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Quality Assessment of Urban Green Parks – A Case of Kathmandu Metropolitan City

by

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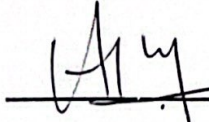
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I hereby declare that the thesis entitled "**Quality Assessment of Urban Green Parks-A Case of Kathmandu Metropolitan City**", submitted to the Department of Architecture in partial fulfilment of the requirement for the degree of Master of Science in Urban Planning, is a record of an original work done under the guidance of Asst. Prof. Dr. Inu Pradhan Salike, Institute of Engineering, Pulchowk Campus. Except for the material consulted, which has been properly referenced and acknowledged, all of the work in this thesis was done by me.

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ABSTRACT

Urban green spaces play a crucial role in enhancing the urban living experience, extending beyond their visual appeal. These spaces serve as vital components in fostering community well-being and addressing complex challenges associated with rapid urbanization, pollution, and urban expansion. The research's primary goal was to create a comprehensive tool for evaluating the quality of urban green parks. Employing a mixed-method approach, the study conducted an in-depth literature review to identify key dimensions and corresponding indicators essential for a thorough assessment of urban green park quality. And also survey was carried out on three prominent parks in Kathmandu Metropolitan City namely Balaju Park, Ratna Park, and Shankha Park. The subsequent calculation of quality scores aimed to offer valuable insights into the overall quality of these urban green spaces.

The assessment of urban green spaces resulted in overall quality scores of 0.643 for Balaju Park, 0.556 for Ratna Park, and 0.495 for Shankha Park. These scores underscore the presence of opportunities for improvement across all three parks, suggesting potential enhancements to various aspects of their design, amenities, and management. The assessment of each park's performance provides valuable insights for park management authority, policymakers and urban planners. These insights can serve as a foundation for informed decision-making and strategic planning aimed at elevating the management and overall quality of urban green spaces within the context of Kathmandu Metropolitan City, Nepal. The findings not only highlight existing strengths and weaknesses but also pave the way for targeted interventions and improvements to optimize the parks' contribution to community well-being and the urban environment.

Keywords: *Green Spaces, Urban Green Parks, Quality Assessment, Dimensions, Tool*

ACKNOWLEDGEMENT

LIST OF ACRONYMS

ULI: Urban Land Institutes

SDGs: Sustainable Development Goals

WHO: World Health Organization

FAO: Food and Agriculture Organization

RECPHEC: Resource Centre for Primary Health Care

AHP: Analytic Hierarchy Process

PCA: Principal Components Analysis

GFA: Green Flag Award

PQS: Park Quality Score

NGSA: Nordic Green Space Award

KII: Key Informant Interview

KMC: Kathmandu Metropolitan City

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CHAPTER ONE: INTRODUCTION

1.1Background

The existence of green spaces in urban areas plays a crucial role in enhancing urban liveability, especially in terms of the health and well-being of city dwellers. (Knobel et al., 2019). Urban green space encompasses a diverse array of vegetated areas within urban settings, comprising green parks, open spaces, community forests, street trees, residential gardens, agricultural land, and any vegetation present in the urban environment. This vegetation may exist in either public or private ownership, and it may include both indigenous and exotic plant species (Barnett et al., 2016). Here Urban Green Park is a specific type of urban green space that is designed and designated as a park within an urban environment. Parks make cities and towns pleasant places to live and work and are essential to the physical, social, environmental, and economic well-being of people and communities. They improve health by creating spaces for physical activity, play, enjoyment of nature, and mental respite. Proximity to a park or green space is inversely related to stress levels, with increased likelihood of residents walking or biking to the park for physical activity (ULI, 2021).
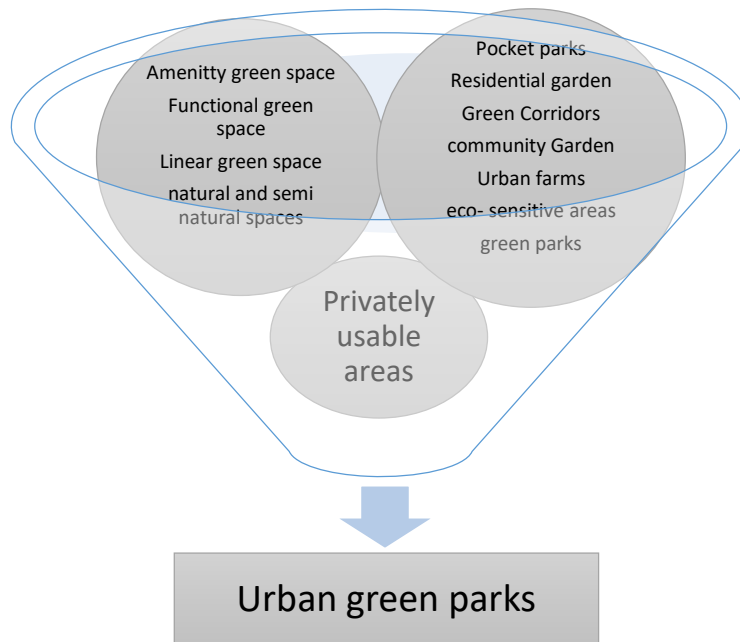
Figure 1 UGS typology (Barnett et al., 2016)

Global cities confront intricate environmental and social issues stemming from urbanization and climate change, such as environmental pollution, traffic congestion, heat, depletion of green and blue spaces, and social inequalities (Kraemer & Kabisch, 2021). As the city witnesses a rise in population density and expanding built-up areas, the need for open, green spaces becomes more urgent to counterbalance this trend of urbanization. Urban green parks play a crucial role in providing essential breathing spaces within the city, offering a reprieve from the concrete jungle. They create opportunities for relaxation, recreation, and a connection with nature. Quality green parks are indispensable for promoting both physical and mental well-being, fostering community interactions, and enhancing urban aesthetics.

The quality dimensions incorporated into the design of urban green parks contribute significantly to social progress, economic development, and the enhancement of public health (Duivenvoorden et al., 2021). The suggested quality dimensions of urban green areas are deemed crucial in influencing their utilization, such as for physical activity, and consequently deriving benefits from these spaces (McCormack et al., 2010). Quality in the context of urban green parks encompasses attributes that impact the population's use and interaction with these spaces, encompassing characteristics like size or location, features such as facilities or amenities, and suitability for their intended purpose (Gidlow et al., 2018). Quality of urban Green Park can be divided into different dimensions, each one referring to a specific feature of quality such as the presence of amenities and facilities, accessibility, safety, or biodiversity. To date, there is a scarcity of studies that assess the impact of quality dimensions on the well-being benefits of urban green parks (Kruize et al., 2020). Furthermore, these studies have typically concentrated on a restricted set of quality dimensions (Knobel et al., 2019).

In context of Nepal, Kathmandu Valley Development Authority (2015) has prepared and published the "Atlas of Open Spaces" to raise awareness about the importance of open parks and playgrounds. The Atlas has identified various open spaces in the Kathmandu valley and did mapping of the same. It has identified a total of 887 open spaces in the valley, with 488 in Kathmandu district, 346 in Lalitpur district, and 53 in Bhaktapur district. Merely identifying and designating urban green spaces is insufficient; their ongoing maintenance, management, and enhancement are crucial for ensuring effectiveness and public benefits. Quality maintenance encompasses various aspects, such as regular cleaning, landscaping, infrastructure upkeep, amenity provision, and ensuring

safety and security. Neglecting these factors can lead to the deterioration of open spaces, making them less inviting and functional for the public. Despite the adoption of planning strategies and policies by the Nepalese government to introduce green elements into urban areas, the circumstances surrounding the urban green park plan remain unsatisfactory. Additionally, there appears to be a lack of an effective method for assessing the quality of green parks.

1.2 Need of the Research

The present condition of urban green parks in Kathmandu poses numerous challenges and reveals gaps in comprehending and appraising their quality. Current assessments frequently concentrate on objective and quantifiable attributes, overlooking subjective experiences, user perspectives, and the holistic well-being benefits derived from these parks. Existing research are more or less limited in its scope for example only considering land coverage (Thapa & Poudel, 2018), gender inclusiveness, accessibility, climate change, women's safety (Agrawal & lal, 2021) individually. Therefore, there is a need to develop a comprehensive and context-specific assessment tool that considers a wide range of quality dimensions to evaluate the urban green parks in Kathmandu.

The importance of urban green spaces, including urban green parks, in enhancing the habitability and well-being of urban residents is widely recognized. However, there is a need for research that specifically focuses on urban green parks in the context of Kathmandu to understand their unique contributions and potential benefits. This research will help to know the significance of urban green parks in addressing various challenges of city area and will provide evidence-based recommendations for their enhancement and integration into the urban fabric of Kathmandu.

1.3 Importance of the Research

In line with the World Economic Forum, the availability of green open spaces and a sense of social connection contribute to the creation of liveable and vibrant cities. In the context of Kathmandu, burdened by its own emissions, the presence of high-quality urban green spaces is imperative for the well-being of its residents (Thapa Shrestha, 2021). The research on the quality assessment of urban green parks in Kathmandu holds immense significance for the city's development and well-being of its residents. With the rapid urbanization and increasing population density, urban green

parks play a crucial role in enhancing the liveability of Kathmandu. By assessing the quality dimensions of these parks, policymakers and urban planners can make informed decisions to improve their design, management, and accessibility and also have broad concept regarding in which dimension the priority should be given for enhancement of the quality of urban green parks. This research will contribute to creating healthier and more sustainable urban environments, promoting the physical and mental well-being of the community.

Urban green parks play a vital role in promoting the physical, social, and mental well-being of urban residents. They provide opportunities for recreation, relaxation, and connection with nature, contributing to improved quality of life. By evaluating the quality of urban green parks, the research will help in the extent to which these parks fulfil their intended purposes and meet the diverse needs of the population. It can identify gaps and deficiencies in terms of amenities, facilities, accessibility, safety, and biodiversity, leading to targeted interventions for enhancing the user experience and maximizing the benefits derived from these spaces. Moreover, the research also aligns with the United Nations' (SDGs), particularly Goal 11,which addresses the need for sustainable urban development by also focusing on the assessment and enhancement of urban green spaces, which are vital for creating liveable, resilient, and environmentally friendly cities.

1.4 Problem Statement

The scarcity of urban green parks in urban areas presents several challenges and negative consequences for the overall well-being and sustainability of these environments. According to recommendations from WHO and FAO, a minimum of 9 square meters of green open space per person is advised for urban residents. However, in Kathmandu, the current availability is a mere 0.25 square meters per person, falling significantly below the recommended standard (RECPHEC, 2016). Lack of sufficient urban green space hampers social interactions, community cohesion, and mental well-being, as it limits spaces for social gatherings, cultural events, and contact with nature. The existing quality assessment of urban green parks in Kathmandu lacks quality assessment tool that incorporates both objective and subjective dimensions of quality, thereby limiting the understanding of their true impact on users and the surrounding community. Current approaches primarily focus on individual dimension or few objective dimension neglecting other subjective dimension. This results in an incomplete evaluation of the park's quality. Additionally, there is no

effective assessment methods that consider the diverse dimensions of quality, based on the aspects which are contributed by the urban green parks.

Addressing these gaps is crucial to guide the improvement and management of urban green parks in Kathmandu, ensuring they meet the needs and aspirations of the users while enhancing the overall well-being and liveability of the city. This problem emphasizes the limitations of the current quality assessment approaches for urban green parks in Kathmandu and highlights the need for a quality assessment tool. By considering a wide range of quality aspects and capturing the user's perspective, the research aims to contribute to the development of assessment methods that effectively evaluate and enhance the quality of urban green parks in Kathmandu.

1.5 Research Purpose

Research Questions

1. What are the key dimensions that define the quality of urban green parks?

2. How can the key dimensions that define the quality of urban green parks be operationalized and measured, leading to the development of effective indicators for assessment?

Research Objective

The main objectives of this research is:

To assess the quality of urban green parks through the identification of relevant dimensions and indicators.

Sub- objectives:

- To identify set of relevant dimensions and indicators that defines the quality of urban green parks.
- To assess the quality of urban green parks of Kathmandu Metropolitan City based on identified dimensions.

1.6 Validity of Research

Validity of the research can be ensured through various approaches. To assess the quality of urban green parks various dimension and indicator will be identified based on a thorough review of relevant literature related to the tool development to assess the quality of parks, expert opinions, and input from the park user themselves to ensure that the tool will includes relevant dimensions and indicators that capture the essence of urban green park quality.

Also, the research topic addresses a critical gap in the existing literature by focusing on the assessment of urban green parks in Kathmandu using identified indicator. While different quality assessment tools has been applied in other contexts, its applicability in the specific context of Kathmandu has not been extensively studied. By exploring this aspect, the research brings new insights and knowledge to the field of urban planning and urban green space assessment, making it a valid and valuable contribution.

1.7 Limitation of study

The research may face limitations in terms of sample size, as it may not be possible to include all urban green parks in Kathmandu so only three parks are taken for the study based on various factors such as scale, location, similar function and responsible management agencies. The findings may not be fully generalizable to all parks in the country. It might vary based on different geographical, cultural, or socio-economic characteristics. Caution should be exercised when applying the results beyond the study area.

CHAPTER TWO: LITERATURE REVIEW

Literature review section of the thesis serves the primary purpose of providing a comprehensive overview of existing research pertaining to urban green parks. It aims to synthesize information on quality assessment tools and techniques used in evaluating these parks. By delving into the body of knowledge already available, this section seeks to establish a strong foundation for the study and identify gaps in the research that the thesis aims to address. It explores the fundamental ideas and definitions of urban green parks, the aspects that contribute to urban green parks, techniques and frameworks employed to assess the quality of urban green parks both globally and in the context of Nepal. By studying existing literature on the quality of urban green parks and conducting thorough analysis, valuable insights can be obtained regarding the selection of dimensions and indicators. These indicator are crucial for assessing the quality of urban green parks. A quality assessment of urban green parks provides a number of significant results. It offers insight into the parks' present condition, highlighting their positive aspects and areas for improvement. This assessment informs evidence-based decision making for park management, design, and investments.

2.1 Overview of Urban Green Space

Urban green spaces have garnered increased recognition as a vital element of the built environment in recent years. Although the acknowledgment of their essential role in cities and towns dates back to the late 19th century, the emphasis on their significance has fluctuated over time (Goede et al., 2000; Swanwick, Dunnett and Woolley, 2003). Urban green space manifests in various forms, encompassing city parks, gardens, playgrounds, pocket parks, expansive forests, residential greenery, and sections within neighbourhoods partially or entirely covered by vegetation (Adlakha et al., 2021). Possible urban green spaces encompass public and private gardens, school and community gardens, rooftop gardens and living walls, squares and plazas featuring permeable cover and vegetation, green areas within business and institutional premises, sports fields and cemeteries, public parks and forest reserves, urban agriculture farms and orchards, streets and transportation corridors, including pedestrian, cycle, and greenways, river and creek corridors, routes along major transport corridors, waterways and wetlands, utility areas like quarries and airports, substantial institutional and manufacturing sites, remnant patches of natural vegetation, and unused land reserved for future use (Mukherjee & Takara, 2018). Urban agriculture should

not be perceived as a replacement for parks; rather, it should be seen as a supplementary form of green space provision with unique value (Contesse et al., 2018). Urban green spaces can have effects on regional, city, neighbourhood, and building/site levels. They exist across macro, meso, local, and micro scales and can be categorized as 'nature bits, patches, corridors, and matrices,' reflecting their structure and function (Mukherjee & Takara, 2018).

Urban green space such as parks, gardens and squares, provide opportunities for relaxation and recreation, as well as for association and social interaction and they help communities to shape their identity and to strengthen their social fabric. Furthermore, urban green spaces contribute to a healthy urban environment by offering clean air, water, and soil, and by assisting in the stabilization of urban temperatures and the overall urban climate (Arvanitidis et al., 2009). Overall, it can be argued that a good quality of urban green space provides an interacting set of physical, social, environmental and aesthetic benefits that investing in green spaces can reverse urban decline and improve the well-being of communities (CABE Space, 2004).

2.2 Urban Green Parks

Urban parks are described as designated open areas, typically characterized by greenery and water features, and primarily set aside for public enjoyment (Annerstedt et al., 2013). Fredric Olmstead, the father of urban parks, thought parks should be built as a place where city residents could experience the beauty of nature, breathe fresh air, have a place for recreation as well as "exertive" activities (Olmsted, 1999).

Urban parks contribute to enhancing the physical, psychological, and social well-being of individuals (Hartig et al., 2014). For example, urban green parks encourage physical activity, thereby enhancing individuals' physical well-being (Kaczynski et al., 2008). The green park help people to relieve from stressful urban routine (Ulrich et al., 1991) and restore the capacity to direct attention (Kaplan, 1995). Moreover, urban parks enhance social relationships by offering venues for people to engage in social activities (Coley et al., 1997; Maas et al., 2009). According to Green space, Scotland (2008) there are three types of urban green parks based on their on their distinct features:

1. City / Regional Parks

City/ regional green parks often serve to define and separate urban areas, link the urban area with the countryside and often provide for recreational needs over a wide area. They may attract the highest number of users, mainly from throughout the local authority area but possibly wider afield, and therefore have a large effective catchment and high distance threshold. A high proportion of users are likely to travel to them by car or public transport. eg. Godawari Botanical Garden

2. Neighbourhood parks

Neighbourhood Parks will tend to attract a significant proportion of their users from particular parts of the local authority area e.g. at least two neighbourhoods. They will provide a range of play, recreational or sporting facilities that will draw users from a wider catchment. Depending on their location, people will travel by foot if they live close to the green parks or by car or public transport if they live further away.eg: Balaju Park

3. Local Parks

Local green parks are often smaller in size, with fewer facilities, but are greater in number, spread throughout a local area and with well used footpaths linking key community facilities. These green parks will tend to attract almost all of their users from a localised area. Many users of these facilities will walk to them.eg: Samakhusi Park

2.3 Benefits of Urban Green Parks

Numerous scientific studies on urban green space begin by highlighting the manifold benefits of parks and other green areas (Lyytimaki & Sipila, 2009). Growing empirical evidence strongly suggests that the existence of natural elements such as urban parks, forests, and green belts, along with components like trees and water, significantly enhances the quality of life in urban environments. There is widespread consensus, particularly within the green space sector, on the vital role of urban parks in fostering liveable and sustainable cities and towns (Konijnendijk et al., 2013). Some of the aspects that urban green contribute or benefits of urban green space are as follows:

a. **Physical Health and Wellbeing**

Urban green parks can play a crucial role in encouraging physical activity (Bedimo-Rung et al., 2005). They offer areas for people to jog or walk, and many feature facilities specifically for sports, exercise, and other strenuous activities.

Engaging in activities within natural settings, often referred to as 'green exercise,' offers physical health benefits (Nath et al., 2018). Green exercise refers to physical activities conducted in natural environments, such as parks (Mackay & Neill, 2010). Engaging in green exercise, such as walking or cycling in natural environments like parks, has positive effects on physical well-being for people of all ages, regardless of their wealth, culture, or the size and type of green space involved. Numerous studies have demonstrated the well-being benefits associated with these activities. Access to green spaces substantially lowers the risk of chronic health conditions like obesity or cardiovascular disease for urban residents engaging in regular physical activity (Jennings et. al, 2016).

b. **Mental Health and Stress Reduction**

Urban green parks directly contribute to public health by alleviating stress and mental disorders (Annerstedt et al., 2012). Additionally, they enhance the benefits of physical activity, diminish health inequalities, and elevate the perception of life quality and self-reported general health (Stigsdotter et al., 2010).

Engaging with a park environment has been shown to reduce stress, foster contemplation, rejuvenate urban dwellers, feelings of peacefulness and tranquillity (Kaplan, 1983). Recent research corroborates the belief in the stress-reduction benefits and positive impact on mental health associated with urban parks and forests (Conway, 2000). Surveys conducted among park visitors have demonstrated a significant correlation between frequent park use and reported good health, highlighting the health-promoting effects of regular park engagement (Godbey et al., 1992). Schroeder (1991) found that natural environments featuring vegetation and water induce more relaxed and less stressful states in observers compared to urban scenes devoid of such elements. This "natural tranquillizer" effect holds particular promise in urban areas where stress is a pervasive aspect of daily life (Berg et al., 1998).

c. Social Benefits

From a social standpoint, green spaces have a broad-ranging impact, influencing issues such as community involvement, empowerment, safety, inclusion, equality, civic pride, education, and recreation (Land Use Consultants, 2004). Notably, well-managed and maintained green spaces have been recognized for their contributions to social inclusion and justice (Ling Wong, 2003), offering cultural connections and opportunities for community events, as well as fostering outdoor interactions among people (CABE space, 2004). Green spaces also provide opportunities for recreation, exercise, and play for individuals of all ages.

Urban parks have been proposed as facilitators of social cohesion, providing spaces for meaningful social interactions (Maas et al., 2009). The presence of trees and grass in urban green parks, in contrast to barren spaces, can draw residents to outdoor environments, thereby enriching opportunities for people to connect with each other (Coley et al., 1997).

d. Environmental Benefits

Urban green parks offer multifaceted environmental benefits to cities by mitigating the urban heat island effect, diminishing noise and air pollution, and providing various ecosystem services. From an environmental standpoint, green spaces contribute to sustainable urban development by absorbing pollutants, ensuring clean air, soil, and water, and stabilizing urban temperatures and humidity (Levent & Nijkamp, 2004). Additionally, they serve as habitats for wildlife, maintaining or enhancing biodiversity.

In the last decade, research on urban biodiversity has gained significance, driven not only by the escalating impact of urbanization on natural ecosystems but also by the growing acknowledgment of urban areas as platforms for innovative approaches to conserve and promote biodiversity (Savard et al., 2000). Scholars have emphasized that urban parks, with their frequently high levels of habitat diversity and microhabitat heterogeneity, can emerge as crucial hotspots for biodiversity within the cityscape, even though their primary function is recreational (Cornelis & Hermy, 2004).

e. Economic Benefits

Economically, high-quality green spaces can enhance the value of adjacent properties, whether commercial or residential (Crompton, 2005). Additionally, they contribute to shaping a positive image for a locality, leading to increased retail sales, tourism attraction (Woolley, 2003), and inward investment in the area (CABE Space, 2005). This, in turn, stimulates employment and can draw skilled labour to the region (Glaeser et al., 2001).

f. Aesthetic Enhancement

In addition to conventional physical elements, research has highlighted other infrastructural aspects that influence perceptions of urban parks and their health benefits. Water features, for instance, facilitate recreational walking (Sugiyama et al., 2015), induce feelings of relaxation, and alleviate stress (Nordh et al., 2011). Man-made water-related attractions, such as fountains, have a similar positive impact on park visitors, promoting visitation (Voigt et al., 2014). Furthermore, positive assessments of culturally specific elements like educational galleries, historical buildings, and sculptures have been associated with favourable attitudes toward urban parks and increased visitation frequency.

The aesthetic enjoyment of urban green spaces hinges on various sensory elements, including perceptions of colour, shapes, and textures, influenced by factors such as the season, weather, and time of day. Sensory appreciation encompasses visual, auditory (sounds of rustling leaves, whistling wind, or birds' chirping), and olfactory experiences. This multisensory engagement enhances the physical health and well-being of citizens (Mukherjee & Takara, 2018).

g. Cultural and Historical Preservation

Urban green parks play a vital role in nurturing cultural and heritage values, fostering people's emotional connections, assigning symbolic meanings to spaces, and enhancing community liveability (Mukherjee & Takara, 2018). In Nepal, urban green parks are intentionally designed around historical monuments, reflecting a strategic approach to preserving and safeguarding cultural heritage. This initiative seeks to harmoniously integrate the protection of historical sites with the creation of open parks accessible to the general public.

h. **Urban Resilience and Disaster Mitigation**

The urban ecosystem has undergone a transformation from a natural system to one that manages the uncertainties of geo-meteorological events, simultaneously enhancing citizens' quality of life. Urban green spaces, such as parks, serve as multifunctional urban resilience tools, contributing to the security of energy, health, water, food, and habitat (Mukherjee & Takara, 2018).

i. **Emotional Dimension and Perceived Benefits**

The emotions and sensations experienced in parks are regarded as significant contributors to people's well-being. These direct benefits manifest in the regeneration of psychophysical equilibrium, relaxation, a reprieve from daily routines, and the stimulation of a spiritual connection with the natural world (Chiesura, 2004). These emotional and psychological advantages play a crucial role in enhancing the quality of human life, a key component of sustainable development (Prescott & Allen, 1991).

2.4 Quality Urban Green Parks

LEEDS (2022) defines quality green space as being 'fit for purpose,' indicating its appropriateness in terms of location, accessibility, safety, inclusivity, welcoming atmosphere, and efficient functioning. The perceived quality of green parks significantly influences positive attitudes toward urban nature, with safety perceptions playing a crucial role in determining public park usage (Giles et al., 2005). Haq (2011) underscores the importance of the quality of urban parks in meeting citizens' social and psychological needs. Dillen et al. (2012) elaborate on quality, emphasizing that green spaces contributing to physical, psychological, and social health benefits should be attractive, pleasurable, safe to experience, and suitable for various uses. According to the leader of the LEEDS city council, the greatness of a civilization is reflected in its cities, and the quality of its public spaces, parks, and squares is a measure of a city's greatness.

2.5 Situation of Urban Green Parks in Context of Nepal

The first public park in Kathmandu, Bhugol Park in New Road, was established in 1934 and served as a temporary shelter during the catastrophic earthquake of 1934. Unfortunately, both the size and beauty of the park have significantly diminished over time, possibly due to the absence of proper policies regarding public parks and urban landscape planning. Recently, the encroachment of

Balaju Park for road expansion has further reduced its area. Currently, the total area under public parks within Kathmandu Valley is only 4,486 ropanis. Notably, the larger public parks were established during the Panchyat regime, while those established after the advent of democracy in 1990 are generally smaller in size (Pun, 2019).

The Kathmandu Valley Development Authority has identified 887 open spaces within the Kathmandu Valley, with 488 sites in Kathmandu, 345 in Lalitpur, and 53 in Bhaktapur. Among these open spaces, 58 percent of the land, totaling 17,750 ropanies, is usable for public activities. These open spaces exhibit variations in size, services, and function, ranging from the prominent three Durbar Squares and Tundikhel to residential courtyards and green pockets like Rani Bari (Shrestha, 2021). Rabin Maan Shrestha, the head of the Department of Environment, has noted that parks like Ratna Park, Shankha Park, and Balaju Park are well-managed, while smaller parks are currently under maintenance (Neupane, 2017).

Public parks are indispensable in urban townships. Despite often being overlooked, parks, green spaces, and recreational areas play a crucial role in the well-being of urban communities. They offer various services, serving as spaces for families and friends to connect and contributing to a healthier, cleaner environment. City parks act as tools for revitalization. However, the current scenario reveals a concerning trend of diminishing per capita space due to inadequate maintenance and expansion efforts. Moreover, government-planned projects, including roads, highways, office buildings, hospitals, educational institutions, and industrial areas, lack provisions for landscaping (Pun, 2019).

The state of public parks in Kathmandu is evidently deteriorating, with many once-peaceful and enjoyable parks now neglected and lacking proper care. Some have even shrunk due to construction, negatively impacting the city's aesthetics and reducing spaces for relaxation and recreation. Although there are open areas with the potential to serve as parks, they are often underutilized and poorly maintained. With the city's population on the rise, there is a growing need for more nature-friendly spaces. To address this issue, it is crucial to implement proper regulations and measures to enhance the condition of parks. Improving the state of parks will revitalize the city, making it more attractive and providing residents with better spaces to unwind and enjoy the outdoors.

2.6 Evaluating Urban Green Park Quality

Assessing the quality of urban green parks is of paramount importance. A comprehensive understanding of how quality differs among parks within a city is crucial for prioritizing improvements equitably. This approach ensures that the benefits of enhanced park quality are distributed inclusively, benefiting all residents (McConville et al., 2021). In-depth, data-driven quality evaluations serve as potent instruments for refining decision-making, galvanizing investment in parks, fostering partnerships, and securing additional resources (McConville et al., 2021). These evaluations are crucial in guiding city decisions regarding park development, design, renovation, maintenance, and programming. Assessing the quality of all parks throughout a system is essential for comprehending disparities between neighbourhoods and strategically directing resources. A citywide park-by-park analysis can unveil variations in park size, maintenance outcomes, the availability and condition of amenities, usage patterns, and other indicators, thereby informing resource allocation among different sites.

Evaluating park quality is a multifaceted endeavour demanding a comprehensive, interdisciplinary approach. It entails grasping the diverse contributions of urban green spaces, spanning physical, social, environmental, aesthetic, cultural, and other dimensions, while acknowledging the intricate interplay between them. The assessment of urban green spaces or parks initiates with the formulation of a scorecard, a tool that systematically captures and evaluates various facets to derive a holistic understanding of their quality (Lindholst et al., 2016). The primary aim in formulating the quality criteria was to establish a fair and straightforward assessment process, making it objective and easily comprehensible to prevent any arbitrary or biased evaluations (Lindholst et al., 2016). The Green Flag Award, Nordic Green Space Award, LEEDS Park and Green Space Strategy 2022-2032 etc. are some of the example of such quality assessment tool for urban green parks.

In this research to assess the quality of urban green parks it is necessary to develop the scorecard. For measuring the indicator first it is necessary to define the measurement scale used and the type of weighing method for the analysis.

A. Scales of Measurement

In statistical measurements, variables are categorized into one of four scales of measurement—nominal, ordinal, interval, and ratio. This classification provides an easy way to distinguish different types of data based on how a variable is defined, categorized, and analysed in collected data (Allanson et al., 2020).
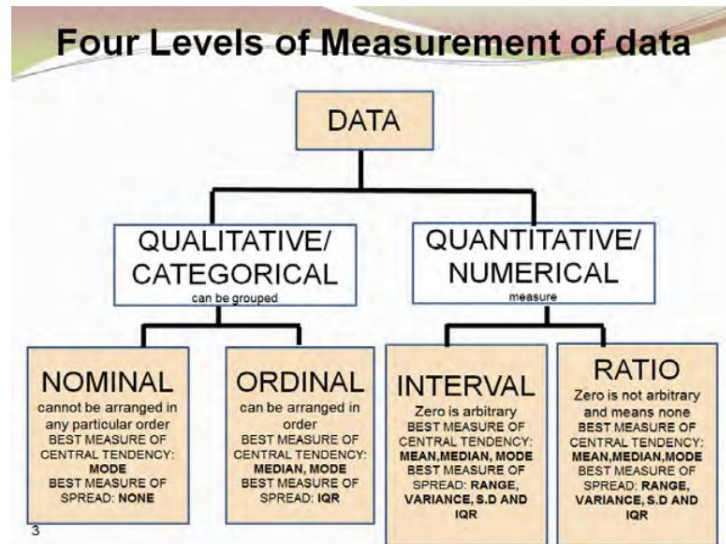
Figure 2 Four levels of measurement of data source :(Allanson et al., 2020)

1. Nominal Scales

Nominal scales lack quantitative value or order, and mathematical operations cannot be applied to them. It's crucial to emphasize that assigning numbers in nominal scales doesn't imply any order or ranking; rather, it is a unique way of naming attributes (Allanson et al., 2020).

Figure 3 Example of Nominal scale (Raghunath, 2019)

2. Ordinal Scales

The ordinal scale builds on the nominal scale. While both nominal and ordinal scales categorize data, the key distinction is that ordinal data involves rank-ordering (i.e., highest to lowest) and summarizes the relative positions of data points. The ordinal scale is a variable measurement scale used to represent the order of variables without indicating the difference between each variable, often utilizing non-numeric categories. A Likert Scale serves as a prime example of ordinal measurement, commonly employed by market researchers to assess non-numeric levels of customer satisfaction (Allanson et al., 2020).

Figure 4   Examples of Ordinal Scales (Raghunath, 2019)

3. Interval Scales

An interval scale is defined as a numerical scale where the order of variables is known, along with the difference between these variables. A crucial feature of interval scales is the equal and meaningful distance between measures, although they lack a true zero point. (Allanson et al., 2020).

4. Ratio Scales

Ratio data is a variable measurement scale that provides the most information about data values. It includes the presence of zero as a starting point, revealing not only the order and difference between variables but also a true zero point. In ratio data, values less than zero are not possible (Allanson et al., 2020).

In this research ordinal and nominal scale is used.

B. Weighing of Indicators

Weighting of indicators is done to give different levels of importance to each indicator within an evaluation work. There are different methods for calculating weightage, depending on the specific context and purpose of the measurement (Asadzadeh, 2008, as cited in Bajracharya, 2023).There are mainly two methods for weighing the indicator. They are equal weighting and unequal weighting.

1. Equal weightage

   Equal weighting is a method where all indicators are given the same importance, either because they are considered equally significant or when no statistical or empirical evidence supports a different approach. This strategy is recognized for its simplicity and ease of replication by others.

2. Unequal weighting

a. Knowledge driven

   Methodologies employing normative procedures or expert opinions often involve seeking input from experts in the field. These experts are asked to evaluate the importance of each indicator and assign weights accordingly. This process may be carried out through surveys or focus groups. Engaging community members in defining indicators and assigning weights based on their values and preferences is a common aspect of these methods (Bajracharya, 2023).

b. Data-Driven Approaches

   These methods use statistical techniques such as regression analysis, correlation analysis, and factor analysis to identify the most important indicators and assign weights to them based on their statistical significance. Approaches that used data-driven techniques e.g. PCA, AHP, or relative importance by Giri et al. (2021). The equation for relative importance is given below:

$$W_i = k \Big/ \sqrt{Var(y_i)} \quad \text{where,} \quad k = \left(\sum_1^m \frac{1}{\sqrt{Var(y_i)}} \right)^{-1}$$

   W_i -represents the weight of the ith indicator such that $0 < W_i < 1$ and the sum of all 'm' number of weights is equal to one
   y_i is the normalized value of ith indicator, $Var(y_i)$ is the variance of y_i and m is the number of indicators.

In AHP (Analytic Hierarchy Process), a multi-criteria decision-making method, a complex problem is systematically broken down into smaller parts, facilitating comparisons using a set of criteria. Decision-makers can assess the relative importance of different criteria and sub-criteria, assigning weights to each. Additionally, Principal Components Analysis (PCA) aims to decrease data dimensionality without significant information loss through linear transformation techniques. PCA is particularly beneficial when dealing with a large number of indicators, as it helps mitigate the risk of double weighting, a potential issue in equal weighting methods (Bajracharya, 2023).

c. Hybrid

Measurements that applied a Combination of the above two method.

Weightage calculation has no one-size-fits-all approach; it must be context-specific and purpose-driven. Different methodologies like subjective judgment, AHP, data-driven methods are available, but careful consideration of biases and limitations is essential for informed decisions. Flexibility ensures fair and accurate representation of factors in various scenarios.

C. Sampling Technique

Sampling technique is process of selecting a sample from a given population. There are two types of sampling method. They are probability sampling and non-probability sampling.
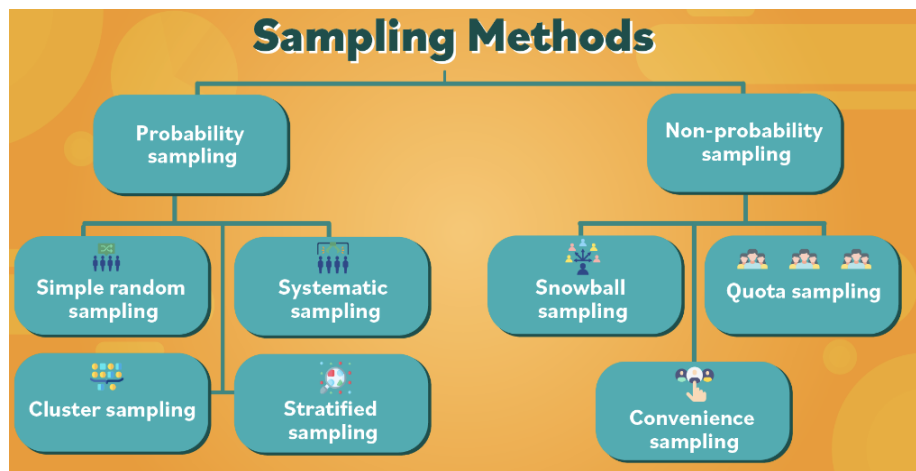
Figure 5 Sampling Technique (Source: Internet)

1. Probability sampling

Probability sampling means that every item in the population has an equal chance of being included in sample. One way to undertake random sampling would be if researcher was to construct a sampling frame first and then used a random number generation computer program to pick a sample from the sampling frame (Zikmund, 2002, as cited in Taherdoost, 2016). Probability or random sampling has energy for a given level of sampling error (Brown, 1947 as cited in Taherdoost, 2016).

Simple random sampling ensures each population member has an equal chance of selection, providing great freedom from bias but potentially being time-consuming. Systematic sampling involves randomly selecting the first individual and then using a fixed interval for subsequent selections. Cluster sampling is suitable for large or geographically dispersed populations, where individuals are randomly chosen from groups or areas. In stratified sampling, the population is divided into smaller characteristic-based groups (strata), and individuals are randomly selected from each stratum to form the sample.

2. Non- probability sampling

Non-probability sampling is commonly linked with case study and qualitative research designs. Unlike probability sampling, it relies on the researcher's judgment rather than a fixed process. Individuals are selected based on convenience or the researcher's discretion, leading to uneven chances of selection. Three types of non-probability sampling include snowball sampling, quota sampling, and convenience sampling.

Snowball sampling initiates with a small group meeting specific criteria, and members are then asked to refer others who share the criteria. This approach is useful for studying hard-to-reach populations or identifying individuals with rare characteristics. Quota sampling is a non-random technique where participants are selected based on predetermined characteristics to ensure the sample reflects the same distribution as the broader population (Davis, 2005 as cited in Taherdoost, 2016).

Convenience sampling is selecting participants because they are often readily and easily available. Typically, convenience sampling tends to be a favoured sampling technique among students as it is inexpensive and an easy option compared to other sampling techniques (Ackoff, 1953 as cited in Taherdoost, 2016). Convenience sampling often helps to overcome many of the limitations associated with research. For example, using friends or family as part of sample is easier than targeting unknown individuals (Taherdoost, 2016). In this research convenience sampling Technique is used.

The most suitable sampling method for park quality assessment depends on several factors, including the research objectives, the size and characteristics of the park, the available resources, and the desired level of precision and generalizability. So sampling technique should be selected in such a way that it ensure that the sample is representative, unbiased, and capable of providing reliable insights into the overall quality of the park.

2.7 Researches on Quality

Parasuraman (1985) initially defined quality as the 'gestalt' attitude toward a service, indicating a holistic perception formed over time through multiple experiences (Baker & Crompton, 2000). Gestalt, in this context, refers to perceiving something as a unified entity. Manning (1986) extended this notion to outdoor recreation, stating that high-quality service occurs when recreation opportunities align with visitors' needs and effectively satisfy their motivations. Therefore, providing high-quality urban parks becomes more achievable when agencies understand the desires of their patrons (Mackay & Crompton, 1990).

Furthermore, urban parks gain significance by enhancing the positive aspects of urban life, encompassing opportunities, physical settings, sociability, and cultural diversity (Burgess et al., 1988). Willie (1992) emphasized that quality involves people and attitudes, extending beyond techniques and procedures to encompass those who use them within the context of 'total quality management.' Willie's definitions of quality include concepts like 'fitness for use,' 'conformance to requirements,' 'continuous improvement,' and 'delighting the customers.' A notable definition by Neil Johnson states, 'Quality is the degree of excellence by which we satisfy the needs of the customer' (Willie, 1992).

There are numerous research on quality in global and national context. This part of the thesis will go into detail regarding all the international and national literature considered in this research.

2.8 International Approaches for quality assessment

There are various approaches used by different researcher for the quality assessment of urban green parks. To develop a tool for assessing the quality of urban green parks in our context, it is essential to understand how other countries evaluate their parks. By looking at different studies and approaches used internationally, we can learn about the different aspects and criteria they consider when assessing park quality. This knowledge will provide valuable insights and guidance for creating context specific tool for the quality assessment of urban green parks.

International approaches for quality assessment of parks and green spaces encompass various prestigious awards and frameworks like the Green Flag Award, Nordic Green Space Award, and LEED etc. In addition to the recognized international awards and frameworks, there is a substantial body of research focused on quality aspects of parks and green spaces. Researchers have developed diverse methodologies, including multidimensional quality assessment tools, to comprehensively evaluate parks quality. These assessment tools consider a wide range of factors, such as aesthetics, safety, ecological value, amenities, social interactions, and overall user experiences. These initiatives recognize and promote well-managed, sustainable, and community-friendly parks, considering factors such as accessibility, biodiversity, environmental impact, and community engagement. So some of the approaches for quality assessment are explained in detail below.

A. The Green Flag Award

The significance of green spaces and parks has gained recognition, especially in the wake of the COVID-19 pandemic. To uphold the quality of green spaces, various assessment tools have been developed. One notable tool is The Green Flag Award (GFA), the UK's national audit tool, specifically designed for the assessment of green space quality. Introduced in 1996, the Green Flag Award serves as a national and international standard for parks and green spaces. It was initiated to acknowledge and reward the best green spaces in the country, while also encouraging other nations to achieve similar high environmental standards, setting a benchmark of excellence in urban green spaces and parks. Any green space that is freely accessible to the public and has a site-specific management plan is eligible to apply for the Green Flag Award. A successful Green Flag

Award site demonstrates a comprehensive understanding of its users, site, and management strategy. This includes knowing who the users are, what they want, how they are informed and involved, understanding the site's special features such as its history, biodiversity, landscape, and social and physical setting, and having a clear management strategy that ensures the site is safe, compliant with legislation and policy, well-maintained, and has plans for the future. In total, there are eight dimension and twenty seven criteria used to evaluate applicants. These are not a list of standards; rather, the Green Flag Award's strength is in the framework for excellent management it offers, which experts may assess and apply to their own unique site. Some of the indicator will be 'not applicable' for some locations, and each site will have a different distribution of how important they are on a relative basis. This method offers a concise but adaptable framework for current management and long-term planning. So the criteria used for the judgement are mentioned below:

Table 1 Dimension and criteria as set out in the 'Raising the Standard' manual.

Sections	Dimension	Indicator	Discussion
Section 1	Welcoming Park	1. Welcoming 2. Good and safe access 3. Signage 4. Equal access for all	A welcoming place is one that invites and draws people into it. This means creating a space which, through its visual appearance, range of facilities, standards of maintenance and ease of access, makes people feel that they are in a cared-for place.
Section 2	Biodiversity, Landscape and Heritage	5. Management of natural features, wild fauna and flora (Biodiversity) 6. Conservation of landscape features 7. Conservation of buildings and structures	Attention should be paid to the appropriate management and conservation of natural features, wildlife and flora; landscape features; and buildings and structures. Their particular character and requirements should be identified and appropriate management strategies put in place to conserve and enhance them
Section 3	Healthy, Safe and Secure	8. Appropriate levels of quality facilities 9. Safe equipment & facilities 10. Personal security in park 11. Control of dogs / fouling	This section looks at how well managers understand their users' needs, encouraging them to enjoy healthy activities using appropriate, safe to-use facilities and activities, and to feel personally safe and secure.

Section 4	Community Involvement	12. Community involvement in management and development 13. Appropriate provision for the community	This section examines the extent to which the managing organisation understands the community it seeks to serve as well as provides opportunities for active participation in site projects and ensures that there is appropriate provision of recreational facilities and activities for all sectors of the community.
Section 5	Well Maintained and Clean	14. Litter and waste management 15. Horticultural maintenance 16. Arboriculture maintenance 17. Buildings & infrastructure maintenance 18. Equipment maintenance	For aesthetic as well as health and safety reasons, issues of cleanliness and maintenance must be addressed.
Section 6	Environmental Management	19. Managing Environmental Impact Waste minimisation 20. Chemical Use 21. Peat use 22. Climate Change Adaptation Strategy	This section seeks to ensure that the way the site is managed has a positive impact on the environment, locally and globally, both now and for the future.
Section 7	Marketing and Communication	23. Marketing and Promotion 24. Appropriate Information Channels 25. Appropriate Educational and Interpretational Information	This section seeks to examine the ways that managers understand the key benefits of the site and how they use this information to promote it appropriately
Section 8	Management	26. Implementation of the management plan	This section evaluates how well the management plan is implemented on site.

- **Scoring Criteria**

Each individual criterion was scored out of 10. Criteria that did not apply to a particular site – e.g. 'conservation of buildings or structures' on a site where no applicable buildings or structures are present – were scored as not applicable and were therefore not included in the total score or average calculations. The Green Flag Forum agreed to use the scoring system below to assess their sites.

Score	0	1	2	3	4	5	6	7	8	9	10
Description	N/A	Very Poor	Low Poor	Mid Poor	High Poor	Low Fair	High Fair	Good	Very Good	Excellent	Exceptional

- **Park Quality Determination**

Park quality scores for GFA were obtained by adding together all the criteria scores and dividing the total by the number of applicable criteria resulting in an average score. This score is then multiplied by 100 to obtain a Park Quality Score (PQS) expressed as a percentage. The maximum score available was therefore 100% for each site. And each park should be described as either 'Excellent', 'Very Good', 'Good+', 'Good', 'Fair' or 'Poor' but that the bandwidth scores should be set differently for each park classification due to the perceived expectations of quality to be found in each type.

	Grade A	Grade B	Grade C	Edin Min Std	Grade D	Grade E
All Parks & Cemeteries	100%-80%	79% - 70%	69% - 60%	60%	59% - 50%	49% - 0%

Figure 6 Table showing the park grading (Source: PAQ,2022)

B. Nordic Green Space Award

In response to the evolving landscape of urban green spaces in the Nordic countries, a collaborative effort among key stakeholders from Denmark, Sweden, and Norway led to the establishment of the prestigious 'Nordic Green Space Award' (NGSA) from 2009 to 2012. The NGSA focuses on acknowledging and honouring municipalities or local authorities in the Nordic countries (Norway, Sweden, Denmark, Finland, and Iceland) for their exceptional efforts and accomplishments in creating and maintaining green spaces. The NGSA has identified eleven dimensions and twenty-five indicators for the quality assessment of urban green space and parks. The primary objective of this initiative was to rethink how the qualities of urban green spaces could be conceptualized and recognized. The NGSA serves as a unique framework, offering a novel methodology for collectively addressing the question of what constitutes an excellent urban green park within the specific regional context of the Nordic countries. By encompassing various types and sizes of green spaces, the NGSA criteria enable each park to be assessed on its individual merits, considering

factors such as its designated functionality, whether it serves as a nature area, recreational woodland, or a cultural-historical park.

This ground-breaking approach set the NGSA apart from traditional awards, as it allowed for a more inclusive and comprehensive evaluation of urban green spaces, recognizing the diverse roles they play in enhancing the well-being and vitality of communities. Through the collaborative efforts of Denmark, Sweden, and Norway, the NGSA has not only celebrated exceptional green spaces but has also encouraged a positive shift in how society perceives and values these vital urban assets. So here Nordic Green Space Award scheme consists of dimension and set of criteria based on which judgment made.

- **Quality criteria**

At the operational core of the NGSA scheme lays its scorecard, consisting of a set of criteria grouped under three overall themes namely a) Structure and general aspects; b) Functionality and experience, and c) Management and organisation. Under the Structure and General Aspects dimension, criteria include Size, Character, and Location, as well as Accessibility, which assesses the physical attributes and ease of access to the green space. Functionality and Experience dimension comprise Recreational and Social Aspects, Culture and History, Nature and Biodiversity, and Landscape and Aesthetic, evaluating the green space's ability to offer recreational opportunities, preserve cultural heritage, support biodiversity, and provide aesthetic appeal. Lastly, the Management and Organisation dimension involves Environment and Climate, Management, Maintenance, and Communication and Information, focusing on sustainable practices, effective management, regular upkeep, and community engagement in the green space. These criteria provide a comprehensive framework to evaluate and recognize outstanding urban green spaces.

The collaborative effort to translate the metaphor of a 'good urban green space' into a practical scheme was embraced by the partnership. The decision to focus on only three dimensions aimed to uphold a concise set of criteria while encompassing all crucial indicators of green space quality considered significant by the partners. Striving for a balanced number of dimensions and criteria was a key objective. The criteria selection process prioritized relevance, ease of assessment by judges, and accuracy. Following extensive testing, adaptation, discussions, and consensus among the NGSA partners, the final set of criteria was established.

Table 2 Nordic Green Space Award Dimension and Indicator

S.N	Theme	Dimensions	Indicators
1.	Structure and general aspects	a. Size, Character and proximity b. Accessibility	1. appropriate size, character 2. well-placed 3. integrated 4. outside nuisances 5. accessibility to the area 6. accessibility into the area accessibility within the area
2.	Functionality and experience	c. Recreational and social aspects d. Culture and History e. Nature and Biodiversity f. Landscape and Aesthetic g. Environment and Climate	7. Recreational activities 8. unique or particular attractions 9. diversity of experience 10. historical aspects 11. cultural events 12. historical importance 13. presence of art 14. biodiversity 15. old and conservation-worthy trees 16. green space 17. area aesthetical value 18. Use of environment friendly material 19. local climate conditions
2.	Management and organisation	h. Management i. Maintenance j. Communication and Information	20. Policy 21. trained staff 22. cleanliness 23. maintenance level 24. multiple language information board 25. Signage 26.

- **Scoring and evaluation**

For the assessment in NGSA against each criterion is evaluated with a score from 1 to 5.

Score	1	2	3	4	5
Description	poor	fair	good	very good	excellent

The scores are then assigned weights in the overall scoring calculation against a predetermined standard. The maximum theoretical overall score for a green space is 5. However, achieving this score in practice is highly unlikely for any green space due to high requirements for management planning and documentation, and not all green spaces prioritize the same functionality. An NGSA is conferred upon a green space when it surpasses a specific threshold score, ensuring that a minimum score of 2.5 is attained for each of the three main themes (Lindholst et al., 2016).

C. Leeds Park and Green Space Strategy 2022-2032

The Leeds Park and Green Space Strategy, developed by Leeds City Council, a local government authority in the UK, aims to establish top-quality parks and green spaces. Aligned with the Green Flag Award criteria, the strategy serves as a framework for assessing and enhancing community parks. It is a forward-looking plan designed to create sustainable and eco-friendly parks and green spaces. The strategy sets forth a range of initiatives and actions for the next decade, focusing on improving the quality, accessibility, and functionality of these areas. Key objectives include increasing the number of Leeds-certified parks, promoting biodiversity and ecological balance, and prioritizing community engagement and well-being. The strategy particularly addresses the management of local public green spaces, including parks, nature reserves, cemeteries, and associated facilities.

The Leeds Parks Strategy outlines eight priority areas of action, strategically addressing key aspects to enhance the quality and impact of parks and green spaces in the city. It places a strong emphasis on climate and biodiversity, seeking to integrate sustainable practices and promote the conservation of biodiversity within green spaces. Ensuring accessibility for all is a crucial focus, with initiatives aimed at enhancing pathways and facilities to create inclusive spaces for everyone. Preserving and celebrating cultural heritage and landmarks within parks is prioritized to instill a sense of identity and pride in the community. Creating child-friendly spaces that foster play and learning, along with community engagement to understand needs and preferences, are pivotal for crafting spaces that truly meet the needs of residents. The strategy also acknowledges the importance of financial sustainability, exploring partnerships and effective budgeting to ensure the long-term well-being of the parks. Lastly, promoting health and well-being through the design of spaces that encourage physical activity and relaxation contributes to overall community welfare.

The Leeds Parks Strategy stands as a visionary roadmap for developing vibrant, sustainable, and people-centric green spaces in the city.

Table 3 Table showing the Priorities of Leeds Park and Green space strategy

S.N	Priorities	Description
1.	Quality	Providing high quality parks and green spaces.
2.	Climate and biodiversity	Increasing wildlife and biodiversity and reducing the impact of climate change.
3.	Access for all	Ensuring that parks and green spaces are accessible to everyone.
4.	Culture	Providing exciting, diverse, interesting and enjoyable green spaces that reflect the history and culture of their local communities.
5.	Child friendly	Providing green spaces that children and teenagers love to visit.
6.	Working with Communities	Having a positive, open, helpful and collaborative approach to delivering the Parks and Countryside service
7.	Financial Sustainability	Ensuring that quality public green space is available for the long term.
8.	Health and Wellbeing	Providing and promoting a wide range of opportunities for people to get the health benefits of spending time in green spaces

Leeds Quality Park Criteria

The Leeds Parks Strategy for 2022-2032 aligns with the dimensions and indicators set by the Green Flag Award, an internationally recognized standard for well-managed parks and green spaces. This alignment reflects the strategy's commitment to meeting the high standards established by the Green Flag Award. The evaluation process involves scoring against 26 indicators, each receiving a score from 0 to 10, ensuring a comprehensive assessment of the parks and green spaces.

Table 4 Table showing the list of Dimensions and Indicators for Leeds Park and Green Space Strategy

S.N	Dimensions	Indicators	Discussion

1.	A Welcoming Place	Welcoming and safe ,Good and safe access, Signage, Equal access for all	A welcoming place is one that invites and draws people into it. This means creating a space which, through its visual appearance, range of facilities, standards of maintenance and ease of access, makes people feel that they are in a cared-for place.
2.	Healthy, Safe and Secure	Appropriate provision of quality facilities and activities, Safe equipment and facilities, Personal security, Control of dogs/ dog fouling	This section looks at how well managers understand their users' needs, encouraging them to enjoy healthy activities using appropriate, safe to-use facilities and activities, and to feel personally safe and secure.
3.	Well Maintained and Clean	Litter and waste management, Horticultural maintenance, Arboriculture and woodland maintenance, Building and infrastructure maintenance, Amenities maintenance	For aesthetic as well as health and safety reasons, issues of cleanliness and maintenance must be addressed.
4.	Environmental Management	Managing environmental impact, Waste minimisation , Chemical use , Peat use , Climate change adaption strategies	This section seeks to ensure that the way the site is managed has a positive impact on the environment, locally and globally, both now and for the future.
5.	Biodiversity, Landscape and Heritage	Management of natural features, wild fauna and flora , Conservation of landscape features, Conservation of buildings and structures	Attention should be paid to the appropriate management and conservation of natural features, wildlife and flora; landscape features; and buildings and structures. Their particular character and requirements should be identified and appropriate management strategies put in place to conserve and enhance them.
6.	Community Involvement	Community involvement in management & development , Appropriate provision for the community	This section examines the extent to which the managing organisation understands the community it seeks to serve as well as provides opportunities for active participation in site projects and ensures that there is appropriate provision of recreational facilities and activities for all sectors of the community.

7.	Marketing	Marketing and promotion, Appropriate information channel, Appropriate educational and interpretational information	This section seeks to examine the ways that managers understand the key benefits of the site and how they use this information to promote it appropriately.
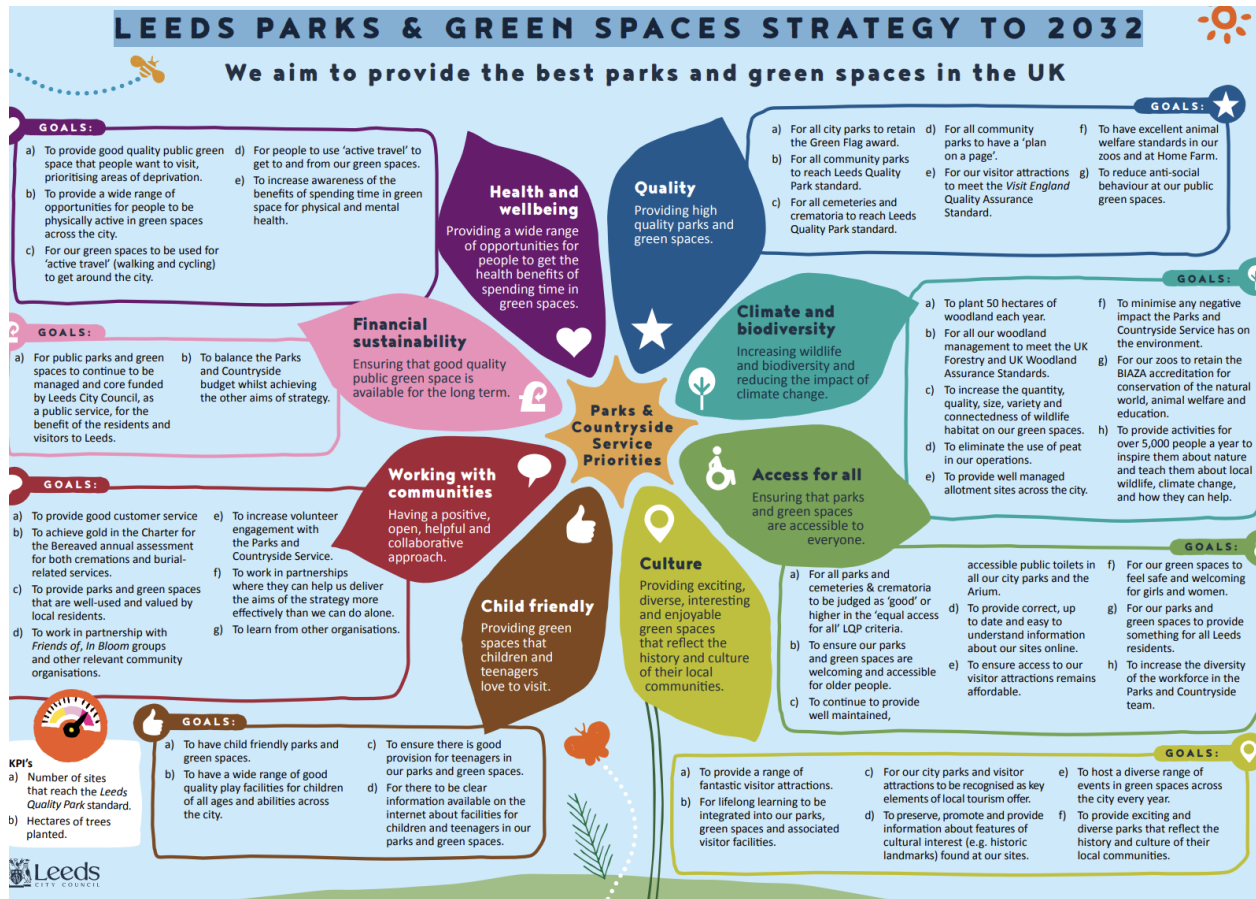
Figure 7 Chart showing Leeds Parks and green space strategy to 2032 (Leeds, 2022)

D. Factor Concerning Quality of parks

There are various factor concerning quality of parks. Different author have identified different types of dimension and indicator to access the quality of parks. Urban Land Institute (2021), Knobel et al. (2019), Bahriny & Bell (2020) and Praliya & Garg (2019) in their respective research identified various dimension and indicator concerning the quality of parks which are important for assessing the quality of urban green parks which are discussed in detail below.

Urban Land Institute (2021) identified five characteristic of high quality parks. It has included six dimension and thirty seven indicator. Five characteristic of high quality park includes dimension such as accessible and well connected, attractive and appealing places, biodiversity supporting ecological networks, active supporting, health and well-being and community supported. Research by Urban Land Institute only considered the key aspects to determine the quality of green parks. The selection of dimensions depend on the context, available resources, the focus of the study, and the desired outcomes. The assessment of park quality is done because park quality can engage communities and address disparities by helping direct dollars and capacity to where they are most needed, creating equitable access to high-quality parks. The qualities are based on best practices that are presently being used in top cities.

In addition to this **Knobel et al. (2019)** identified 10 dimensions and 67 indicators. The dimension included are surroundings, access, facilities, amenities, aesthetics and attractions, incivilities, safety, potential usage, animal biodiversity and birds biodiversity. For the preparation of this tool, they assessed the characteristics of 15 published and assessed tool by different author. These 15 tool are Public Open Space Tool, Environmental Assessment of Public Recreation Spaces, Children Public Space Tool, Community Park Audit Tool, Neighbourhood Green Space Tool, resilience for Physical Activity Park Audit Tool, playable Space Quality Assessment Tool, Parks, Activity and Recreation among Kids and Natural Environment Scoring Test. Each tool have different dimension suitable for each context. It shows that the 15 tool by different author are limited in their scope like concerned with physical activities, children friendly, recreational, resilience, recreational space etc. individually. So the tool by Knobel et al. (2019) tried to include all the possible dimension related to the quality of urban green parks with the help of the 15 tool by different authors. The dimension of quality assessment tool was finalized after reviewing the various tool for various characteristics of parks such as size, location etc. And a final list of indicator are determined by reviewing all these tool and can be applicable for all kinds of urban green parks.

Similarly, **Bahriny & Bell (2020)** also identified 13 dimensions and 33 indicators for the quality assessment of the parks. This tool was used to assess the destination and local parks of Tehran, Iran. The dimension includes Accessibility, Management and maintenance, Range of activities, anti-social behaviour, Permeability and movement, Inclusiveness, The quality of public areas,

Climate comfort, Lighting, Vegetation, Flexibility, Vitality, Safety and security. The reason behind identifying above dimensions was that Tehran had no comprehensive investigation method of urban parks regarding their level of use, range of activities, quality of maintenance, evidence of anti-social activities and important information for Effective Park planning. So the authors have focused more on the 'level of use' as pleasant parks with good facilities are less well used because of, e.g., evidence of anti-social behaviour, poor maintenance and accessibility, women safety issue etc. So the approach applied by authors have potential to help other cities in similar areas to learn more about their green space systems for planning purposes.

Praliya & Garg (2019) identified 7 dimensions and 49 indicators for the assessment of the park quality of Indian cities. This indicator were validate through the assessment of three public parks of India of three different size large, medium and small. Based on success and failure of the urban parks list of dimension were identified for the quality assessment. The dimension includes Accessibility and Linkage, Maintenance, Attractiveness and Appeal, Comfort, Inclusiveness, Activities and Uses, Purposefulness, and Safety and Security.

The accessibility and linkage dimension is associated with different means of physical access and visual approaches, as well connectivity to nearby and far-off areas of the city through different modes; maintenance is associated with the attributes that help in preserving the state of parks such that the space is able to perform the function/uses it is meant to. The attractiveness and appeal dimension is associated with the possession of qualities or features that make the space appealing to the senses; whereas comfort is the state of being at ease due to certain features, elements and climatic conditions present in the space and; inclusiveness refers to the characteristics of a space which makes it usable by all, irrespective of different physical, social and economic parameters or external influences. The activities and uses dimension refers to different activities taking place in a space and the uses a space is put to; whereas purposefulness is associated with accommodating the needs of different users, which change with time justifying its planning, design and the uses it is put to. The safety and security dimension is associated with a feeling of being protected and free (Praliya & Garg, 2019).

The dimensions mentioned above are based on fundamental principles of urban park planning and design, and they address different aspects that contribute to a park's overall quality and functionality which can be better reference for context of Nepal as well.

1. Dimension and indicators of factor concerning to quality of parks

Dimension and indicator identified by different author mentioned above are show in detail below respectively.

Table 5 Table showing factor concerning quality of parks given by Urban Land Institute (2021)

S.N	Dimensions	Indicators
1.	Access and linkage	1. Well located close to a community 2. Meets DDA requirements/ disabled user needs 3. Provide surfaced, high quality paths 4. Connects with other transport modes 5. Allows movement in and between places 6. Accessible entrances in the right places 7. Offers connecting path network and signage
2.	Aesthetic and attraction	8. Attractive, with a positive image 9. Attractive setting for urban areas 10. Quality materials, equipment and furniture 11. Attractive plants and landscape elements 12. Welcoming boundaries and entrance areas 13. Facilities in clean, safe and usable condition 14. Low levels of litter and adequate bins 15. Well maintained
3.	Biodiversity supporting ecological networks	16. Contribute positively to biodiversity 17. Large enough to sustain wildlife populations 18. Offers a diversity of habitats 19. Part of the wider landscape structure/ setting 20. Connects with wider green networks 21. Balance between habitat protection & access 22. Resource efficient
4.	Active supporting, health and well being	23. Provides places for a range of outdoor activities 24. Diverse play, sport & recreational opportunities 25. Providing places for social interaction Appropriate, high quality facilities meeting needs 26. Appropriate facilities for location and size 27. Carefully sited facilities for a range of ages 28. Adaptable to changing needs/ uses
5.	Community supported	29. Safe and welcoming 30. Good levels of natural surveillance

		31. No evidence of anti-social behaviour
		32. Appropriate lighting levels
		33. Sense of local identity and place
		34. Good routes to wider community facilities
		35. Distinctive and memorable places
		36. Catering for a range of functions and activities
		37. Community involvement in management

Table 6 Table showing factor concerning quality of parks given by Knobel et al. (2019)

S.N	Dimensions	Indicators
1.	Surroundings	Surrounding buildings visibility, Surrounding buildings facades maintenance, Surrounding buildings facades greenness, Connection to the site
2.	Access and linkage	Space entries, Fences, Walking paths, Bike lanes, Car parking spaces, Handicapped adaptations , Slope
3.	Facilities	Playgrounds, Grass pitches, Courts, Dog playing grounds, Skateboard/BMX ramps, Open space for multi choice usage, Water-related facilities, Outdoor gym
4.	Amenities	Seating and benches, Litter disposal, Informational signage, Picnic tables, Drinking fountains, Public toilets, Shelter, Shade, Dog mess bins, Specific sports amenities, Barbeques, Cafe/Kiosk, Bike parking, Vegetable garden, Aromatics garden, Guiding signage
5.	Aesthetics and attractions	Views Primary surface , Material of primary surface, Seasonal and high maintenance vegetation, Year-round vegetation, Water fountain, Public art , Historic structures or buildings, Quietness
6.	Incivilities	General litter, Alcohol use, Other drugs, Sex work , theft, Noise Smells
7.	Safety	Lighting, Visibility from ground intensity, Visibility form surrounding buildings, Safety adaptations form cars, Safety adaptations from bikes, CCTV

8.	Potential usage/activity	Sports activities in courts, Informal game, Walking or running, Children's play Conservation or biodiversity, Enjoy landscape, Dog walking, Social activities, Relaxing, Cycling , Educational information
9.	Animal biodiversity	Species of animal
10.	Birds biodiversity	Species of birds

Table 7 Table showing factor concerning quality of parks given by Bahriny & Bell (2020)

S.N	Dimension	Indicator
1.	Accessibility	Access, Pathways, Accessible for all
2.	management and maintenance	maintenance of surfaces, maintenance of vegetation, litter collection
3.	Range of activities	Playground , Courts, Sports
4.	anti-social behaviour	Vandalism, litter, graffiti
5.	Permeability and movement	very free pathways , permeable to very restricted pathways
6.	Inclusiveness	all gender, age groups
7.	facilities	overall functionality and suitability of facilities, outdoor furniture, public art
8.	Climate comfort	Areas exposed to sun, degree of shade, air currents and prevailing winds, vegetation, air and noise pollution
9.	Lighting	Evening Lighting
10.	Vegetation	use in the design, condition
11.	Flexibility	Flexibility for different activities , Flexible Event Spaces
12.	Vitality	sense of liveliness , popularity of the park
13.	Safety and security	Surveillance, Visibility/ security arrangement

Table 8 Table showing factor concerning quality of parks given by (Praliya & Garg, 2019)

S.N	Dimension	Indicator

1.	Accessible & Linked	Visibility of space from a distance, Visibility of space from immediate surroundings, Accessibility walking, Accessibility via private transport, Accessibility via public transport, Ease of movement in and around
2.	Maintenance	Management of litter and filth, Presence and condition of waste bins, Condition of green areas, Condition of park infrastructure, Conditions for walking, jogging, cycling tracks, Management of graffiti, vandalism
	Aesthetic and Attraction	Aesthetic appeal, Visual pleasure in the overall space, Uncluttered view of the space, Presence, quality and condition of public art, Arrangement of park furniture, Landscape, Condition of grass/verges, Presence and condition of flowered areas, Presence of themed play area
3	Comfort	Comfortable sitting areas, Presence and condition of public facilities and amenities, Presence and condition of shelter spaces, Presence of Signage's, Provision of parking spaces, Provision of buffer from traffic nuisance
4	Inclusiveness	Used by all, irrespective of age, race, class, gender and physical abilities, Control of entrance to the space according to specified timings, Control of entrance by entrance fee
5	Activity and uses	Walking Socialising, Physical fitness related activity, Children's play, Sports and games, Family outings, Contact with flora and fauna, Educational visits, Events and gatherings, Relaxing
6	Purposefulness	Suitability of layout and design, Ambience
7	Safety and security	Presence of adequate lighting, illumination, Surveillance measures, Security arrangements, Check on entry of animals, Check on criminal activities, Check on antisocial elements, Availability of information/ complaint centre

2. Scoring Criteria

The scoring criteria utilized for the quality assessment of urban green parks serve as a method to systematically evaluate and gauge different aspects of these parks, aiming to ascertain their overall quality, effectiveness, and appropriateness for their designated purposes. Through scoring, a structured and organized approach is applied to assess the performance and features of urban green spaces. These criteria establish a standardized framework for evaluating parks, promoting

consistency and objectivity among assessors. This standardization minimizes subjective biases, ensuring that assessments are reliable and can be meaningfully compared.

Scoring criteria for the three international quality evaluation tool is already mentioned above as they stands solely as tool and scoring criteria used by the authors such Urban Land Institute (2021), Knobel et al. (2019), Bahriny & Bell (2020) and Praliya & Garg (2019) in their respective research are mentioned below.

a. Scoring Criteria used by Urban Land Institute (2021)

Green park sites may undergo an audit process, but if they fail to meet certain requirements, they will be classified as "not suitable" for inclusion.

Assessment Criteria	5	3	1	n/a
	High	Fitness for Purpose	Low	
Provides surfaced, quality paths fit for purpose	Appropriate path surface, well maintained with no management or drainage issues	Appropriate path surface with some minor maintenance/ drainage issues	Poor quality or inappropriate path surface for location or levels of use. Significant maintenance or drainage issues	No paths expected on a site of this type or size (e.g. waterbody, dense woodland or scrub, small scale amenity space.)

b. Scoring Criteria used by Knobel et al. (2019)

The five point scale was used in most of the tools to evaluate the dimension.

Score	1	2	3	4	5
Description	poor	fair	good	very good	excellent

c. **Scoring Criteria used by Bahriny & Bell (2020)**

The park was assessed qualitatively using a five-point rating scale (where 1 was the lowest value and 5 was the highest value).

Score	1	2	3	4	5
Description	poor	fair	good	very good	excellent

d. **Scoring Criteria used by Praliya & Garg (2019)**

The park was assessed qualitatively using a five-point rating scale (where 1 was the lowest value and 5 was the highest value).

Score	1	2	3	4	5
Description	poor	fair	good	very good	excellent

Using a five-point rating scale to assess the park qualitatively is a common and effective approach in research, especially when the aim is to capture varying degrees of quality or characteristics. This type of scale allows to assign a level of evaluation or judgment to different aspects of the park, providing a structured and standardized way to gather data.

3. **Weightages to Attributes**

Assigning weightages to attributes can be equal and unequal as described above. Assigning weightages to attributes in a quality assessment is necessary to reflect the relative importance of different attributes or criteria in the overall evaluation. This approach acknowledges that not all attributes carry the same level of significance when determining the quality of a product, service, or entity. Some attributes may have a greater impact on the overall quality or effectiveness of the

subject being assessed. Weightages help prioritize these attributes, ensuring that the assessment focuses more on those that are considered more critical or influential.

In most of the research Park quality scores were obtained by adding together all the criteria scores and dividing the total by the number of applicable criteria resulting in an average score. This score is then multiplied by 100 to obtain a Park Quality Score. The process used by Praliya & Garg (2019) is described in detail below:

Praliya & Garg (2019) assigned weightages on the same scale for each dimension facilitates a proper evaluation, as each dimension is given the same weightage of 10. Therefore, the rating of each attribute was converted into weightages by calculating the relative importance of each attribute, where the total of all the attributes for a specific dimension adds up to a total of 10.

Average Rating for respective attributes (Rd) = {[U1+ U2+….Un]/n}

Where, n - is the total number of surveys conducted to gather users' opinions, Rd - average rating, Un - individual ratings for respective attributes

Attribute Score (Sd) = Wd x Rd

Where, d - is the total number of attributes, Rd - average rating for respective attributes, Wd - Weightages for respective attributes

Dimensions Score for each of the dimensions (Di) = S1+ S2+….Sd

Where, i - is the total number of dimensions, Sd - Attribute scores,

Overall Performance of Park (Pp) = [(D1+D2+ ….Di)/i]

Where, Di = Dimension Score for each of the dimensions

Since the maximum rating for an attribute can be 5 (on the 1to 5 scale used in the survey) the maximum score that can be achieved for any dimension will be 50. The Dimension Score is converted into a percentage. In this way park quality index can be applied to all the parks taken for study and the overall performance of the parks can be measured using this method used by above authors.

2.9 National Approaches for Quality Assessment

In case of Nepal there have been many attempts to assess the urban spaces but very few regarding the quality aspect of urban green parks and also these attempts are very specific in their scope. For example: A Study on Public Spaces of Kathmandu Metropolitan City for Policy Revision by Resource Centre for Primary Health Care RECPHEC (2016) focused on multi dimensions such as Physical infrastructure Social, Economic, Environmental and Management of Public Open Spaces. Acharya & Lal (2022) focused on five dimension of Gender Inclusiveness in the Planning of Urban Space. In addition, Shrestha (2022) identified six dimension for the quality aspect of Public Open Spaces in Kathmandu Valley. By analysing the different dimensions identified by various authors, it becomes apparent which aspects are commonly emphasized and which dimensions are crucial for the overall assessment of urban green parks. Through the comprehensive review, it gets easy to identify the most prevalent factors that contribute to park quality and determine which dimensions should be considered in a holistic evaluation. By combining the overlapping dimensions and incorporating the unique insights from each study, it gets possible to create a well-rounded and inclusive approach to assess urban green parks, ensuring that their design, management, social inclusivity, economic benefits, environmental impact, and overall quality are adequately addressed. So the detail of each identified factors of quality of urban green space and parks are mention in detail below.

A. Factor concerning quality of parks

Factors concerning the quality of parks are essential for park quality assessment. They provide a structured guidelines to systematically evaluate different aspects of a park's attributes, features, and overall user experience. In context of Nepal, RECPHEC (2016), Acharya & Lal (2022), Shrestha (2022) identified various dimension and indicator concerning the quality of parks which are important for assessing the quality of urban green parks which are discussed in detail below.

RECPHEC (2016) identified 4 dimension and 22 indicator for the quality assessment of urban green space and parks of Kathmandu valley. The dimension includes Physical infrastructure, Social, Economic and Culture specific, Environmental and Management of Public Open Spaces. The physical infrastructure dimension evaluates the design and amenities to create safe and attractive spaces. The social, economic, and culture-specific dimension considers the park's impact

on the community, economy, and cultural identity. The environmental dimension assesses its ecological contributions and sustainability. Lastly, the management dimension focuses on effective operation, maintenance, and community engagement. By evaluating these dimensions together, urban green parks can be designed and managed to meet diverse needs, promote social cohesion, stimulate the economy, support the environment, and provide high-quality public spaces for the community. As author is more concerned for protection and inclusion of public open spaces and parks, identified dimension seems enough for this particular scope of research.

Acharya & Lal (2022) identified 5 dimension and 22 indicator for gender Inclusiveness in the Planning of Urban Spaces. The identified dimension includes Infrastructure and Comfort Connectivity, Public safety, Occupancy and Lighting. In the dimension of Infrastructure and Comfort Connectivity, the focus is on creating an inclusive design that accommodates different mobility needs and preferences, providing amenities like accessible pathways and gender-specific facilities. Public Safety entails evaluating lighting and surveillance to ensure well-lit and secure spaces, reducing the risk of crime and harassment. Occupancy involves assessing seating arrangements and distribution to accommodate various activities and prevent overcrowding, making the spaces functional and comfortable for all users. Lastly, the dimension of Lighting concentrates on creating an inviting atmosphere through appropriate illumination, enhancing safety and user experience during both daytime and night-time use. As authors main concern is on gender inclusiveness, for the quality assessment of urban green parks dimension concerning to the quality aspect of it can also be incorporated for the development of the tool.

Shrestha (2022) identified 6 dimension and 28 indicator for use and Management of Public Open Spaces in Kathmandu Valley. The identified dimension includes Access and Linkages, Comfort and Image, Inclusiveness, Engagement, Uses and activities and Management Access and Linkages focus on evaluating the ease of entry and connectivity to the park, ensuring it is easily accessible for all members of the community. Comfort and Image assess the overall aesthetics and sensory experience of the park, striving to create a welcoming and visually appealing environment. Inclusiveness is concerned with catering to the diverse needs and preferences of different user groups, promoting gender inclusivity, and ensuring that the park is welcoming to all. Engagement evaluates the level of community involvement and social interactions within the park, fostering a sense of ownership and cohesion. Uses and Activities assess the diversity of recreational

opportunities and programming within the park to cater to various interests and age groups. Lastly, Management addresses the effectiveness of park operations, maintenance, and programming, ensuring that the park remains well-maintained, safe, and vibrant for the community. Author employed a case study approach to explore the users' opinion for assessing the use and management of public open spaces focusing on three POSs of different hierarchy, scale, location, similar function and responsible management agencies located in Kathmandu Valley namely UN Park, Shankha Park and Suryamukhi Garden.

B. Dimensions and Indicators

The dimensions and indicator identified by RECPHEC (2016), Acharya & Lal (2022), Shrestha (2022) are mentioned in the table below respectively.

Table 9 Table showing dimensions and indicator identified by RECPHEC (2016)

S.N	Dimension	Indicator
1.	Physical infrastructure	access road, pedestrian way, furniture, lighting, drinking water, sanitation and drainage, solid waste management
2.	Social, Economic And Culture specific	safety and security, gender issues, Inclusiveness, encroachments, disaster friendly, willingness of user, capturing land value rise, Presence of traditional building
3.	Environmental	noise pollution, air pollution, ecological parameters
4.	Management of Public Open Spaces	issues on transformations of open spaces, role of community in managing and preserving the open spaces, maintenance issues, challenges in managing the open spaces

The research used qualitative analysis to identify issues in urban open spaces and parks. Comparative analysis based on dimensions was conducted, and gaps in policies were identified through a review of relevant policies. The study aimed to understand challenges and provide recommendations for policy improvements.

Table 10 Table showing dimensions and indicator identified by Acharya & Lal (2022)

	Dimension	Indicator
1.	Infrastructure and Comfort	well maintained and adequate public toilets for both men and Women, Presence of ramps, rubbish bins, Furniture, Presence of shade ,Food kiosk
2.	Access and linkage	easily accessed from the surrounding neighbourhood, sidewalks surrounding the public space, transit stops located nearby for enhanced connectivity, adequate directional signage within the space
3.	Public safety	clear sight lines within the public space, overgrown or non-maintained vegetation that hinders visibility, fences or walls that blocks clear pathway to exits, visible policing, people or group of people that makes women feel unsafe, presence of Alcohol or Drug Dealing
4	Occupancy	Visiting time, Range of activities, areas that people are using the most, mixed use facilities
5	Lighting	existing lights in working condition, distributed evenly in all

Table 11 Table showing dimensions and indicator identified by Shrestha (2022)

S.N	Dimension	Indicator
1	Access and Linkages	Proximity, mode of transportation, travel time, location
2	Comfort and Image	Safety, convenient walkways and seating, climatic comfort, Landscape features, attractive views, no outdoor noise while roaming POS

3	Inclusiveness	Promotes diversity, universal access, Participation in events and programs , sense of community, social networking, sense of pride, Users to freely roam in the POS
4	Engagement	Space encourages a variety of activities, space fulfilling the need of users, Space encourages social activities and interactions, local culture and arts
5	Uses and activities	Physical, informal , quiet, social activities
6	Management	Availability of basic facilities- drinking water, washroom , cleanness and maintenance of space

C. Analysis

RECPHEC (2016) used qualitative analysis to identify issues in urban open spaces and parks. Comparative analysis based on dimensions was conducted, and gaps in policies were identified through a review of relevant policies. The study aimed to understand challenges and provide recommendations for policy improvements.

Acharya & Lal (2022) analysed the data qualitatively. The data obtained from the site observation, questionnaire survey, Key informant interview and focused group discussion were analysed qualitatively and presented in bar graphs which shows important differences and resemblances between two parks in terms of above mentioned dimensions.

Shrestha (2022) represented the data obtained from the site observation, questionnaire survey, Key informant interview directly through bar graphs and charts based on identified dimensions. The result from analysis showed that public open spaces and parks taken into consideration are not well maintained, the spaces lack sitting spaces, infrastructures, regulation and timely monitoring and maintenance. The most important reason for dissatisfaction among the users is lack of maintenance and inefficient management which need to be considered for the quality assessment.

CHAPTER 3: CONCEPTUAL FRAMEWORK AND METHODOLOGY

3.1 Research paradigm

Research paradigm are fundamental philosophical frameworks based on ontological, epistemological, and methodological assumptions (Egon G & Yvonna S, 1994). In this research, the objective has been set to assess the quality of urban green parks by identifying indicators and recognizing policy gaps. The research paradigm that is most commonly related to the development of scorecards or developing indicators assessing the quality of urban green parks is post-positivist paradigm. Post-positivism is an extension of positivism, which acknowledges the limitations of objective knowledge and recognizes the role of the researcher's subjectivity in the research process. For developing a scorecard for quality assessment, which involves identifying dimensions and indictors from documents and literature written by different authors. This process suggests objective criteria for quality assessment (positivist aspect) while also recognizing the importance of different perspectives and interpretations (post-positivist aspect).

This particular research can't be approached through the positivism paradigm only as the phenomenon taken for the research is a phenomenon of the social world rather than a scientific research and there might exist a multiple reality. Constructivist paradigm can be the approach, if the primary focus is on understanding subjective experiences only, a constructivist paradigm can serve as a solid foundation for the research to identify the policy gaps. But this research might not be entirely based on interpretivism since interpretivism focuses on understanding social phenomena through subjective interpretations and meanings. While this research involves some subjective elements, such as the interpretation of documents and papers, the overall focus seems to be on deriving objective criteria for quality assessment through a mixed-methods approach.

3.2 Methodology

Mixed methodology is used for the research on quality assessment of urban green parks to comprehensively evaluate the diverse dimensions of park quality, combining qualitative methods for in-depth understanding of user experiences and management practices, with quantitative methods for structured data collection and analysis, allowing for validation, and a more holistic perspective on park quality, which is essential for informing effective policy recommendations,

accommodating dynamic park environments, and ensuring a more inclusive understanding by involving diverse stakeholders in the research process.

3.3 Methods

The method used in this research includes the mixed method. A mixed methods research design is a procedure for collecting, analysing, and "mixing" both quantitative and qualitative research methods in a single study to understand a research problem. The method used for this research includes:

- Literature review: Literature review is done to identify relevant dimensions and indicators that have been previously used or recommended in similar studies. It helps to establish a solid theoretical foundation for the scorecard development.
- Expert Consultation (KII): Key informant interview of chairperson and management expert is done of respective parks to have valuable insights and guidance on selecting appropriate dimensions and indicators.
- Surveys and Questionnaires: Survey and questionnaire is done in order to validate the identified indicator for the quality assessment of the parks and also to know about in which dimension park is lagging behind and need to improve for the better quality of park. In this research both closed ended and open ended questionnaire is used. Structure or closed ended questionnaire is for the ark visitors and open ended questionnaire to the park management team.
- Site Visits and Observations: It allows to directly assess the physical aspects of the parks, such as cleanliness, accessibility, amenities, recreational opportunities etc.

Table 12 Table showing research method

S.N	Research Method	Primary or Secondary	Qualitative or Quantitative	Use
1.	Literature Review	Secondary	Either	- To situate research in an existing body of work or to evaluate trends within a research topic

				• To identify dimensions and parameters for quality assessment • To identify policy gap
2.	Key Informant Interview	Primary	Qualitative	KII with Parwati Thapaliya (official of Balaju park) and Umesh Bhandari(Head of Shankhadhar Park) is done for finalization of the indicators and also to gain more in depth understanding of the park quality.
3.	Observation	Primary	Either	To have understanding of the park environment, user behaviour, interactions, maintenance and cleanliness etc.
4.	Questionnaire survey	Primary	Quantitative (closed ended questionnaire)	To validate the identified indicator for the quality assessment of the parks

3.4 Research Framework

Framework for research topic involves identifying and organizing the key concepts, variables, and relationships that guide the study. The key concepts here is urban green parks, assessment indicator and the user. Firstly it is very necessary to know the aspects that contribute to urban green parks. Based on these aspects various assessment tool are studied and the context specific indictors are selected .And selected dimension are tested through the case study method. The sample is selected for the Questionnaire survey. The scorecard is developed and the analysis is done.
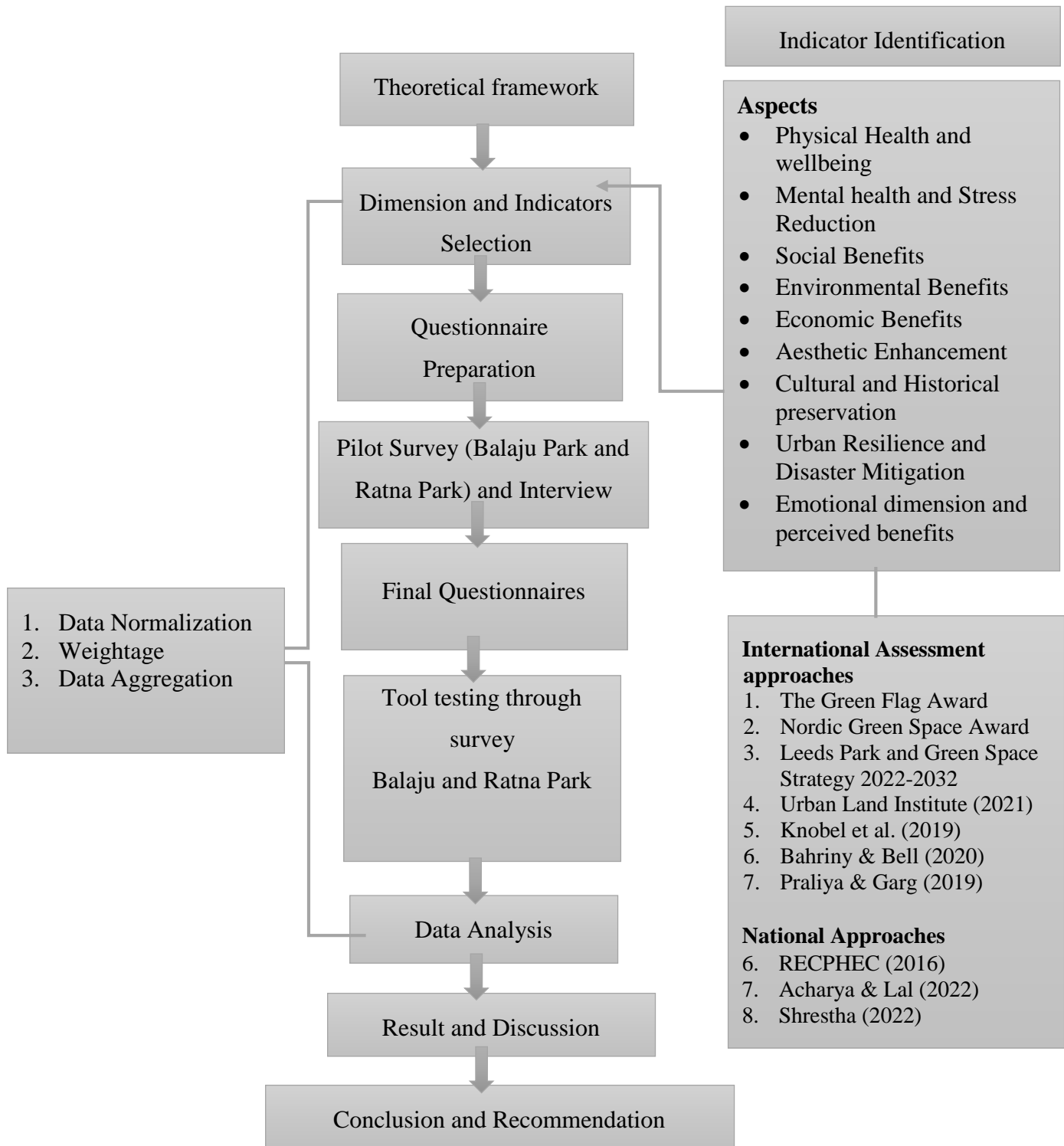
Figure 8 Research framework

So according the research framework the process for indicator selection and identification along with other process required for the quality assessment of the park is given in detail below.

3.5 Dimensions and Indicators Selection

The first step towards assessing the quality of urban green parks is to identify the set of quality dimension and indicator. The process of selecting indicators should be backed by a proper theoretical framework (McConville et al., 2021) . For this study, firstly the aspects are identified that urban green parks contribute. From that it became easy to know the benefits of urban green parks which help to identify the dimension which are important for classification of the indicator and all of these are properly backed up by the theory.

After this, around 76 dimensions and 334 indicators were identified from the literature review. During this process, duplicates needs to be removed and only set of relevant dimensions and indicator needs to be selected. There are two important aspects when it comes to choosing the indicators. 1) Suitable for Nepali context and 2) Availability of data. Finally, 64 indicators were finalized based on this theoretical framework. A brief of this process has been described below:

Table 13 Table showing the total number of identified dimensions and indicators from literature

S.N	LITERATURE REVIEWED	NUMBER OF DIMENSIONS AND INDICATORS
A	INTERNATIONAL	
1	The Green Flag Award	Dimensions: 8, Indicators: 26
2,	Nordic Green Space Award	Dimensions: 11, Indicators: 25
3	LEEDS Park and Green Space Strategy 2022-2032	Dimension: 7, Indicator: 26
4.	(Urban land Institute, 2021)	Dimensions: 5, Indicators: 37
5	(Knobel et al., 2019)	Dimensions: 10, Indicators: 67
6	(Bahriny & Bell, 2020)	Dimensions: 13, Indicators: 33
7	(Praliya & Garg, 2019)	Dimensions: 7, Indicators: 49
B	NATIONAL	
1.	(RECPHEC, 2016)	Dimensions: 4, Indicators: 21

2	(Acharya & Lal, 2022)	Dimensions: 5, Indicators: 22
3	(Shrestha, 2022)	Dimensions: 6, Indicators: 27
	Total	**Dimensions : 76, Indicators: 334**

3.6 Validation of Dimensions and Indicators

Validation of dimensions and indicators for the quality assessment of urban green parks is a critical step. It involves conducting a thorough review of existing literature related to park quality assessment to identify relevant dimensions and indicators. These dimensions should be context-specific and applicable to the unique characteristics of urban green parks in Nepal.

Urban green spaces contribute significantly to various aspects that benefit the environment, society, and individuals. The literature review revealed numerous positive impacts of green spaces, including physical health and well-being, mental health improvement, stress reduction, social benefits, environmental advantages, economic benefits, aesthetic enhancement, cultural and historical preservation, urban resilience, disaster mitigation, emotional well-being and perceived benefits.

Based on these aspects, set of 12 dimensions and 64 indicators were finalized for the quality assessment of urban green parks. These dimensions and indicators were derived from a synthesis of different international and national approaches used for park quality assessment. The selection process prioritized dimensions with the highest number of repetitions in the literature and considered context-specific relevance. A matrix displaying the dimensions included in various international and national approaches is presented in (annex section I), showcasing the integration of these dimensions to ensure the evaluation of urban green park quality. A lot of duplicates were also removed at this stage. This step reduced 76 dimensions to 12 dimensions and 334 indicators to 64 indicators. A pilot survey was conducted to validate the dimension and indicator to two parks of KMC.

3.6.1 Pilot survey

A pilot survey was conducted in Balaju Park and Ratna Park for the validation of the dimensions and indicators to assess the quality of the park. It was done on the basis of site observation,

questionnaire survey with both the administration and the park user and Key informant interviews. Discussion on dimensions and indicators for assessing the quality of parks were done with the officials of Balaju Park Mrs.Parwati Thapaliya and head of Ratna Park Mr.Umesh Bhandari .The initial draft of questionnaires based on the dimension and respective indicators had been tested for quality through Key informant interview and sample interviews with the park user held on 07/26/2023 and 07/28/2023.

Figure 9 Key Informant Interview with Mrs.Parwati Thapaliya (Official of Balaju Park) and Pilot survey with park users respectively

During the Key Informant Interview with Mrs. Parwati Thapaliya, an official from Balaju Park, valuable insights were gathered regarding the park. Mrs. Thapaliya discussed management practices, user satisfaction,challenges, and future plans for the park. Her perspective offered a understanding of the park's strengths, areas of improvement, and the steps being taken to enhance the overall quality of the park, making her interview a significant contribution to the research. Also the discussion on indicator were made and based on the feedback received, the questionnaires were revised to improve accuracy and effectiveness.

Figure 10 Key Informant Interview with Mr.Umesh Bhandari (Head official of Ratna Park) and Pilot survey with park users respectively

The Key Informant Interview with Mr. Umesh Bhandari, the Head official of Ratna Park, and the Pilot survey conducted with park users provided valuable insights about the park . During the interview with Mr. Bhandari, he highlighted the park's management practices, focusing on maintenance schedules, staff responsibilities, and budget allocation for park improvements. Additionally, Mr. Bhandari shared future plans for the park, which included initiatives to enhance amenities and increase community engagement and also planning to introduce the concept of wearing traditional attire from various cultures to create a welcoming space for individuals to celebrate and showcase their cultural pride. . Also the discussion on indicator were made and based on the feedback received, the questionnaires were revised accordingly.

3.7 Finalization of Dimensions and indicators

After a pilot survey, the dimension were reduced to 11 and indicator to 52 based on the site observation, questionnaire and Key informant interviews. The finalization of the 11 dimension and 52 indicator involved a two-step filtering process. Firstly, a suitable dimension and indicator were selected based on the existing literature. This helped to identify dimension and corresponding indicators that were relevant for the context of Nepal. The second step of the filtering process involved assessing the suitability of data for each indicator. This was achieved through a pilot survey conducted with key informant and the park users. The survey aimed to gather all the relevant dimension for the quality assessment of urban green parks and the practicality of using them in the

assessment. Dimensions and indicators that were challenging to measure and not context specific were excluded and only the dimension which were relevant for assessing the quality of urban green parks were taken into consideration. By employing this two-step filtering approach, the final set of 11 dimension and 52 indicators was identified for the quality assessment of urban green parks which are discussed in detail below.

a. Access and linkage

It centres on assessing the ease and convenience with which park visitors can access the green space and the connectivity of the park to its surroundings—a crucial aspect in determining the quality of urban green parks. The evaluation considers both the accessibility to the park and the ease of movement within it, examining how straightforward it is to reach the park and navigate its internal spaces (Bahriny & Bell, 2020). It considers various elements that influence the ease of access and connectivity. The reason for selecting the "Access and Linkage" dimension and these specific indicators is that they directly influence the park's usability. Easy access to green spaces encourages more people to visit and use the parks regularly, promoting physical activity, social interactions, and community engagement. Additionally, an accessible and well-connected park contributes to urban mobility, reducing the reliance on private vehicles and supporting sustainable transportation options. The validation process through the pilot survey with key informants and park users helped confirm their relevance and practicality for the quality assessment of urban green parks. The five indicator identified for this dimension are:

1. Transport modes

   The dimension of accessibility and linkage is linked to various physical access methods and visual approaches, as well as connectivity to both nearby and distant areas of the city through different modes (Praliya & Garg, 2019). This indicator evaluates the presence and accessibility of different transportation modes that facilitate easy access to the park. It is crucial to guarantee that individuals can reach the park using a variety of transportation choices.

2. Proximity

   Lindholst et al. (2016) focused on the proximity as it measures how far from the people visit the park. Parks that are located within walking distance or a short commute are more likely to be used frequently.

3. Accessible entrances

   Urban Land Institute (2021) has prioritized on accessible entrance in right place. This indicator evaluates the number and location of park entrances, ensuring that there are entry points that are easy to find and are accessible and welcoming for all visitors, including those with disabilities.

4. Fences

   The presence of fences can impact perceptions of park accessibility and safety Knobel et al. (2019). This indicator considers whether the park has appropriate fencing that balances safety with an open and inviting atmosphere.

5. Connecting path network

   This indicator looks at the network of paths and walkways within and around the park, assessing the ease of movement and the connectivity to surrounding areas. A well-designed path network encourages exploration and enhances the park's integration with its urban context (Praliya & Garg, 2019).

Above mentioned are the critical factors that directly affect park usability and accessibility. Other indicator such as public transportation routes, slope are not readily accessible which are excluded from the study.

b. Inclusiveness

It focuses on evaluating the extent to which the urban green park is designed and managed to be inclusive and welcoming for diverse groups of people (Bahriny & Bell, 2020). It considers elements that ensure accessibility, safety, and comfort for all park users, regardless of age, ability, gender, cultural background, or other characteristics. The reason for selecting the Inclusiveness dimension and these specific indicators is to create a park environment that is accessible, safe, and comfortable for all individuals, promoting social equity and community cohesion. Inclusive design features and amenities cater to diverse needs, allowing people of all ages, abilities, genders, and cultural backgrounds to enjoy the park's offerings. By prioritizing inclusiveness, urban green spaces can become more welcoming and enhancing the overall well-being of the community.

6. Universal Design Features

The extent of inclusiveness of any public space is determined by the range of activities which take place and the user group it supports (Shrestha, 2022). This indicator assesses the incorporation of universal design principles in the park's infrastructure and amenities. Universal design aims to create spaces that are accessible and usable by people of all abilities, including those with disabilities or mobility challenges.

7. Inclusive Playgrounds

Bahriny & Bell (2020) focused on all age group for the quality assessment. This indicator evaluates the presence of inclusive playgrounds that cater to children of varying physical abilities, providing equipment and facilities that promote play and interaction among all children.

8. Accessible Amenities

This indicator looks at the accessibility of amenities such as restrooms, seating areas, drinking fountains, and picnic areas to ensure that they are usable by everyone, including individuals with disabilities (Bahriny & Bell, 2020).

9. Senior-Friendly Activities

Bahriny & Bell (2020) focused on all age group for the quality assessment. The availability of activities and features suitable for senior citizens, such as gentle exercise areas, seating with shade, and walking paths, is assessed under this indicator.

10. Gender-Neutral Facilities

This indicator considers whether the park provides gender-neutral restroom facilities, ensuring a more inclusive and safe environment for all park users.

11. Culture Sensitivity

Praliya & Garg (2019) focused on the Park's design, programming, and signage need to be evaluated for cultural sensitivity to ensure that the space is inclusive and respectful of diverse cultural backgrounds and practices.

12. Control on Entrance

The Park's entrance fee and security measures are evaluated to ensure they do not create barriers or discriminate against specific groups of park users (Praliya & Garg, 2019).

Broader inclusivity criteria such as Sensory-Friendly Elements, Language Accessibility are not taken into consideration for this study because it very hard to see the simple physical inclusiveness

in the park in that case going into the broader inclusiveness criteria might not be suitable case for the study.

c. Amenities and Facilities

The urban green park features that allow for the realization of a specific activity such as presence of playgrounds, sitting space (Knobel et al., 2019). This dimension focuses on assessing the availability and quality of various amenities and services within the urban green park. These amenities and facilities are essential to enhance visitors' experiences, convenience, and comfort during their time in the park. The validation process through the pilot survey with key informants and park users helped confirm the relevance and practicality of the Amenities and Facilities dimension and its indicators in assessing the quality of urban green parks in the specific context of Nepal.

13. Parking

Knobel et al. (2019) focused on this indicator as this evaluates the provision and accessibility of parking spaces near the park entrance to accommodate visitors arriving by private vehicles, promoting ease of access and reducing traffic congestion.

14. Seating and Benches

Bahriny & Bell (2020) focused on this indicator which examines the availability of seating and benches throughout the park, providing visitors with rest areas and opportunities to enjoy the park's ambiance and scenery.

15. Picnic Area and Shelter

The presence of designated picnic areas and shelters allows visitors to enjoy outdoor meals and gatherings while providing protection from adverse weather conditions (Knobel et al., 2019).

16. Drinking Water Taps

The availability of drinking water taps in park ensures that visitors can stay hydrated during their stay and encourages to enjoy the park environment for longer period of time (Knobel et al., 2019).

17. Public Toilets:

This indicator assesses the provision and maintenance of public toilet facilities within the park, ensuring adequate access to sanitation for park users (Knobel et al., 2019).

18. Cafe/Kiosks

   The presence of cafes or kiosks offering food and beverages provides additional convenience and refreshment options for visitors (Knobel et al., 2019).

19. Guiding Signage

   This indicator evaluates the presence of clear and informative guiding signage that helps visitors navigate the park, locate amenities, and learn about the park's features and attractions (Knobel et al., 2019).

Practical and essential facilities and amenities that serve a wide range of park users are only taken into consideration excluding the dimension such as dog Wi-Fi availability playing grounds, Skateboard/BMX ramps which are not important and practical in our context.

d. Activities

Activities in public spaces are like building blocks that gives people reason to come to the public space and spend their time. Group activities increases socialisation encouraging various physical activities, informal activities, social activities (Shrestha, 2020).This dimension assesses the availability and diversity of recreational opportunities and social interactions within the urban green park. This dimension focuses on providing spaces and activities that promote physical activity, social engagement, and community gatherings, enhancing the overall park environment.

20. Recreational activities

   The evaluation of park quality is significantly influenced by the breadth of recreational activities provided (Lindholst et al., 2016). A diverse range of activities, accessible to various age groups and interests, contributes to the park's inclusivity and engagement, attracting a wider visitor base.

21. Physical Fitness Activity

   This indicator evaluates the presence of facilities and spaces that encourage physical fitness and exercise, such as jogging tracks, outdoor gyms, and exercise stations, promoting a healthier lifestyle for park visitors (Shrestha, 2020).

22. Children's Play Area

This indicator examines the presence of well-designed and safe play areas for children, providing a space for fun, imaginative play, and interaction with other children (Shrestha, 2020).

23. Relaxing

The provision of peaceful and shaded areas with comfortable seating and greenery is assessed to offer visitors spaces for relaxation and contemplation (Knobel et al., 2019).

24. Socializing

This indicator looks at the availability of open spaces, seating arrangements, and community-friendly environments that foster social interactions and gatherings among park visitors (Knobel et al., 2019).

25. Events and Gatherings

The park capacity to host events, community gatherings, and cultural activities is evaluated to encourage community participation and engagement (Shrestha, 2020).

26. Educational visits

This indicator focuses on the park's role in providing educational opportunities and experiences for visitors, particularly in terms of environmental education, nature interpretation, and learning about the park's ecological and cultural aspects (Praliya & Garg, 2019).

Indicators selected should provide valuable insights into the range of activities that the urban green parks offer to their visitors as main focus in this study is given to mostly physical, recreational and social activities other indicator such as cycling, dog park are excluded which does not seems relevant in urban parks in our context as park are is comparatively smaller to accommodate all the activities.

e.   Aesthetic and attraction

The aesthetic and attraction dimension is associated with the possession of qualities or features that make the space appealing to the senses (Praliya & Garg, 2019). This dimension focuses on evaluating the visual and sensory appeal of the urban green park, as well as its ability to attract and engage visitors through natural and designed elements. This dimension aims to create a visually pleasing and immersive experience for park users, enhancing their connection to nature and the urban environment. The reason for making Park visually attractive and enjoyable, creating a

beautiful and special environment is to connect people to the beauty of nature. The incorporation of natural elements, water features, and art installations enhances the park's visual appeal and provides opportunities for unique and engaging experiences.

27. Landscaping and Greenery

Praliya & Garg(2019) focused on this indicator to assess the quality and diversity of landscaping, including the presence of trees, shrubs, flowers, and well-maintained greenery that contribute to the park's overall aesthetic.

28. Natural Aesthetic

The park's ability to capture and showcase natural beauty, such as scenic views, natural habitats, and biodiversity, is evaluated under this indicator (Praliya & Garg, 2019).

29. Non-Natural Aesthetic

This indicator examines the incorporation of art installations, sculptures, or other non-natural elements that enhance the park's visual appeal and cultural significance (Praliya & Garg, 2019).

30. Water Features

The presence of water features, such as ponds, fountains, or streams, is assessed to add an element of tranquillity and visual interest to the park environment (Praliya & Garg, 2019).

31. Wildlife and Nature

The presence of wildlife and opportunities for nature observation within the park is evaluated, enhancing the park's ecological value and providing unique experiences for visitors.

32. Soundscape

This indicator considers the park's auditory environment, including the presence of natural sounds like bird songs or flowing water, which contribute to a positive sensory experience for visitors (Praliya & Garg, 2019).

The indicators are chosen provides valuable insights into the visual and sensory aspects of the urban green parks' appeal, contributing to a holistic assessment of their overall quality and visitor experience beside this other indicator such as seasonal Variation, year-round vegetation etc. are not taken into consideration due to given time limitations for study which is much broader topic to consider as well.

f. Safety and Security

Presence of elements or characteristics that make urban green spaces feel safer (Knobel et al., 2019). This dimension focuses on assessing the measures and provisions in place to ensure the safety, well-being, and comfort of park visitors. This dimension is crucial for creating a welcoming and secure environment that encourages park usage and instils a sense of trust and confidence among visitors. The reason for selecting the "Safety and Security" dimension and these specific indicators is to create a safe and inclusive park environment that encourages a sense of security and trust among park users. Adequate lighting, surveillance measures, and the presence of park staff contribute to the park's overall safety and discourage undesirable activities. Additionally, the availability of information and complaint centres provides visitors with accessible resources for assistance and information.

33. Welcome and Safe

    This indicator assesses the overall perception of safety and welcome within the park, considering factors such as cleanliness, maintenance, and the presence of park staff or volunteers (GFA, 1996).

34. Lighting

    Adequate and well-placed lighting throughout the park is evaluated to ensure visibility during evening and night hours, enhancing safety and reducing the risk of accidents or illicit activities (Knobel et al., 2019).

35. Security Arrangements

    This indicator examines the presence of security personnel or park rangers to provide a visible and proactive presence in the park, promoting a sense of security and assistance for visitors ((Praliya & Garg, 2019).

36. Clear Sightlines

    Parks design and layout are evaluated to ensure clear sightlines and visibility, reducing potential hiding spots and enhancing overall safety and surveillance (Acharya & Lal, 2022).

37. Women Safety

    This indicator specifically addresses measures and initiatives aimed at ensuring the safety and comfort of women within the park, such as well-lit pathways, women-only spaces, and awareness campaigns (Acharya & Lal, 2022).

Other indicator such as Emergency Services Accessibility, Emergency Call Points are excluded as such devices are not prevalent in study area. Other indicator such as parks car safety, bike safety are excluded as assessing the park aren't designed to accommodate significant car or bike traffic, the inclusion of these indicators might not accurately reflect the safety and security concerns within the park.

g. Culture and History

Attention should be paid to the appropriate management and conservation of natural features, wildlife and flora; landscape features; and buildings and structures (GFA, 1996). It focuses on assessing how urban green parks embrace and showcase the cultural heritage and historical significance of the local community and the park itself. This dimension aims to create a sense of place and identity, celebrating the park's unique cultural heritage and historical elements (NGSA, 2009). The reason for selecting this dimension and these specific indicators is to honor and celebrate the park's cultural heritage and historical significance, creating a unique and meaningful experience for visitors. Historical features and cultural events add a sense of richness and depth to the park, fostering a connection with the local community's identity and heritage. Additionally, the preservation of cultural and historical elements ensures their continued value and educational potential for visitors.

38. Historical Features

    This indicator evaluates the presence and preservation of historical features within the park, such as monuments, landmarks, artifacts, or structures that hold cultural or historical significance (GFA, 1996).

39. Cultural Events

    The park's role as a venue for cultural events, festivals, performances, or exhibitions that celebrate local traditions, arts, and cultural diversity is assessed under this indicator (Lindholst et al., 2016).

40. Preservation

    This indicator examines the efforts made to preserve and protect the park's cultural and historical elements, ensuring their integrity and authenticity for present and future generations. As this indicator is also not identified in above mentioned tool It is given priority because a

well-preserved park with cultural and historical significance enhances the park's appeal, fosters a sense of pride and identity, offers educational opportunities, supports sustainable tourism, and contributes to the overall quality of the park by showcasing Nepal's unique cultural heritage.

h. Flexibility

This dimension focuses on evaluating the adaptability and versatility of the urban green park in accommodating a wide range of activities, events, and user needs (Bahriny & Bell, 2020). A flexible park design allows for dynamic usage and ensures that the park can cater to various community interests and changing requirements over time. The reason for selecting the "Flexibility" dimension and these specific indicators is to create a park environment that is adaptable and responsive to the evolving needs and preferences of the community. A multi-functional park design allows for the optimization of available spaces and resources, providing a diverse range of opportunities for recreational, cultural, and social activities. Additionally, the provision of flexible event spaces allows the park to be a venue for various community events and celebrations.

41. Multi-functionality of Space

    This indicator assesses how well the park's spaces and areas can serve multiple purposes and accommodate diverse activities, such as sports, cultural events, recreational programs, and community gatherings (Bahriny & Bell, 2020).

42. Flexible Event Spaces

    The presence of designated event spaces or open areas that can be easily transformed to host different events, festivals, or gatherings is evaluated under this indicator (Bahriny & Bell, 2020).

i. Climate Comfort

This dimension focuses on evaluating the ecological and environmental aspects of the urban green park, including factors that influence the park's sustainability, ecological health, and the overall well-being of park users (Bahriny & Bell, 2020).. This dimension encompasses elements related to natural features, air and noise quality, and environmental education initiatives. The reason for

selecting the "Environment" dimension and these specific indicators is to create a park environment that is ecologically healthy, sustainable, and conducive to the well-being of both the natural ecosystem and park users. By providing a balance of sun-exposed and shaded areas, the park accommodates a variety of user preferences and outdoor activities. The presence of vegetation enhances the park's biodiversity and ecological services, while efforts to reduce air and noise pollution contribute to a healthier urban environment.

43. Area Exposed to Sun

   This indicator assesses the amount of open space in the park exposed to sunlight, considering the availability of sunny areas for recreational activities, sunbathing, and plant growth (Bahriny & Bell, 2020).

44. Degree of Shade

   The availability of shaded areas, such as tree canopies or pergolas, is evaluated to provide relief from direct sunlight and create comfortable resting spots for park users (Bahriny & Bell, 2020).

45. Vegetation/Greenery

   The presence and diversity of vegetation and greenery in the park, including trees, shrubs, and ornamental plants, are assessed to enhance the park's ecological value and visual appeal (Bahriny & Bell, 2020).

46. Air and Noise Pollution

   This indicator looks at the park's air quality and noise levels, assessing the extent of pollution from nearby traffic or industrial sources and considering measures to mitigate such impacts (Bahriny & Bell, 2020).

Other indicator such as air currents, thermal Comfort, Ecosystem Services, Climate-Adaptive Design excluded because of need for specialized equipment or data collection challenges and also the primary focus is on existing park conditions.

j. Anti-Social Behaviour

It focuses on evaluating the presence and extent of behaviours that may negatively impact the park's safety, cleanliness, and the overall experience of park users (Knobel et al., 2019). This dimension aims to address and mitigate anti-social activities that can disrupt the park's positive atmosphere and community well-being. The reason for selecting the "Anti-Social Behavior"

dimension and these specific indicators is to create a safe, respectful, and pleasant environment for all park users. Addressing general litter helps maintain the park's cleanliness and visual appeal, while tackling theft incidents ensures the protection of park amenities and visitors' belongings. Additionally, monitoring and managing alcohol use and drug-related activities contribute to maintaining a safe and family-friendly atmosphere within the park.

47. General Litter

    This indicator assesses the presence of litter and waste within the park, considering the cleanliness and maintenance of the park's public spaces (Knobel et al., 2019).

48. Theft

    The occurrence of theft incidents, such as vandalism, property theft, or damage to park amenities, is evaluated under this indicator (Knobel et al., 2019).

49. Alcohol Use and Other Drugs

    This indicator looks at the prevalence of alcohol consumption and the use of illegal drugs within the park, as well as the measures in place to address substance-related issues (Bahriny & Bell, 2020).

Other indicator such as presence of Graffiti, vandalism rate are excluded as graffiti wasn't a significant issue in the study area and vandalism rate is excluded due to the challenges in accurately quantifying vandalism incidents or the availability of similar indicators.

k. **Cleanliness and Maintenance**

GFA (1996) focused for aesthetic as well as health and safety reasons, issues of cleanliness and maintenance must be addressed. This dimension focuses on evaluating the upkeep and cleanliness of the urban green park, ensuring that it remains well-maintained and visually appealing to park users. This dimension emphasizes the importance of regular maintenance to provide a positive and pleasant experience for visitors. The reason for selecting the "Cleanliness and Maintenance" dimension and these specific indicators is to create a park environment that is well-groomed, inviting, and hygienic for park users. Providing an adequate number of waste bins encourages responsible waste disposal, contributing to the park's cleanliness. Proper greenery and landscape maintenance enhance the park's aesthetic appeal and ecological health, creating a visually pleasing

and enjoyable environment. Additionally, the maintenance of amenities ensures that park facilities remain in good condition and safe for public use.

50. Litter collection

This indicator assesses the presence and distribution of waste bins throughout the park, encouraging proper waste disposal and helping maintain a litter-free environment (Bahriny & Bell, 2020).

51. Greenery and Landscape Maintenance

The maintenance of greenery, including trees, shrubs, and flower beds, is evaluated to ensure their health and aesthetic appeal. This indicator also considers the management of grass and vegetation to maintain a neat and tidy appearance (Bahriny & Bell, 2020).

52. Maintenance of Amenities

This indicator examines the regular upkeep of park amenities such as benches, playground equipment, restrooms, signage, and other infrastructure to ensure their functionality and safety (Leeds, 2023).

Other indicator such as horticultural and arboriculture practices are excluded because it might require specialized knowledge and resources, influencing the decision to exclude them due to practical constraints.

In conclusion, the selection of 11 dimensions and 52 indicator indicators was achieved through a comprehensive process that involved consulting relevant literature and conducting a pilot survey. During this process, certain indicators were found to be impractical to assess the quality of park community, leading to their exclusion. Additionally, certain indicators were identified as not being suitable for the context of Nepal and were therefore also removed from the final list. This approach ensured that the chosen indicators accurately reflect the specific needs, accessibility, and cultural appropriateness of the urban green parks within KMC.

Table 14 Table showing the final list of Dimensions and Indicators

S.N	Dimensions	Indicators	References
1	Access and Linkage	1. Transport modes 2. Proximity 3. Accessible entrances	(ULI,2021); (Knobel et al., 2019);(Bahriny & Bell ,2020)(Praliya & Garg, 2019);

		4. Fences 5. Connecting path network	(Acharya & Lal, 2022);(Shrestha ,2022)
2	Inclusiveness	6. Universal design features 7. Inclusive playgrounds 8. Accessible amenities 9. Senior-friendly activities 10. Gender neutral facilities 11. Culture sensitivity 12. Control on entrance	(GFA,1996); (ULI,2021); (Knobel et al., 2019); (Bahriny & Bell ,2020); (Praliya & Garg, 2019); (RECPHEC, 2016); (Acharya & Lal, 2022); (Shrestha ,2022)
3	Amenities and Facilities	13. Parking 14. Seating and benches 15. Picnic area and shelter 16. Drinking water taps 17. Public toilets 18. Cafe/Kiosks 19. Guiding signage	(GFA,1996); LEEDS2022-2032 (ULI,2021); (Knobel et al., 2019)(Bahriny & Bell ,2020)(RECPHEC, 2016)
4	Activities	20. Recreational activities 21. Physical Fitness activity 22. Children's play area 23. Relaxing 24. Socialising 25. Events and gathering 26. Educational visits	(Lindholst et al.,2016)(ULI,2021); (Knobel et al., 2019); (Bahriny & Bell ,2020); (Praliya & Garg, 2019);(Shrestha ,2022)
5	Aesthetic and Attraction	27. Landscaping and Greenery 28. Natural aesthetic 29. Non-natural aesthetic 30. Water features 31. Wildlife and nature 32. Soundscape	(Lindholst et al., 2016) (ULI,2021); (Knobel et al., 2019);(Bahriny & Bell ,2020); (Praliya & Garg, 2019); (Shrestha ,2022)
6	Safety and Security	33. Welcome and safe 34. Lighting 35. Security arrangements 36. clear sightlines 37. Women safety	(GFA,1996); (ULI,2021); (Knobel et al., 2019); (Bahriny & Bell ,2020); (Praliya & Garg, 2019); (RECPHEC, 2016); (Acharya & Lal, 2022); (Shrestha ,2022)
7	Culture and History	38. Historical Features 39. Cultural events 40. Preservation	(GFA,1996); (Lindholst et al., 2016); LEEDS (2022-2032); (RECPHEC, 2016)

8	Flexibility	41. Multi functionality of space 42. Flexible Event Spaces	(Bahriny & Bell ,2020)
9	Climate comfort	43. Area exposed to sun 44. Degree of shade 45. Vegetation/Greenery 46. Air and noise pollution	(GFA,1996); (Lindholst et al., 2016) (ULI,2021); (Knobel et al., 2019);(Bahriny & Bell ,2020)
10	Anti-social behaviour	47. General Litter 48. Theft 49. Alcohol use and Other drugs	(Knobel et al., 2019); (Bahriny & Bell ,2020); (RECPHEC, 2016); (Acharya & Lal, 2022)
11	Cleanliness and maintenance	50. Litter collection 51. Greenery and Landscape Maintenance 52. Maintenance of amenities	(GFA,1996);(ULI,2021); (Bahriny & Bell ,2020); (Praliya & Garg, 2019); (RECPHEC, 2016);(Acharya & Lal, 2022);(Shrestha ,2022)

3.8 Sampling Design

There are various method to determine of sample size. A sample is a smaller group of subject drawn from the population in which a given study was conducted for a purpose of drawing conclusions about the population targeted. For example, Kothari (2004) argued that the result from the sample can be used to make generalizations about the entire population as long as it is truly represented. One of the Standard sample size formula is William G. Cochran formula which is also known as Cochran's Formula. To assess these two parks convenient sampling method as described by Taherdoost (2016) had been used to implement. This is mainly due to the ease and cost effectiveness of this method for academic research (Taherdoost, 2016).

Cochran's Formula:

Where,
$$n_0 = \frac{z^2 pq}{e^2} \qquad (i)$$

n = Sample size,

z = Selected critical value of desired confidence level = 1.96 (for 95% confidence level)

p = Estimated population proportion of an attribute = 0.5

q = 1-p and

e = desired level of precision = 0.1

For a finite population, the following formulae will be used to calculate the final sample size,

$$n = \frac{n_0}{1+\frac{n_0-1}{N}} \qquad \text{(ii)}$$

Using above formula, sample size for each park is as follows:

Park	Average daily visitors (N)	Sample Size	Sample Taken
Balaju Park	800	86	91
Ratna Park	600	83	86
Shankha Park	600	83	79

3.9 Scoring Criteria

Sample questionnaires had been prepared based on 52 criteria for quality assessment of urban green parks (Annex I). The scoring criteria is based on the ordinal and nominal variable. The replies to these questionnaires were recorded as ordinal variables from "1" to "2" or "1" to "5" based on the type of questionnaire. Some other questionnaires such as age, gender and frequency of visit were recorded as nominal variable.

3.10 Data Analysis

The main procedures for having tool for quality assessment of urban green parks include selecting appropriate quality indicators, weighting the selected indicators, and aggregating those indicators. There are various ways for data analysis which have been used in developing different quality assessment tools. Iyengar & Sudarshan (1987) method is used for the analysis. The Method is one with unequal weights, which ensures that large variation in any one of the indicators does not unduly dominate the contribution of the rest of the indicators which have been widely used for different kind of assessment.

There are three steps to data analysis as discussed in the methodology framework:

i.   Data normalization

ii.   Weightage

iii.   Data Aggregation

3.10.1 Data normalization

Data normalization is done in research to ensure fair comparisons, eliminate scale effects, enhance interpretability, support statistical analysis, facilitate comparability over time, and improve the reliability of research findings. It makes data from different sources or units comparable and reduces biases, leading to more meaningful and accurate results. The initial data analysis step involves applying the Min-Max rescaling scheme to normalize the variables, bringing their values within the range of zero to one. Normalisation was done us

Y_{ip} = Normalized score for an ith indicator of the $_p$th park (Y_{ib}- Balaju park, Y_{ir} – Ratna park and Y_{is}- Shankha Park)

Max X_i = $$Y_{ip} = \frac{X_{ip} - \text{Min } X_i}{\text{Max } X_i - \text{Min } X_i} \qquad (1)$$

Maximum possible value of an ith indicator

Min X_i = Minimum possible value of an ith indicator

X_{ip} = Mean score of ith indicator of the $_p$th park (X_{ib} – Balaju park and X_{ir} – Ratna park)

3.10.2 Weightage

A method described by Iyengar and Sudarshan (1982) had been used to calculate the relative importance of individual indicators. The weights are assumed to vary inversely to the variance of the normalized value of the indicators over multiple regions and are given by the following equation (3). The weights calculated in this approach ensure that large variations in any one of the indicators do not dominate the contribution of the rest of the indicators (Iyengar & Sudarshan, 1982; Nazeer & Bork, 2021) and distort inter park comparisons (Bajracharya, 2023).

$$W_i = \frac{k}{\sqrt{\text{Var}(Y_{ip})}} \qquad (3)$$

Where,

W_i = *Weight of the ith indicator such that* $\sum_{i=1}^{m} W_i = 1$ *and* $0 < W_i < 1$

m = total number of all the indicators i.e 52

Y_{ip} = *Normalized value of the ith indicator of the park*

$$k = \left(\sum_{i=1}^{m} \frac{1}{\sqrt{Var(Y_{ip})}} \right)^{-1} \qquad (4)$$

$$And, \qquad Var(Y_{ip}) = \frac{\sum (Y_{ip} - \overline{Y_{ip}})^2}{(N-1)} \qquad (5)$$

Where, N = Total number of Parks in consideration, here, N = 3 as data was collected from Balaju Park, Ratna Park and Shankha park)

$\overline{Y_{ip}}$ = *Mean of Yib and Yir*

3.10.3 Data Aggregation

For the calculation of the overall quality scores, the following equation given by Iyengar and Sudarshan (1982) had been used. The overall quality scores for Balaju Park, Ratna park and Shankha had been calculated and tabulated using formula:

$$Q_p = \sum_{i=1}^{m} W_i Y_{ip} \qquad (6)$$

Q_p = Overall quality scores of a park i.e. Q_b is Balaju Park, Q_r is Ratna Park and Q_s – Shankha park

W_i = Weight of the ith indicator such that, $\sum_{i=1}^{m} W_i = 1$ *and $0 < W_i < 1$*

m = Total number of all the indicators i.e 52 in this study

Y_{ip} = Normalized value of the ith indicator of the respective park

CHAPTER 4: CASE AREA

For the validation of the tool, three urban green parks of Kathmandu metropolitan City has been taken into consideration. Three parks have been selected on the basis of various factors such as scale, location, similar function and responsible management agencies. Three parks with differs size, location and similar management agencies is taken for study to understand how the quality assessment tool performs across different park sizes. This allows for examining how the assessment tool addresses the specific needs and challenges of different park contexts and how the quality varies in different parks and provides insight towards in which dimensions they need to work for the quality enhancement of the park. So the detail of the each case area is given below.
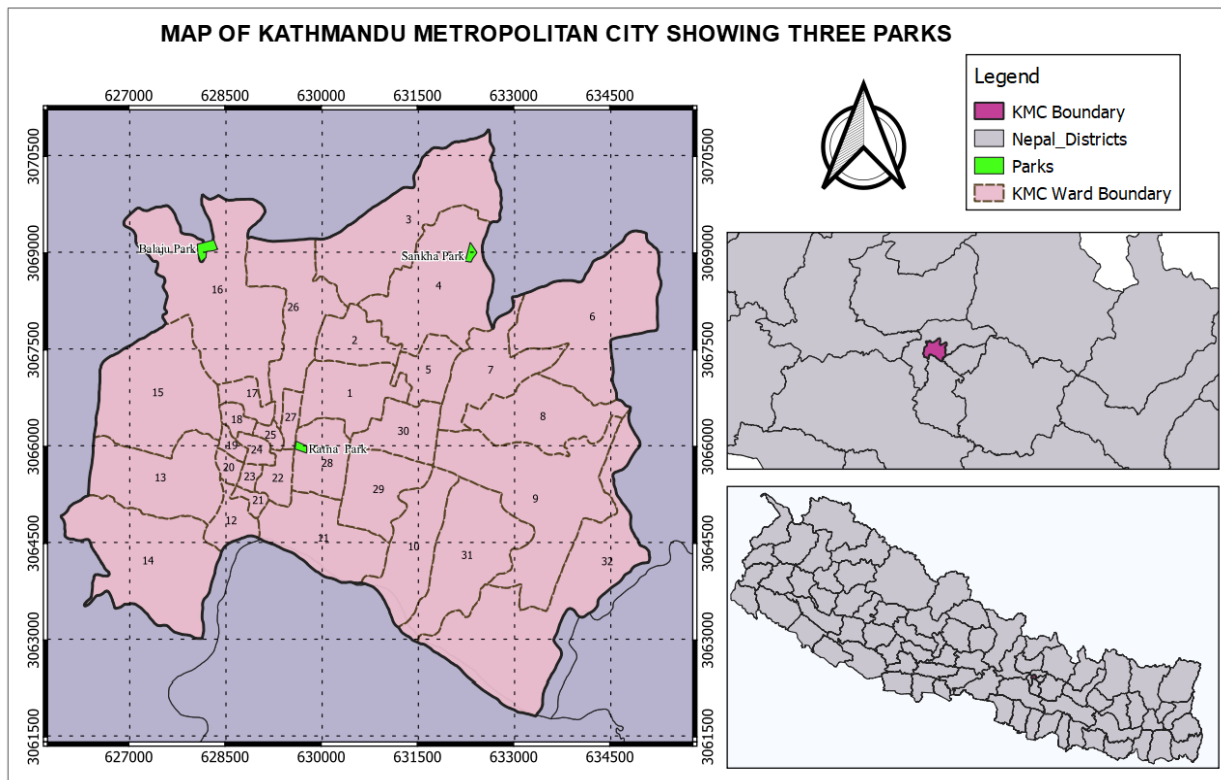
Figure 11Map showing three parks of KMC

4.1 Balaju Park

1. Location and context

Balaju Park which is situated in Ward 16 of the Kathmandu Metropolitan City, falls within a residential sub-zone. It is renowned as one of the valley's most renowned leisure destinations and

recreational spot attracting both locals and visitors. It encompasses a total area of approximately 162 Ropanis and was established in 1964 (Maharjan & Kattel, 2013). The park is located in close proximity to Nagarjun Hill, approximately 5 kilometres northwest of the Kathmandu Valley, and is adjacent to the Balaju industrial area. The potential impact of an industrial area on the nearby park environment may vary, depending on factors such as the type of industries present, the scale of operations, and the effectiveness of environmental management practices. Recognized as one of the valley's premier leisure destinations, this recreational spot draws both locals and visitors alike.

Figure 12 Balaju Park layout

2. Cultural and Historical Significance

Balaju Park stands out for its distinctive features, notably the enchanting water garden and a collection of historic stone spouts. At the heart of its allure lies the ancient "Balaju Baishdhara," an assembly of 22 stone water spouts whose origins trace back to the 18th century. The park's historical roots extend to the Lichhavi period, marked by King Pratap Malla's addition of a cultural gem – a replica of the renowned Budhanilkantha, referred to as Bala Budhanilkantha. Adding to the cultural tapestry, the park embraces the Sitala Mai temple, enhancing its significance as a repository of history and heritage.

Figure 13 Balaju Baishdhara

3.Park Features and Amenities

a. Access and Parking

Park is surrounded by fences and has a single entrance gate on the eastern side. Though the entrance is accessible to all, the park design includes multiple steps, making it challenging for people with disabilities to access certain areas. There is a designated parking space located close to the entrance. The capacity of parking is around 50 numbers for two-wheelers and 10 numbers for four-wheelers However, during weekends and special occasions, the capacity seems insufficient to accommodate the high number of visitors.

Figure 14 Balaju Park Entrance and Parking

b. Sitting Space and Shades

There is provision of sitting spaces for park visitors. Instead of much sitting benches, the park featured a higher number of chautaris and covered shades. These chautaris and shades were distributed evenly throughout the park, offering visitors various options for sitting and resting. These chautaris played a significant role as socializing spaces, particularly among the senior citizens. These areas provided a welcoming environment for people to gather, relax, and engage in conversations. The distribution of covered shades and chautaris throughout the park ensured that visitors could find shelter from the sun or rain, enhancing the park's overall comfort and usability.

Figure 15 Shade and Chautari in Park

c. Religious Area

There is presence of a religious area within the park. The park is home to two prominent temples, namely the mini-Budhanilkantha Temple and Sitala Mai Temple. These temples added significant spiritual and cultural dimension to the park, attracting devotees and visitors seeking a place of worship and reflection. In addition to the temples, there is park features 22 water spouts, adding to its religious significance. These water spouts are intricately carved with various deities and mythical figures, contributing to the park's cultural heritage and historical value.

Figure 16 Sitala Mai Temple and 22 Water Spouts respectively

d. Fountain and Ponds

Park has several fountains aligned in a straight axis in the middle, adding beauty to the surroundings. However, both the fountains and ponds require proper maintenance, as some fountains were not functioning, and the ponds seemed to lack regular upkeep. The presence of aquatic life in the ponds appeared to be degrading due to the insufficient maintenance and care. To enhance the park's overall ambiance and ecological health, it is crucial to address these maintenance issues promptly and ensure the preservation of the park's water features and aquatic environment.

Figure 17 Fountain and Pond in Park

e. Toilets

Park offers toilet facilities that are designated for both male and female visitors, with separate facilities for each gender. Toilet lacks provision of the ramp facilities which hindered the ability to access the toilet facilities comfortably by person with disabilities. Moreover, the cleanliness of the toilets seems poor, suggesting a need for improved maintenance and regular cleaning to ensure a hygienic environment for park users.

Figure 18 Toilet present in Park

f. Landscape and Greenery

Balaju Park boasts abundant greenery, with a significant portion covered by grass and various types of trees. The presence of labelled trees provides educational value, attracting visitors interested in learning about different tree species. However, one notable issue is the park's drainage problem, particularly during the rainy season. Excessive water accumulation makes it challenging to walk around the park grounds, affecting the overall visitor experience.

Figure 19 Landscape and Greenery in Park

g. Picnic Area

Picnic area lies in the outer section of the park within the forested area. It consists of picnic shades and open grounds for picnicking but seems it lacks proper maintenance. The picnic shades and grounds appeared to be in need of upkeep and cleaning to provide a pleasant environment. Additionally, the picnic area consists of only one water tap, which might not be sufficient to cater to the needs of all visitors. Another notable absence was the lack of toilet facilities in the picnic area, which could inconvenience park users, especially during extended picnics.

Figure 20 Picnic area in the Park

Beside this there is provision of water ATM by KMC but its location is not convenient for the users and its access it from outside the park premises. And dustbin were also located in many places which helped to keep the park clean. One important aspect is that park has good guiding signage which helps visitor's mobility around the park easily.

4. Management and Maintenance

Balaju Park operates with a specific schedule, allowing public access for physical fitness activities until 8 am, beyond which an entrance fee is applicable. Notably, individuals falling within certain categories, including people with disabilities, senior citizens, and children, are exempt from this fee. The governance and management of Balaju Park fall under the jurisdiction of the Kathmandu Metropolitan City. The personnel responsible for maintaining the park are directly employed by KMC. Furthermore, KMC plays a vital role in ensuring the park's cleanliness and sets forth the established rules and regulations that govern park usage.

5. Usage and Visitors of Park

The findings from the questionnaire survey reveal that the park predominantly serves as a space for various activities, with a notable emphasis on physical, informal, social, and tranquil pursuits. The survey data underscores that a significant majority of visitors engage in informal activities like family outings and leisurely strolls, ranking them as the most common reasons for park visits, closely followed by engagement in physical activities.
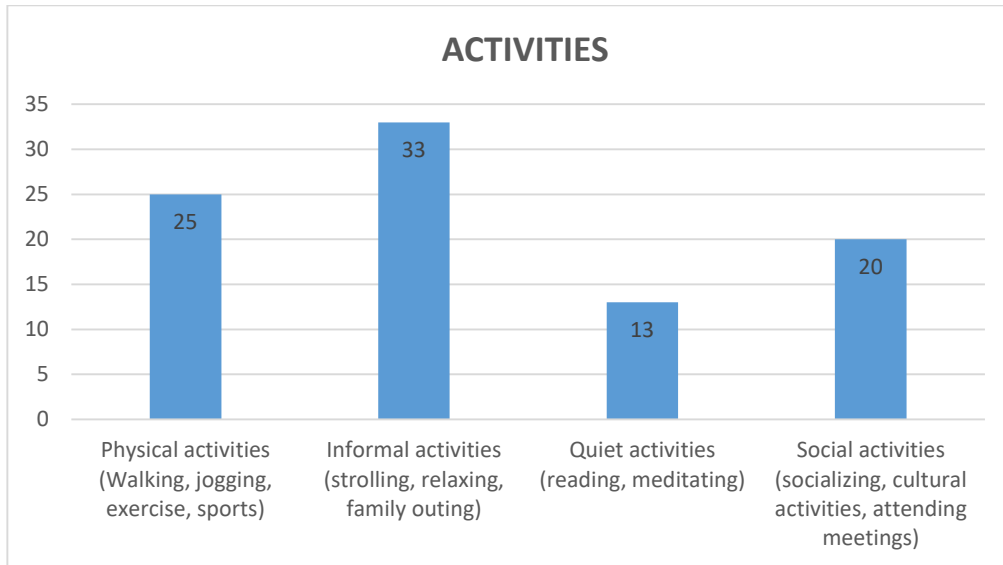
Figure 21 Activity Chart in Balaju Park

The survey data indicates a notable gender and age distribution among respondents, with a higher representation of males participating in the survey. Furthermore, the majority of respondents fall within the age brackets of 16 to 30, with the second-highest representation observed in the 31 t060 age group.
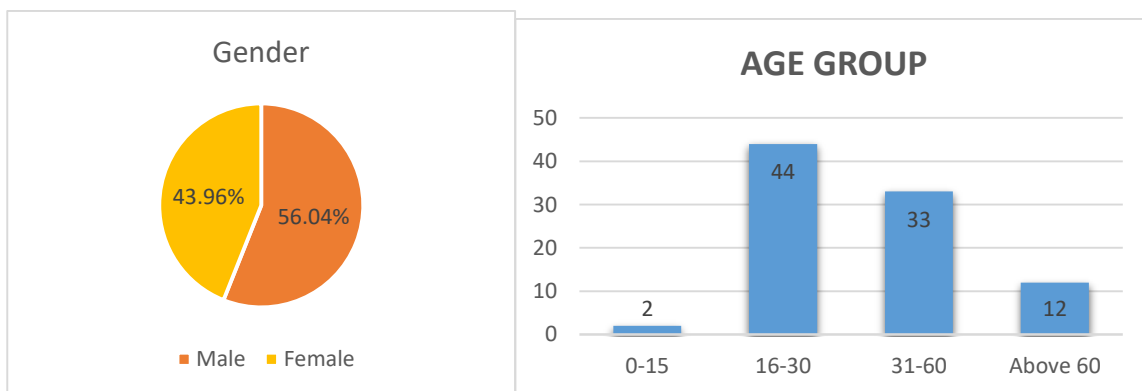
Figure 22 Chart showing Gender and Age group of the Respondent of Balaju Park respectively

As Balaju Park likely provides a unique and special experience for the visitors and can be a one of the enjoyable destination most of the park users seems to be user who visits the park occasionally followed by the one who visits the park several times a months and then daily.
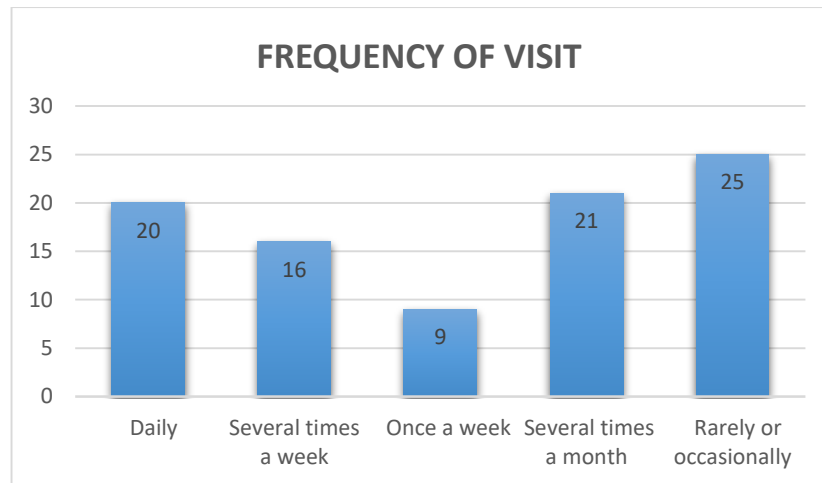
Figure 23 Chart showing Frequency of Visits of the Respondents

4.2 Ratna Park / Shankhadhar Park

1. Location and context

Ratna Park, situated at the heart of Kathmandu city in ward 28, stands as an iconic green space surrounded by Tudikhel and Ranipokhari in a densely mixed residential sub-zone. Named after Queen Ratna, the second queen of King Mahendra, this park holds historical significance. Its construction commenced in 1962, focusing initially on providing a space for children, and was completed in 1965. Covering an area of 42 ropanis, the park underwent expansion with the construction of roads around it (RECPHEC, 2016). Recently, it has also acquired the name Shankhadhar Park following the inauguration of the Statue of Shankhadhar in 2020. The park features greenery, ponds, flowerbeds, and sculptures, attracting numerous visitors daily who come for various purposes, including recreation, social gatherings, and relaxation.

Figure 24 Ratna Park layout

2. Park Features and Amenities

a. Access and linkage

Park features a single entrance open to visitors and also there is secondary entrance for the people with disabilities. To aid movement within the park, there is a guided pathway present throughout and around the park, facilitating navigation for visitors. However, a notable limitation is the park's lack of a designated parking space, which creates difficulties for those who wish to access the park using private vehicles.

Figure 25 Park gate and pathways in park

b. Ponds

The park comprises three ponds, and their situation becomes problematic during the monsoon season as they tend to overflow. Among these ponds, one located at the park's entrance is of particular significance, as it features a statue of Shankhadhar Sakhwa, serving as the main focal point of the park's identity.

Figure 26 Ponds in the park

c. Sitting Benches

Park consists of attractive and well-maintained sitting benches spread throughout the park in sufficient quantities. These benches are not only functional but also visually pleasing, as they come in various colours, adding to the park's aesthetic appeal. The availability of ample and well-maintained seating options ensures that visitors can find comfortable places to rest and enjoy the park's ambiance.

Figure 27 Sitting benches for visitors

d. Shades

Parks offers a single covered shade or resting area for visitors. The design of the shade plinth is elevated, allowing visitors to enjoy the scenic view of the park while staying comfortably under the shade. This resting area provides a relaxing and scenic spot for visitors to unwind and appreciate the beauty of the park's surroundings.

Figure 28 Covered shade in Park

e. Children play area

Park consists of a designated space that includes a limited number of swings and slides for children's enjoyment. However, it was evident that the condition of the play equipment was in poor condition which requires immediate attention and maintenance. Additionally, the surface of the play area appeared to be muddy, potentially affecting the safety and play experience of children.
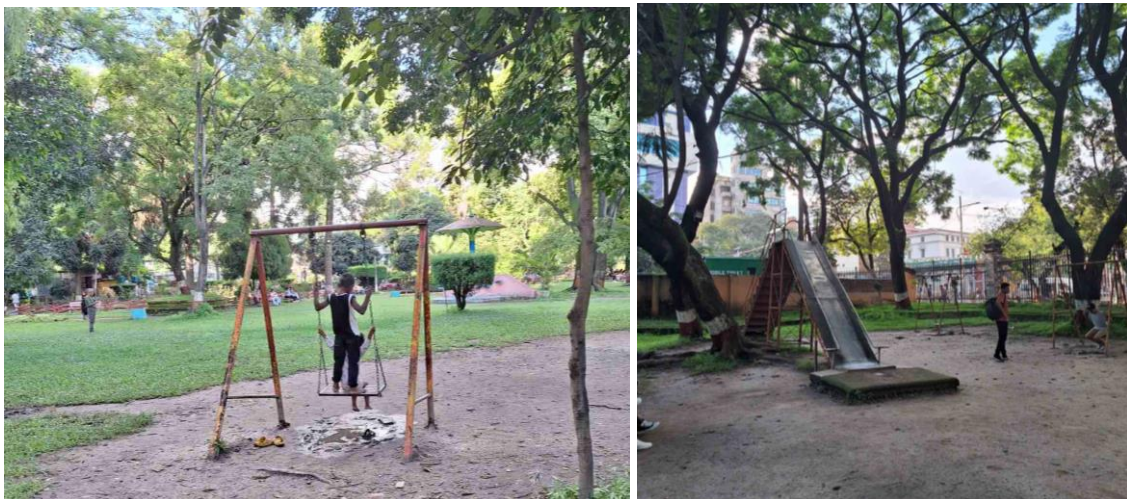
Figure 29 Play Area in Park

f. Toilet

Park consists of separate toilet facilities for both male and female visitors. However, there is only one toilet available, which may lead to inconvenience during peak times. Additionally, it was observed that the toilet lacks a ramp, making it difficult for persons with disabilities to access the facility comfortably. Moreover, the cleanliness of the toilet was found to be satisfactory, highlighting the need for improved maintenance and regular cleaning to ensure a hygienic environment for park users.

Figure 30 Toilet in the Park

g. Landscape and Greenery

Park consists of diverse collection of plant species spread throughout the park. The presence of green grounds enhances the park's aesthetic appeal and creates a refreshing ambiance for visitors. Despite being located in a central and busy area, the park's tall trees act as a buffer, shielding the park from external noise and disturbances, thus maintaining a peaceful atmosphere inside. These trees not only provide shade and comfort but also contribute to the park's ecological balance and environmental well-being. The greenery in Ratna Park offers a serene and tranquil retreat within the bustling city, providing visitors with a much-needed escape and connection with nature.

Figure 31 Landscape and Greenery of Park

As the park offers a serene escape amidst the urban landscape, with its greenery, open spaces, and recreational facilities attracting visitors for various purposes, ensuring the quality of the overall park becomes of very importance. Maintaining the park's cleanliness, accessibility, and functionality is essential to provide a pleasant and enjoyable experience for all visitors.

3. Maintenance and management

Ratna Park operates with a specific schedule, allowing public access for physical fitness activities until 8 am, beyond which an entrance fee is applicable. Notably, individuals falling within certain categories, including people with disabilities, senior citizens, and children, are exempt from this fee. The governance and management of Ratna Park also fall under the jurisdiction of the Kathmandu Metropolitan City. The personnel responsible for maintaining the park are directly employed by KMC. The four number of security personnel are there to safeguard the park Furthermore, KMC plays a vital role in ensuring the park's cleanliness and sets forth the established rules and regulations that govern park usage. According the management team the condition of the park seems far better than the past but there are still issues with regular maintenance, especially with drainage problems and the playground equipment being in poor condition.

6. Usage and Visitors

From the questionnaire survey in Ratna Park, it is known that park is mostly used for physical, informal, social and quiet activities. The survey recorded shows that the most of the people visit

park for the informal activities such as relaxing family outing, strolling etc. followed by the social activities.
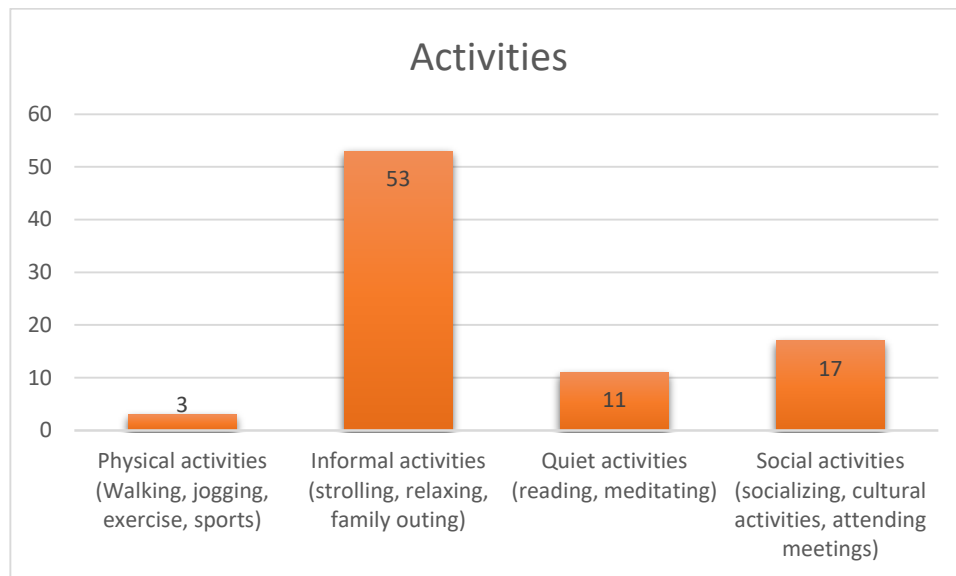
Figure 32 Activity Chart in Ratna Park

From the survey data it is known that male respondent were 56.04% and female were 43.96%. And also most of the respondent were of age group of 16 to 30 followed by 31 to 60.
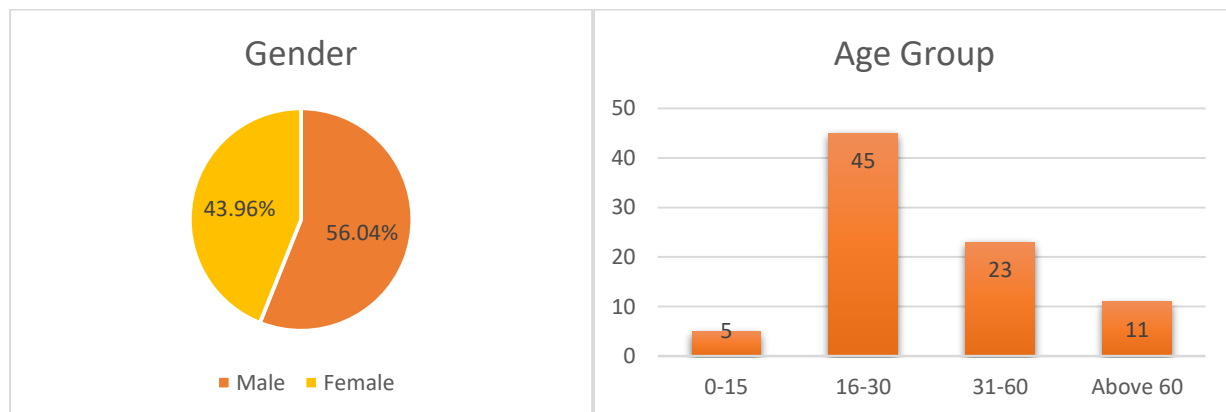
Figure 33 Chart showing Gender and Age group of the Respondent of Ratna Park respectively

As Ratna Park is located in heart of city and likely provides a unique and special experience for the visitors and can be a one of the enjoyable destination most of the park users seems to be the one who visits the park occasionally followed by the one who visits the park several times a months and then daily.
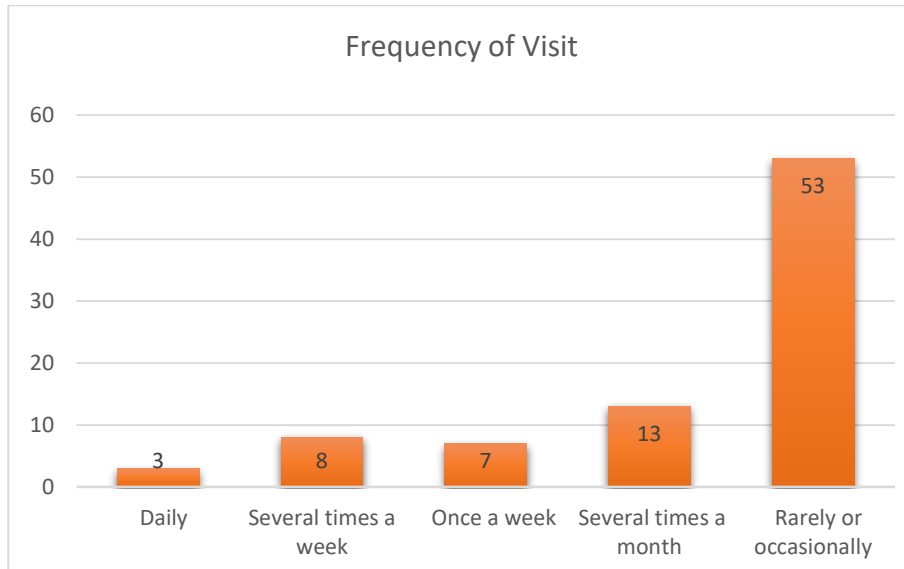
Figure 34 Graph showing Frequency of visit in Ratna Park

4.3 Shankha Park

1. Location and context

Shankha Park which is established in 2036 B.S., is situated in Ward 4 Chappal Karkhana, Kathmandu, covering a sprawling area of 27 ropanis. Initially named Panchayat Silver Jubilee Park, it has evolved into a well-loved destination for various recreational and communal activities. This green oasis has become synonymous with jogging, picnicking, and casual meetings, drawing people from the community and beyond. The park's scenic landscape provides a serene backdrop, inviting visitors to immerse themselves in its natural beauty. Shankha Park stands as a vibrant space that caters to diverse interests, offering a welcoming environment for relaxation, fitness, and community engagement.

Figure 35 Shankha Park layout

2. Cultural and Historical Significance

The cultural and historical significance of Shankha Park is exemplified by the presence of the Shankha statue at its centre and the Risheshwor temple within its grounds. The Shankha, or conch shell, holds profound importance in Hinduism, Buddhism, and various other religions, symbolizing sacredness and serving as a key element in rituals such as prayer and meditation. In Hinduism, it is particularly associated with Lord Vishnu, a central deity in the religion. The Risheshwor temple, situated in the park, witnesses' daily religious and cultural rituals, becoming a focal point for

worship and community engagement along with the sattal which adds a communal space for gatherings, bhajans, morning yoga sessions, and social interactions among the elderly.

3. **Park Features and Amenities**

a. Access and Parking

Shankha Park promotes inclusivity by offering free entrance to all visitors, there are notable challenges related to accessibility and parking. Despite the park being enclosed by fences, the absence of a ramp at the entrance poses difficulties for people with disabilities. Additionally, the park's sloped design can be challenging for those with mobility issues, hindering their movement within the park. Although the internal pathways are well-paved for easy navigation, the lack of designated parking within the park premises detracts from its overall aesthetic appeal. The provision for roadside parking in front of the gate, while functional, may impact the visual appeal of the main entrance. Furthermore, the limited parking space raises concerns about its sufficiency for accommodating visitors. Enhancing accessibility and parking facilities could contribute to a more seamless and enjoyable experience for all park users.

Figure 36 Parking

b. Sitting Space and Shades

The park features a centrally located amphitheatre, thoughtfully integrated into its design to provide a designated area for seating. Additionally, the uppermost section of the park offers strategically placed shades, serving as versatile spaces for relaxation, yoga sessions, and picnics. The natural shade provided by the trees in this elevated area enhances the overall ambiance. Well-maintained sitting benches are conveniently spaced throughout, ensuring a

comfortable and inviting environment for park visitors to enjoy various activities and moments of respite.

Figure 37 Sitting area and Shade

c. Religious Area

In the northern part of Shankha Park, the presence of the Risheshwor temple and a traditional-style sattal adds a cultural and religious dimension to the park's ambiance. The temple serves as a sacred space for daily rituals, attracting worshippers who seek spiritual solace and cultural connection. Additionally, a strategically placed statue of the Shankha, a revered symbol in Hinduism and Buddhism, graces the heart of the park. This placement is not arbitrary; it carries profound cultural and religious symbolism. The Shankha symbolizes purity, auspiciousness, and the divine sound in these spiritual traditions. By positioning the Shankha at the centre of Shankha Park, the design elevates its importance, creating a focal point that embodies the rich cultural and spiritual significance associated with this sacred symbol. This thoughtful placement contributes to the park's identity as a space that seamlessly integrates cultural and religious elements into its design, inviting visitors to engage in a meaningful and contemplative experience.
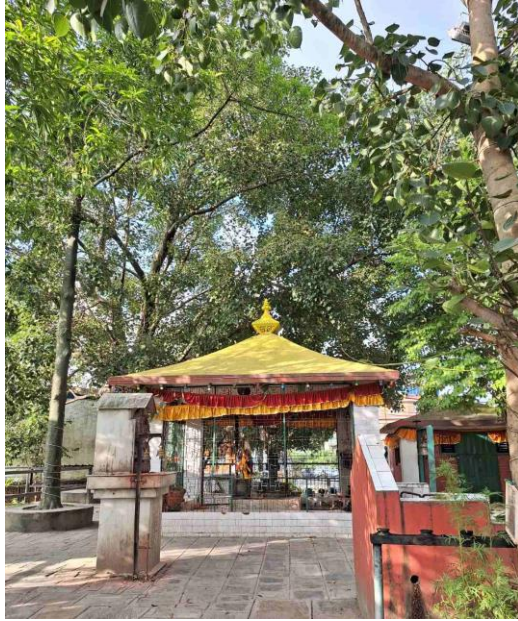
Figure 38 Risheshwor Temple

d. Fountain and Ponds

Shankha Park boasts the presence of two serene ponds flanking its sides; however, the overall maintenance of the park appears to be lacking. Unfortunately, the current state of the ponds does not contribute to a lively and vibrant park environment. To elevate the park's ambiance and bolster its ecological health, addressing these maintenance concerns is imperative. Swift action is needed to ensure the proper preservation and revitalization of the park's water features and aquatic environment. This proactive approach will not only enhance the aesthetic appeal of the park but also contribute to the overall well-being of its natural elements.

Figure 39 Pond

e. Toilet

The park provides toilet facilities catering to both male and female visitors, with dedicated spaces for each gender. However, the absence of ramp facilities poses a challenge for individuals with disabilities, impeding their comfortable access to the toilets. Furthermore, the cleanliness of the restroom facilities leaves much to be desired, indicating a pressing need for enhanced maintenance and regular cleaning.

Figure 40 Toilet

f. Landscape and Greenery

The park's focal point lies in its vibrant central green amphitheatre, radiating an ambiance of joy and vitality. The lower expanse unfolds as a verdant tapestry of well-maintained grass, contributing to the park's aesthetic appeal. Transitioning to the upper tier, purposeful hardscape areas cater to diverse recreational activities, including sports. Large trees, though limited in variety and number, complement the scenery, while cultivated seasonal flowers add a touch of beauty. Enhancing the park's educational potential could involve introducing a greater diversity of trees, fostering a more informative experience for visitors.

Figure 41 Landscape and Greenery

g. Children play area

A designated play area with slides is set up for children, but it appears to lack safety measures as it is directly placed on the paved surface. Even though the area is separated, it is important to prioritize safety, especially for children of all ages. Adding more play options could make the area more attractive to visitors.

Figure 42Children play area

Additionally, there is a water ATM provided by KMC, but its location is not convenient for users as it is accessed from outside the park premises. In terms of cleanliness, there are only a few dustbins placed in specific areas, which could impact the overall cleanliness of the park.

4. Management and Maintenance

The park, open to the public at no cost, has historically accommodated commercial activities like video production, photography, blood donation drives, and picnics. However, it experienced challenges with insufficient restroom facilities and subpar greenery maintenance. In response, a comprehensive renovation took place during the fiscal year 2076-2077 B.S., overseen by the Environment Management Department of the Kathmandu Metropolitan City (KMC). This renovation aimed not only to address the existing issues but also to enhance the overall maintenance of the park, ensuring a more pleasant and well-kept environment for visitors.

5. Usage and Visitors of Park

The survey findings highlight the park's role as a space for diverse activities, with many visitors engaging in informal pursuits such as family outings and relaxing strolls. Notably, physical activities are also popular reasons for visiting the park. This suggests that the park serves as a versatile environment catering to various interests and preferences among visitors.
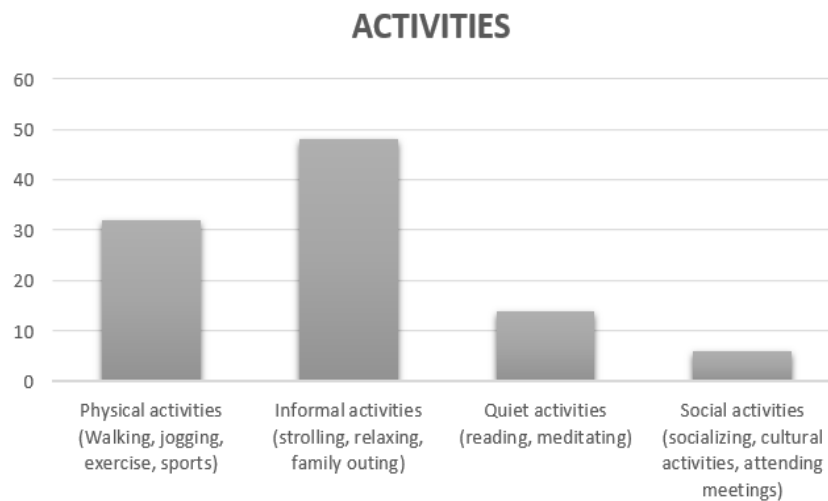
Figure 43 Activity chart of Shankha Park

Most survey participants belong to the age group of 16 to 30, with the subsequent highest representation in the 31-60 age range. This indicates that a significant portion of the park's visitors comprises young individuals, suggesting a preference for the park among this demographic for a variety of reasons.
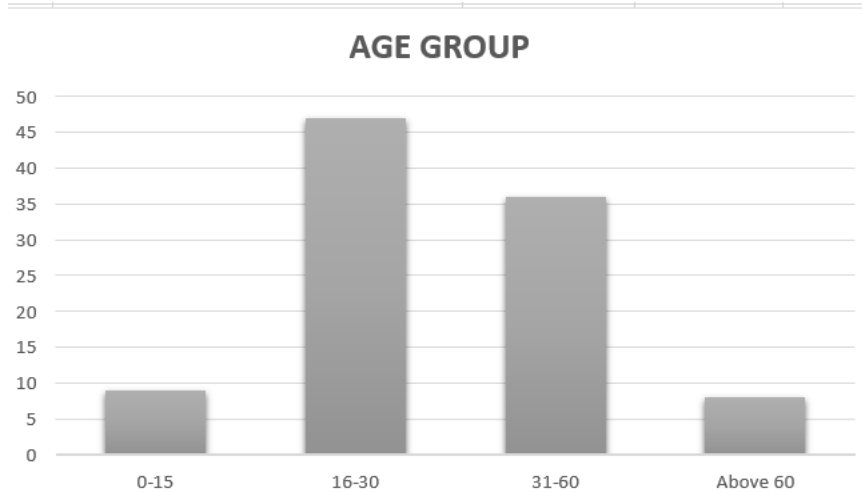
Figure 44 Chart showing Age group of the Respondent of Shankha Park

Shankha Park appears to offer a distinctive and enjoyable experience for its visitors, with a notable proportion of park users indicating that they visit the park several times a month. The frequency distribution shows that a significant number of visitors fall into the categories of occasional visits and several times a week, highlighting the park's appeal to a diverse range of users.
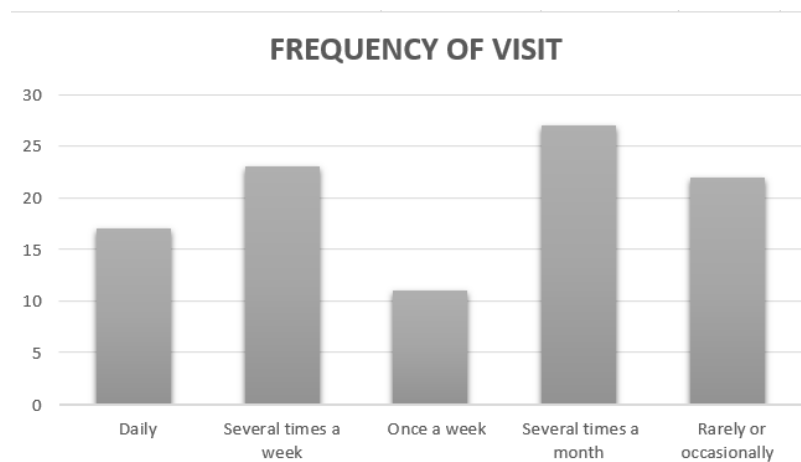
Figure 45 Chart showing Frequency of Visits of the Respondents

CHAPTER 5: ANALYSIS AND FINDINGS

In this section, analysis and outcomes from the survey for the evaluation of park quality have been presented. Primary objective of research was to have quality assessment tool capable of assessing park quality. These identified indicators and dimensions serves as a practical tool for park management and urban planners, enabling them to uplift the overall quality of urban green parks.

The assessment covered a range of eleven dimensions including access and linkage, inclusiveness, amenities and facilities, activities, aesthetic and attraction, safety and security, culture and history, flexibility, climate comfort, anti-social behaviour, cleanliness and maintenance. Park demonstrating excellence in which aspect and which aspects requires improvements are discussed in detail in this section.

5.1 Computation of quality scores

This section focuses on how the quality scores for the urban green parks are determined. As discussed in methodologies section, step-by-step process is followed for the park quality evaluation. There are three steps to data analysis as discussed in the methodology framework so the results have also been divided accordingly:

a) Data Normalization
b) Weightage and Data aggregation

5.1.1 Data normalization

The formula discussed in methodology section is used for the data normalization. Here data normalization was employed to transform the raw scores of various indicators across different dimensions into normalized scores (Y_{ip}) that fall within a consistent range (usually between 0 and 1). This normalization process allows for a fair comparison of the indicators and their respective impact on the overall assessment, eliminating the bias that may arise due to differences in the original measurement scales or magnitudes of the indicators. This standardized representation of the data enables a more meaningful and accurate comparison of the performance of different areas, in this case, Balaju Park, Ratna Park and Shankha Park with regard to each indicator. Mean scores and normalized scores for collected data is mentioned below in table.

Table 15 Table showing the calculation of mean scores and normalized scores for collected data

	Dimension	Indicator	Mean scores (X_{ip})			Normalized Scores		
			Balaju Park	Ratna Park	Shankha Park	Balaju Park	Ratna Park	Shankha Park
A.		1. Transport modes	2.62	2.76	2.74	0.54	0.59	0.58
		2. Proximity	3.81	2.52	2.48	0.7	0.38	0.37
	Access and linkages	3. Accessible entrances	4.45	3.14	2.68	0.86	0.54	0.42
		4. Fences	2	1.76	1.56	1	0.76	0.56
		5. Connecting path network	4.46	3.55	3.43	0.87	0.64	0.61
B.		6. Universal design features	1.2	1.89	1	0.2	0.89	0
		7. Inclusive playgrounds	1.03	1.71	1.26	0.03	0.71	0.26
		8. Accessible amenities	3.45	1.81	-1.62	0.61	0.2	0.16
	Inclusiveness	9. Senior-friendly activities	2	1.69	1.33	1	0.69	0.33
		10. Gender neutral facilities	2	2	2	1	1	1
		11. Culture sensitivity	1	1	1	1	0	0
		12. Control on entrance	2	1.89	1.49	1	0.89	0.49
C.		13. Parking	2.9	1	1.06	0.48	0	0.02
		14. Seating and benches	2.9	3.89	3.23	0.48	0.72	0.56
		15. Picnic area and shelter	3.35	2.3	1.5	0.59	0.33	0.13
	Amenities and Facilities	16. Drinking water taps	1.18	0.33	0.33	0.05	0	0
		17. Public toilets	3.96	2.83	2.8	0.74	0.46	0.45
		18. Cafe/Kiosks	1	1	1	0	0	0
		19. Guiding signage	2	1.28	1	1	0.28	0
D.		20. Recreational activities	3.53	3.13	3.11	0.63	0.53	0.53
		21. Physical Fitness activity	1.21	1	1.47	0.21	0	0.47
		22. Children's play area	2.16	2.57	2.4	0.29	0.39	0.35
	Activities	23. Relaxing	4.59	3.48	2.98	0.9	0.62	0.49
		24. Socialising	4.4	3.48	3.22	0.85	0.62	0.55
		25. Events and gathering	3.2	3.01	2.87	0.55	0.5	0.47
		26. Educational visits	3.43	3.27	1.61	0.61	0.57	0.15
E.		27. Landscaping and Greenery	4.75	3.96	3.91	0.94	0.74	0.73
	Aesthetic and Attraction	28. Natural aesthetic	3.82	3.08	3.06	0.71	0.52	0.52
		29. Non-natural aesthetic	3.43	3.19	2.76	0.61	0.55	0.44
		30. Water features	2.88	3.26	2.5	0.47	0.56	0.38
		31. Wildlife and nature	3.29	2.84	2.74	0.95	0.81	0.75
		32. Soundscape	3.89	3.7	2.82	0.72	0.68	0.46
F.	Safety and Security	33. Welcome and safe	4.66	4.15	3.18	0.91	0.79	0.55
		34. Lighting	3.27	2.2	1.44	0.57	0.3	0.11

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		35. Security arrangements	2.74	3.23	2.14	0.43	0.56	0.28
		36. Clear sightlines	3.39	3.53	3.87	0.6	0.63	0.72
		37. Women safety	2	1.97	1.92	1	0.97	0.92
G.	Culture and History	38. Historical Features	1.91	0	2.06	0.6	0	1
		39. Events	1.55	0	1.04	0.55	0	0.28
		40. Preservation	3.04	0	3.04	0.51	0	0.72
H.	Flexibility	41. Multi functionality of space	1.9	1.96	1.95	0.9	0.96	0.51
		42. Flexible Event Spaces	2.98	3.36	2.95	0.49	0.59	0.49
I	Climate comfort	43. Area exposed to sun	4.76	3.94	4.15	0.94	0.74	0.79
		44. Degree of shade	3.4	2.47	2.21	0.6	0.37	0.3
		45.Vegetation/Greenery	4.51	3.83	3.44	0.88	0.71	0.61
		46. Air and noise pollution	4.69	3.15	2.46	0.92	0.54	0.37
J.	Anti-social behaviour	47. General Litter	3.88	3.13	3.03	0.72	0.53	0.51
		48. Theft	4.71	4.58	4.41	0.93	0.9	0.85
		49. Alcohol use and Other drugs	1.55	1.95	1.85	0.55	0.95	0.85
K.	Cleanliness and maintenance	50. Litter collection	2	1.22	1.18	1	0.22	0.18
		51. Greenery and Landscape Maintenance	4.48	3.16	2.74	0.87	0.54	0.43
		52. Maintenance of amenities	4.16	2.49	2.57	0.79	0.37	0.39

5.1.2 Weightage and Data Aggregation

The weightage values (W_i) for each indicator within specific dimensions, along with the corresponding scores for Balaju Park, Ratna Park and Shankha park was calculated. These weightage values represent the relative importance or significance of each indicator within its respective dimension. The total weightage sums up to 1, indicating that all the indicators together constitute the complete assessment.

The data aggregation here involves the multiplication of each indicator's weightage with its respective normalized score for Balaju Park, Ratna Park and Shankha Park. This process is repeated for each dimension, and then the dimension scores are further aggregated to calculate the overall score for all three parks. This aggregation process allows for understanding of how each indicator contributes to the overall assessment within its dimension.

Following a questionnaire survey involving approximately 256 respondents (91 in Balaju, 86 in Ratna Park, and 79 in Shankha Park), various metrics such as mean (X_{ip}), normalized scores (Y_{ip}),

weightage (Wi), and Quality scores (Qp) were computed and documented in Table 15 and Table 16. The overall quality scores were determined as 0.641 for Balaju Park, 0.559 for Ratna Park, and 0.495 for Shankha Park, showcasing the effectiveness of unequal weightage in achieving a more comparable scale of scores for park quality assessment. This approach, employing normalization, serves to prevent criteria with larger numerical values from disproportionately influencing the overall score.

To validate the method, an equal weightage approach was also applied, assigning equal importance to each indicator and calculating the average. The scores obtained through equal weightage were 0.701 for Balaju Park, 0.609 for Ratna Park, and 0.478 for Shankha Park. However, the scores obtained with equal weightage exhibited a more distorted scale compared to the unequal weightage method. The absence of normalization in the equal weightage approach allowed criteria with larger numerical values to exert a more pronounced impact on the overall score, leading to greater variability.
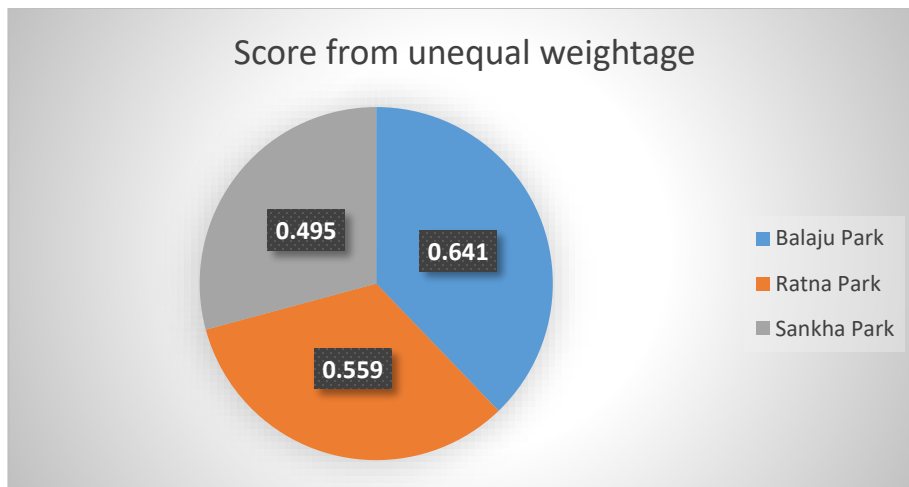
Figure 46 Chart showing quality score from unequal weightage

In this research, the unequal weightage method was prioritized for quality score calculation to underscore the importance of specific indicators. This choice was driven by the need to prevent disparities in numerical scales from disproportionately affecting the overall assessment, highlighting the role of normalization in ensuring a more accurate and balanced evaluation. The calculation of individual indicator weightage and quality scores are tabulated below.

Table 16 Table showing calculation of individual indicator weightage and Quality scores

SN	Dimensions	Indicators	Weightage (Wi)	Quality score (Qp)		
				Balaju Park	Ratna Park	Shankha Park
A.	Access and linkages	1. Transport modes	0.074	0.04	0.043	0.043
		2. Proximity	0.012	0.008	0.005	0.004
		3. Accessible entrances	0.01	0.009	0.005	0.004
		4. Fences	0.011	0.011	0.008	0.006
		5. Connecting path network	0.017	0.015	0.011	0.01
B.	Inclusiveness	6. Universal design features	0.005	0.001	0.004	0
		7. Inclusive playgrounds	0.007	0	0.005	0.002
		8. Accessible amenities	0.009	0.006	0.002	0.001
		9. Senior-friendly activities	0.007	0.007	0.005	0.002
		10. Gender neutral facilities	0	0	0	0
		11. Culture sensitivity	0.004	0.004	0	0.004
		12. Control on entrance	0.009	0.009	0.008	0.004
C.	Amenities and Facilities	13. Parking	0.009	0.004	0	0
		14. Seating and benches	0.018	0.009	0.013	0.01
		15. Picnic area and shelter	0.01	0.006	0.003	0.001
		16. Drinking water taps	0.074	0.003	0	0
		17. Public toilets	0.014	0.01	0.006	0.006
		18. Cafe/Kiosks	0	0	0	0
		19. Guiding signage	0.005	0.005	0.001	0
D.	Activities	20. Recreational activities	0.037	0.023	0.02	0.02
		21. Physical Fitness activity	0.01	0.002	0	0.005
		22. Children's play area	0.043	0.013	0.017	0.015
		23. Relaxing	0.011	0.01	0.007	0.005
		24. Socialising	0.015	0.013	0.009	0.008
		25. Events and gathering	0.052	0.029	0.026	0.024
		26. Educational visits	0.009	0.005	0.005	0.001
E.	Aesthetic and Attraction	27. Landscape and Greenery	0.02	0.019	0.015	0.015
		28. Natural aesthetic	0.021	0.015	0.011	0.011
		29. Non-natural aesthetic	0.028	0.017	0.015	0.012
		30. Water features	0.025	0.012	0.014	0.009
		31. Wildlife and nature	0.023	0.022	0.019	0.017
		32. Soundscape	0.017	0.012	0.011	0.008
F.	Safety and Security	33. Welcome and safe	0.013	0.012	0.01	0.007
		34. Lighting	0.01	0.006	0.003	0.001
		35. Security arrangements	0.017	0.007	0.009	0.005
		36. Clear sightlines	0.037	0.022	0.023	0.026
		37. Women safety	0.074	0.074	0.072	0.068

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G.	Culture and History	38. Historical Features	0.005	0.003	0	0.005
		39. Events	0.009	0.005	0	0.003
		40. Preservation	0.006	0.003	0	0.004
H.	Flexibility	41. Multi functionality of space	0.01	0.009	0.01	0.005
		42. Flexible Event Spaces	0.043	0.021	0.025	0.021
I.	Climate Comfort	43. Area exposed to sun	0.022	0.021	0.016	0.017
		44. Degree of shade	0.015	0.009	0.006	0.005
		45. Vegetation/Greenery	0.017	0.015	0.012	0.01
		46. Air and noise pollution	0.008	0.007	0.004	0.003
J.	Anti-social behaviour	47. General Litter	0.02	0.014	0.011	0.01
		48. Theft	0.052	0.048	0.047	0.044
		49. Alcohol use and Other drugs	0.011	0.006	0.01	0.009
K.	Cleanliness and maintenance	50. Litter collection	0.005	0.005	0.001	0.001
		51. Greenery and Landscape Maintenance	0.01	0.009	0.005	0.004
		52. Maintenance of amenities	0.01	0.008	0.004	0.004
			1	**0.643**	**0.556**	**0.495**
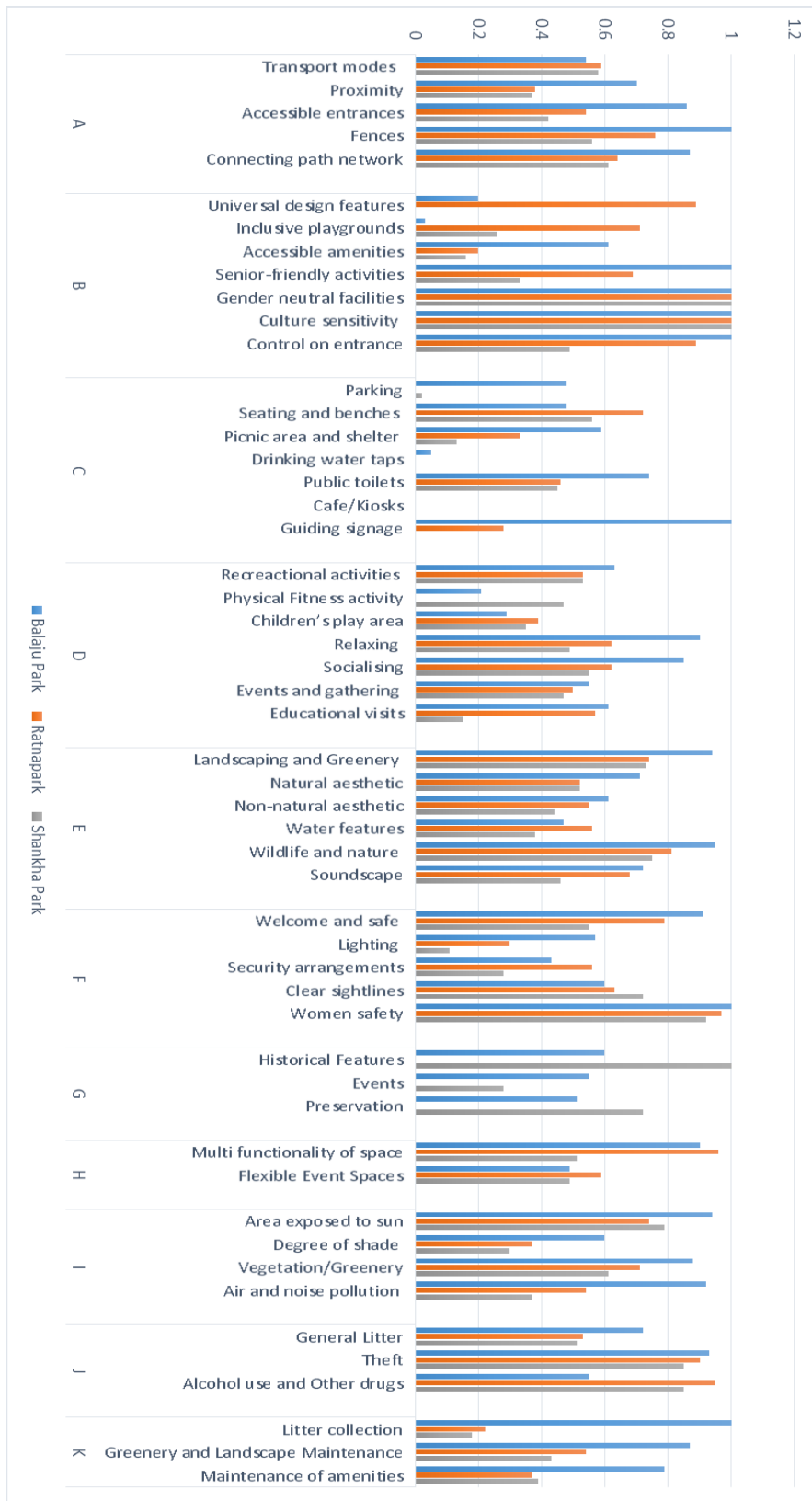
Figure 47 : Graph of Quality scores of individual indicators for Balaju & Ratna Park

5.2 Result on 11 dimensions and 52 indicators

a. Access and Linkage

When evaluating the quality of a park, the aspects of access and linkage play a crucial role, encompassing five key indicators: transport modes, proximity, accessible entrances, fences, and connecting path networks. The findings reveal that Balaju Park is easily accessible through various transportation modes, and Shankha Park is similarly accessible through diverse means of transportation. In contrast, Ratna Park is primarily accessible via public transportation and walking, lacking parking facilities for private vehicles. Furthermore, the study indicates that a majority of visitors residing in the vicinity prefer Balaju Park, possibly due to its proximity, while Ratna Park, situated in a mixed zone, attracts fewer local residents. Notably, the presence of fences emerges as a preference for most park visitors across all three parks, driven by considerations such as safety and the perception that fenced parks are better maintained. In terms of ease of movement, both Ratna Park and Shankha Park show room for improvement compared to Balaju Park. The dimension of accessible entrances in Shankha Park received a lower score of 0.421, highlighting the absence of accessible entrances for individuals with disabilities. This underscores the need for enhancements to ensure inclusivity and ease of access for all park visitors.
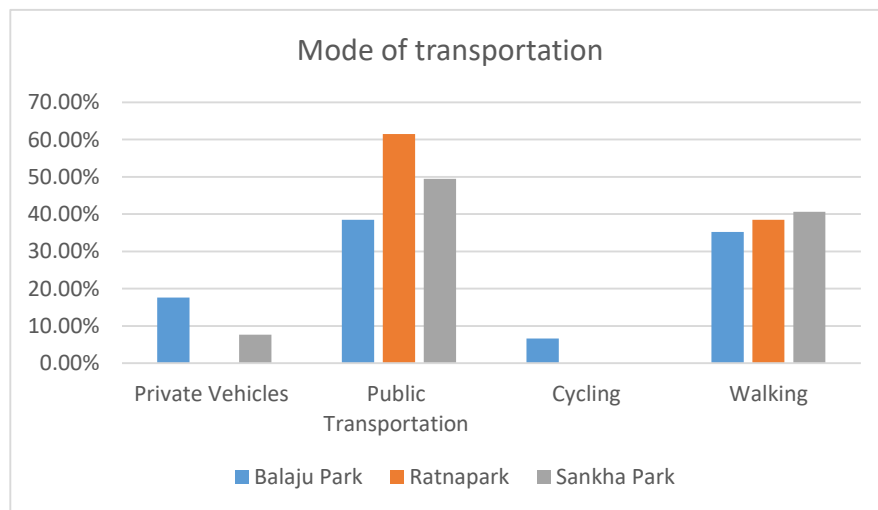

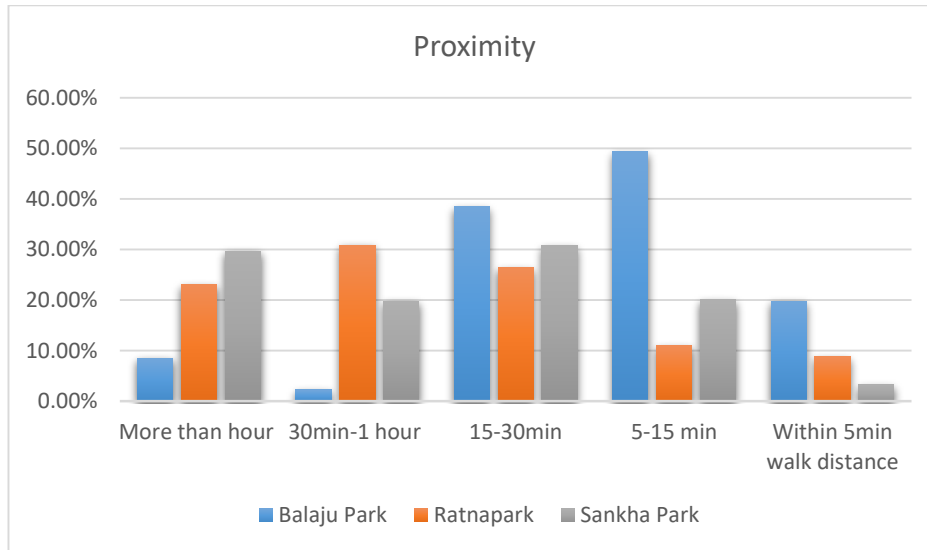*Figure 48 Transportation Mode of respondents*

Figure 49 Travel time to Parks

Table 17 Descriptive statistics of survey for Access and Linkage

Dimension	Survey questions	Options	Balaju Park	Ratna park	Shankha Park
a. Access and linkages	1. How do you travel to park?	Private Vehicles	17.6%	0%	7.69%
		Public Transportation	38.5%	61.5%	49.45%
		Cycling	6.6%	0%	0%
		Walking	35.2%	38.5%	40.66%
	2. How much time does it take to reach the park?	More than hour	8.5%	23.1%	29.67%
		30min-1 hour	2.3%	30.8%	19.78%
		15-30min	38.5%	26.4%	30.77%
		5-15 min	49.3%	11%	20.05%
		Within 5min walk distance	19.8%	8.8%	3.30%
	3. How easy is it to access park entrances?	Very Difficult	0%	6.6%	10.99%
		Difficult	0%	20.9%	31.87%
		Neutral	6.6%	34.1%	34.07%
		Easy	41.8%	28.6%	13.19%
		Very Easy	51.7%	9.9%	9.89%
	4. Do people prefer parks with fences?	No	0%	23.1%	45.05%
		Yes	100%	74.7%	51.65%
		Very Difficult	0%	2.2%	2.20%

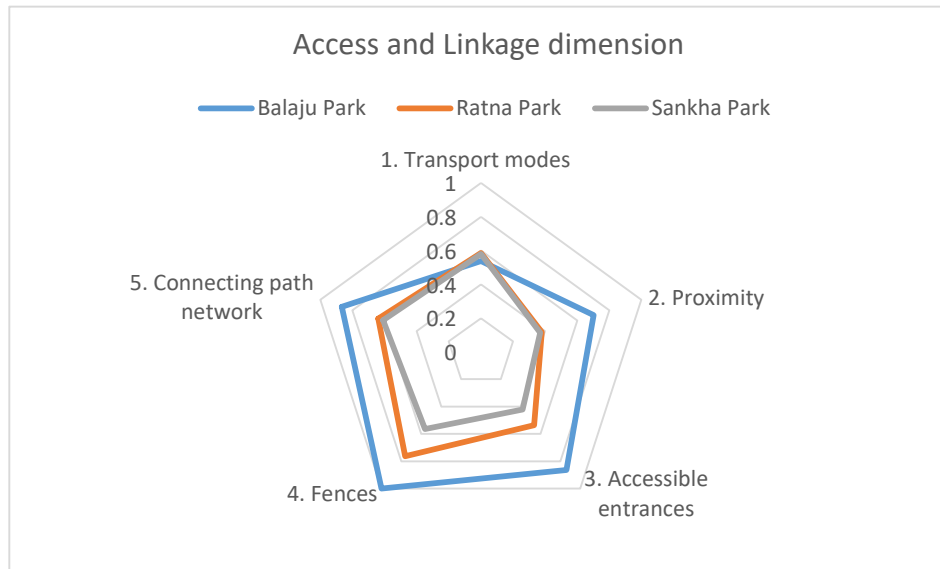| 5. How would you rate the ease of movement in and around the park? | Difficult | 0% | 11% | 10.99% |
	Neutral	6.6%	16.5%	36.26%
	Easy	40.7%	71.4%	48.35%
	Very Easy	52.8%	0%	10.99%

Figure 50 Score for Individual Indicator of Access and Linkage dimension

b. Inclusiveness

It focuses on evaluating the extent to which the urban green park is designed and managed to be inclusive and welcoming for diverse groups of people. There are seven indicator namely universal design features, inclusive playgrounds, accessible amenities, senior-friendly activities, gender neutral facilities, culture sensitivity and control on entrance. Significant score disparities are evident, with Balaju Park scoring lower in universal design features (0.2) and inclusive playgrounds (0.03), while Shankha Park exhibits notably lower scores in universal design features (0.00), accessible amenities (0.16), and control at entrances (0.49). These varying scores highlight critical aspects in evaluating the parks' overall quality and inclusivity.
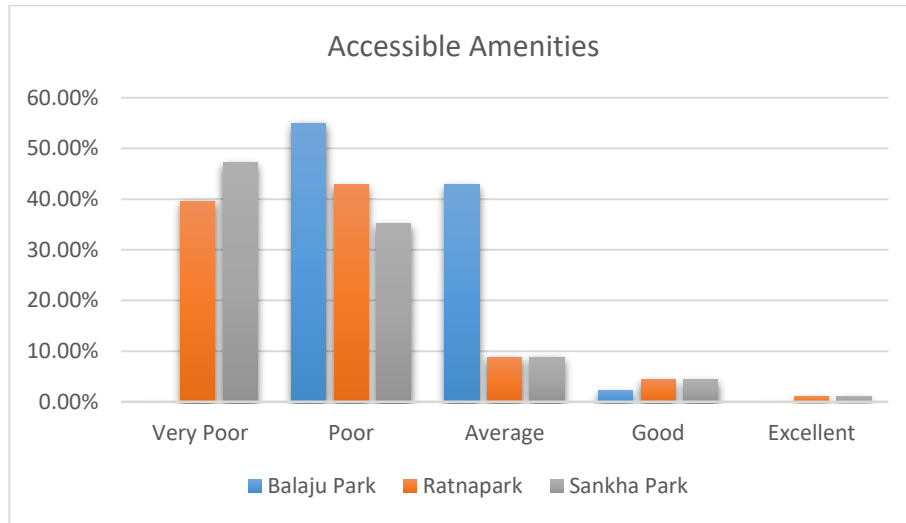
Figure 51 Graph showing response on accessibility of the amenities for all people
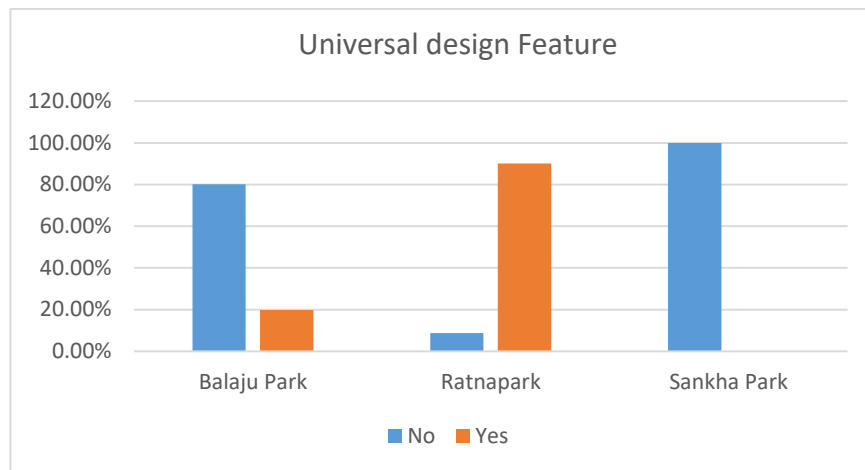

Table 18 Descriptive statistics of survey for Inclusiveness

Dimension	Survey question	Options	Balaju Park	Ratna park	Shankha Park
b. Inclusiveness	6. Can people of all ages and abilities get to and around the park?	No	80.2%	8.8%	100%
		Yes	19.8%	90.1%	0%
	7. a. Does the park have playground for children?	No	100%	0%	68.13%
		Yes	0%	100%	36.26%
	b. If yes does the playground area caters to children of all abilities?	No	0%	57.1%	68.13%
		Yes	0%	40.7%	24.18%

|		Very Poor	27.00%	9%	47.25%
8. How would you rate the accessibility of amenities in the park (e.g., restrooms, seating areas) for people with disabilities?		Poor	24.00%	33.00%	35.16%
		Average	51.80%	29.00%	8.79%
		Good	2.20%	19.00%	4.40%
		Excellent	0%	10.00%	1.10%
9. Are there specific activities or facilities in the park that cater to the needs of senior citizens?		No	0%	30.8%	65.93%
		Yes	100%	69.2%	32.97%
10. Is there provision of separate toilets for male and female?		No	0%	0%	0%
		Yes	100%	100%	100%
11. Is it difficult to access to park based different cultural background?		No	100%	100%	100%
		Yes	0%	0%	0%
12. Do you think the park should charge an entrance fee?		No	0%	11%	46.15%
		Yes	100%	89%	51.65%
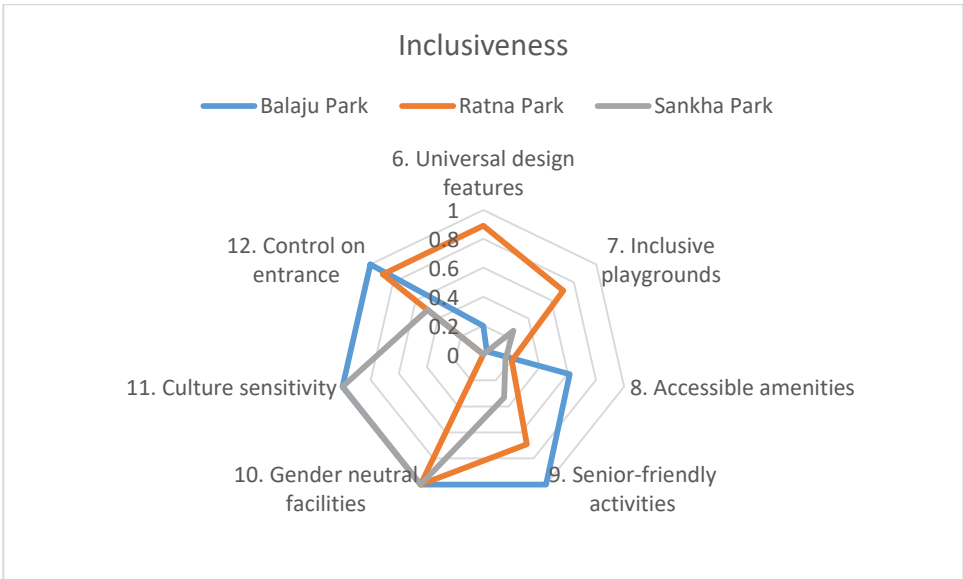
Figure 52 Score for Individual Indicator of Inclusiveness

c. Amenities and Facilities

It focuses on assessing the availability and quality of various amenities and services within the urban green park. There are seven indicator to measure this dimension namely Parking, Seating and benches, Picnic area and shelter, Drinking water taps, Public toilets, Cafe/Kiosks and Guiding signage. Several key indicators exhibit notably low scores. In Ratna Park, these include parking (0.00), guiding signage (0.28), and picnic areas and shelters (0.33). In Shankha Park, the low-scoring indicators are parking (0.02), guiding signage (0.00), and picnic areas and shelters (0.13). Furthermore, there is a notable absence of drinking water taps in all three parks.
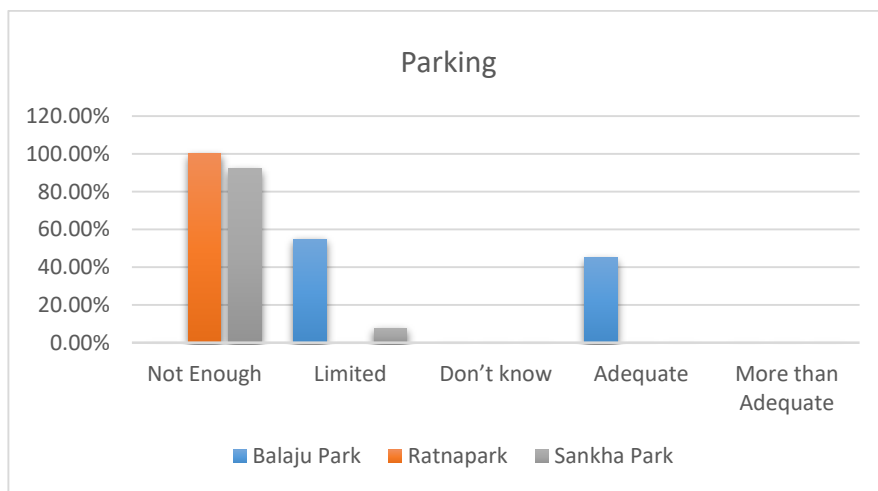

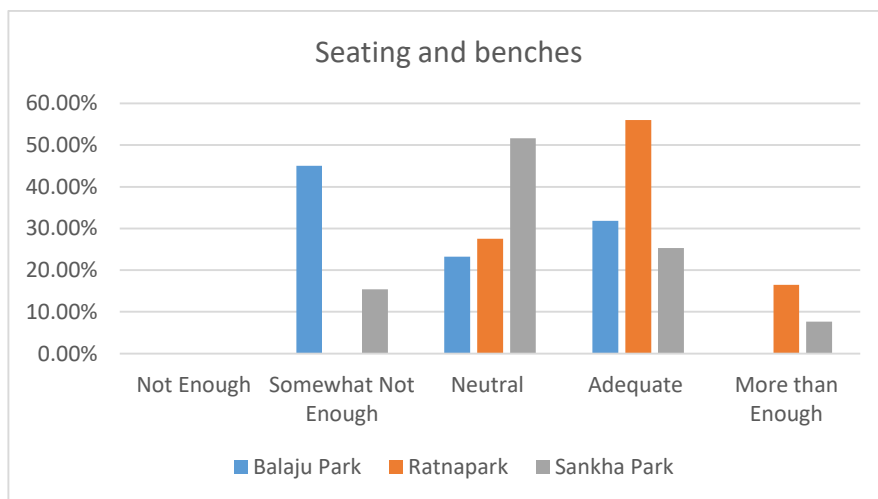*Figure 53 Chart showing the response on Provision of Parking Space*

Figure 54 Graph showing the response on availability of Seating and Benches

Table 19 Descriptive statistics of survey for Amenities and Facilities

Dimension	Survey questions	Options	Balaju Park	Ratna park	Shankha Park
c. Amenities and Facilities	13. Is there enough parking space to accommodate visitors' vehicles?	Not Enough	0%	100%	92.31%
		Limited	55%	0%	7.69%
		Don't know	0%	0%	0%
		Adequate	45.1%	0%	0%
		More than Adequate	0%	0%	0%
	14. Are there enough seating benches available in the urban green park to accommodate visitors?	Not Enough	0%	0%	0%
		Somewhat Not Enough	45%	c	15.38%
		Neutral	23.2%	27.5%	51.65%
		Adequate	31.8%	56%	25.27%
		More than Enough	0%	16.5	7.69%
	15. How likely are you to recommend this park to others based on the availability of picnic space and shades?	Very Poor	0%	22	65.93%
		Poor	4.4%	38.5%	26.37%
		Neutral	56%	26.4%	3.30%
		Good	39.6%	7.7%	0%
		Very Good	0%	3.3%	3.30%
	16. Is there provision of drinking water taps?	No	100%	100%	100%
		Yes	0%	0%	0%
	17. Are there an adequate number of public toilets available in the park to meet the needs of visitors?	Not Enough	4.4%	8.8%	0%
		Somewhat Not Enough	14.3%	16.5%	0%
		Neutral	18.7%	35.2%	0%
		Adequate	57.1%	39.6%	0%
		More than Enough	5.5%	2.2%	0%
	b. How would you rate the cleanliness of public toilets in the park?	Very Poor	0%	9.9%	9.89%
		Poor	0%	48.4%	34.07%
		Neutral	14.3%	18.7%	30.77%
		Good	80.2%	20.9%	23.08%

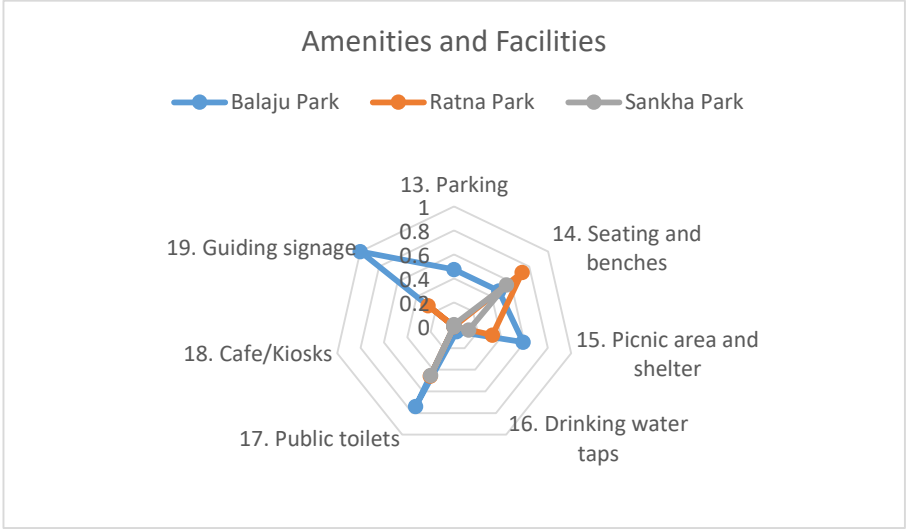|		Very Good	5.5%	2.2%	2.20%
18. Is there a cafe or food kiosk available within the park?	No		100%	100%	100%
	Yes		0%	0%	0%
19. Are there guiding signage throughout the park to help visitors find their way?	No		0%	71.4%	100%
	Yes		100%	27.5%	0%

Figure 55 Score for Individual Indicator of Amenities and Facilities Dimension

d. Activities

Activities in parks are diverse and cater to a wide range of interests and age groups. Activities includes seven indicator namely recreational activities, Physical Fitness activity, Children's play area, Relaxing, Socialising, Events and gathering and Educational visits. Balaju Park has 20.9% of respondents participating in physical fitness-related activities and Shankha Park has 46.15% whereas Ratna Park do not promote physical fitness related activities in the park. From the calculation lower scores in observed in specific indicators such as Shankha Park scores 0.15 for educational visits, and Ratna Park scores 0.00 for physical fitness activities. Furthermore, the indicator for children's play areas reflects lower scores, with Balaju Park at 0.29, Ratna Park at 0.392, and Shankha Park at 0.35. These findings underscore the need for improvement in Ratna Park, specifically in promoting physical fitness activities and enhancing facilities for children's recreation in all three parks.
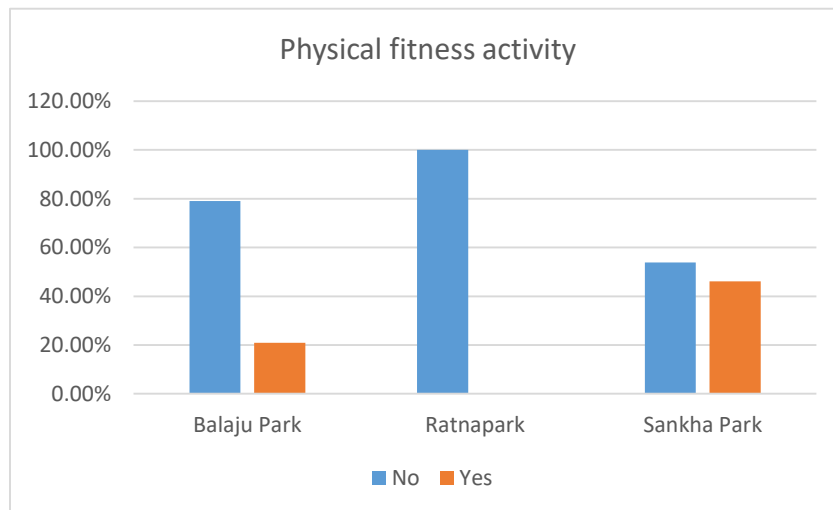
Figure 56 Graph showing the participation of Responder in Fitness related activities
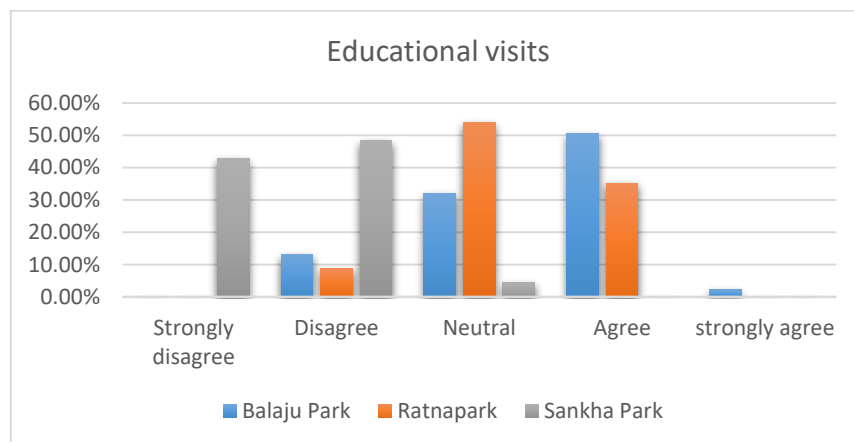

Figure 57 Graph showing the response on provision of educational opportunities for children

Table 20 Descriptive statistics of survey for Activities

Dimension	Survey questions	Options	Balaju Park	Ratna park	Shankha Park
Activities	20. How would you rate park on the basis of varieties of recreational activities?	Not suitable	0%	0%	0%
		Somewhat not suitable	2.2%	18.7%	20.88%
		Neutral	49.5%	49.5%	51.65%
		suitable	42.9%	31.9%	27.47%

		More than suitable	6.6%	0%	0%
21. Do you participate in any physical fitness-related activities in this park?		No	79.1%	100%	53.85%
		Yes	20.9%	0%	46.15%
22. Do you find park is suitable for children's activities?		Not sufficient	34.1%	4.4%	4.40%
		Somewhat not sufficient	15.4%	40.7%	48.35%
		Neutral	50.6%	47.3%	45.05%
		Sufficient	0%	6.6%	0%
		More than sufficient	0%	0%	0%
23. How enjoyable is your experience of relaxation or quite activities at this park?		Not Enjoyable	0%	0%	8.79%
		Somewhat Not Enjoyable	0%	12.1%	28.57%
		Neutral	4%	2.2%	37.36%
		Enjoyable	40.7%	50.6%	24.18%
		Very Enjoyable	55.3%	6.6%	3.30%
24. Are there designated places in the park that encourage social interaction among visitors?		No Social Interaction Spaces	0%	6.6%	6.59%
		Very Few Social Interaction Spaces	0%	13.2%	13.19%
		Few Social Interaction Spaces	4.4%	13.2%	29.67%
		Several Social Interaction Spaces	51.7%	58.2%	44.78%
		Numerous Social Interaction Spaces	44%	7.7%	4.40%
25. How well does the urban green park accommodate events and gatherings?		Very Poor	0%	0%	0%
		Poor	16.5%	23.1%	27.47%
		Neutral	47.3%	45.1%	50.55%
		Good	36.3%	24.2%	17.58%
		Excellent	0%	0%	0%
26. Do you think the park provides educational		Strongly disagree	0%	0%	42.86%
		Disagree	13.2%	8.8%	48.35%

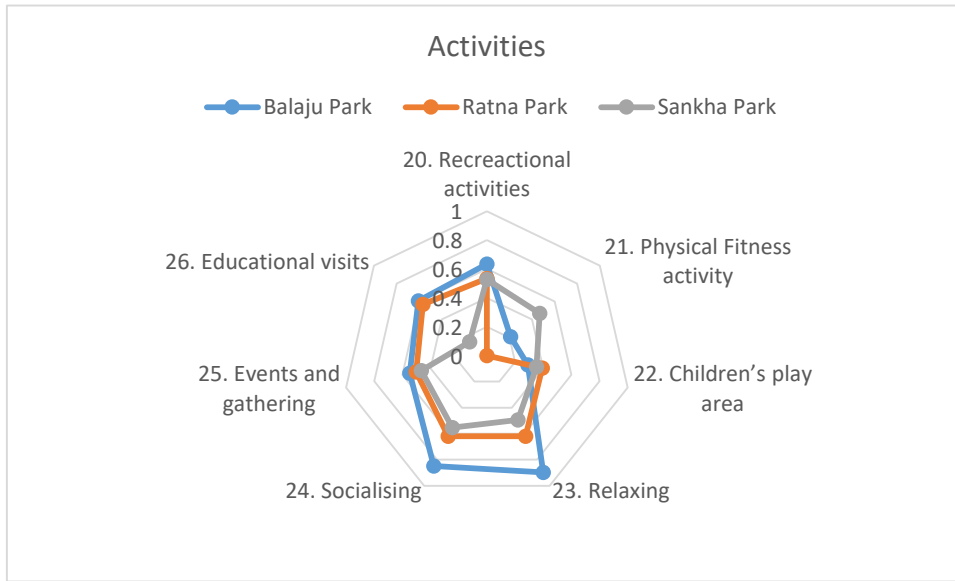| opportunities for children, such as bird-watching and observing different species of plants etc.?	Neutral	31.9%	53.9%	4.40%
	Agree	50.6%	35.2%	0%
	strongly agree	2.2%	0%	0%

Figure 58 Score for Individual Indicator of Amenities and Facilities

e. Aesthetic and Attraction

Aesthetic and attraction" dimension is essential in the quality assessment of urban green parks. It focused on six indicators such as Landscaping and Greenery, Natural aesthetic, Non-natural aesthetic, water features, Wildlife and nature and Soundscape. So the result shows that both Balaju Park and Ratna Park appear to offer positive aesthetics and attractions, with Balaju Park receiving slightly higher ratings in some aspects, such as overall landscaping and greenery, preservation of natural aesthetic elements, integration and maintenance of water features, and the enjoyment of observing wildlife and nature. The score for Indicators like Landscaping and Greenery (0.937 in Balaju Park and 0.739 in Ratna Park), Wildlife and nature (1 in Balaju Park and 0.945 in Ratna Park), Soundscape (0.723 in Balaju Park and 0.676 in Ratna Park) shows that both the park offers positive aesthetic and attraction with the better scores. In contrast, Shankha Park exhibits lower scores in specific indicators, particularly non-natural aesthetic (0.44), water features (0.38), and soundscape (0.46), indicating areas where improvements or enhancements may be beneficial.
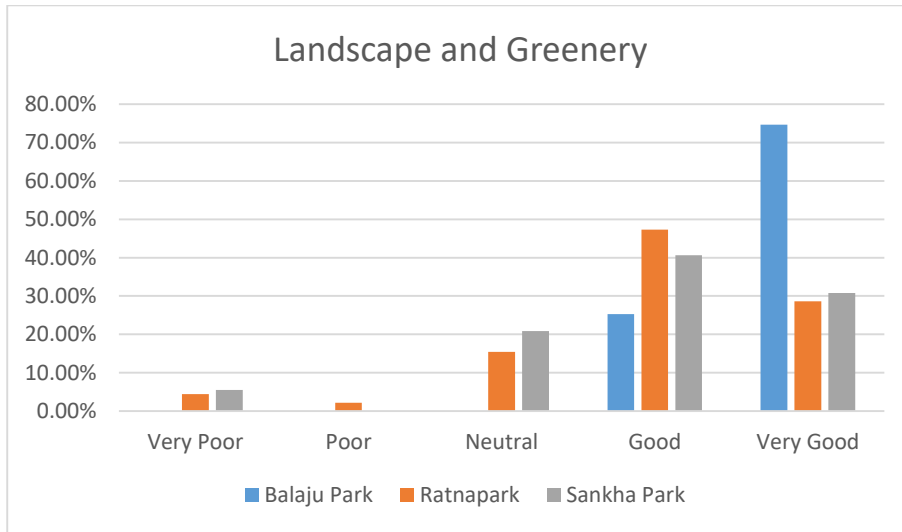
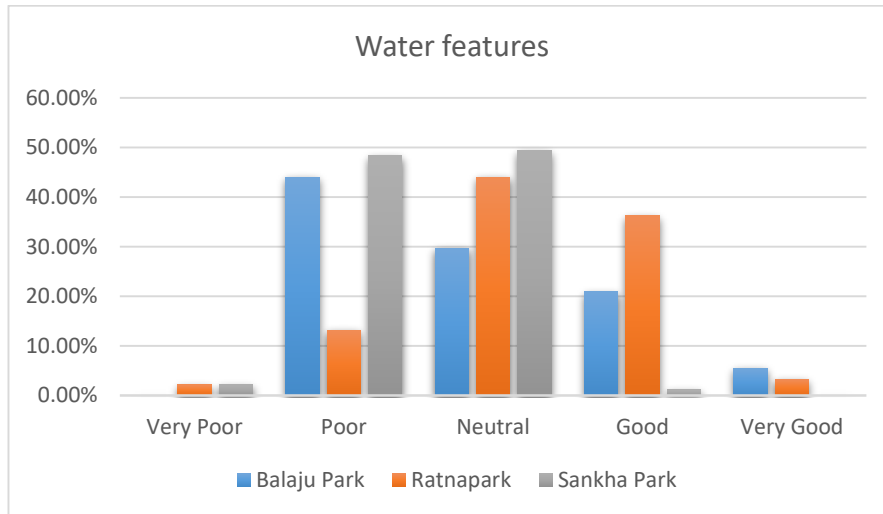*Figure 59 Graph showing the rating on overall Landscape and Greenery of the parks*

Figure 60 Graph showing the response on Design and maintenance of the water Features in park

Table 21 Descriptive statistics of survey for Aesthetic and Attraction

Dimension	Survey question	Options	Balaju Park	Ratna park	Shankha Park
Aesthetic and Attraction	27. How would you rate the overall landscaping and greenery in the park?	Very Poor	0%	4.4%	5.49%
		Poor	0%	2.2%	0%
		Neutral	0%	15.4%	20.89%
		Good	25.3%	47.3%	40.66%
		Very Good	74.7%	28.6%	30.77%

|		Very Poor	0%	11%	10.99%
28. How would you rate the park's efforts in preserving and promoting natural aesthetic elements (e.g., natural vegetation, wildlife habitat)?		Poor	0%	27.5%	21.98%
		Neutral	22	41.8%	50.55%
		Good	73.6%	30.8%	27.47%
		Very Good	4.4%	0%	0%
29. How well does the park incorporate non-natural aesthetics (e.g., art installations, sculptures) into its design?		Very Poor	0%	3.3%	3.30%
		Poor	7.7%	17.6%	28.57%
		Neutral	41.8%	36.3%	50.55%
		Good	50.6%	42.9%	18.68%
		Very Good	0%	0%	0%
30. How well are water features integrated into the park's design and maintained?		Very Poor	0%	2.2%	2.20%
		Poor	44%	13.2%	48.35%
		Neutral	29.7%	44%	49.45%
		Good	20.9%	36.3%	1.15%
		Very Good	5.5%	3.3%	0%
31. a. Did you observe any wildlife or nature elements (e.g., birds, butterflies) during your visit?		No	0%	5.5%	17.58%
		Yes	100%	94.5%	82.425
b. If yes do you enjoy observing wildlife and appreciating nature while visiting the urban green park?		Not Enjoyable	0%	4.4	3.30%
		Somewhat Not Enjoyable	0%	0%	0%
		Neutral	0	34.1%	38.46%
		Enjoyable	42.9%	41.8%	49.45%
		Very Enjoyable	57.1%	20.9%	10.99%
32. How would you describe the soundscape of the park? (e.g., birdsong, flowing water, tranquillity)		Very Displeasing	0%	0%	0%
		Displeasing	0%	7.7%	31.87%
		Neutral	27.5%	28.6%	58.24%
		Pleasing	56%	49.5%	9.89%
		Very Pleasing	16.5%	14.3%	0%
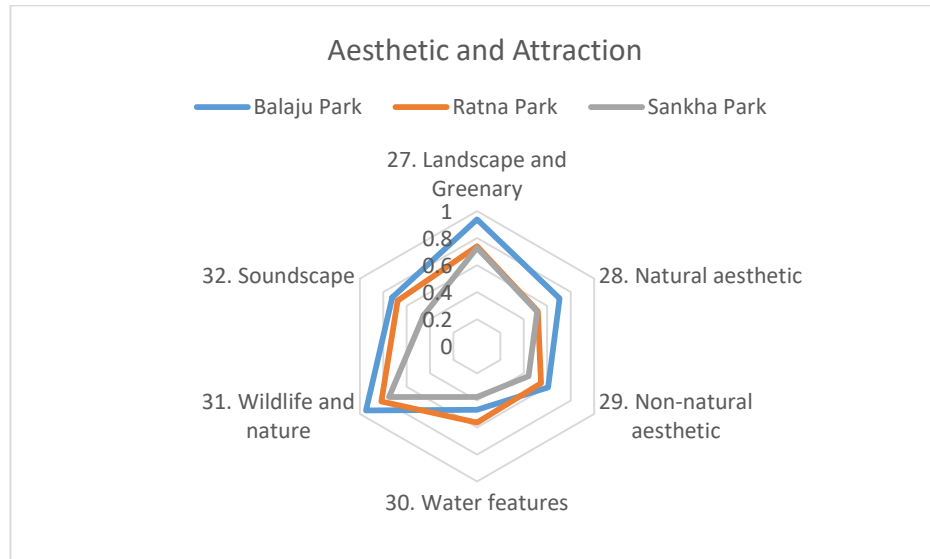
Figure 61 Score for Individual Indicator of Aesthetic and Attraction

f. Safety and Security

Safety and security dimension in urban green parks is essential as it ensures a secure environment for park users. The indicators that are included in this dimension are welcome and safe, Lighting, Security arrangements, clear sightlines and Women safety. The results underscore that Balaju Park and Ratna Park are generally perceived as safe and welcoming, with a notable percentage of respondents expressing a greater sense of security in Balaju Park compared to Shankha Park. Notably, both Ratna Park and Shankha Park received lower scores in the lighting indicator, 0.3 and 0.11 respectively. Furthermore, Shankha Park demonstrated a lower score of 0.28 in the security arrangements indicator. These findings emphasize the importance of continuous efforts to enhance lighting infrastructure and security measures in urban green parks, ensuring a safe and welcoming environment for all park users.
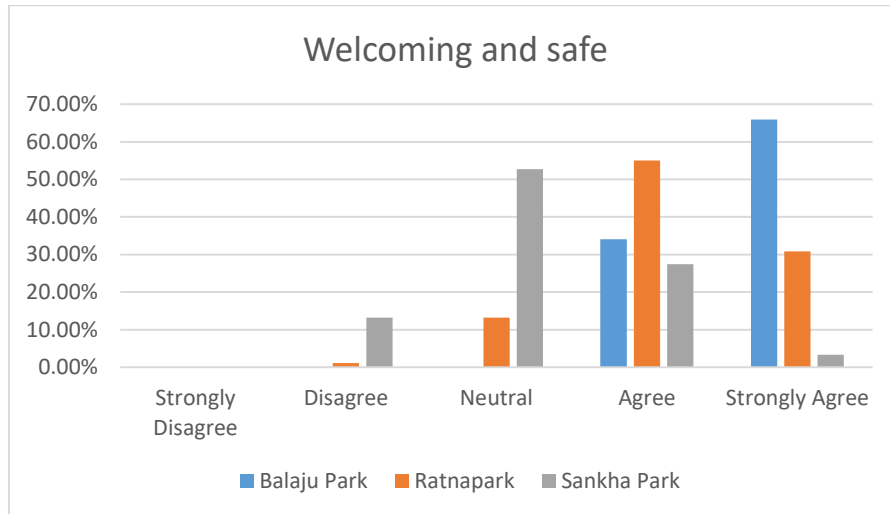
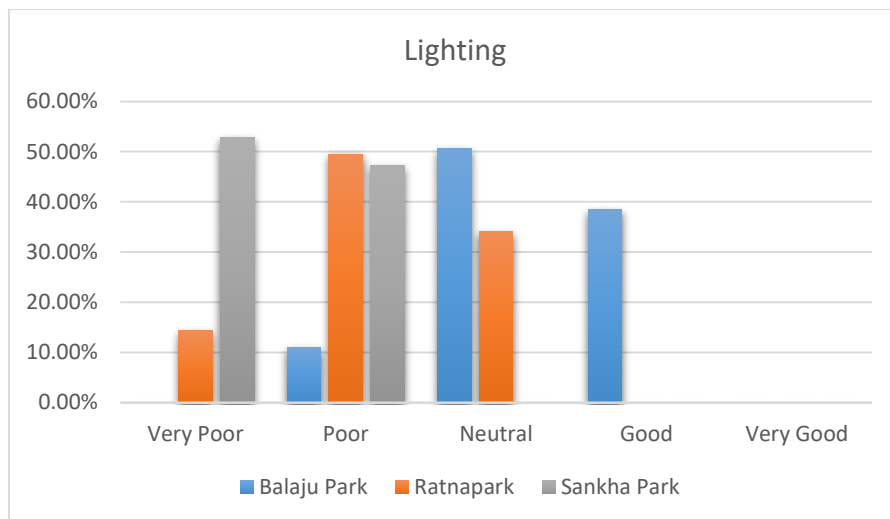*Figure 62 Graph showing response on welcome safe feeling in park*

Figure 63 Graph showing response on lighting condition in Park

Table 22 Descriptive statistics of survey for Safety and Security

Dimension	Survey question	Options	Balaju Park	Ratna park	Shankha Park
Safety and Security	33. Do you feel welcome and safe in and around the park?	Strongly Disagree	0%	0%	0%
		Disagree	0%	1.1%	13.19%
		Neutral	0%	13.2%	52.75%
		Agree	34.1%	55%	27.47%
		Strongly Agree	65.9%	30.8%	3.30%

|		Very Poor	0%	14.3%	52.75%
	34. How would you rate the presence of lighting within the park?	Poor	11%	49.5%	47.25%
		Neutral	50.6%	34.1%	0%
		Good	38.5%	0%	0%
		Very Good	0%	0%	0%
	35. How would you rate the security arrangements at the urban green park to ensure the safety of visitors?	Very Poor	0%	0%	13.19%
		Poor	36.3%	13.2%	53.85%
		Neutral	53.9%	50.6%	30.77%
		Good	9.9%	36.3%	0%
		Very Good	0%	0%	0%
	36. How effective are the clear sight lines within the park, allowing good visibility and reducing potential hiding spots?	Very Ineffective	7.7%	0%	0%
		Ineffective	17%	3.3%	0%
		Neutral	24.2%	39.6%	35.16%
		Effective	40.7%	55%	46.15%
		Very Effective	13.2%	0%	20.88%
	37. Did you feel that the park is safe and conducive for women's visits?	No	0%	0%	7.69%
		Yes	100%	100%	92.31%
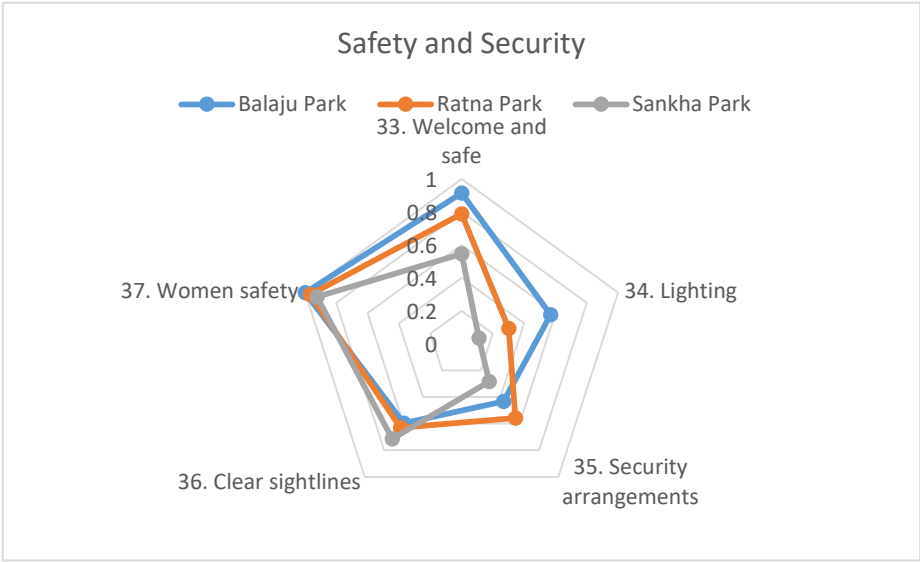
Figure 64 Score for Individual Indicator of Safety and Security

g. Culture and History

Culture and History dimension in urban green parks is crucial for preserving cultural heritage, celebrating local identity, and providing various cultural opportunities. This dimension includes

mainly three indicator such as Historical Features, Cultural events and Preservation. The result shows that Balaju Park and Shankha Park have a historical significance, as indicated by the presence of historical features or landmarks. The absence of historical features in Ratna Park does not inherently mean that it lacks quality or value. However, the presence of historical features in Balaju Park and Shankha Park may give it an additional dimension of significance and contribute to a more diverse and enriched park experience which is also shown by the result. And also the park's ability to reflect and celebrate its cultural and historical context.
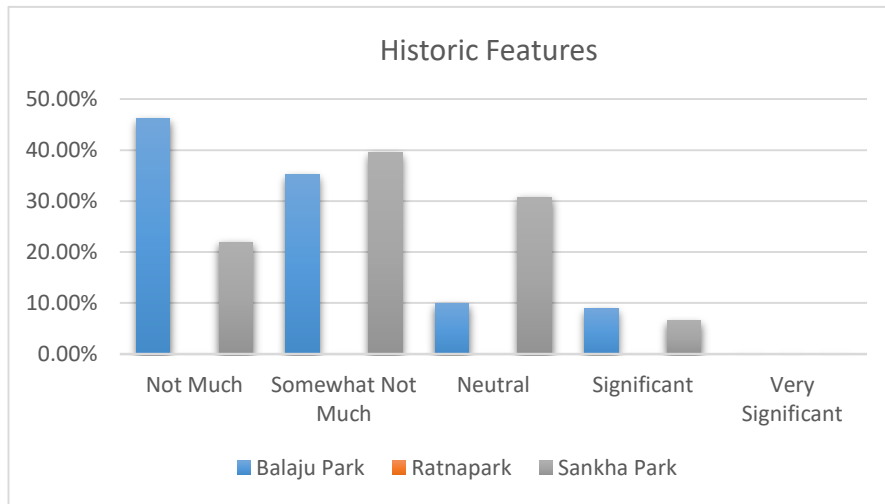

Figure 65 Graph showing the contribution to your overall experience

Table 23 Descriptive statistics of survey for Culture and History

Dimension	Survey questions	Options	Balaju Park	Ratna Park	Shankha Park
	38. How much does the historical significance of the urban green park contribute to your overall experience and enjoyment of the park?	Not Much	8.8%	0%	21.98%
		Somewhat Not Much	9.9%	0%	39.56%
		Neutral	35.2%	0%	30.77%
		Significant	46.2%	0%	6.59%
		Very Significant	0%	0%	0%
	39. Have you ever been part of any popular activities, events and festivals in space?	No	45.1%	0%	96.70%
		Yes	55%	0%	3.30%
	40. How would you rate the park's efforts in preserving and showcasing its cultural and historical heritage?	Not at all	0	0%	0%
		Slightly	28.6%	0%	21.98%
		Moderately	46.2%	0%	56.04%

		Very engaging	17.6%	0%	23.08%
		Extremely engaging	7.7%	0%	0%

h. Flexibility

This dimension centres on assessing the urban green park's adaptability and versatility in accommodating diverse activities, events, and user needs. Two key indicators, namely the multi-functionality of space and flexibility of event space, define this dimension. The high scores for the multi-functionality of space indicator, with Balaju Park at 0.901 and Ratna Park at 0.956, indicate that these parks excel in providing adaptable spaces. The noteworthy aspect is that Shankha Park receives a low score of 0.51 in the indicator for multi-functionality of space, indicating a rigidity in planning and zoning inadequacies. Moreover, the flexibility event scores across all three parks are only average, suggesting room for improvement in all of them to enhance their capacity for accommodating a wider range of activities and events.
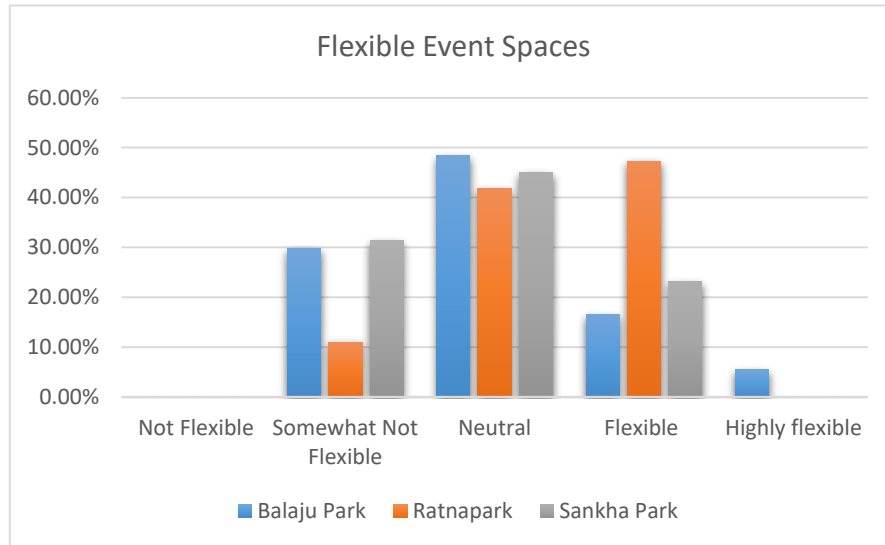

Figure 66 Graph showing response on flexibility of park in providing space during the time of emergency or any event

Table 24 Descriptive statistics of survey for Flexibility

Dimension	Survey questions	Options	Balaju Park	Ratna park	Shankha Park

Flexibility	41. Is the park layout designed in a way that allows for different activities to take place simultaneously without interference?	No	9.9%	4.4%	7.69%
		Yes	90.1%	95.6	92.31%
	42. How would you rate the urban green park's flexibility in providing space during the time of emergency or any event?	Not Flexible	0%	0%	0%
		Somewhat Not Flexible	29.7%	11%	31.32%
		Neutral	48.4%	41.8%	45.05%
		Flexible	16.5%	47.3%	23.08%
		Highly flexible	5.5%	0%	0%

i. Climate comfort

Climate comfort dimension in urban green parks is crucial for ensuring visitor comfort. So in order to measure this dimension there are four main indicator namely Area exposed to sun, Degree of shade, Vegetation/Greenery and Air and noise pollution. The result shows that Ratna Park and Shankha Park exhibit lower scores in the degree of shade indicator, with 0.37 and 0.3, respectively. Moreover, air and noise pollution indicators in Ratna Park and Shankha Park score 0.54 and 0.37, respectively, indicating areas that may require attention to enhance the ecological and environmental quality of these urban green spaces.
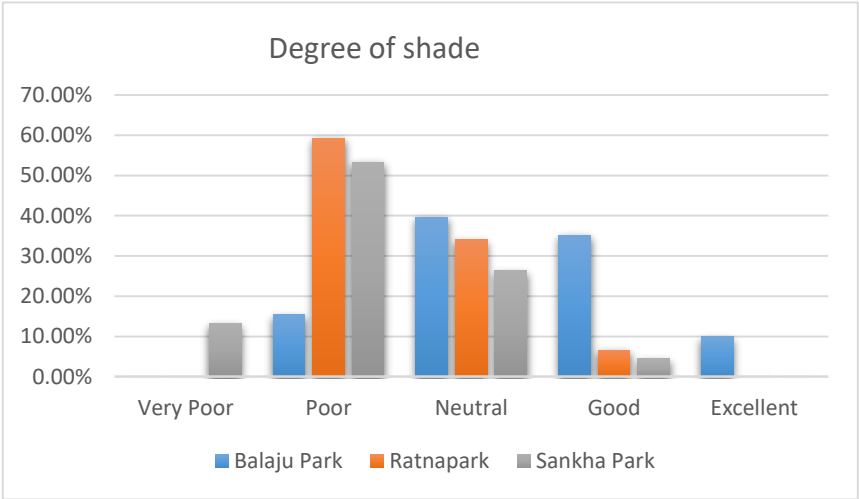

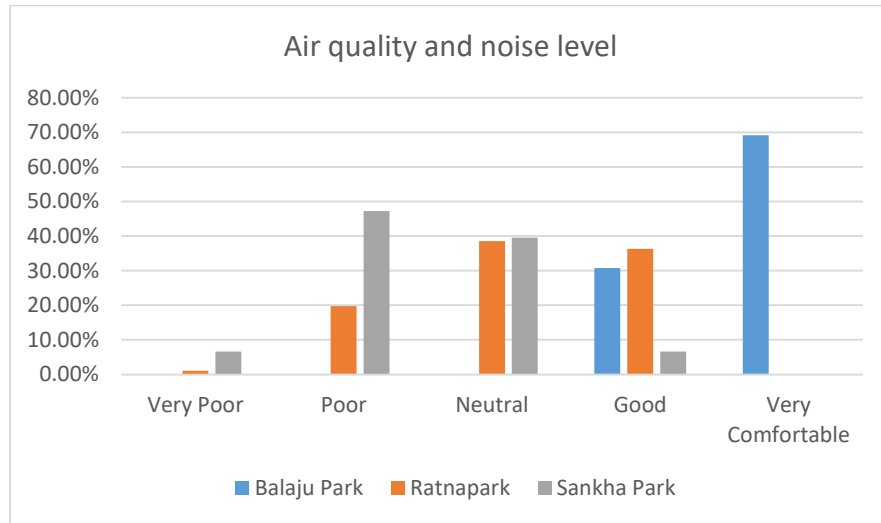*Figure 67 Graph showing the response on provision of shaded area in park*

Figure 68 Graph showing response on overall air quality and noise levels in the park

Table 25 Descriptive statistics of survey for Climate Comfort

Dimension	Survey questions	Options	Balaju Park	Ratna park	Shankha Park
Climate Comfort	43. How would you rate the park's areas in terms of sunlight exposure?	Very Poorly Exposed	0%	0%	0%
		Poorly Exposed	0%	0%	0%
		Neutral	5.5	20.9	17.58%
		Well Exposed	13.2	59.3	45.05%
		Very Well Exposed	81.3	15.4	30.77%
	44. How would you rate the availability of shaded areas in the park for protection in summer season?	Very Poor	0%	0%	13.19%
		Poor	15.4	59.3	53.30%
		Neutral	39.6	34.1	26.37%
		Good	35.2	6.6	4.40%
		Excellent	9.9	0%	0%
	45. How would you rate the park's efforts in making park green?	Very Poor	0%	0%	0%
		Poor	0%	9.9	12.09%
		Neutral	6.6	15.4	41.76%
		Good	36.3	53.9	40.66%
		Excellent	57.1	18.7	4.40%
	46. How would you rate the overall air quality and noise levels in the park?	Very Poor	0%	1.1	6.59%
		Poor	0%	19.8	47.25%
		Neutral	0%	38.5	39.56%

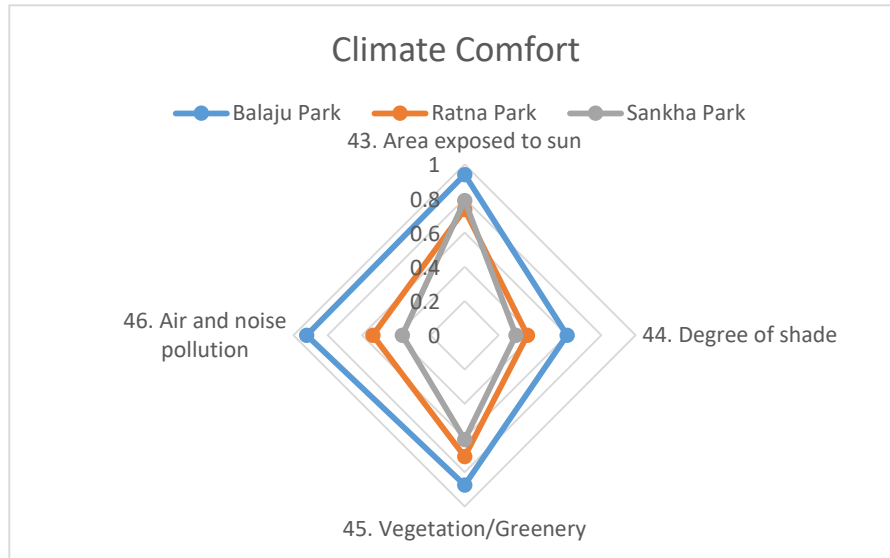| | | Good | 30.8 | 36.3 | 6.59% |
| | | Very Comfortable | 69.2 | 0% | 0% |

Figure 69 Score for Individual Indicator of Climate Comfort

j. Anti-social behaviour

Anti-social behaviour refers to disruptive or harmful actions that negatively impact the peaceful enjoyment and safety of urban green parks. The indicators to measure this dimensions are General Litter, Theft, Alcohol use and other drugs. The quality score for indicator Alcohol use and other drugs (0.55) shows that Balaju Park should focus on enhancing prevention, treatment, and enforcement measures as Alcohol and other drug use is observed in park. The quality scores for general litter, which are 0.53 in Ratna Park and 0.51 in Shankha Park, indicate that both parks need improvement in maintaining cleanliness and managing litter effectively.
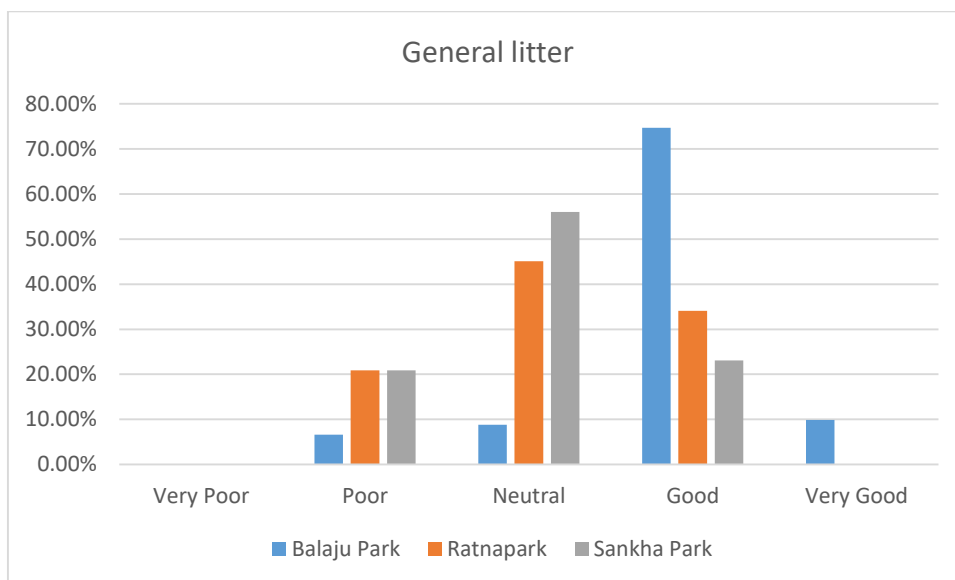
Figure 70 Graph showing response in terms of presence of General litter
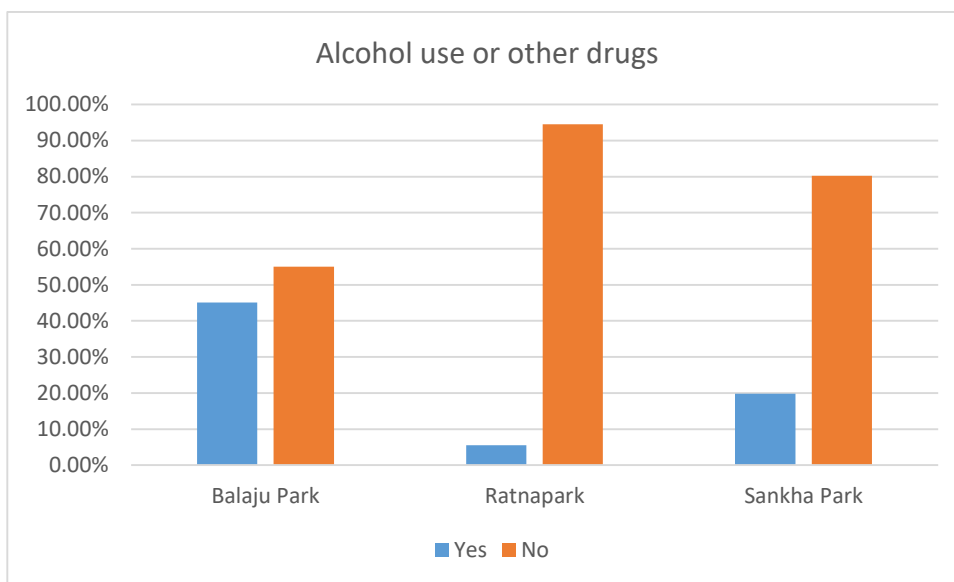

Figure 71 Graph showing response of Alcohol use

Table 26 Descriptive statistics of survey for Anti-social behaviour

Dimension	Survey questions	Options	Balaju Park	Ratna park	Shankha Park
Anti-social behaviour	47. How would you rate the park in terms presence of general litter?	Very Poor	0%	0%	0%
		Poor	6.6%	20.9%	20.88%
		Neutral	8.8%	45.1%	56.04%
		Good	74.7%	34.1%	23.08%
		Very Good	9.9%	0%	0%

48. Have you observed or heard about any kind of theft activity in park during your visits?	Frequently	0%	0%	0%
	Occasionally	5.5%	4.4%	6.60%
	Neutral	2.2%	0%0	0%
	Rarely	7.7%	29.7%	38.46%
	Never	84.6%	68.1%	0%
49. During your visit to the park, did you observe any of the following behaviours related to alcohol use and other drugs?	No	55%	94.5%	19.78%
	Yes	45.1%	5.5%	80.22%

k. Cleanliness and maintenance

Cleanliness and maintenance is important dimensions in the quality assessment of urban green parks. The three indicators for this dimension are Waste bins, Greenery and Landscape Maintenance and Maintenance of amenities. The result shows that Ratna Park and Shankha Park exhibit lower scores in the indicator for litter collection (0.22 and 0.18, respectively), as well as in the maintenance of amenities indicator (0.37 for Ratna Park and 0.39 for Shankha Park), signifying a need for improvement in these areas to enhance the parks' cleanliness and overall quality f .
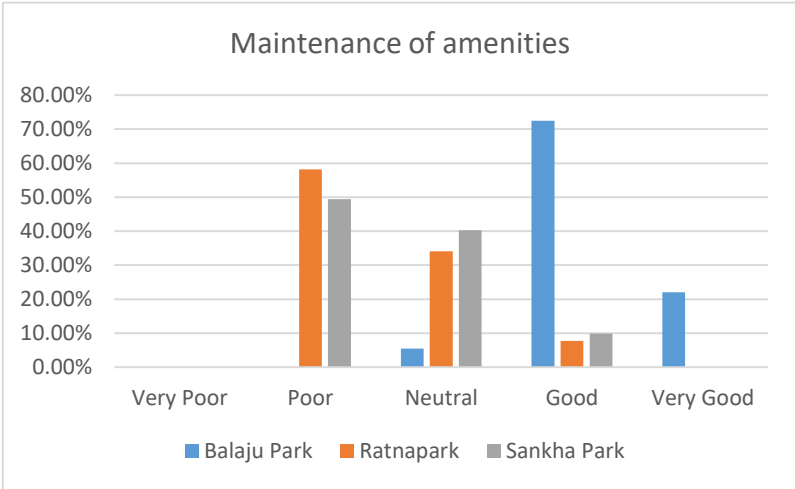

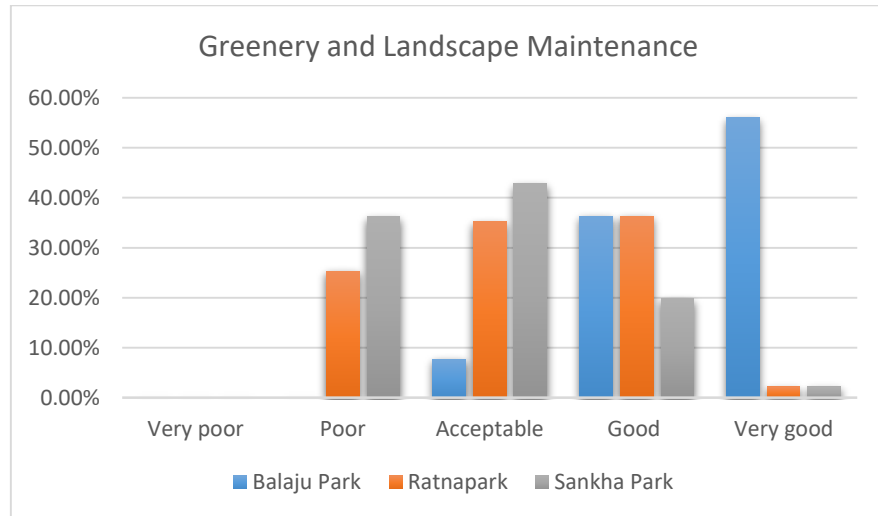*Figure 72 Graph showing response on maintenance of natural features of park*

Figure 73 Graph showing response on overall maintenance of Amenities in park

Table 27 Descriptive statistics of survey for Cleanliness and maintenance

Dimension	Survey questions	Options	Balaju Park	Ratna park	Shankha Park
Cleanliness and maintenance	50. Did you find sufficient waste bins conveniently placed throughout the park?	No	0%	79.1%	83.52%
		Yes	100%	22%	17.58%
	51. How maintained are the park's landscape elements to visitors?	Very poor	0%	0%	0%
		Poor	0%	25.3%	36.26%
		Acceptable	7.7%	35.2%	42.86%
		Good	36.3%	36.3%	19.78%
		Very good	56%	2.2%	2.20%
	52. How would you rate the overall maintenance of amenities and facilities in the park?	Very Poor	0%	0%	0%
		Poor	0%	58.2%	49.45%
		Neutral	5.5%	34.1%	40.29%
		Good	72.5%	7.7%	9.89%
		Very Good	22%	0%	0%

The assessment of Balaju and Ratna Park based on the identified dimensions and indicator provides valuable insights into the strengths and areas for potential improvement in these urban green parks. Balaju and Ratna Park demonstrating better quality scores across multiple indicator and the indicator with lower score which requires improvement are tabulated below:

For the validation of the result obtained participant feedback survey was conducted in all three parks. Where people were asked about which park they like most in all three parks and what the indicator they like most in respective park are and which indicator they should work on to improve. So the result from the survey shows that 48% people prefer to visit Balaju Park, 28% Ratna Park and 24% Shankha Park. The survey results reveal that Balaju Park exhibits several high-scoring indicators, indicating its overall positive quality. The indicator with high score in Balaju park includes accessible entrance, Fences, Connecting path networks, Senior friendly activities, Gender neutral facilities, Guiding signage, Recreational activities, Relaxing, Socialising, Landscape and greenery, Natural aesthetic, Wildlife and nature, Soundscape, Welcoming and safe, Women safety, Multi-functionality of space, educational visits. However, improvement is needed in specific areas, including security arrangements, maintenance of water features, children's play areas, provision of drinking water taps, picnic area amenities, universal design features, and addressing issues related to alcohol or drug use. Allocating budget and prioritizing these areas for enhancement can significantly contribute to elevating the overall park quality. The participant feedback survey aligns with the calculated results, validating that Balaju Park stands out as a high-quality park compared to three parks.
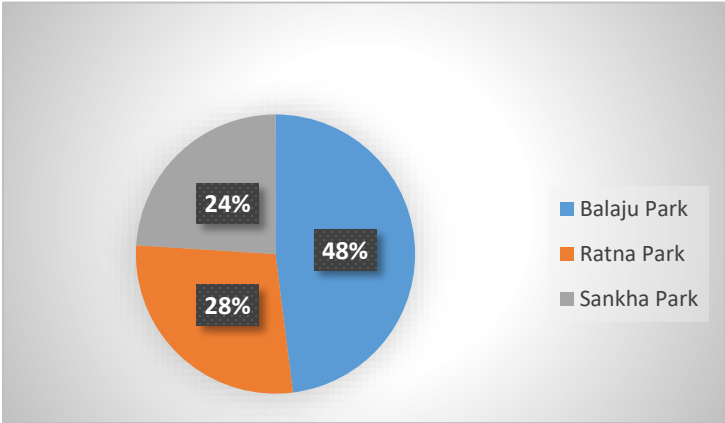

Figure 74 Respondent preference to visit park

Also the high scoring indicator for Ratna parks includes Universal design features, Gender neutral facilities, Welcoming and safe, Landscape and greenery, Women safety and Multi functionality of space. However, areas for improvement are identified in parking facilities, provision of drinking water taps, guiding signage, physical fitness activities, degree of shade, litter collection, maintenance of amenities, and lighting. This calls for focused attention and budget allocation to enhance these aspects, ensuring a well-rounded improvement in Ratna Park's

overall quality. In the case of Shankha Park, high-scoring indicators include Connecting path network, Landscape and Greenery, Wildlife and nature, Clear sightlines, Women safety, Area exposed to sun. However, low scores in universal design features, inclusive playgrounds, accessible amenities, parking facilities, educational visits, water features, lighting, security arrangements, provision of shades, litter collection, provision of drinking water taps, and guiding signage indicate areas requiring attention and improvement. The participant survey also reflects concerns about Shankha Park, emphasizing the need for concerted efforts to enhance various indicators. The data suggests that, when allocating budget and resources, priority should be given to improving Shankha Park, followed by Ratna Park and Balaju Park, to ensure comprehensive enhancements across all three parks.

CHAPTER 6: DISCUSSION

The assessment of urban green parks across a spectrum of dimensions provides a way through which helps to understand and assess the quality of Balaju Park, Ratna Park, and Shankha Park. Each dimension, from Access and Linkages to Cleanliness and Maintenance, serves as a critical aspect shaping the overall park experience for visitors. The discussion unfolds as it explore the strengths, challenges, and potential areas for enhancement within each dimension. In this section eleven dimensions with its indictors will be discussed in detail.

a. Access and Linkage

The Access and Linkage dimension in the assessment of Balaju Park, Ratna Park, and Shankha Park is foundational to ensuring that these urban green spaces are easily accessible, interconnected, and welcoming to diverse segments of the community. A proximity score for Shankha Park suggests that the park is not very closely situated to its target demographic or the urban centre. This result in reduced accessibility for some potential park visitors, which might include local residents or those who need to travel a considerable distance to reach the park. Improving proximity often involves considerations of location and urban planning to ensure that parks are conveniently located for the communities they serve.

Additionally, low score for accessible entrances in Shankha Park indicates that there are limitations or barriers to convenient access, particularly for individuals with mobility challenges or disabilities. This score is indicative of factors such as lack of ramps and insufficient signage and facilities to assist individuals with specific needs. Enhancing accessible entrances is essential to ensure that the park is welcoming and accommodating for all members of the community, fostering inclusivity and providing a positive experience for a broader range of visitors. Most of other indicators surpass the average range, signifying well-established transportation options, effective fencing, and a comprehensive pathway network that enhances accessibility and overall quality in these urban green parks.

b. Inclusiveness

The evaluation of urban green parks with respect to inclusiveness is important in understanding the extent to which these public spaces cater to the diverse needs of the community. The significant score disparities observed in universal design features, with Balaju Park scoring lower (0.2) and

Shankha Park even lower (0.00), prompt an exploration into the underlying factors influencing these outcomes. Universal design features aim to create spaces accessible to individuals of all abilities. The lower scores results due to indicative of a lack of ramps, handrails, or other accommodations that facilitate ease of access for individuals with mobility challenges. Balaju Park's lower score in inclusive playgrounds (0.03) suggests a potential deficiency in equipment or features that cater to children of varying abilities. In contrast, Shankha Park's negligible score in universal design category (0.00) raises concerns about the overall inclusivity of its recreational spaces, necessitating a closer look at the design and equipment provided for children. Shankha Park's lower score in accessible amenities (0.16) signals potential challenges in providing facilities that are universally accessible. This include restrooms, seating areas, or other amenities that may not adequately accommodate individuals with disabilities. Identifying and addressing these specific shortcomings is essential for enhancing the park's overall accessibility. The consideration of gender-neutral facilities in park design is crucial for encouraging inclusivity. All three parks appear to have scored adequately in this aspect, indicating a positive step towards providing facilities that cater to individuals irrespective of gender. Shankha Park exhibits a notably lower score in control at entrances (0.49), implying potential issues related to security or management at park entry points. A thorough examination of the control mechanisms in place is necessary to identify deficiencies and implement measures that ensure the safety and comfort of park visitors.

c. **Amenities and Facilities**

The evaluation of amenities and facilities within the urban green parks reveals critical insights into the current state of infrastructure and services provided for park visitors. The alarming scores for parking in Ratna Park (0.00) and Shankha Park (0.02) indicate a substantial deficiency in available parking spaces. This deficiency not only poses an inconvenience for visitors but also raises concerns about traffic management in the vicinity of these parks. The designated zone should be separated for the parking as it is one of the import aspect for any parks. The low scores for guiding signage in both Ratna Park (0.28) and Shankha Park (0.00) underscore a significant gap in way finding infrastructure. Navigational challenges can diminish the overall enjoyment of the park, especially for first-time visitors. Also low scores for picnic areas and shelters in both Ratna Park (0.33) and Shankha Park (0.13) suggest a lack of designated spaces for recreation and protection from the elements. Creating well-defined picnic areas with adequate shelters can foster a sense of

community and encourage visitors to spend more time in the parks, contributing to a vibrant and engaging atmosphere. The notable absence of drinking water taps in all three parks is a cause for concern regarding the health and well-being of park visitors Access to clean and potable water is a fundamental necessity, and efforts should be directed towards installing drinking water facilities within the park to ensure the comfort and hydration of visitors.

d. Activities

The assessment of park quality in terms of activities delves into the diversity and inclusivity of offerings, catering to a broad spectrum of interests and age groups. The notable disparity in the percentage of respondents engaging in physical fitness-related activities is striking. While Balaju Park register 20.9%, Shankha Park records a significantly higher 46.15%, and Ratna Park reports a complete absence of participation in this category. The lack of emphasis on physical fitness in Ratna Park attributed to lack of dedicated spaces, equipment, or organized programs that encourage visitors to engage in fitness activities. Addressing this gap is crucial to promoting a healthier lifestyle and maximizing the utility of the park space.

Shankha Park's relatively lower score (0.15) in educational visits suggests a potential area for improvement in terms of incorporating educational elements within the park. Educational visits can encompass guided tours, informational displays, or workshops that contribute to a holistic experience for visitors specially children. Enhancing the educational aspects of Shankha Park could contribute to a more enriching and informative environment. The scores for children's play areas reveal areas for improvement in all three parks. The reasons for these lower scores include insufficient or outdated play equipment, lack of age-appropriate zones and also inadequate safety measures. Investing in upgraded and well-designed children's play areas is imperative to ensure that parks are appealing and enjoyable for families with young children. The promotion of physical fitness activities in Ratna Park, enhancement of educational components in Shankha Park, and the revitalization of children's play areas in all three parks emerge as key priorities. Addressing these aspects will contribute not only to the overall quality of park experiences but also to the health, education, and recreational well-being of the communities they serve.

e. Aesthetic and Attraction

The Aesthetic and Attraction dimension is integral in assessing the overall quality of urban green parks. The higher scores in indicators such as Landscaping and Greenery, Wildlife and Nature and Soundscape indicate that both Balaju Park and Ratna Park excel in providing visually appealing landscapes, integrating natural elements, and offering pleasant auditory experiences. These scores reflect a successful implementation of design and maintenance strategies that contribute to the overall aesthetic enjoyment of the parks. In contrast, Shankha Park exhibits lower scores in specific indicators, particularly Non-natural Aesthetic (0.44), Water Features (0.38), and Soundscape (0.46). These scores suggest areas where enhancements could significantly benefit the park's overall aesthetic appeal. The lower rating in non-natural aesthetic elements indicate a need for improvements in the design and integration of human-made features within the park. The Water Features indicator (0.38) highlights potential issues related to the maintenance or absence of well-designed water elements, suggesting that enhancing or introducing water features could significantly contribute to the park's visual appeal. The lower score in the Soundscape indicator (0.46) indicates a potential need for improvements in managing ambient sounds within the park including minimizing disruptive noises and enhancing positive auditory experiences.

f. Safety and Security

The Safety and Security dimension important in evaluating the quality of urban green parks, as it directly influences the well-being and comfort of park users. Balaju Park and Ratna Park emerge as generally perceived safe and welcoming spaces, with a notable preference for the safety measures in Balaju Park compared to Shankha Park. The positive perception of safety in these parks attributed to effective management strategies, visible security presence that brings a sense of security among park visitors. In contrast, the lower scores in the Lighting indicator for both Ratna Park (0.3) and Shankha Park (0.11) implies potential inadequacies in the lighting infrastructure of these parks, which can contribute to diminished visibility and a sense of insecurity, especially during evening hours. Also, Shankha Park stands out with a lower score of 0.28 in the Security Arrangements indicator. This indicates a potential need for enhancements in the park's security infrastructure, such as the deployment of security personnel, installation of surveillance systems, or the implementation of proactive security measures. Strengthening security arrangements is crucial to build confidence and create a safe space for visitors.

g. Culture and History

The Culture and History dimension in the assessment of urban green parks is paramount, as it serves as a custodian of cultural heritage, a platform for celebrating local identity, and an avenue for diverse cultural opportunities. The evaluation, encompassing Historical Features, Cultural Events, and Preservation indicators, reveals that Balaju Park and Shankha Park bear historical significance through the presence of landmarks or features. This dimension adds a layer of cultural depth, offering visitors a connection to the community's past and contributing to a more enriched park experience. Noteworthy is the absence of historical features in Ratna Park, emphasizing that the park's value is not diminished but rather aligned with different community needs. Importantly, the assessment underscores the significance of parks in reflecting and celebrating cultural and historical contexts. Parks with historical features, like Balaju Park and Shankha Park, become not just recreational spaces but cultural hubs, increasing community pride and providing platforms for cultural expression. To enhance this dimension, future considerations may include integrating cultural events, celebrations, and interpretive elements within parks, further promoting community engagement and a profound sense of identity among local residents.

h. Flexibility

The Flexibility dimension in the assessment of urban green parks serves as a crucial measure of their adaptability and versatility in meeting diverse community needs. The scores in the indicator multi-functionality of space for Balaju Park (0.901) and Ratna Park (0.956) underscore their proficiency in providing adaptable spaces, showcasing a commitment to versatility. Conversely, Shankha Park's low score of 0.51 in the same indicator suggests rigidity in planning and potential zoning inadequacies, highlighting areas for improvement to enhance the park's overall adaptability. Notably, while all three parks receive average scores in the flexibility of event space indicator, there is a clear indication of room for improvement. This implies that enhancements in their capacity to accommodate a broader spectrum of activities and events are warranted. To increase their adaptability, the parks might explore strategies such as modular designs, configurable seating, or dedicated event zones.

i. Climate Comfort

The Climate Comfort dimension within the assessment of urban green parks is a critical consideration for ensuring the comfort and well-being of park visitors. The results highlight specific areas of concern within Ratna Park and Shankha Park, particularly in the Degree of Shade indicator, where both parks exhibit lower scores of 0.37 and 0.3, respectively. This indicates a potential lack of sufficient shade, prompting the need for strategic interventions such as installation of shade structures to enhance visitor comfort, especially during sun-exposed periods.

Moreover, the indicators for Air and Noise Pollution underscore areas that may require attention in Ratna Park and Shankha Park, with scores of 0.54 and 0.37, respectively. Mitigating air and noise pollution is crucial for creating a healthier and more serene park environment. Collaborating with local authorities, planting additional greenery to act as natural filters, and incorporating sound-absorbing features within the park are potential strategies to address these concerns .In essence, enhancing the Climate Comfort dimension in Ratna Park and Shankha Park is not only about providing physical comfort but also making ecologically sound and enjoyable environment for park visitors. By implementing targeted measures to improve shade provision and mitigate pollution, these parks can transform into more welcoming, comfortable, and environmentally sustainable spaces, aligning with the broader goal of creating urban green areas that contribute positively to the well-being.

j. Anti-Social Behaviour

In Balaju Park, where the quality score for the Alcohol use and other drugs indicator is 0.55, there is a pressing need to focus on enhancing prevention, treatment, and enforcement measures to address observed instances of substance use in the park. This signifies the importance of implementing security measures, educational campaigns, and community engagement initiatives to ensure a secure and positive park experience. Similarly, Ratna Park and Shankha Park, with quality scores of 0.53 and 0.51, respectively, in the General Litter indicator, indicate a need for improvement in maintaining cleanliness and managing litter effectively. Strategies such as increased waste management efforts, the installation of additional waste bins plays an important role in mitigating litter issues and enhancing the overall cleanliness of these parks. By addressing these aspects, urban green parks can be more welcoming and secure, having positive recreational environment for all park visitors.

k. Cleanliness and Maintenance

The Cleanliness and Maintenance dimension in the assessment of urban green parks plays an important role in shaping the overall quality of these public spaces. With indicators including Waste Bins, Greenery and Landscape Maintenance, and Maintenance of Amenities, the evaluation of Ratna Park and Shankha Park reveals areas that necessitate immediate attention for improvement. Both parks exhibit lower scores in the Litter Collection indicator (0.22 for Ratna Park and 0.18 for Shankha Park), indicating a pressing need to enhance waste management practices. Implementing strategies such as more frequent litter collection, strategic placement of additional waste bins, and education on responsible waste disposal can significantly contribute to resolving these challenges. Furthermore, the Maintenance of Amenities indicator shows lower scores for both Ratna Park (0.37) and Shankha Park (0.39), emphasizing the need for focused efforts in ensuring the upkeep and functionality of park amenities. Regular inspections, prompt repairs, and user's involvement in reporting and monitoring the condition of facilities are essential to maintaining the quality and usability of park amenities. By addressing these cleanliness and maintenance aspects, Ratna Park and Shankha Park have the potential to create a more welcoming, aesthetically pleasing, and functional environment for park-users, contributing to the overall well-being and satisfaction of the community. A collaborative effort involving park management, local authorities, and the community is crucial to effectively address and rectify these issues, ensuring that urban green parks remain valuable assets for residents and visitors alike.

CHAPTER 7: CONCLUSION

7.1 Conclusion

In conclusion, this thesis represents a pioneering effort in the realm of urban planning and community well-being by introducing a tool for the assessment of urban green park quality. Through the adoption of a mixed-methodology approach, the research has successfully identified and quantified key dimensions and indicators essential for evaluating the quality of urban parks of various kinds. The application of this tool to prominent parks in Kathmandu Metropolitan City— Balaju Park, Ratna Park, and Shankha Park has not only has it illuminated their present condition, but it has also revealed aspects that require enhancement.

The findings underscore the significance of urban green spaces in the face of escalating urbanization challenges and emphasize their pivotal role in enhancing the quality of life for city residents. By offering a systematic and quantitative assessment framework, this tool equips policymakers, urban planners, and community stakeholders with actionable insights for informed decision-making. The scores derived for each park, with Balaju Park at 0.643, Ratna Park at 0.556, and Shankha Park at 0.495, not only indicate areas for enhancement but also provide a benchmark for future evaluations and comparisons.

As urban landscapes continue to evolve globally, the development and application of such assessment tools become imperative for steering urban planning strategies in the direction of sustainability, inclusivity, and improved community well-being. This thesis contributes not only to the specific context of Kathmandu Metropolitan City but also adds to the broader discourse on the role and quality of urban green spaces in the face of rapid urbanization. Ultimately, it is envisaged that the insights derived from this research will catalyse positive transformations in park design, management, and overall urban green space enhancement, fostering healthier, happier, and more sustainable urban environments for current and future generations.

7.2 Recommendation

The research undertaken in this thesis has provided valuable insights into the quality assessment of urban green parks, specifically focusing on Balaju Park, Ratna Park, and Shankha Park in Kathmandu Metropolitan City. The application of a mixed-methodology approach, combining

literature review, surveys, and participant feedback, has yielded comprehensive data on various dimensions and indicators crucial for evaluating park quality. Here are few recommendations that offers a practical roadmap for implementing positive changes in urban green parks. With the help of these recommendation, authorities and urban planners can contribute to enhance the park quality.

1. Integration of Assessment Tool in Urban Planning Practices

   This identified tool for quality assessment of urban green parks can stands as a valuable resource, providing a clear and consistent guide for the evaluation and enhancement of urban parks by incorporating the tool into the routine procedures of different planning authorities.

2. Focused Enhancements Based on Assessment Findings

   This approach aims to facilitate improvement in the overall quality of each park. For this the focus should be on prioritizing the identified improvement areas in Balaju Park, Ratna Park, and Shankha Park such as Children play area, Provision of drinking water taps, Universal design features, Lighting, security arrangements etc.

3. Budget Allocation and Phased Implementation:

   Allocation of budgets should be done strategically, adopting a phased implementation approach. Start with Shankha Park, addressing its multiple identified areas needing attention. Subsequent phases can focus on Ratna Park and Balaju Park, ensuring a gradual and comprehensive improvement.

4. Utilization of Scores as Benchmarks:

   By utilizing the derived scores (Balaju Park: 0.643, Ratna Park: 0.556, Shankha Park: 0.495) as benchmarks for future evaluations. Periodic assessments using established scores will provide a basis for tracking improvements and guiding ongoing efforts to enhance urban green spaces.

5. Application Beyond study area

   The use of the developed assessment tool should also be used beyond the study area. It encourages application of the tool globally by sharing methodology and best practices, fostering positive changes in urban green spaces and community well-being.

6. Continued Research and Adaptation:

   It is necessary to have culture of continued research to adapt assessment tools to evolving urban challenges. It may encourage researchers to build on this pioneering effort, exploring new dimensions, indicators, and methodologies to refine the assessment of urban green park quality.

7.3 Recommendation for Future Research

Due to time constraints, this study focused on three parks to develop the assessment tool. However, future researchers can expand the study to include more diverse study areas. The current research calculated scores for the selected parks, and future investigations could set benchmarks, such as a standard minimum quality score, for comparison. For instance, researchers could consider grading parks based on predetermined standards, like a threshold score, to categorize them into different quality grades. This approach would provide a standardized framework for evaluating and comparing urban green parks.

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ANNEX I Survey Questionnaires Sample

Balaju Park/ Ratna Park/Shankha Park

Date:

Questionnaire for Respondents

This questionnaire has been developed as per the requirement of the master's thesis study in Urban Planning under Department of Architecture, Pulchowk Campus, Lalitpur, I.O.E., T.U.

Consent from the interviewee

The survey will be conducted completely anonymously. I will group all the information that I have gathered and analyse to reach logical conclusion for my study. I will use the information and publish in my research thesis and paper. Would you be willing to participate voluntarily in the survey?

- o Yes
- o No

Name: _____ Age: _____ Gender_____

A. Access and linkages

1. How do you travel to park?
   - o Private Vehicles
   - o Public Transportation
   - o Cycling
   - o Walking
   - o Other
2. How much time does it take to reach the park?
   - o Within 5 min walk distance
   - o 5- 15 min
   - o 15-30 min
   - o 30min - 1 hour
   - o More than hour
3. How easy is it to access park entrances?
   - o Very Difficult
   - o Difficult
   - o Neutral
   - o Easy
   - o Very Easy
4. Do people prefer parks with fences?
   - o Yes
   - o No

5. How would you rate the ease of movement in and around the park?
   - o Very Difficult
   - o Difficult
   - o Neutral
   - o Easy
   - o Very Easy

B. Inclusiveness
6. Can people of all ages and abilities get to and around the park?
   - o Yes
   - o No
7. a. Does the park have playground for children?
   - o Yes
   - o No

   b. If yes does the playground area caters to children of all abilities?

   - o Yes
   - o No
8. How would you rate the accessibility of amenities in the park (e.g., restrooms, seating areas) for people with disabilities?
   - o Very Poor
   - o Poor
   - o Average
   - o Good
   - o Excellent
9. Are there specific activities or facilities in the park that cater to the needs of senior citizens?
   - o Yes
   - o No
10. Is there provision of separate toilets for male and female?
    - o Yes
    - o No
11. Is it difficult to access park based different cultural background?
    - o Yes
    - o No
12. Do you think the park should charge an entrance fee?
    - o Yes
    - o No

C. Amenities and Facilities
13. Is there enough parking space at park to accommodate visitors' vehicles?
    - o No parking
    - o Limited
    - o Don't know
    - o Adequate
    - o More than Adequate
14. Are there enough seating benches available in park to accommodate visitors?
    - o Not Enough

- o Somewhat Not Enough
- o Neutral
- o Adequate
- o More than Enough

15. How likely are you to recommend this park to others based on the availability of picnic space and shades?
    - o Very Poor
    - o Poor
    - o Neutral
    - o Good
    - o Very Good

16. a. Is there provision of drinking water taps?
    - o Yes
    - o No

    b. Are there an adequate number of drinking water taps available?

    - o Not Enough
    - o Somewhat Not Enough
    - o Neutral
    - o Adequate
    - o More than Enough

    c. How would you rate the cleanliness and safety of the drinking water provided by the taps in the park?

    - o Very Poor
    - o Poor
    - o Neutral
    - o Good
    - o Very Good

17. a. Are there an adequate number of public toilets available in the park to meet the needs of visitors?
    - o Not Enough
    - o Somewhat Not Enough
    - o Neutral
    - o Adequate
    - o More than Enough
    b. How would you rate the cleanliness of public toilets in the park?
    - o Very Poor
    - o Poor
    - o Neutral
    - o Good
    - o Very Good

18. Is there a cafe or food kiosk available within the park?
    - o Yes
    - o No

19. Are there guiding signage throughout the park to help visitors find their way?
    - o Yes

o   No

D. Activities

20. a. For what purposes do you visit the park?
    o   Physical activities (Walking, jogging, exercise, sports)
    o   Informal activities (strolling, relaxing, family outing)
    o   Quiet activities (reading, meditating)
    o   Social activities (socializing, cultural activities, attending meetings)
    o   Other

    b. Do you participate in any physical fitness-related activities in this park?

    o   Yes
    o   No

    c. If yes how would you rate the availability and suitability of fitness-related facilities in the park?
    o   Very Poor
    o   Poor
    o   Neutral
    o   Good
    o   Excellent

21. Do you find the area of the urban green park is sufficient for children's activities?
    o   Not sufficient
    o   Somewhat not sufficient
    o   Neutral
    o   Sufficient
    o   More than sufficient

22. How enjoyable is your experience of relaxation or quite activities at this park?
    o   Not Enjoyable
    o   Somewhat Not Enjoyable
    o   Neutral
    o   Enjoyable
    o   Very Enjoyable

23. Are there designated places in the park that encourage social interaction among visitors?
    o   Not sufficient
    o   Somewhat not sufficient
    o   Neutral
    o   Sufficient
    o   More than sufficient

24. How well does the park accommodate events and gatherings?
    o   Very Poor
    o   Poor
    o   Neutral

      o   Good
      o   Excellent

25. Do you think the park provides educational opportunities for children, such as bird-watching and observing different species of plants etc.?
      o   Strongly Disagree
      o   Disagree
      o   Neutral
      o   Agree
      o   Strongly Agree

E. Aesthetic and Attraction
26. How would you rate the overall landscaping and greenery in the park?
      o   Very Poor
      o   Poor
      o   Neutral
      o   Good
      o   Very Good
27. How would you rate the park's efforts in preserving and promoting natural aesthetic elements (e.g., natural vegetation, wildlife habitat)?
      o   Very Poor
      o   Poor
      o   Neutral
      o   Good
      o   Very Good
28. How well does the park incorporate non-natural aesthetics (e.g., art installations, sculptures) into its design?
      o   Very Poor
      o   Poor
      o   Neutral
      o   Good
      o   Very Good
29. How well are water features integrated into the park's design and maintained?
      o   Very Poor
      o   Poor
      o   Neutral
      o   Good
      o   Very Good
30. a. Did you observe any wildlife or nature elements (e.g., birds, butterflies) during your visit?
      o   Yes
      o   No

b. If yes do you enjoy observing wildlife and appreciating nature while visiting the urban green park?

      o   Not Enjoyable
      o   Somewhat Not Enjoyable

- o Neutral
- o Enjoyable
- o Very Enjoyable

31. How would you describe the soundscape of the park? (e.g., birdsong, flowing water, tranquillity)
    - o Very Displeasing
    - o Displeasing
    - o Neutral
    - o Pleasing
    - o Very pleasing

F. Safety and Security

32. Do you feel welcome and safe in and around the park?
    - o Strongly Disagree
    - o Disagree
    - o Neutral
    - o Agree
    - o Strongly Agree

33. How would you rate the presence of lighting within the park?
    - o Very Poor
    - o Poor
    - o Neutral
    - o Good
    - o Very Good

34. How would you rate the security arrangements at the urban green park to ensure the safety of visitors?
    - o Very Poor
    - o Poor
    - o Neutral
    - o Good
    - o Very Good

35. How effective are the clear sight lines within the park, allowing good visibility and reducing potential hiding spots?
    - o Very Ineffective
    - o Ineffective
    - o Neutral
    - o Effective
    - o Very Effective

36. Did you feel that the park is safe for women's visits?
    - o Yes
    - o No

G. Culture and History

37. a. Are there any historical features or landmarks within the park?

   o Yes

   o No

b. How much does the historical significance of the urban green park contribute to your overall experience and enjoyment of the park?

   o Not Much
   o Somewhat Not Much
   o Neutral
   o Significant
   o Very Significant

38. Have you ever been part of any popular activities, events and festivals in space?
   o Yes
   o No

39. How would you rate the park's efforts in preserving and showcasing its cultural and historical heritage?
   o Not at all
   o Slightly
   o Moderately
   o Very engaging
   o Extremely engaging

H. Flexibility

40. Is the park layout designed in a way that allows for different activities to take place simultaneously without interference?
   o Yes
   o No

41. How would you rate the urban green park's flexibility in accommodating a variety of activities and events?
   o Not Flexible
   o Somewhat Not Flexible
   o Neutral
   o Flexible
   o Highly flexible

I. Environment

42. How would you rate the park's areas in terms of sunlight exposure?
   o Very Poorly Exposed
   o Poorly Exposed
   o Neutral
   o Well Exposed
   o Very Well Exposed

43. How would you rate the availability of shaded areas in the park for protection in summer season?

- Very Poor
- Poor
- Neutral
- Good
- Excellent

44. How would you rate the park's efforts in providing adequate greenery to enhance the climate comfort?
      - Very Poor
      - Poor
      - Neutral
      - Good
      - Excellent

45. How would you rate the overall air quality and noise levels in the park?
      - Very Poor
      - Poor
      - Neutral
      - Good
      - Very Comfortable

J. Anti-social behaviour

46. How would you rate the cleanliness of the park in terms of general litter?
      - Very Poor
      - Poor
      - Neutral
      - Good
      - Very Good

47. Have you observed or heard about any kind of theft activity in park during your visits?
      - frequently
      - occasionally
      - Neutral
      - rarely
      - never

48. During your visit to the park, did you observe any of the following behaviours related to alcohol use and other drugs?
      - Yes
      - No

K. Cleanliness and maintenance

49. Did you find sufficient waste bins placed throughout the park?
      - Yes
      - No

50. How attractive and maintained are the park's landscape elements to visitors?
      - Very Unattractive
      - Unattractive
      - Moderately Attractive

- o Attractive
- o Extremely Attractive

51. How would you rate the overall maintenance of amenities and facilities in the park?
    - o Very Poor
    - o Poor
    - o Neutral
    - o Good
    - o Very Good

ANNEX II Matrix Table

(For a review of dimensions of different tools used for quality assessment of urban green spaces and parks)

Tool	Welcoming Surrounding	Access and Linkage	Facilities	Inclusive	Amenities	Aesthetic and attraction	Antisocial behaviour	Safety	Activities	Biodiversity And environment	Maintenance	Climate comfort	Proximity	Size	Culture and History	Local identity (Image)	Community involvement and	Permeability and movement	Flexibility	Financial sustainability
(GFA, 1990)	1	1	1	1	1			1	1	1	1	1			1					
NGSA (Lindholst et al., 2016)		1	1	1		1			1	1			1	1	1		1			
LEEDS 2022-2032	1					1				1	1				1					
(ULI,2021)		1	1	1	1	1		1	1	1	1	1				1				
(Knobel et al., 2019)	1	1	1	1	1	1	1	1	1	1										
(Bahriny & Bell, 2020)		1	1	1	1	1	1	1	1	1		1						1	1	
[Praliya & Garg, 2019]		1		1	1	1		1	1		1	1								
(RECPHEC, 2016)		1	1	1	1	1	1	1			1				1					1
(Acharya & Lal, 2022)		1	1	1			1	1			1									
(Shrestha ,2022)		1	1	1					1		1					1				
TOTAL	3	8	7	8	6	7	4	7	7	6	7	4	1	1	4	2	1	1	1	1

Annex III IOE GC Acceptance Letter and Paper

Date: November 26, 2023

To Whom It May Concern:

This is to certify that the paper titled "*Quality Assessment of Urban Green Parks – A Case of Kathmandu Metropolitan City*" (Submission# **370**) submitted by **Prativa Khanal** as the first author has been accepted after the peer-review process for presentation in the 14th IOE Graduate Conference being held during Nov 29 to Dec 1, 2023. Kindly note that the publication of the conference proceedings is still underway and hence inclusion of the accepted manuscript in the conference proceedings is contingent upon the author's presence for presentation during the conference and timely response to further edits during the publication process.

Bhim Kumar Dahal, PhD
Convener,
14th IOE Graduate Conference

Quality Assessment of Urban Green Parks – A Case of Kathmandu Metropolitan City

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Abstract
Urban green parks serve as essential spaces for recreation, relaxation, and environmental enrichment in rapidly growing cities like Kathmandu. Ensuring the quality of these parks is crucial to enhance the well-being of urban residents and promote sustainable urban development. This research paper aimed to develop tool for the quality assessment of urban green parks in Kathmandu Metropolitan City. In this research qualitative approach has been followed to identify a set of eleven key dimensions that contribute to evaluation of these green spaces. Here the identified tool offers valuable insights into the strengths and weaknesses of urban green parks in Kathmandu, which highlights their collective impact on overall quality. As a result, the tool presented here can act as practical tool for urban planners and authorities to prioritize enhancements that enhance the quality of these urban green parks, ultimately promoting the well-being and sustainability of the city.

Keywords
Green Spaces, Urban green parks, Quality Assessment, Dimensions, Tool

1. Introduction

The significance of green spaces in urban areas has been recognized to varying extents since the late 19th century [1].These urban green spaces come in various forms, encompassing city parks, gardens, playgrounds, pocket parks, residential green areas, forests, and vegetated zones within neighborhoods [2].Among these, Urban Green Parks stand out as a distinct category, intentionally designed and designated as parks in urban settings[3].Cities around the world are increasingly recognizing the vital role of high-quality urban parks in addressing the challenges posed by urbanization and climate change [4].The quality of urban green parks plays a significant role in enhancing social well-being, promoting environmental sustainability, providing recreational opportunities, and improving public health [5].While research on Urban Green Parks has explored various quality dimensions limited in their particular scope there remains a noticeable gap in studies that comprehensively examine their overall collective impact on well-being [6].

In context of Kathmandu, the Kathmandu Valley Development Authority (2015) published the "Atlas of Open Spaces," which highlights the significance of parks and playgrounds by identifying them. However, it doesn't address their maintenance and improvement methods. Additionally, there's a need for quality assessment tools for parks in Nepal. Research focused on this aspect in urban area is crucial for the city's growth and the well-being of people.

2. Rationale of Research

The current state of urban green parks in Kathmandu presents several challenges and gaps in understanding and evaluating their quality. Current assessments focus on objective aspects, overlooking subjective experiences and well-being benefits. By developing the quality assessment tool the research will help in the extent to which parks fulfil their intended purposes and meet the diverse needs of the population. By assessing the quality dimensions in parks, policymakers and urban planners can make informed decisions to improve design, management and quality.

3. Problem Statement

The scarcity of urban green parks in urban areas presents several challenges and negative consequences for the overall well-being and sustainability of these environments. Lack of sufficient urban green space hampers social interactions, community cohesion, and mental well-being, as it limits spaces for social gatherings, cultural events, and contact with nature. The quality of urban green parks is influenced by factors such as pollution, insufficient maintenance, inadequate infrastructure and amenities, and limited community engagement. The absence of well-defined dimensions for assessing park quality affects the areas requiring enhancement and allocate resources for park development and maintenance.

4. Research Objective

The main objective of research is to develop quality assessment tool for assessing the parks quality in Kathmandu Metropolitan City.

5. Literature

5.1 Aspects of urban green spaces

Urban green spaces are pivotal for a multitude of reasons. They enhance physical health by offering space for exercise and

Figure 1: Benefits of urban green space

relaxation. They also improve mental health, providing serene environments for stress relief. These spaces foster social cohesion, acting as community hubs for social interaction. Environmentally, they reduce pollution, support biodiversity, and mitigate urban heat. Economically, they boost property values and tourism. Aesthetically, they beautify the urban landscape. They also preserve culture and history, aid in disaster preparedness, and provide emotional well-being through a sense of serenity. In summary, urban green spaces have far-reaching positive impacts on urban quality of life. These considerations collectively emphasize the fundamental role of urban green spaces in elevating well-being, sustainability, and the overall quality of life in urban environments. The dimensions selected for evaluation are aligned with the various contributions made by urban green spaces to these aspects.

5.2 International Approaches for Quality Assessment

For this paper seven international approaches for quality assessment including quality dimensions have been studied in detail. The international approaches to quality assessment encompass various standards and dimensions. The Green Flag Award, recognized nationally and internationally, sets a benchmark with eleven quality dimensions for parks and green spaces. Likewise, the Nordic Green Space Award, a collaborative effort by Denmark, Sweden, and Norway, assesses various types and sizes of green spaces at the municipal or regional level through ten quality dimensions. The Leeds Park and Green Space Strategy 2022-2032, initiated by the Leeds City Council in the UK, aspires to create vibrant, sustainable, people-centric green spaces, focusing on eight dimensions. Different authors have proposed varying numbers of dimensions for park quality assessment. Here five dimensions by [7], ten dimension by [6], thirteen dimension by [8], and seven dimension by [9]. To align with Nepal's context, the selection process prioritizes dimensions that are frequently mentioned in the literature and hold contextual relevance.

5.3 National Approaches for Quality Assessment

In Nepal, there have been several efforts to evaluate urban spaces, but relatively few have specifically addressed the quality of urban green parks, and these endeavours have often been narrowly focused. Here, three national approaches, along with their associated quality dimensions, have been studied in

detail. For instance, A Study on Public Spaces of Kathmandu Metropolitan City for Policy Revision conducted by [10] explored five dimensions. Another study by [11] concentrated on five dimensions related to gender inclusiveness in urban space planning. Additionally, [12] identified six dimensions for assessing the quality of public open spaces in the Kathmandu Valley. Through an analysis of these diverse dimensions proposed by various authors, it becomes evident which aspects are commonly emphasized and which dimensions require further attention for a comprehensive evaluation of urban green parks.

6. Methodology

6.1 Research Paradigm

The research was carried out using qualitative methodology within the interpretative paradigm. Firstly the aspects that urban green parks contribute were identified which is mentioned in literature section and based on this dimensions were finalized though the followings steps.

6.2 Dimensions Identification

To evaluate urban green park quality, the first step is defining quality dimensions with a proper theoretical framework[7]. In this study, the factors that urban green space contribute are studied which facilitated the recognition of their benefits which aid in identifying the crucial dimensions. Subsequently, 76 dimensions were identified from the literature. To streamline this, duplicates were removed, and only the most relevant dimensions were selected.

6.3 Dimensions Validation

To validate quality assessment dimensions for urban green parks, a thorough literature review focused on context-specific elements, reducing 76 dimensions to 12. A pilot survey, based on site observations and key informant interviews in Kathmandu Metropolitan City parks, further confirmed these dimensions' validity. Pilot survey was conducted as a qualitative approach to validate the dimensions for assessing urban green park quality. These visits were characterized by informal discussions. The primary purpose of pilot survey was to confirm the suitability and relevance of the initially identified dimensions. The Culture and History dimension was incorporated through a pilot survey, recognizing the religious significance of many parks in Nepal, enriching the quality assessment framework. Unlike structured surveys, the approach allowed for open and flexible conversations, ensuring that the selected dimensions accurately represented the key aspects for evaluating urban green park quality in Kathmandu.

6.4 Finalization of Dimensions

The finalization process involved a two-step filter: firstly, selecting dimensions and indicators based on literature relevance to Nepal's context, and secondly, using a pilot survey to assess data suitability, eliminating challenging or non-context-specific dimensions and indicators. This approach yielded a final set of 11 dimensions for urban green park quality assessment.

Table 1: Eleven Dimensions

S.N.	Dimensions	Justification
1.	Access and Linkage	[6], [7], [8], [9], [11], [12]
2.	Inclusiveness	[6], [7], [8], [9], [11], [12]
3.	Amenities and Facilities	[6] [7] [8]
4.	Activities	[6], [8], [9], [12], [13]
5.	Aesthetic and Attraction	[6], [8], [9], [12], [13]
6.	Safety and Security	[6], [8], [9], [11], [12]
7.	Culture and History	[13], [14]
8.	Flexibility	[8]
9.	Climate Comfort	[6], [7], [8]
10.	Anti-Social Behaviour	[6],[8], [11], [14], [15]
11.	Cleanliness and Maintenance	[7], [8], [9], [11], [12], [14], [15]

Figure 2: Final dimensions for quality assessment

7. Result and Discussion

The primary research goal was to develop a practical quality assessment tool for evaluating park quality. These identified dimensions now serve as a valuable resource for park management and urban planners, offering a means to enhance the overall quality of urban green parks.

7.1 Tool development

In the early 2010s, assessment tools predominantly centred on physical activity, but gradually, there was a shift towards broader-focused tools, which later became increasingly prevalent. So in this research the development of tool for the Park quality assessment demonstrates a systematic approach to create a reliable and valid tool for park quality assessment in the context of Kathmandu. Its thorough development process ensures that it accurately captures the multifaceted nature of park quality, enhancing the credibility of our research findings.

7.2 Tool Dimensions

Effectively choosing the right dimensions for quality assessment is vital. This ensures that the evaluation process not only functions well but also provides valuable insights. The selection of these tools should closely match the precise objectives and needs of the project. Based on this the following are the finalized dimensions included in tool for quality assessment.

1. Access and Linkage: The Access and Linkage dimension in the park quality assessment tool evaluates the ease of reaching and connecting urban green parks. Access considers factors like proximity to residential areas, transportation options, and the availability of amenities. Linkage assesses how well the park integrates with its surroundings, fostering connectivity within the city. Ensuring convenient access and effective linkage is essential for promoting park usage, social interaction, and overall well-being in Kathmandu's urban environment..

2. Inclusiveness: The Inclusiveness dimension assesses the park's design and management in terms of its ability to embrace diversity and ensure that it welcomes visitors from various backgrounds. It emphasizes the importance of creating a park environment that is accessible and accommodating to people of different ages, abilities, and cultural backgrounds. Inclusive urban green parks foster a sense of belonging and community, making them more valuable resources for a wide range of visitors.

3. Amenities and Facilities: It evaluates the presence and quality of amenities and services provided within the urban green park. This includes amenities such as seating, restroom facilities, playgrounds, picnic areas, and other services like food vendors or recreational equipment rentals. Assessing these aspects helps determine the park's ability to meet the diverse needs of its visitors and enhance their overall experience, making the park more attractive and functional for the community..

4. Activities: It focuses on evaluating the variety and accessibility of recreational opportunities and social interactions offered within the urban green park. It assesses the availability of activities such as sports, fitness areas,and spaces for social gatherings. This dimension is crucial in understanding how well the park caters to the recreational and social needs of the community

5. Aesthetic and Attraction: This dimension centers on assessing the visual and sensory appeal of the urban green park. It encompasses the park's ability to captivate and engage visitors through a combination of natural elements like landscaping, flora, and fauna, as well as designed features such as sculptures, artwork, and architectural elements. This dimension plays a significant role in enhancing the park's overall ambiance and attractiveness, ultimately influencing its popularity and its ability to draw

people to the park for various recreational and leisure activities.

6. Safety and Security: The Safety and Security dimension delves into various aspects, such as the presence of well-lit pathways, the availability of park personnel or security staff, surveillance systems, and emergency response mechanisms. It assesses how effectively these measures contribute to the safety, well-being, and overall comfort of park visitors. This dimension plays a crucial role in creating a park environment where visitors can enjoy their time without concerns about safety or security issues.

7. Culture and History: This dimension evaluates the extent to which urban green parks celebrate and preserve the cultural and historical heritage of the community. This involves considering elements such as the incorporation of cultural symbols, historical artifacts, or themed areas within the park, as well as organizing events or exhibitions that highlight the local culture and history. By embracing and showcasing the unique cultural and historical significance of the park and the community it serves.

8. Flexibility: The Flexibility dimension assesses the park's capacity to adapt and cater to a diverse range of activities, events, and user needs. It examines whether the park can easily transform to accommodate various purposes, from recreational activities and sports events to cultural festivals and community gatherings. Parks that are flexible and versatile in their use can better serve the dynamic and evolving needs of the community, making them more inclusive and responsive public spaces.

9. Climate Comfort: This dimension encompasses various factors, including the amount of sunlight, the level of shade, the presence of vegetation and greenery, as well as air and noise pollution. These elements collectively contribute to the park's overall climate comfort and environmental quality, influencing the well-being of park users and the ecological sustainability of the space.

10. Anti-Social Behaviour: It focuses on evaluating the presence and extent of behaviors that may negatively impact the park's safety, cleanliness, and the overall experience of park users. This dimension is instrumental in identifying and addressing activities that may disrupt the park's positive atmosphere, ensuring a harmonious and secure environment.

11. Cleanliness and Maintenance: This dimension focuses on evaluating the regular maintenance and cleanliness of the urban green park, ensuring that it remains well-maintained and visually appealing to park users. A well-maintained park aligns with sustainability goals and enhances its value to the community.

7.3 Tool validity and comparability

The park quality assessment exhibited strong evidence of content validity, with its dimensions derived from an extensive review of park quality frameworks. Also the park quality assessment

is comprehensive approach to assessing park quality rendered it highly comparable between the parks but caution should be applied behind the study area. Its multidimensional nature allows for meaningful comparisons between different parks, facilitating a deeper understanding of the relative strengths and weaknesses of each green space.

8. Conclusion

The development of the Park Quality Assessment Tool having eleven distinct dimensions marks a significant input to ability to evaluate and enhance the quality of urban green spaces. Through different processes, including identification, selection, validation the park quality assessment tool has proven to be a reliable and effective instrument for assessing quality of park.Its potential for applicability not only within our specific study but also in urban areas globally positions it as a valuable resource for urban planners, park managers, researchers, and policymakers. The park quality assessment stands to contribute to sustainable urban development, the well-being of city residents, and the preservation of essential green environments. Future applications of the park quality assessment tool hold the promise of advancing the understanding of park quality dynamics and enriching discussions on urban planning and green space management.

While this study successfully identified key dimensions for assessing the quality of urban green parks in the context of Kathmandu, it is important to acknowledge the limitations of the approach. The utilization of key informant surveys primarily involved discussions with the park management team to validate these dimensions and gather their insights. However, it is recognized that a more comprehensive survey methodology, including a wider range of stakeholders and quantitative data collection, would further enhance the credibility and rigor of the analysis. This limitation presents an opportunity for future research, where a detailed survey methodology can be incorporated to provide quantitative data and in-depth analysis. By considering a broader spectrum of perspectives and employing rigorous data collection methods, future studies can delve deeper into the dimensions of park quality and offer more comprehensive insights.

Acknowledgments

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