 21–30 years old (Figure 8). Two other most popular activities detected in all age groups referred to rest and relaxation and social interactions (e.g., spending time with family, friends, etc.). Particularly, among the elderly people (over 60 years old), rest and relaxation seemed to be more preferred. As for the visitors among the age group of 21–30 years old, they seemed to be involved in nearly all types of park activities, whereas the elderly people showed significantly less interest in active recreation (Figure 8).

Translation of the park activities into CES (Figure 9) shows that the share of the recreation category (see Table 2) is more than 75%, making it the largest category of the CES delivered by Gorky Park. It is followed by the social relations category (17.5%) and aesthetic appreciation of nature (aesthetic values) (4.2%). At the same time, cultural heritage (0.5%), educational values (0.1%), and inspiration (0.1%) seem to be least utilized CES among the park visitors.

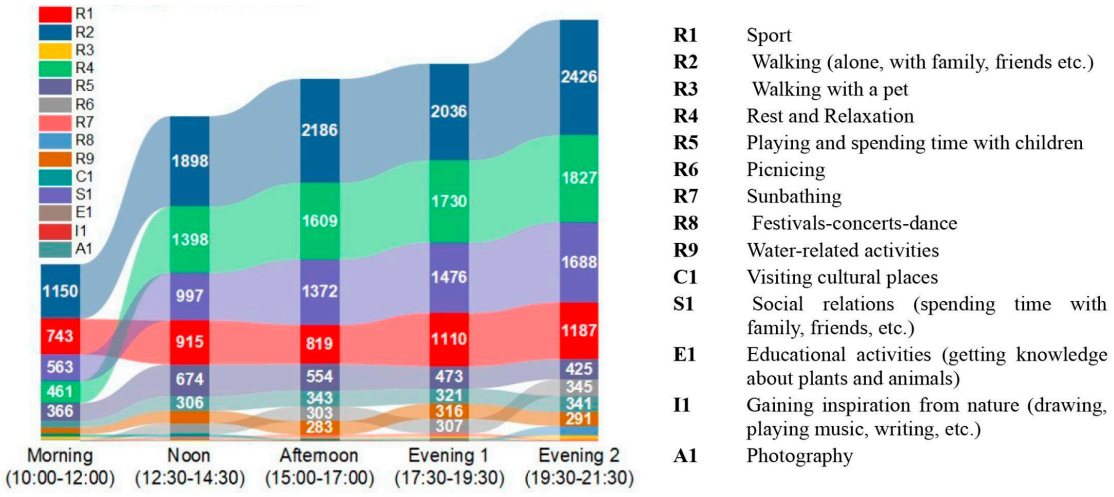


Figure 7. Distribution of park activities within all days of observation.

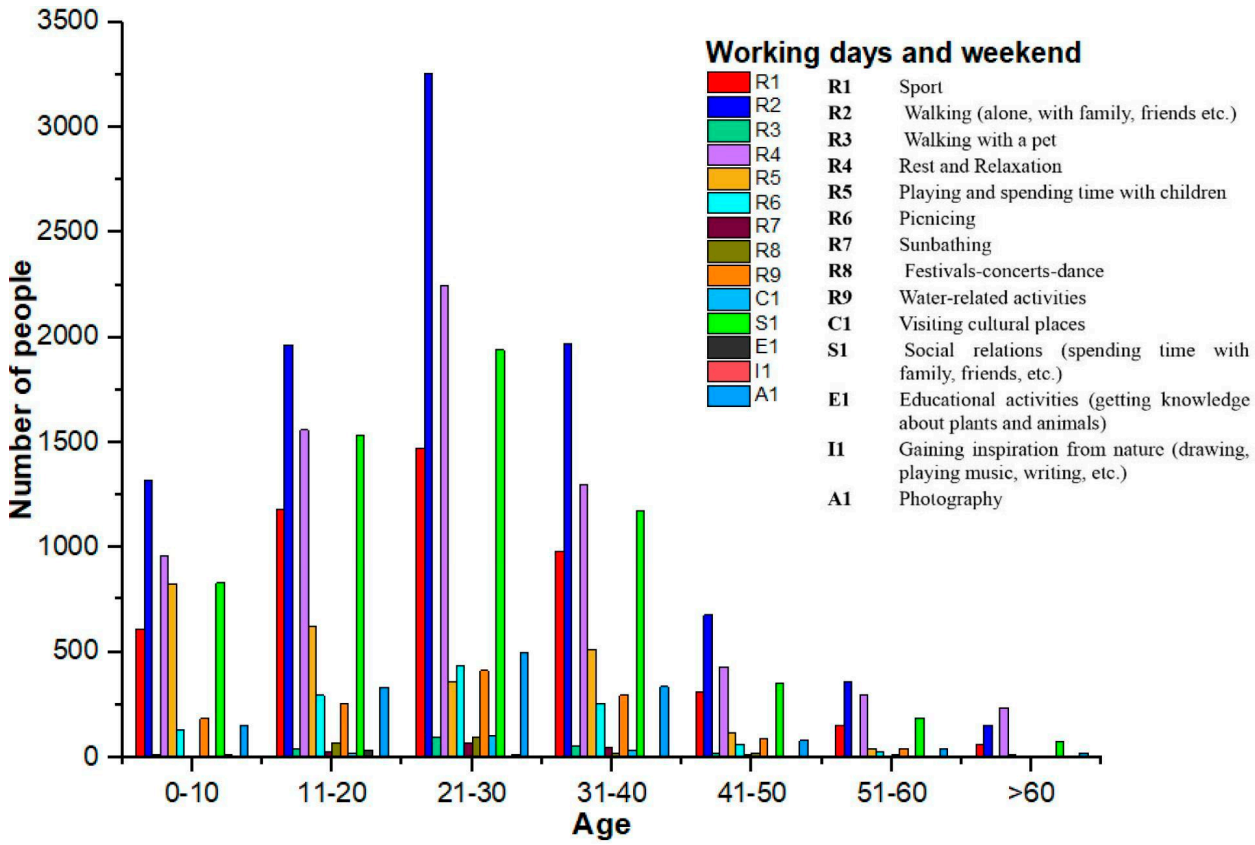


Figure 8. Distribution of park activities among the age groups: as a cumulative for working days and weekend.

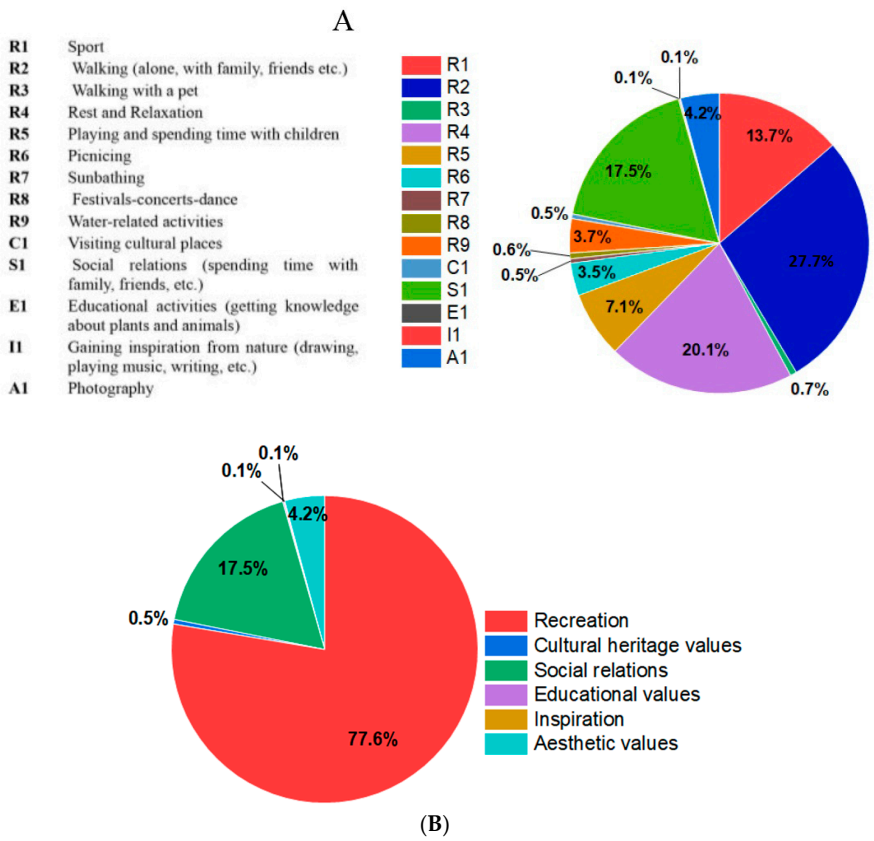


Figure 9. The distribution of park activities (**A**) and their translation into CES utilization (**B**).

3.3. Recreational Activities and CES Utilized in Gorky Park

The distribution of park activities at each observation point is represented in Figure 10A and Figure S11 in the Supplementary Materials.

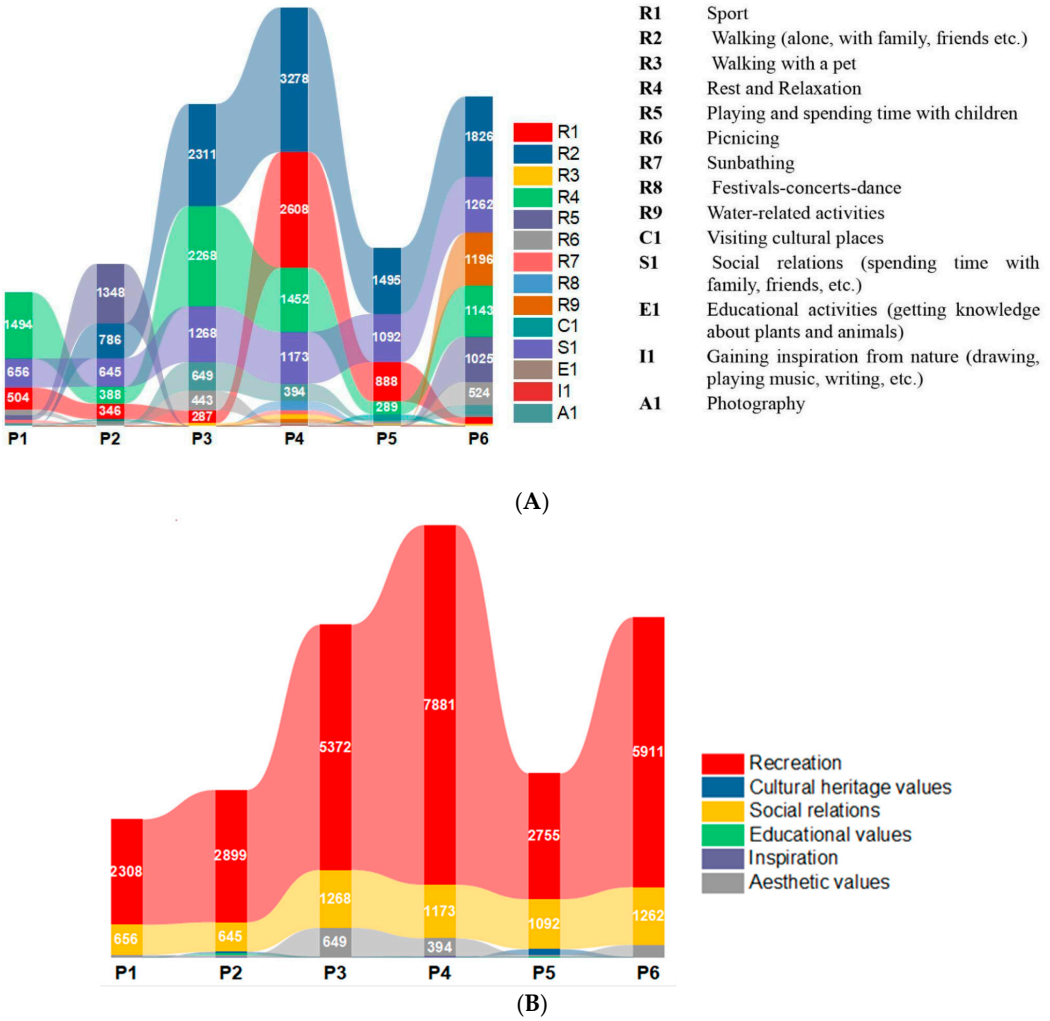


Figure 10. The distribution of park activities (**A**), and their translation into CES (**B**) at each observation point of Gorky Park (as cumulative numbers for all observation days).

Point 4, the pedestrian riverside (the Pushkin embankment), seemed to be the most attractive park site (according to the number of observed visitors). Nearly every type of activity was observed here: walking (alone, with family, with friends, etc.) (34.6%), sports (27.6%), rest and relaxation (16.3%), and social relations (spending time with family, friends, etc.) (12.4%).

Point 1 (the sport center and the lawn area) was prominent for providing rest and relaxation opportunities as around 50% of the activities belong to this category. Other popular activities included social relations (spending time with family, friends, etc.) (21.7%) and exercising/sports (16.7%).

Among playing and spending time with children (36.7%), the most preferred activities at *point 2* (the Salout playground) also referred to walking (alone, with family, with friends, etc.) (21.4%) and social relations (spending time with family, friends, etc.) (17.6%). At the same time, rest and relaxation (10.6%) and sports (9.4%) seemed to be less favored.

Point 3 (the fountain) mostly attracted the park visitors toward walking (alone, with family, with friends, etc.)—31.7%, resting and relaxing—31.1%, and socializing (spending time with family, friends, etc.)—17.4%.

The dominant activities at *point 5* (the Garage Museum area) consisted of walking (alone, with family, with friends, etc.), social relations (spending time with family, friends, etc.), and sports/training exercises.

Finally, *point 6* (the Golitsynsky Pond) could be characterized as one of the most crowded observation points where all of the abovementioned park activities were equally represented.

It can be concluded that only three main categories of CES utilization in Gorky park were observed (Figure 10, Table 2): recreational services (recreation), social relations, and aesthetic values. The remaining categories (cultural heritage, educational values, and inspiration from nature) were rarely represented in all observation points. Recreation was the dominant CES at all observation points, with its most evident presence at point 4. Social relations were the most favored activities at points 1 and 5. Point 5 had the largest share of cultural heritage sites and the related CES among all of the observation points. Aesthetic CES were mostly relevant for point 3, while educational ES seemed to be especially utilized at point 2.

3.4. Linking CES and Park Infrastructure

A variety of Gorky Park's infrastructure (both built and BGI) created opportunities for different recreational and other CES-based activities at all observation points. The comparison revealed that the observation points with the greater total score had a higher ranking/grade (Figure 11). Thus, the following relationship was detected: the more infrastructure elements were identified, the more types of park activities (and related CES categories) were determined at the certain observation point. For instance, observation point 4 (the Pedestrian Riverside) held the top position, followed by point 6 (the Golitsynsky Pond), point 3 (the central fountain), point 5 (the Garage Museum of Contemporary Art), point 2 (the Salout playground), and point 1 (the sport facility and the adjacent lawn area). The statistical dependence between the point location and the observed activities (Sig = 0.000) as well as between the observation points and CES (Sig = 0.000) was significant (Tables 4 and 5). Cramer's V for the pair "recreational activities—observation points" was 0.344, indicating a medium degree of relationship. In contrast, the Cramer's V for the pair "CES—observation points" was 0.110, reflecting a weak relationship.

In regard to the distribution of CES (Figure 11), it was found that the recreational ES were more dominant at observation points 4 and 6. The presence of BGI elements (e.g., a wide lawn area) and the built infrastructure facilities (e.g., playgrounds or sports fields) can be considered an important factor promoting the social activities of the park visitors, especially at observation point 1. Moreover, at observation point 5, the presence of built infrastructure elements (e.g., benches, resting areas, etc.) promoted social relations. Aesthetic appreciation of nature (aesthetic values) was prominent at observation points 3, 4, and 6 with the highest number of BGI elements (in particular, with the simultaneous presence of green and blue spaces). ES related to cultural heritage and education seemed to be less attractive to the park visitors at all observation points and were detected only in the places with the related built infrastructure, e.g., museums, historic places, exhibitions, etc. (observation points 2 and 5). Nevertheless, the presence of various BGI elements increases the potential of Gorky Park to provide educational ES, considering the essential role of nature in nature-based learning, promoting a deeper connection to nature, pro-environmental behaviors, etc.

Table 4. Chi-Square and Cramer's V follow-up results for the pair "the activities and the observation points".

Chi-Square Test				Cramer's V Follow-Up Test			
Value		df	Asymptotic Significance (2-Sided)		Value		Approximate Significance
Pearson Chi-Square	20,694.082	65	0.000	Nominal by Nominal	Phi	0.770	0.000
Likelihood Ratio	19,729.078	65	0.000		Cramer's V	0.344	0.000
Linear-by-Linear Association	354.991	1	0.000	N of Valid Cases		34,934	
N of Valid Cases	34,934						

Table 5. Chi-Square and Cramer's V follow-up results for the pair "the CES and the research points".

Chi-Square Test				Cramer's V Follow-Up Test			
Value		df	Asymptotic Significance (2-Sided)		Value		Approximate Significance
Pearson Chi-Square	2132.045	25	0.000	Nominal by Nominal	Phi	0.247	0.000
Likelihood Ratio	1823.309	25	0.000		Cramer's V	0.110	0.000
Linear-by-Linear Association	5.300	1	0.021	N of Valid Cases		34,934	
N of Valid Cases	34,934						

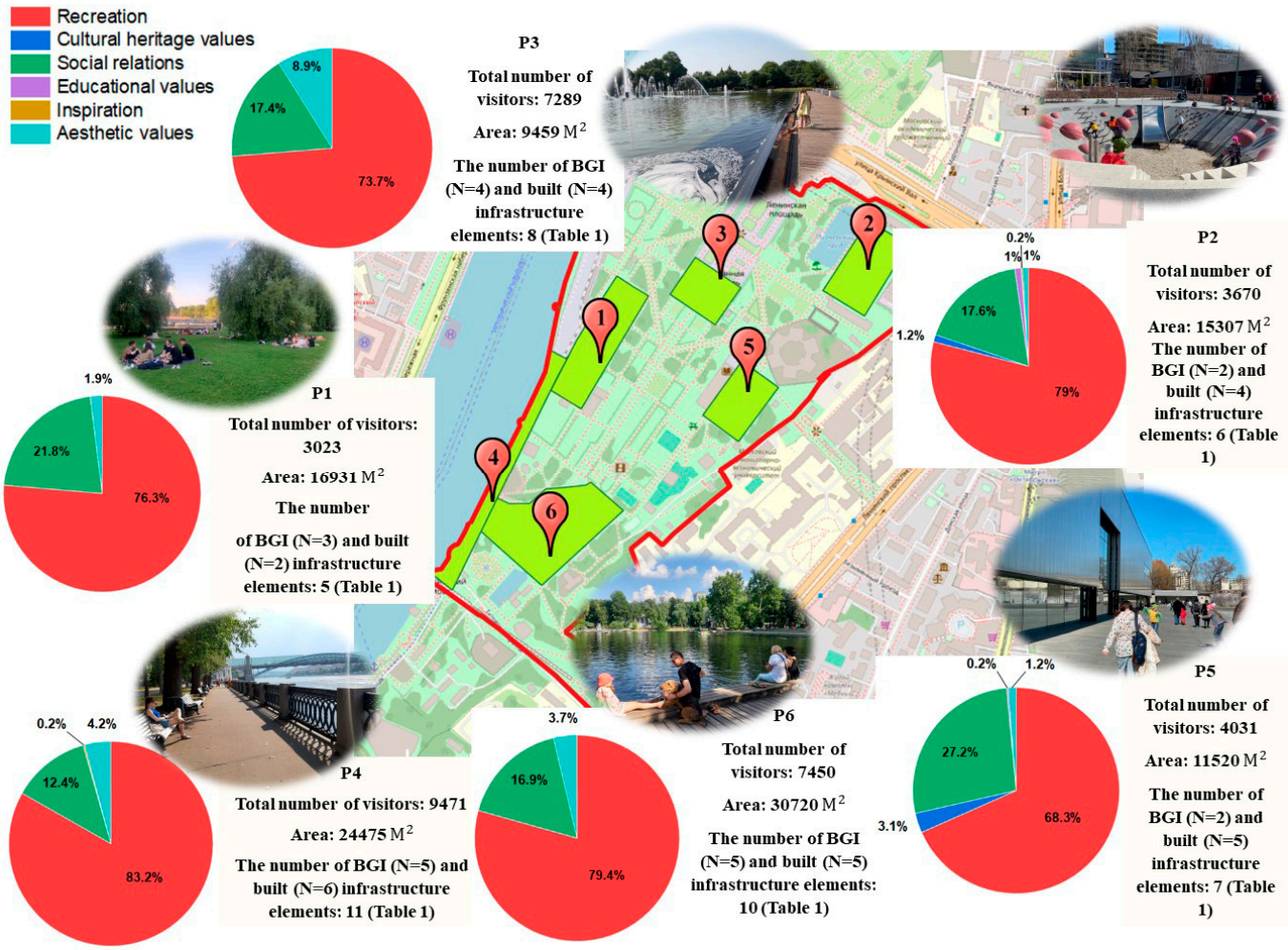


Figure 11. Distribution of CES at each observation point (P1–P6).

4. Discussion

4.1. Park Visitors, Infrastructure, and CES Utilized

RQ1: How do visitors of different gender and age use Gorky Park throughout the week? *RQ2*: What CES are in demand in the park/what park activities are most popular among park visitors?

The results indicated several differences in the use (CES-based activities) of Gorky Park by visitors of different ages and genders, in regard to various observation days and considering the specifics of park infrastructure.

Types of park use. In general, the most frequent recreational activities were walking (alone, with family, with friends, etc.) (27.8%), rest and relaxation (20.1%), social relations (spending time with family, friends, etc.) (17.5%), and sport (13.7%). This corresponds with the results of the other related studies [29,50], where recreation, sport activities, the aesthetic value of nature, and relaxation were detected as the main reasons for visiting Gorky Park.

Age. The park seemed to be more attractive for the younger generation (the highest number of visitors was among the age group of 21–30 years old) than for the elderly people (the least number of visitors). The statistical dependence between the location of the observation point and the age of visitors was detected as significant. This may be explained by the fact that the park is well-designed for active recreation (according to the number of the related park's infrastructure elements detected). The previous study [29] emphasized that a certain negative perception of Gorky Park among several social groups was associated with noise and crowdedness (large number of visitors). Despite this fact, elderly people were still observed there since the park also provided several opportunities for passive recreation and social interactions linked to the presence of the related infrastructure elements. We can conclude that the park contributes to increasing social and environmental justice by providing the possibility of using CES for all age groups as also highlighted by other studies [1,28]. Nevertheless, there is a potential to extend and improve the characteristics of the Gorky Park infrastructure that specifically respond to the needs of elderly people, for example, seniors' outdoor exercise equipment [57], engagement in nature-related activities [58], walkway features [59], places for playing cards or other similar games [60].

Gender. According to the gender distribution, the women appeared to find the park more appealing than the men did. Moreover, the differences in preferred park activities among the male and female visitors were revealed. In particular, among the women, these activities included walking (alone, with family, with friends, etc.), rest and relaxation, spending time and playing with children, picnicking, water activities (e.g., boating), and taking photographs. The men, in turn, were more interested in sport activities than walking, resting, and relaxation. These results correspond with the other studies [61,62] demonstrating that women prioritize recreation in UGS and tend to value nature more than men do.

RQ3: Is there a relationship between the CES supply and the park infrastructure?

Relationship between the elements of the park infrastructure and the CES supply. There was a significant statistical dependence between the built infrastructure and BGI elements and the CES that determined the specific park activities in all of the observation points and their popularity among the visitors. However, this relationship was assessed as weak, especially at the observation points within the multifunctional park areas, where it was challenging to verify whether it was specifically linked to the BGI or built infrastructure elements. For example, the pedestrian riverside (the Pushkin embankment) and the pond were the most popular park sites among the visitors for various types of activities. As previously mentioned, at these observation points, walking, exercising, resting and relaxing, and social

relations were the most common activities. This is most probably due to the existence of wide paths for walking and exercising, benches, and other sitting areas with the panoramic river view that encourage the mentioned activities. A similar explanation applies to the Golitsynsky Pond (observation point 6) with a well-developed BGI and designated areas for picnicking and social gatherings that promote water-related activities and socializing, as well as the Sport facility (observation point 1) with a wide lawn area encouraging rest, relaxation, and social relations. This is in line with the study [63], which emphasizes the linkages between recreation, spiritual services, and aesthetic experiences and the presence of the following BGI elements such as ponds, natural/green fences, lawns, and groves. At the same time, the results of the study revealed a potential for future research that could (1) explain how park features contribute to CES supply and demand, (2) further explore design-related urban park features, and (3) discover more nature-based solutions that could positively affect CES.

4.2. Implications of Research for Sustainable Planning and Management of the Park and Enhancing Its Multifunctionality

RQ4: What is the potential for improving the park planning and design to address the needs of its users (through considering CES) and promote sustainability?

This study confirms the role of the park as an important element of urban BGI in providing diverse CES to support the well-being of its visitors. There is a variety of benefits for citizens obtained through CES delivered by Gorky Park for physical (e.g., through the opportunity for physical activities, sport exercises, etc.) and mental health (e.g., ability to relax and stress reduction). This corresponds with the results of the other research [33,64,65]. Our study also shows that a few specific factors (e.g., the park built infrastructure and BGI, demographic characteristics, and spatial variables) can influence the use of CES among park visitors. The results demonstrate the direct relationship between the CES determined at each observation point and the existing park infrastructure. In particular, the observation points with the higher score of the built infrastructure and BGI elements (e.g., points 4, 6, and 3) have been characterized by the largest number of park visitors and the greater provision of CES. This corresponds to the research [20], which emphasizes that park characteristics and socio-demographic variables have different effects on particular CES: sport activities and exercise, nature interactions, socializing, and relaxation. Our study reveals three main categories of CES: recreation, social relations/interactions, and aesthetics, while other CES (e.g., heritage and culture, nature-based education, and inspiration from nature) remain insignificant for most of the park visitors. This is in line with the findings of other surveys indicating that recreation, relaxation, aesthetics, and social relations are the most frequently recognized CES [5,65]. Studies [8,66] emphasize that recreational and leisure activities are primarily influenced by the extent and spatial arrangement of park infrastructure, in particular by the quality of vegetation, spatial design, management of vegetation elements, selected environmental aspects, available amenities, and architectural elements needed for recreation. In the previous research [29], it was found that recreation and aesthetics were also prioritized by the Gorky Park visitors as the main CES categories over physical and mental health, social interactions, and sense of place. However, in addition to recreation, parks are important in providing educational opportunities that can increase the human–nature connection and people's interest in and empathy with nature [66]. Another essential role that parks play relates to promoting cultural heritage and preservation of historical and cultural values. Nevertheless, our results demonstrate that Gorky Park is mostly utilized by the visitors as a place for recreation and socializing, whereas its value as a cultural heritage site still receives less appreciation. In order to address this issue, we developed a set of specific measures for park management and maintenance. They primarily aim to foster the cultural values of this park and its multiple sustainability benefits. In par-

ticular, we suggest *advancing existing cultural elements* of the park built infrastructure, such as natural monuments, museums, sculptures, etc. (e.g., by raising public awareness to their cultural values, historical roles, identity-forming specifics, etc.). Additionally, *organizing various cultural events such* as festivals, concerts, etc. on a regular basis can contribute to enhancing the cultural value of the park and its role in promoting cultural heritage and creativity, enhancing local identity, and handing down heritage to future generations. On the other hand, the cultural value of the park could be strengthened by *adding more ornamental planting*. With their diverse and aesthetic qualities, ornamental plants create visually pleasing landscapes within cities and positively influence the psychological well-being of citizens [5]. Furthermore, when using pollinator-friendly plant species, ornamental planting also supports biodiversity by providing essential habitats for various pollinators and other wildlife enhancing the general well-being of urban ecosystems [67]. Another important direction for the future park development relates to its potential for *nature-based education* (educational CES). As previously mentioned, Gorky Park already has the Green School (located at observation point 4); however, there is a great prospect to develop similar nature-educational facilities for promoting a culture of nature conservation through communication and co-creation, especially among the younger generation of park users [28,36,65]. Another suggested step relates to *further promoting human–wildlife interactions* to improve nature connectedness in cities through enhancing the biodiversity in Gorky Park. However, it requires park visitors to have *sufficient environmental knowledge* and understanding of the parks' flora and fauna [68]. This can be reached by organizing additional educational events and related facilities (e.g., pavilions, summer houses, etc.). Therefore, nature-based activities and opportunities for nature observation should be provided to explore various flora and fauna species, e.g., through citizen science [69,70], urban gardening [65], IoT and smart technologies [50,71], etc.

When looking at the existing studies on how to better integrate CES in environmental policy, planning, and design of BGI, we can conclude that they rather suggest urban planners create opportunities for CES to evolve (e.g., through facilitating measures that further promote human engagement with nature in urban spaces). In particular, Cheng et al. proposed three key considerations for incorporating the concept of CES into landscape design, particularly in urban parks by (1) defining the park type and its scale; (2) comprehensive data collection process to support the methods used; and (3) the development of evaluation tools, guidelines, and practical resources to aid designers in their work [41]. Tandarić et al. introduced the 5P framework, which outlines five critical factors (e.g., place, people, past, practices, and purpose) that urban planners should consider when planning CES in cities [42]. In exploring the relationship between humans and UGS, Liu and Jensen identified six key variables: the importance of green spaces, the accessibility of green spaces, the distance between visitors and green spaces, the socioeconomic status of visitors, the frequency of visits, and the activities visitors engage in, all of which are linked to the CES provided by the certain UGS [13]. This is closely related to the approach proposed by Zwierzchowska et al., which along with accessibility also considered assessing CES demand and flows as reflected in visitor perception and behaviors [65]. Moreover, Blicharska et al. suggest considering four key components: the connection between CES and specific ecosystems or their elements, the identification of human needs, the determination of spatial scale, and the consideration of temporal scale [31]. They point out that decision-makers must focus on shaping policies that address the diverse needs of potentially conflicting stakeholders, determining what actions should be taken or avoided regarding the ecosystems, as well as specifying the locations, timing, and responsible parties for these actions. Wang et al. propose landscape site design strategies for enhancing different CES types as practical solutions for managers and landscape architects, in particular suggesting to consider the

density of facilities, the proportion of tree canopy-shaded ground, and the richness of land-cover types for urban park design practices [5]. As pointed out by Zhu et al., the supply and demand analysis of urban parks can enhance the quality and effectiveness of the CES they provide, offering a solid foundation for informed decision-making in the park planning and management [72].

Based on these approaches [5,13,31,42,65], the study provides specific place-based perspectives that can help to deepen the understanding of the issues related to UGS multifunctionality and better integrate the CES approach in the planning and design of BGI/urban parks. For this purpose, the following recommendations on how to improve the CES provision by addressing the visitors' needs and certain sustainability issues in the particular functional zones of Gorky Park (observation points) are suggested:

- *Point 4 (the Pedestrian Riverside)*, as the most visited site (functional zone) of the park, requires specific management and maintenance. The uniqueness of this site is linked to the presence of the high diversity of BGI elements along the Moscow River as its main natural feature. It also offers a variety of recreational activities due to the well-established built infrastructure (e.g., walking and cycling paths and amenities for sport activities/training). The current park infrastructure supports the flow of several CES (e.g., social values, aesthetic values, and recreational services). However, there is a high potential to increase the delivery of other CES, for instance, through adding new or improving the existing facilities and amenities that increase the cultural and educational values of nature.
- *Point 6 (the Golitsynsky Pond)* is the second most visited park zone. It is rich in both BGI and built infrastructure elements (e.g., wooden chairs and benches that allow resting and relaxing; boating; diversity of flora and fauna species). The main categories of CES delivered here refer to the social and recreational services that provide opportunities for relaxation and water-based activities. Considering the abundant species diversity of fauna (e.g., 19 bird species) and flora (variety of plants used for landscape design), further planning and design strategies should use this biodiversity richness as an opportunity to promote nature-based learning. This can be achieved using tailored educational measures that foster public awareness about nature and environmental issues (e.g., through installing information banners or posters, organizing nature-based learning activities, workshops, etc.). Moreover, in order to maintain the high level of biodiversity in this zone, it is important to extend the range of biodiversity-supportive activities. This can include measures that enhance a diverse range of native species (e.g., pollinator-friendly alternatives to grass lawns, native flower beds, etc.) and provide important habitats for pollinators, birds, and other animals.
- *Point 3 (the central fountain)* represents one of the main symbols of Gorky Park. Being mostly attractive to the park visitors due to its high aesthetic and social values, it is a popular park site for recreational activities, socializing/spending time with family and friends. Still, there is a potential to enhance the supply of other CES (e.g., cultural values and inspiration from nature) by designing specific areas and organizing related events (e.g., festivals, workshops, etc.) that use natural, historical, and cultural heritage to promote regional identity, sense of place, and allow gaining inspiration from nature.
- *Point 5 (the Garage Museum of Contemporary Art).* The existence of the museum contributes to the prominence of the site, not only in terms of providing recreational and social services but also representing the modern elements of architecture in the park and the whole city (relating to cultural and educational values). The area is equipped with some elements of built infrastructure (e.g., open space with an amphitheater, several benches, wide path with a resting area). Nevertheless, it is underdeveloped in regard to BGI (e.g., limited number of plants used in landscaping and design).

To address it, the existing vegetation (e.g., limited number of plants, mostly single trees, and a tree line on the edge) can be extended and diversified. Considering that a large part of the area is paved, it is recommended to integrate additional lawn areas, flower beds, and trees to provide shade and better mitigate the microclimate as well as support the local biodiversity. In terms of architectural improvement and redesign, the area has been greatly improved; however, the landscape design of the public space around the museum needs to be refined in regard to making it more oriented towards sustainability and multifunctionality. This particular space can be considered as both an important element of the park ecosystem and its development history. Thus, redesigning the area can be organized to reflect the history, political regime, and cultural diversity that have influenced the park's landscape design style and the model of human–nature interaction.

- *Point 2 (the Salut Playground)*, presented with a variety of flora and recreational amenities tailored to the needs of various age groups, is one of the park's modern playgrounds that is suitable for all age groups of visitors. According to the existing park infrastructure in this area, nearly all the groups of CES have been detected here. The playground area encourages children to explore nature through using their senses when touching plants, feeling various textures, and hearing different sounds. The Green School located here provides additional educational opportunities related to ecology, agriculture, and gardening. Considering that recreational, social, and educational CES are mostly prioritized and that the area is especially popular among families with children, it is possible to increase the CES that take into account parents' interests as well (e.g., through organizing nature-based education for adults, designing an area with a high aesthetic value, etc.).
- *Point 1 (the sport center and lawn area)* allows this park zone to provide CES related to leisure and relaxation as well as services related to social values. In regard to the presence of several BGI elements, the area offers shaded places thanks to the trees and shrubs planted on the edge that form a green fence, isolating the area from other functional zones of the park. The opportunities for diverse types of social interactions/gatherings with family and friends as well as relaxation are provided by the lawn area. Keeping in mind that many visitors at this observation point use the lawn for close contact with nature (e.g., walking barefoot through a grassy field, lying down, or sitting on the grass), it is important to integrate the trampling-resistant lawn species. This will allow ensuring sustainable lawn use and capacity of the lawn ecosystem to further provide this important CES.

4.3. Limitations and Directions for Future Research

The main method used in the study, namely, non-participatory observation, has several limitations, in particular, the level of the researchers' observational skills. This can result in the incomplete understanding or misunderstanding of certain behaviors or interactions, misinterpretation of data, the impact of personal perceptions in data collection, etc. To address this, we conducted the preliminary study (unstructured observation) and collected field notes in Gorky Park, which allowed us to avoid the challenges in interpreting the observed park activities. Additionally, a table consisting of clear definitions of the activities according to the CES categories was developed. Still, several errors/misinterpretations might appear (e.g., defining the age of the visitors; for this purpose, several age intervals were used). This calls for both intense attention to particular details and the capacity for sustained concentration by the observer. Since not all the observed behaviors can help address the research questions, other research methods are required. In this regard,

the study also applied field notes, literature analysis, and desktop research as additional methods.

Another limitation refers to the intangibility of some CES such as a sense of place, aesthetic and educational values as well as cultural heritage. Compared to the other CES, for example, recreational services and social relations that can be assessed using objective evaluation, these intangible CES are often subjectively valued (e.g., as perceived by the observer). To reduce this effect, we selected a set of particular activities as criteria for investigating certain CES. In particular, for researching the aesthetic values of nature, the activity related to "taking photograph(s) of nature" was set as a criterion. In regard to educational services, the assigned criteria referred to "gaining knowledge about nature" ("gaining knowledge about plants and animals", "learning from nature") and using educational facilities (e.g., the Green School in Gorky Park). Along with the existing informative banners, they promote nature-based education and raise ecological awareness. However, certain CES (e.g., sense of place) were not integrated into the study design because it was impossible to specify the related activity as an assigned criterion due to the intangible nature of such CES.

The results obtained in the current research will be further verified by additional research. As suggested by other related studies [51,73], a combination of methods such as the Public Participation GIS (PPGIS) and passively crowdsourced data from social media will enable a better evaluation of CES delivered by urban parks that in turn could supplement and enrich the outcomes of this study. Moreover, the provided results serve as a base for further questionnaire surveys and interviews with park visitors as well as expert interviews (e.g., considering the results of the study [24]), participatory mapping, etc.

The study revealed a potential for improving the park planning and design to address the needs of its users (through considering CES) and promote sustainability. The provided recommendations can be used for the further adaptation of park infrastructure to the changing environment (e.g., climate change) and for enhancing its multifunctionality to respond to the interests of different social groups. These recommendations will be further elaborated within the following activities: a questionnaire survey among the park visitors to reveal the values, attitudes, and preferences for the future park development, expert interviews/focus groups with urban planners and policymakers on the prioritization and feasibility of the suggested measures and their cost–benefit analysis, etc. Only after conducting these additional follow-up activities, tailoring and prioritization of the recommendations in regard to their short- and long-term outcomes, sustainability impact, and the capacity of park management to address urgent needs will be possible [33]. According to [47,74] and our previous research [24,44], such prioritization is a time-consuming process and depends on the city's priorities and vision and the government's urban agenda. However, considering that the Moscow government has made the integration of ES into BGI planning one of the priorities in the city's environmental policies [47], we can predict the increase of interest in further related research and actions (e.g., on how to use the CES assessment in the planning, development, and redesign of UGS/parks to increase the efficiency of UBGI (see [43]).

5. Conclusions

This paper enhances the understanding of CES provided by urban parks and their contribution to socio-ecological sustainability. In Russia, such studies that explore the CES delivered by the BGI and especially urban parks, that examine the interaction between people and nature, are still rare. Furthermore, the application of the ES approach in research, policy, and BGI planning, particularly for urban parks, is limited in Russia (e.g., BGI planning primarily follows expert and official standards, with little integration of social factors such as public values, preferences, and perceptions of benefits from UGS). To

address this gap, this study evaluates the CES offered by Gorky Park and explores how park infrastructure influences CES availability and aligns with visitor needs. Through the lens of CES, the findings reveal the potential for improving the park planning and design to better serve users' needs and address the current urban challenges (e.g., ongoing urbanization, cultural diversity, the demand for multifunctional UGS, and climate change). This study provides recommendations for better integrating CES into environmental policies and urban planning. Specifically, these recommendations focus on increasing the park's multifunctionality to deliver diverse CES (and other ES) and enhancing the park's infrastructure to foster sustainability by incorporating nature-based solutions in different functional zones of the park. As the Moscow government nowadays prioritizes the integration of ES into BGI planning, these recommendations can help urban parks as key components of the city's BGI to better address the current challenges.

Gorky Park is indeed a front-runner among the other public green spaces of Russia in several aspects. As the very first public park of culture and leisure in the Soviet Union, Gorky Park became an iconic example of Soviet landscape architecture and initiated a new culture of leisure. This led to a significant transformation of the concept of public parks. In particular, it reshaped the perception of parks as recreational places that in addition to providing opportunities for socializing also support people's health and well-being through engaging in and promoting physical activity, experiencing nature, and relaxation. From its creation, throughout the entire Soviet period and up to this day, the park has been demonstrating its importance as UGS designed to promote innovation, education, and sustainability, providing various opportunities to experience the new public park tradition and its activities, including outdoor recreation. The park continues to embody the vision of Moscow as the "city for people" and maintains its progressive approach across different dimensions. The study revealed the variety of CES provided by the park to meet the interests of a wider audience, including the younger generation, families, and seniors, by offering a venue for internationally and nationally prominent events, performances, and numerous opportunities for sports (e.g., biking, walking, skating, and yoga) and leisure. Moreover, in order to address the climate change-related issues and the need for multifunctionality, several practical recommendations aiming to better integrate CES in urban park planning have been provided. In particular, the extended greenery in most parts of the park is co-developed according to the nature-based solution approach. In particular, a large part of the park infrastructure is established using eco-friendly materials; also, the park governance brings together multiple actors—policymakers, planners, entrepreneurs, citizens, and scientists. By providing the facilities (e.g., various playgrounds, educational pavilions/green schools, etc.) for nature-based activities that inspire children and youths to explore the outdoors, the park also creates a more inclusive environment for all. Various ecological events organized in the park's outdoor educational settings contribute to raising public awareness of environmental issues with a particular focus on biodiversity, sustainable agriculture, ecological/environment-friendly behaviors, climate change, etc., thus enhancing the connection between people and nature that is especially important in the megacities such as Moscow. The study results indicate that among the various categories of CES, recreational services are the most utilized by park visitors. The park is particularly appealing for recreation and social interaction, likely due to the well-developed infrastructure and recreational facilities and spaces conducive to social engagement. However, there is a potential for further improvement of park planning and management to enhance the provision of other CES such as cultural heritage, aesthetic, environmental educational values, and nature-inspired experiences. Focusing on place-based perspectives (such as the built infrastructure and BGI) could promote greater multifunctionality by addressing visitors' needs and advancing sustainability issues.

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