



SPATIAL ANALYSIS OF PUBLIC PARKS IN PUNE

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Abstract: The socio-ecological and physical functions of public parks in urban areas are multifaceted and crucial to the livability of cities. The study assessed three public parks in Pune, based on a holistic evaluation framework covering eight key areas: Access and Linkages; Design and Site Plan; Environmental and Ecological Aspects; Social and Leisure Elements; Safety and Security; Maintenance and Administration; Financial and Cultural Relevance; and Inclusivity. A number of parameters and indicators were used in each category such as Entry Points, Connectivity, Inclusivity, Spatial Organization, Wayfinding, Biodiversity, Green Cover, Water Management, Community Participation, Lighting, Surveillance, Cleanliness, Infrastructure, Property Value, Local Economy Boost, Accessibility for All, etc.

Visual research methodology along with spatial analysis and documentation was done to evaluate the parks. The comparative analysis technique facilitated the ascertainment of best practices. The study suggests that a holistic evaluation of public parks using multidimensional measures can be of practical help to city officials, planners and community residents. These types of analyses can contribute to better decision-making in the prioritization of investment, enhancement of park performance, promotion of equitable, sustainable and vibrant urban green spaces in the fast-growing urban scenario.

Index Terms – public parks, spatial, urban

I. INTRODUCTION

Urbanization stimulates positive growth in many aspects such as employment opportunities, access to better health care facilities and improvement in the standard of living. With the positive aspects some negative aspects also arise such as degradation of environment, loss of green spaces and overcrowding. To achieve sustainable and eco-friendly urban growth, it is essential to adopt and implement planning in which parks and green spaces are given importance and due consideration in the overall growth of the urban areas. (Ramaiah & Avtar, 2019) Green spaces are essential and play a major role for wellbeing of the people living in urban areas along with providing significant health benefits. (Zhang, Yang, Wang, & Guo, 2024)

As the influx of people in the urban areas is increasing it is impacting the sustainability of the urban systems adversely. (Paul & Nagendra, 2017) Rapid urbanization has resulted in the density of population and pollution that has reached unprecedented high levels, leading to the transformation of cities into concrete jungles with deteriorating environmental quality and life conditions and the disappearance of green areas.

In this regard, parks are instrumental in promoting urban well-being due to their potential among others to enhance air quality, mitigate urban heat, space for physical activity, relaxation and social involvement. They are like a shield in the degraded urban environment that helps to safeguard it positively by providing a good quality of life and also being visually pleasing. (Hussain, Nadeem, Younis, Riaz, Khan, & Naveed, 2010) Parks help to minimize the negative impacts of urbanization by acting as buffer spaces and increasing resilience. (Paul & Nagendra, 2017). People visit parks for different reasons, maybe because of the biodiversity it offers, social connections or some other kind of motivation. (Taylor, Leckey, Lead, & Hochuli, 2020)

This paper contributes to the assessment of three public parks located in Pune - Anusaya Sadba Lonkar Garden (Kondhwa), Shahid Ashok Kamthe Udyan (Wanowrie) and Shahid Abdul Hamid Ayurvedic Garden (Kondhwa) using the multi-dimensional tool-based on UN-Habitat Guidelines for Public Space Assessment (NuSocia, 2025). This study analyzes the following eight major attributes: Accessibility and Connectivity, Design and Layout, Environmental and Ecological Performance, Social and Recreational Functions, Security, Maintenance and Management, Economic and Cultural Value and Inclusiveness.

II. PUBLIC PARKS

Parks are one of the many important components of an urban ecosystem because of its different dynamics and also because of its pivotal role in the well being of mankind at large. (Rao & Puntambekar, 2014) Public parks are a key component of an environmentally sustainable urban plan since they have a positive influence on urban ecological and community health. They are an essential element of the urban environment and they play an important role for mental well-being and social connections by acting as a mediator between humans and the environment. (Sadeghian & Vardanyan, 2013) They operate as the green lungs of the city that improve air quality and reduce air pollution and urban heat island effect with the help of trees, vegetation, and green open spaces. Public park space is known to promote physical exercise, socialization, and mental health, and as a result, urban dwellers' quality of life is improved. Parks provide a chance for likeminded people to come together for social and health benefits. (McCormack, Rock, Swanson, Burton, & Massolo, 2014)

Parks in densely urbanized areas offer respite from the hustle and bustle of city living, providing access to fresh air and green space that can improve both physical and psychological health. Parks also promote biodiversity in cities, by acting as habitats for birds, insects and other creatures, help manage storm water and the city's ecological balance. Parks help in enhancing the resilience and self regulatory capacity of the urban environment. (Hussain, Nadeem, Younis, Riaz, Khan, & Naveed, 2010) In addition to providing environmental and health benefits, urban parks improve the visual quality and aesthetic character of the cityscape. Surrounding communities become more appealing and livable, value of properties get a boost and become an integral element for a well balanced growth of the city. Parks serve as public recreational green spaces for people of all age groups and with diverse communities. (Jogdande & Bandyopadhyay, 2022) Parks hold utmost significance in the urban scenario but sadly they are not given due importance due to the unplanned urban sprawl. (Bhaskar, 2012) The existence of parks plays a key role in shaping the sustainable urban development in many aspects. It impacts the urban ecosystem on a large scale and its absence deteriorates the environment impacting the stakeholders. (Sharma, 2021) Due to the increase in urbanization it has now become a big challenge to provide ample amount of green spaces in the urban areas. (Patel, Gandhi, & Bhatt, 2016)

III. METHODOLOGY

This study employs a mixed method research approach that combines visual assessment and comparative analysis to analyze the extent of inclusion, access and usable convenience of public parks. This combination of approaches enabled a detailed analysis of public parks within the city through on-site observation and qualitative research methods. The evaluation criteria for the assessment are based on the UN-Habitat Guidelines for Public Space Assessment. These criteria offer a meaningful template to evaluate how well public parks meet the needs of diverse users and contribute to daily urban life.

A set of eight key assessment principles were used to evaluate each park. These standards address physical accessibility, universal access, security, environmental factors, presence of services, use of space, upkeep and overall user satisfaction. The evaluation facilitates a holistic examination of the spaces to ascertain site design, infrastructure and management attributes shaping usability and inclusion.

The data were collected by means of direct observation and photography, capturing spatial features and the state of the physical environment of the parks. Direct observation was essential in outlining trends in accessibility, user activity, spatial exploitation and equipment. Photographs facilitated the visual assessment process and after that they were an evidence to be analyzed.

The analysis of the data was qualitative and comparative. This approach revealed the strengths, weaknesses and/or opportunities in design, planning and management of the parks. In doing so, the study was able to reveal differences in relative park performance, as evaluated against the same set of criteria and ascertain which design or management characteristics were most usable and inclusive. From the field, qualitative ratings were assigned to each assessment indicator (e.g. high/strong, medium/moderate and low/weak performance) based on how much the park met the related criteria. These parameters were subsequently combined to assess the performance of the chosen parks in all areas. The comparative findings enhance our understanding of how public parks operate in an urban context and identify means for making them more accessible, inclusive and environmentally stimulating.

IV. INDICATORS OF STUDY

The importance of the eight public space assessment parameters promoted by UN-Habitat lies in their ability to ensure that public parks function as equitable, safe, and sustainable urban infrastructure rather than merely recreational spaces. These parameters provide a structured framework so that the parks can be evaluated if they cater to the community needs and help contribute to the broader urban development goals.

4.1. Accessibility & Connectivity

Accessibility is a measure of the ease in which people can get to the park from adjacent neighborhoods. Public parks ought to be within walking distance from homes and be linked with pedestrian, cycling and public transportation rides. Distinct entrances and exits, barrier-free access and integration with adjacent streets allow all people, of all ages and abilities to effortlessly enter the park.

4.2. Design & Layout

The design layout refers to the configuration of the park elements, including trails, sitting places, playing areas, open areas and landscaping. UN-Habitat suggests that designs promote active use, visibility, adaptability for various activities such as recreation, relaxation, social interaction, cultural events and so on. It also allows brisk walks, dog walking and exercise routes.

4.3. Environmental & Ecological Performance

This is an element in assessing how the park impacts the quality of urban environment. Parks must promote biodiversity, tree cover and natural vegetation, as well as water management and micro-climate regulation. Urban greening plays a vital role in mitigating urban heat island, augmenting the air quality and enhancing eco-sustainability in the city.

4.4. Social & Recreational Aspects

The public parks have to be spaces suitably designed to foster social interaction, leisure activity and that also promote public community well-being. Facilities like children parks, tennis courts, jogging trails, seating areas and common meeting places stimulate people of different age categories to come to the park for relaxation, physical activities and sociability.

4.5. Safety and Security measures

Safety is a key part of making people feel comfortable in using the park through different times of day by providing good lighting, clear visibility, active edges and natural surveillance. Avoidance of concealment and expectation of routine involvement contribute to a good design for a safe environment for all users.

4.6. Maintenance and Management

Maintenance over time is what keeps the park clean, usable and attractive. Management of elements like-landscaping, waste, utilities, and the collective involvement of local authorities and community organizations, can prove to be a powerful means of space sustainability.

4.7. Economic and Cultural Values

Parks also add to the regional economic and cultural vitality. They can enhance the value of property in the surrounding community, support neighborhood vendors, hold cultural events, festivals and center activities. Through landscape design and programming of activities, public parks also contribute to maintain local identity and cultural tradition.

4.8. Inclusion

It has much to do with general park access and visitors of all ages and social classes are encouraged to enjoy the parks' offerings and make them their own. To what maximum extent should the space be designed for universal access and include universal design principles and barrier-free access, social inclusion and equal participation in public life should also be given importance.

V. STUDY AREA

5.1 Anusaya Sadba Lonkar Garden, Kondhwa



Figure 1: Layout and Location of Park

Source:

https://www.google.com/search?q=1.+Anusaya+Sadba+Lonkar+Garden+in+Kondhwa+toilet&sc_e sv=9e2784469eca2aa9&sxsrf=

Pune has a substantial number of public parks spread throughout the city under the administration of Municipal Corporation which are essential to cater the recreational needs to the residents. For the present study, three selected parks were investigated in order to understand the extent to which design attributes contribute in catering the needs of different user groups (e.g. older people, children, users with special needs). One of the selected gardens is Anusaya Sadba Lonkar located in the heart of Kondhwa. It has single access with a security cabin and parking is in front of the entrance. The convention park is divided into areas designed to accommodate different user group types. Separate sitting area is provided for senior citizens along with the pathway for walking, Children play area, green zone for doing yoga and exercise. The children's play ground is layered with granular gravel, a low-maintenance and child-safe surface. There is a green lawn in the middle of the park but it is

not for playing and sitting purpose, but it can be used for yoga and exercise. A clearly marked jogging track as well as short, non-slippery pathways is provided which can be used for elderly people to walk and move.



Figure 2: Accessibility & Connectivity of the park

Source: Author

The seating arrangements are under the shades of tree canopies and the stone benches are also accessible. The granular gravel surface also provides an acupressure walking experience, which is good for the elderly. The layout gives a smooth circulation and efficient space planning, so that people can move around comfortably and navigate the area with ease.

Different native trees are planted in major part of park and there are grass-blanketed peripheral mounds where children can play, fall and tumble. The whole area is monitored by CCTV. The entire park is equipped with lawn lighting. Different cultural events take place here.

In order to increase the interactive and sensory play for children, a TARU urban tactical intervention was deployed in the park. Such interventions take the form of sensory boxes, hanging xylophones, ropes art installations, wall art, and painted surfaces with characters, numbers and colour games. These two factors are very important in the development of children's thinking, emotional and social abilities through play interaction. The mix of urban design features and urban infill interventions makes Anusaya Sadba Lonkar Garden a lively place in the public domain, although potential improvements in access could make it a little more inclusive. Despite these well considered design elements, some accessibility barriers remain. The children's play area is not accessible to all, because it is sunken and children with mobility impairments cannot get in. Similarly, toilet facilities are also not user friendly for people with disabilities.



Figure 3: Spaces inside park

Source: Author

5.2. Shahid Abdul Hamid Ayurvedik Garden, Kausar Baugh, Kondhwa



Figure 4: Layout and Location of Shahid Abdul Hamid Ayurvedik Garden

Source:

<https://www.google.com/maps/place/Shahid+Abdul+Hameed+Park/@18.4731666,73.8948507,524m/data>

This 25,000 sq. m public garden is in Kausar Baugh, Kondhwa, Pune. The garden is a one gated entry with a security cabin and is situated in a residential area. There is parking outside the gate. The entrance is 'barrier free' and the space as whole is intended to be used for several activities which are linked by paved walkways. But many of these areas are on different levels and connected by stairs, so they are not accessible for people with disabilities.

The children's play area has several swings, play items and seating for parents and caregivers. Next to it is a green lawn area with a gazebo which is often used for parties, community events and picnics. There is also a playing space for games like badminton, tennis and cricket along with an outdoor gymnasium designed to cater for all age groups, which is accessed via a barrier-free pathway.

Benches are provided throughout the garden, both inside and outside the activity zones and along the pathways. Play area for children has granular gravel surface that is safe and easy to maintain. The paths are wide and paved up well with signage for easy reference. There is a toilet block that is universally accessible; however, it lies at the very end of the park. Drinking water is provided near the gate, and there are dustbins in and around the gardens.

The garden has been well lit and is under CCTV surveillance for safety and security. There are many types of trees, shrubs and herbs grown within the garden and all are labeled with details of the health benefits. In general speaking, the garden is clean and provides users with a lot of facilities.



Figure 5: Different Spaces in Shahid Abdul Hamid Ayurvedik Garden

Source: Author

5.3. Shahid Ashok Kamthe Garden, Wanowarie



Figure 6: Layout and Location of Shahid Ashok Kamthe Garden

Source: <https://www.google.com/maps/place/Shahid+Ashok+Kamthe+Garden/@18.4846666,73.8985665,441m/data=!3m1!1e3!4m6!3m5!1s0x3bc2ea79b2920971:0x3fc069dc807ed88c!8m2!3d18.>

This public park in Wanowarie is around 2400 sqm in area managed by the Pune Municipal Corporation (PMC). Even though it is a small play park, it has everything from walking track open gym a children's park and a lawn area. Universal access is at the gate and the parking just outside the garden.

This park has a peaceful ambience with the seating arrangements are shaded by the trees. The lawn is on a lower level than the pathway so it is not comfortably accessible. There is a children's play area with swings and slides but the flooring is not child friendly and this result in safety concerns. There is a gazebo in the play area but due to level difference it is not accessible by everyone.

The open gym caters to the needs of people across all age groups. But absence of drinking water and toilet facility is a big letdown as these are very much needed in any public park. Early in the morning and late in the evening people come to walk and have a peaceful time. Most of the part of park is shaded with trees.



Figure 5: Different Spaces of Shahid Ashok Kamthe Garden

Source: Author

VI. EVALUATION PARAMETERS

Category	Assessment Parameter	Indicators / Evaluation Criteria	Anusaya Sadba Lonkar Garden, Kondhwa	Shahid Ashok Kamthe Garden, Wanowarie	Shahid Abdul Hamid Ayurvedik Garden, Kondhwa
1. Accessibility & Connectivity	Proximity	Distance from residential & commercial areas	Within proximity of 50- 100 meters	Within proximity of 20 - 50 meters	Within proximity of 20 - 50 meters
	Entry Points	Number & distribution of access points	One access point	One access point	One access point
	Connectivity	Linkages with public transport, pedestrian & cycling networks	Strong	Moderate	Strong
	Inclusivity	Barrier-free access for differently-abled individuals	Strong	Strong	Moderate
2. Design & Layout	Zoning	Allocation for various activities (sports, relaxation, gatherings)	Strong	Strong	Strong
	Spatial Organization	Efficient use of space & circulation patterns	Strong	Moderate	Strong
	Wayfinding	Presence & clarity of signage for navigation	Strong	Moderate	Strong
	Aesthetics	Visual appeal, thematic elements & cultural integration	Strong	Strong	Strong

3. Environmental & Ecological Performance	Biodiversity	Presence of native flora & fauna	Strong	Strong	Strong
	Green Cover	Tree canopy percentage & shaded areas	Yes, Trees are present around the boundary and major seating benches are in shaded areas around 50% are shaded area	Yes, Trees are present around the seating area around 60% are shaded area	Yes, the majority of the park covered with tree canopy 80% of the area is shaded.
	Water Management	Rainwater harvesting, permeable pavements & water bodies	Yes, permeable pavements, no water body present	Yes, permeable Pavements , no water body present	Yes, permeable Pavements , no water body present
	Sustainability	Use of eco-friendly materials & renewable energy	Yes, somewhere	No	No
4. Social & Recreational Aspects	User Engagement	Frequency & diversity of visitors	Strong	Strong	Strong
	Amenities & Comfort	Availability of seating, restrooms, drinking water	Moderate	Moderate	Moderate
	Activity Areas	Playgrounds, sports courts, event spaces	Strong	Strong	Strong
	Community Participation	Involvement in park design, events & maintenance	Strong	Moderate	Moderate
5. Safety & Security	Lighting	Availability of adequate lighting for night use	Strong	Strong	Strong
	Surveillance	Presence of CCTV & security personnel	Strong	Strong	Strong

	Crime Rate	Incidences of vandalism or illegal activities	No	No	No
	Emergency Access	Availability of emergency exits & first-aid stations	No	No	No
6. Maintenance & Management	Cleanlines	Frequency of waste collection & sanitation	Strong	Strong	Strong
	Infrastructure Condition	State of pathways, seating, playgrounds & equipment	Strong	Moderate	Strong
	Park Governance	Management authority (municipal, private, community-based)	Municipal	Municipal	Municipal
	Property Value Impact	Influence on surrounding real estate prices	Yes	Somewhere Yes	Somewhere Yes
7. Economic & Cultural Value	Local Economy Boost	Presence of vendors, food stalls, small businesses	Moderate	No	No
	Event Hosting Capacity	Suitability for public gatherings & community events	Strong	Moderate	Strong
8. Inclusion	Accessibility for All	Universal design principles for people with disabilities	Yes, except Children play area	No, only pathways are accessible	No, not all spaces are accessible

	Gender Inclusivity	Safe & comfortable spaces for all genders	Strong	Strong	Strong
	Age-Friendly Design	Facilities catering to children, elderly, and youth	Strong	Strong	Strong
	Social Equity	Equitable distribution of resources & facilities for all communities	Strong	Strong	Strong
	Cultural Representation	Inclusive design reflecting diverse cultural identities	Moderate	Moderate	Moderate

VII. DISCUSSION/ CONCLUSION

This paper presents the multifunctional social-ecological and place-based value of public parks as urban sustainable development enhancers. Taking all the multi-dimensional evaluations into consideration based on the public space assessment ideology by UN-Habitat, the paper briefly analyzed three public parks in Pune on eight parameters. The findings revealed that pedestrian accessibility and spatial connectivity have been reasonably well established and universal accessibility; environmental enhancements, inclusive design features and structured community engagement still faced enormous challenges.

Crucially, the study stresses that public parks are not to be considered as simple playgrounds but critical city infrastructures that sustain environmental sustainability, public health and social engagement. Applying quality indicators for the accessibility, quality of design, sustainability, safety, governance, cultural value and inclusivity domains allows for the formulation of strong evidence supported policies and investment agendas. Certainly, by means of inclusivity, ecological performance and participatory governance, local parks can be turned into a resilient, dynamic and sustainable public space that bestows significant contributions to the enhancement of both urban livability and the ambitions of inclusive urban development.

The comparative study of all three cases approach enabled the analysis and discussion of the positive and negative aspects. Promising new models such as the higher levels of native biodiversity, way-finding system, and active volunteer participation show that the quality of design and the mode of governance can greatly influence park functioning. Nevertheless, some gaps such as in inclusive infrastructure, nature-based amenity and sustainable management strategies for the future need to be addressed.

In the end, tools and policies now exist that enable city managers, planners and residents to work together to improve park quality and equity within a city.

It is anticipated that the results of the study will advance knowledge-based strategies for urban design and planning that enable the provision of public parks that serve as inclusive, safe, sustainable and universally accessible for socially and racially diverse urban citizens. In today's time when urban growth is hampering the environment on a large scale, the importance of preserving and prioritizing urban green spaces should not be given a second thought. (Edeigba, Ashinze, Umoh, Biu, & Daraojimba, 2024)

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