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Availability, Accessibility, and Optimization of Children's Spaces in Mass Housing: A Case Study of Summit Condominiums in Addis Ababa, Ethiopia

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A Thesis Submitted to the School of Graduate Studies of Ethiopian Institute of Architecture, Building Construction and City Development (EiABC), Addis Ababa University, for the Partial Fulfillment of the Requirement for the Master of Science in Urban Design and Development

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I. DEDICATION

This research is dedicated to the loving memory of my dear friends and family who have greatly influenced my life and career. Your absence has left a void, but your inspiration continues to guide me.[1]

[1] These are my favorite people, the people of wisdom and everlasting heart of love, upon whom absence (R.I.P. to all), I am obliged to change the title of my thesis work. Their names are: *Akhaakhuu* Bule Arero Dadu, *Aabboo-guddaa* Waqo Roba Waqo, *Aabba* Gurro Dida Dima Teqe, *Aabboo* Abb-Khusee Haro Galgalo, *Aabboo* Godana Tuni Khano, *Aabboo* Nura Dida Halakhe, *Aabboo* Halakhe Dida Gobessa, *Aabba* Gurro Okkola, *Soddaa* Qancooraa Guyyoo Aadanoo, *Jaal* Guyyo Gollicha Dida Aja'a and *Jaal* Gurraccha Yayya Lakhe.

These people passed away in a short period between the times I was planning to join this master's class and the time this paper took to get completed. My heart is truly heavy thinking about your absence!

II. DECLARATION

I, **Mr. Jarso Gollisa Roba**, hereby declare that this thesis is my original work and has not been submitted for any other degree or qualification at Addis Ababa University or any other institution.

Signature_____

III. ACKNOWLEDGEMENT

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IV. ABSTRACT

Children today have significantly less access to outdoor play spaces than previous generations. Moreover, the design of existing spaces often fails to meet the dynamic needs of modern children, resulting in decreased engagement in outdoor activities. This study investigates the availability, accessibility, and usability of children's play spaces within Summit Condominium, Addis Ababa. It critically examines how the spatial design of mass housing environments influences children's outdoor play opportunities. As Ethiopia continues implementing mass housing programs to address rapid urbanization, ensuring child-friendly spaces becomes increasingly vital. Employing a mixed-methods approach, the research integrates physical site analysis, spatial analysis using Space Syntax methods, systematic observations, questionnaires, and focus group discussions. These methods assess the physical and visual accessibility of outdoor spaces, community perceptions, and actual utilization patterns of children's play spaces. Findings reveal that although Summit Condominium includes designated open spaces, most are poorly designed or misused, limiting support for children's independent play. Physical barriers such as parked vehicles, poor connectivity, and safety concerns further restrict access. Additionally, community perceptions prioritize green areas and parking spaces over play areas, often excluding children from available outdoor spaces. The study concludes that current planning practices in Addis Ababa's mass housing developments inadequately address children's spatial needs. It recommends integrating child-centered design principles, enhancing community awareness, and enforcing policies that protect children's rights to play within urban residential environments. The study emphasizes participatory design approaches, advocating for children's involvement in designing optimized and inclusive play areas. Ultimately, this research contributes to the broader understanding of child-friendly urban design and offers scalable recommendations for improving play spaces in mass housing developments.

***Key Words**: accessibility, availability, mass housing, children's play space, optimization*

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IX. ABBREVIATIONS AND ACRONYMS

AACA	Addis Ababa City Administration
AACG	Addis Ababa City Government
AACPO	Addis Ababa City Plan Project Office
AAHDAB	Addis Ababa Housing Development and Administration Bureau
AAHPO	Addis Ababa Housing Project Office
AAMPO	Addis Ababa Master Plan Office
AMA	Axial Map Analysis
BAR	Built-Up Area Ratio
CAD	Computer Aided Design
CGAA-OPPP	City Government of Addis Ababa – Office of the PPP
ECD	Early Childhood Development
EiABC	Ethiopian Institute of Architecture, Building Construction and City Development
FDRE	Federal Democratic Republic of Ethiopia
FLA	Fewest Line Analysis
FLMA	Fewest Line Map Analysis
GIS	Geographical Information Systems
HH	House Hold
HU	Housing Unit
LDP	Local Development Plan
NHD	Neighborhood Design
PMO	Prime Minister's Office
PPP	Public-Private Partnerships
Sq	Square Meter
SS	Space Syntax
UN-ECA	United Nations Economic Cooperation for Africa
UN – Habitat	United Nations Habitat (The United Nations Human Settlements Programme)
UN – WRI	United Nations World Resources Institute
UNCRC	United Nations Convention on the Rights of the Child
VGA	Visibility Graph Analysis
WHO	World Health Organization

X. GLOSSARY OF LOCAL (AMHARIC) TERMS

Abbarrosh – Cops and robbers

Iqa`qa`– Role playing

Gullit – Retail businesses that operates on small scale petty trading

Jiraf Machoh – Whip snapping

Kebele – Smallest administrative unit under Woreda/District, roughly equivalent to ward

Woreda – Secondary level administrative tier hierarchal under sub-city, roughly equivalent to district or borough

1 CHAPTER ONE: INTRODUCTION

1.1 Introduction

Urbanization is rapidly transforming cities worldwide, reshaping residential patterns and influencing the way children experience their environments (UN-Habitat, 2020). As cities expand and housing densities increase, the availability of safe and accessible play spaces for children is increasingly becoming a critical concern. Play is an essential component of childhood development, contributing to physical health, cognitive growth, and social well-being (Ginsburg, 2007). However, in many urban settings, particularly in mass housing developments, the provision of designated play areas is often inadequate or poorly integrated into residential planning (Lester & Russell, 2010).

This study investigates children's play spaces in mass housing projects, with a focus on Summit Condominium in Addis Ababa. The research examines the availability, accessibility, and usability of play areas, addressing the challenges posed by rapid urbanization and high-density living. Through this study, the aim is to highlight key barriers to adequate play space provision and propose strategies for optimizing these spaces to enhance children's overall well-being and development.

1.2 Background of the Study

Children comprise a significant portion of the global population, with more than 2.2 billion children worldwide. Approximately two billion of these children live in developing countries, where rapid urbanization presents both opportunities and challenges for their development (Humanium, 2021). The United Nations estimates that by 2025, 60% of the world's children will reside in cities, highlighting the critical need for urban environments that support their physical, cognitive, and social well-being (Lilius, 2014; Boterman and Karsten, 2015).

Ethiopia, one of the fastest-urbanizing countries in sub-Saharan Africa, is no exception to these trends. As of 2018, the country had approximately 13 million children under the age of five, accounting for 16% of its total population of 96 million (Ayenew, 2018). By 2050, this number is projected to grow to 58 million children under 18 years old, with Addis Ababa alone anticipated to house over 6.5 million residents by 2027, of which 20% will be children under six years old (World Population Review, 2021).

Urbanization in Ethiopia has brought substantial changes to housing patterns, driven largely by the Integrated Housing Development Program (IHDP), launched in 2005. This program aimed to address the urban housing deficit through mass condominium developments, emphasizing densification as a core design principle (UN-HABITAT, 2011). While densification maximizes land use efficiency, it often neglects essential aspects of urban design, such as child-friendly outdoor spaces. Consequently, many mass housing developments, including Summit Condominium in Addis Ababa, fail to provide adequate play areas for children.

Play is not merely a recreational activity for children; it is essential for their physical, cognitive, and social development. Outdoor environments offer unique opportunities for exploration, creativity, and peer interaction, which are critical for fostering a sense of well-being and community (Aileen et al., 2007, Agarwal et al. 2021, Anne-Maree Parrish 2016). However, urban densification, particularly in mass housing developments, has significantly reduced the availability of such spaces. This limitation forces children to rely on indoor environments, contributing to increased physical inactivity and reduced opportunities for social interaction (Nurul and Sabarinah, 2016).

In Addis Ababa, these challenges are particularly evident in mass housing condominiums like Summit Condominium, where communal spaces are poorly planned or absent. Parental concerns about safety, inadequate play space orientation, and unsuitable surface materials further limit children's ability to engage in outdoor play. This neglect of children's needs highlights a critical gap in urban planning and design.

This research explores the availability, accessibility, and optimization of children's play spaces within the context of mass housing condominiums, focusing on Summit Condominium as a case study. By addressing these gaps, the study aims to contribute to the creation of child-friendly environments that align with Ethiopia's urbanization trends and uphold the rights of children to play, as emphasized in the United Nations Convention on the Rights of the Child (1989).

1.3 Problem Statement

The United Nations Convention on the Rights of the Child (1989) states that "*Every child has the right to rest and leisure, to engage in play and recreational activities appropriate to the age of the child, and to participate freely in cultural life and the arts*." Play is fundamental to children's development, shaping their cognitive, social, and physical growth while fostering a sense of community and well-being (Poh and Low, 2019).

However, rapid urbanization and mass housing developments have significantly reduced children's access to outdoor play spaces, particularly in densely populated cities like Addis Ababa. As high-rise condominiums become the dominant housing model, open spaces for children are often overlooked or poorly designed. This shift in housing typology has restricted children's ability to interact with their physical environment, limiting their opportunities for unstructured play and outdoor recreation.

Research indicates that children's play experiences are shaped by various factors, including socioeconomic status, ethnicity, gender, physical ability, and cultural norms (Holloway and Valentine, 2000). Unfortunately, in many developing countries, investment in play spaces is often seen as a luxury rather than a necessity, despite the well-documented benefits of outdoor recreation on children's health and social development (Ucfudun, 2015).

In Addis Ababa, urban design has historically prioritized the construction of buildings over the integration of public and recreational spaces. While housing projects have expanded rapidly, the lack of dedicated play areas has led to unstructured, unsafe, and inaccessible environments for children. Many available open spaces are either repurposed for parking, informal businesses, or left underdeveloped (Yitbarek, 2016). Consequently, children are forced to play in unsafe or unintended areas, exposing them to traffic hazards, environmental risks, and limited social interaction.

Moreover, the transition from low-rise traditional housing to high-density condominiums has created additional constraints. Poorly planned housing clusters restrict children's mobility, while parental concerns over safety further discourage independent outdoor play (Ucfudun, 2015). As a result, many children spend more time indoors, leading to decreased physical activity, increased screen time, and reduced engagement with their social and physical environments.

1.4 Research Gap and Justification

Despite the growing emphasis on child-friendly urban planning, there is limited research on how mass housing developments in Ethiopia—particularly Summit Condominium—have impacted children's outdoor play spaces. Existing policies do not adequately address the design, accessibility, or optimization of children's play areas, leading to a disconnect between urban planning goals and real-life child development needs.

Therefore, this study examines the availability, accessibility, and optimization of children's play spaces within Summit Condominium, identifying challenges and proposing strategies for

integrating child-friendly urban spaces into mass housing developments. The findings will contribute to a broader discussion on sustainable urban planning and help inform future policy decisions regarding play spaces in Ethiopian cities.

1.5 General Objective

The general objective of this research is to assess the availability, accessibility, and optimization of children's play spaces in mass housing condominiums, with a specific focus on Summit Condominium in Addis Ababa, Ethiopia. The study aims to identify key challenges affecting children's outdoor play areas and propose design and planning strategies for more inclusive, functional, and child-friendly environments within mass housing developments.

1.5.1 Specific Objectives

1. Examine the availability and accessibility of children's play spaces in mass housing condominiums.
2. Assess the adequacy and diversity of play activities within these spaces.
3. Analyze factors influencing the comfort and usability of play areas from the perspective of children and their caregivers.
4. Develop recommendations for optimized design approaches that enhance children's outdoor play experiences.
5. Propose planning strategies for integrating child-friendly play spaces into mass housing developments.

1.6 Research Questions

This study is guided by the following key research questions:

1. To what extent are children's play spaces available and accessible within Summit Condominium?
2. What types of activities occur in these spaces, and are they sufficient to meet children's play and social interaction needs?
3. What factors influence the comfort and usability of children's outdoor play areas in mass housing condominiums?
4. What design interventions can be implemented to improve and optimize children's play spaces in these environments?

5. What planning strategies can enhance the integration of play spaces into mass housing developments?

1.7 Significance of the Study

Urban environments play a crucial role in shaping children's development. Well-designed play spaces contribute to physical health, cognitive growth, and social interaction, fostering well-rounded individuals. However, in mass housing developments, children’s play needs are often overlooked, leading to restricted outdoor activity and increased indoor isolation.

This study is significant in several ways:

1. **Enhancing Child-Friendly Urban Planning**
    - Provides data-driven insights to help urban planners incorporate accessible and engaging play spaces in mass housing developments.
    - Encourages participatory design approaches, ensuring children and parents/ guardians contribute to planning decisions.
2. **Impact on Housing Policy and Urban Development**
    - Offers policy recommendations for government agencies such as the Addis Ababa Housing Development and Administration Bureau (AAHDAB) to mandate play space standards in condominium projects.
    - Helps inform future housing regulations to ensure sufficient and well-integrated outdoor spaces for children.
3. **Community and Social Benefits**
    - Demonstrates how optimized play spaces can enhance social cohesion, neighborhood safety, and community well-being.
    - Provides insights for residents' associations and local government bodies on improving existing communal areas.
4. **Contribution to Future Research and Urban Design Innovation**
    - Serves as a foundation for further research on child-friendly cities in Ethiopia and other developing nations.
    - Highlights the importance of integrating green spaces and multi-functional play areas in urban housing projects.

By addressing the barriers to accessibility and usability, this research contributes to a more inclusive, child-friendly approach to urban planning, ultimately improving the quality of life for children in mass housing environments.

1.8 Scope and Limitations of the Study

This study is spatially, thematically, and temporally defined to ensure focused research and practical findings.

1.8.1 Scope of the Study

1. **Spatial Scope:**
    - The research focuses on Summit Condominium, a mass housing development in Lammi Kura Sub-City, Woreda 05 (Arada Site), Addis Ababa, Ethiopia.
    - The findings, while specific to Summit Condominium, may also provide insights applicable to other mass housing projects in Ethiopia.
2. **Thematic Scope:**
    - The study examines the availability, accessibility, and optimization of children's play spaces.
    - It explores physical design factors, social perceptions, and environmental considerations but does not focus on socio-economic factors or policy enforcement mechanisms.
3. **Temporal Scope:**
    - Data collection occurred during *Kiremt* (the Ethiopian rainy season), when schools are closed, allowing children more time for outdoor play.
    - The findings reflect seasonal play behavior, which may differ in dry seasons.

1.8.2 Limitations of the Study

Despite its strengths, the research has certain constraints:

1. **Data Availability Constraints:**
    - Limited access to recent demographic data for Addis Ababa and the study area.
    - The study relies on available reports and interviews rather than a comprehensive population dataset.
2. **Methodological Constraints:**
    - Observer bias may influence behavioral mapping interpretations.
    - The study primarily uses qualitative methods (e.g., interviews, focus groups), which may not fully capture quantitative play patterns.
3. **Seasonal and Climatic Considerations:**
    - Since observations were conducted during the rainy season, outdoor play behavior may not represent year-round activity patterns.
    - Future studies should incorporate multi-seasonal observations for a more comprehensive analysis.

While these limitations do not compromise the validity of the findings, they highlight areas for further investigation to ensure a holistic understanding of children's play spaces in mass housing environments.

2 CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

A well-planned urban environment significantly influences children's well-being, social integration, and cognitive development. However, the rapid urbanization of Addis Ababa has led to a decline in child-friendly open spaces, particularly in mass housing developments. Addressing this issue requires an in-depth understanding of urban planning theories, child play behavior, and best practices in play space design.

This chapter reviews relevant literature and theoretical frameworks to establish a foundation for the study. The first section defines key concepts, including playgrounds, public spaces, mass housing, and accessibility. It then explores global and local case studies, highlighting successful strategies and identifying gaps in current practices. Finally, the chapter examines planning approaches and design principles that can inform the optimization of play spaces in mass housing developments.

2.2 Introduction to Basic terminologies and concepts

Understanding the design and accessibility of children's play spaces in mass housing developments requires familiarity with key urban planning and child development concepts. This section defines fundamental terminologies relevant to the study, providing a foundation for analyzing children's spatial experiences in mass housing environments.

2.2.1 Open space

The concept of open space has evolved over time, with its first recorded use in 1833 by a committee addressing a public trail in London (Mehdi and Mohd, 2017). The term was later formally defined in Britain's Metropolitan Open Space Act of 1877 and revised in 1906, where it was described as any land with less than 5% built-up area (Mehdi and Mohd, 2017).

In contemporary urban planning, open space refers to any undeveloped land within an urban setting that provides recreational, environmental, or social benefits (Mehdi and Mohd, 2017). This includes parks, plazas, playing fields, urban squares, green areas, and communal courtyards, all of which play a crucial role in enhancing public health, environmental sustainability, and social interaction (Yu and Hien, 2006). Furthermore, open spaces can extend beyond parks to encompass all significant outdoor spaces that fall within the influence of the urban environment, contributing to improved urban livability and well-being (Mehdi and Mohd, 2017).

…

2.2.2 Green space

Green space is a subcategory of open space that refers to a public area of open space with green elements. A term generally applied to land or vegetative structures such as parks, green spaces, natural landscapes, conservation zones, tree-lines streets, open spaces, natural heritage or ecological sites, moorland, conservation areas or green infrastructure such as ditches which contribute to air quality improvement, temperature regulation, and biodiversity in cities (Mehdi and Mohd, 2017).

2.2.3 Urban Space vs. Public Space

- **Urban Space** encompasses all built and natural environments within a city, including residential, commercial, and recreational areas (Mehdi and Mohd, 2017). It is not always accessible to everyone, as private properties and restricted zones are also part of urban spaces.
- **Public Space,** on the other hand, is a space in an urban location; it's accessible to the public in the social, political, relational and interpersonal context, developed through an inclusive process. These areas should be accessible to all individuals regardless of ownership, such as streets, plazas, and parks (Yang, 2007). These spaces play a vital role in social engagement and urban identity formation.

2.2.4 Urban landscape

The urban landscape consists of the open green space of the urban environment; it is dependent of the surrounding buildings and buildings. Urban landscapes usually consist of buildings, roads, lawns, trees, soil, water, etc. It's a complex combination. It contributes to the urban landscape through function and aesthetics. Thus, it enhances the city's sense of place and identity (Yu and Hien, 2006).

2.2.5 Play Grounds and Play Spaces

A playground is a designated area containing equipment and structures for children's recreation, typically designed by adults (Aziz and Said, 2015). In contrast, a play space is a broader concept that includes any environment where children engage in unstructured, imaginative, and self-

directed play. Play spaces can be formal (playgrounds, parks) or informal (vacant lots, sidewalks, or natural landscapes) (Rasmussen, 2004).

2.2.6 Types of Open Spaces for Children's Play

Open spaces for children can be classified based on their formality, function, and spatial scale. The following sections detail these types and contextualize them within Mass Housing Development. (Jafrin & Beza, 2018; UN-Habitat, 2011).

2.2.6.1 Formal Play Spaces

Formal play spaces are purpose-built, designated areas designed, maintained, and regulated for children's play. They typically feature safety measures, age-appropriate equipment, and clear boundaries separating play areas from other functions.

Examples include:

- Designated playgrounds with swings, slides, seesaws, and climbing frames;
- Schoolyards and kindergarten compounds, which also serve as informal community play spaces after school hours (UN-Habitat, 2011);
- Multi-purpose recreational fields accessible to children and youth;
- Community parks with dedicated child zones.

2.2.6.2 Informal Play Spaces

Informal spaces are unregulated and unplanned, emerging from children's spontaneous use of available land. These spaces lack infrastructure or supervision but are often the most accessible.

Common examples:

- Vacant plots around residential areas, especially condominiums;
- Streets and sidewalks, frequently appropriated for play in dense urban neighborhoods;
- Riverbanks, gullies, and drainage lines, despite being hazardous;
- Religious grounds (churches, mosques) used during off-hours (Dina et al., 2021).

2.2.6.3 Semi-Formal / Multi-Use Spaces

Semi-formal spaces are designed for multiple users or activities but are often adapted by children for play, especially when formal facilities are lacking.

Examples include:

- Condominium green areas—originally communal but repurposed for parking, laundry, or gardening (Wondimu Consultant, 2014);
- Marketplaces, reflecting Ghana's "Playful Marketplace" model where children play during off-peak hours (Amowi, 2022);
- Urban plazas and gardens, like the Abrehot Library's Knowledge Spring Garden, offering dual functions—quiet reading and child play (Ketema Journal, 2022).

2.2.6.4 Nature-Based and Adventure Play Areas

These spaces combine natural and built elements, encouraging exploration, sensory engagement, and physical challenges critical for children's cognitive and physical development (Nicholson, 1971).

Typical examples:

- Parks with natural features, including hills, wooded areas, and streams;
- Cultural or art-integrated spaces, incorporating local materials and heritage;
- Adventure trails and play zones, offering elevation changes, climbing structures, and shaded pathways.

2.2.7 Mass Housing and Condominium Housing

Mass Housing refers to large-scale residential developments designed to accommodate rapid urban population growth. These housing schemes prioritize density and cost-efficiency over individualized spatial design (Claudio et al., 2021).

Condominium Housing is a specific form of mass housing where individual units are privately owned, but common areas (such as playgrounds and green spaces) and amenities of the building

(such as entrances, heating system and elevators) are shared with equal ownership and responsibility (UN-HABITAT, 2011).

2.2.8 The Introduction and Evolution of Mass Housing in Addis Ababa

The Integrated Housing Development Programme (IHDP) was initiated by the Ministry of Works and Urban Development (MWUD) in 2005 as part of Ethiopia's broader urban development strategy. The IHDP aimed to:

- Increase housing supply for low-income populations to address Addis Ababa's growing urban housing deficit.
- Recognize and upgrade informal settlements while mitigating future slum expansion.
- Create job opportunities for micro and small enterprises (MSEs) and unskilled laborers, improving their ability to afford housing.
- Enhance wealth creation and equitable distribution through the construction sector and homeownership policies.

Since its inception, the IHDP has transformed Addis Ababa's housing landscape, leading to the development of large-scale condominium housing projects intended to improve urban living conditions (UN-HABITAT, 2011).

However, while the IHDP successfully increased housing availability, the integration of essential public spaces, including children's play areas, has remained a challenge. Many mass housing developments prioritized residential units over open spaces, leading to limited, poorly designed, or inaccessible play areas for children. These shortcomings in urban planning and public space allocation have raised concerns about the livability and inclusivity of mass housing environments, particularly for young residents.

This research further examines the impact of IHDP policies on the accessibility and quality of children's play spaces in condominium housing, addressing key gaps in urban design, safety, and usability.

2.2.9 Accessibility of Play Spaces

Accessibility refers to the ability of children to reach and utilize play spaces safely and independently (El-Geneidy et al., 2006). Key factors affecting accessibility include:

- **Physical Accessibility** – The presence of ramps, pathways, and well-maintained sidewalks.

- **Visual Accessibility** – Clear sightlines that allow parents and caregivers to supervise children.
- **Social and Economic Accessibility** – Ensuring play spaces are free, inclusive, and equitably distributed across different communities.

2.3 Accessibility of Children's Spaces

Accessibility in children's play spaces refers to the ease with which children can reach, enter, and utilize outdoor environments for recreational and social activities. An accessible play space ensures safe movement, inclusive design, and equitable distribution within urban areas (El-Geneidy et al., 2006).

In mass housing developments, accessibility is often compromised due to poor spatial planning, infrastructure limitations, and safety concerns (Hansen, 1959). This section examines the key dimensions of accessibility and the barriers preventing children from freely engaging with outdoor spaces.

2.3.1 Dimensions of Accessibility in Play Spaces

Accessibility is influenced by several interrelated factors, including physical infrastructure, social perceptions, and urban policy regulations.

2.3.1.1 Physical Accessibility

Physical accessibility refers to the structural and spatial design of a play area that allows children to move freely and safely (Timperio et al., 2004). Key factors include:

- **Pathways and Entrances** – Well-maintained sidewalks, ramps, and direct routes leading to play spaces.
- **Playground Surface Materials** – Safe, non-slippery, and impact-absorbing materials to prevent injuries.
- **Proximity to Housing Units** – Play areas located within safe walking distance of residential buildings.

2.3.1.2 Social and Perceived Accessibility

Even when a play space is physically present, social factors can limit its usability. These include:

- **Parental Restrictions** – Fear of crime, accidents, or peer conflicts leading parents to restrict outdoor play (Prezza et al., 2005).
- **Gender and Cultural Norms** – In some communities, girls have fewer opportunities for outdoor play due to safety concerns or cultural restrictions (McKendrick et al., 2000).
- **Sense of Belonging** – Children are less likely to engage in play spaces that feel unwelcoming or poorly maintained (Huttenmoser, 1995).

2.3.1.3 Economic Accessibility

Economic accessibility refers to whether all children, regardless of financial background, can access quality play environments. Key concerns include:

- **Unequal Distribution of Play Spaces** – Low-income neighborhoods often have fewer public play areas compared to wealthier districts (Hillman, 1999).
- **Commercialized Playgrounds** – The rise of private play facilities in urban centers excludes lower-income families (Rigolon and Németh, 2018).
- **Maintenance Costs** – Lack of **funding for repairs** leads to **deteriorating playground equipment** (Blakely, 1994).

2.3.2 Barriers to Accessibility in Mass Housing

Despite the theoretical principles of inclusive urban design, several barriers restrict children's access to play spaces in mass housing:

1. **Poor Urban Planning** – High-density housing developments prioritize building units over open spaces, leading to playground shortages (Bringolf, 2011).
2. **Lack of Safe Pedestrian Networks** – Many condominium sites have inadequate pedestrian infrastructure, exposing children to vehicular traffic risks (Tang and Wong, 2021).
3. **Safety and Security Concerns** – Insufficient lighting, lack of supervision, and crime risks discourage outdoor play (Lindsay et al., 2024).

4. **Socioeconomic Inequality** – Playgrounds in wealthier districts are often better maintained than those in low-income housing projects (Power, 2012).
5. **Limited Child-Friendly Design** – Play spaces in mass housing rarely incorporate inclusive designs for children with disabilities (Skiba and Züger, 2009, Lai et al. 2019).

2.3.3 Strategies for Improving Accessibility

To ensure that all children can safely and freely use play spaces, urban planners and policymakers must integrate accessibility-focused solutions into mass housing designs:

- ✓ **Inclusive Design Standards** – Ensure barrier-free access for all children, including those with disabilities (Prellwitz, 2007).
- ✓ **Community Participation** – Engage parents, children, and local residents in playground planning and maintenance (Jansson, 2015).
- ✓ **Traffic-Calming Measures** – Designate safe pedestrian zones near play areas to reduce road hazards (Fang et al., 2024).
- ✓ **Equitable Play Space Allocation** – Enforce policies that require developers to allocate sufficient green spaces in mass housing projects (Loit, 2021).

2.4 Uses and Activities of children space

Activities are the basic building blocks of a place. Because having something to do give people a reason to come to a place – and return. When there is nothing to do, a space will be empty and that generally means that something is wrong (Project for public Space, 1999).

Children play in a variety of ways, depending on their interests and abilities. They enjoy various games at different times and places (Shackell et al., 2007). It enriches children's play experiences by providing open and narrow space, high and low, soft and hard, and limited space for resting and running (Sio, 2018).

To encourage physical activity in children, playgrounds must be well equipped (Hanapi et al., 2016). When designing a play environment, there should be a variety of contexts that include different play activities (Memik, An evaluation of the changing approaches to children's play spaces, 2004). This allows children to have a variety of play experiences and learn about their natural environment (Shackell et al., 2007). However, design for children's outdoor environments

has not met children's needs and preferences, often resulting in reduced engagement with the environment.

Landscape texture has a huge impact on gameplay. According to Martensson (2004), play is stimulated by a content-rich environment because plants and vegetation stimulate children's imagination (Jansson, 2010).

2.4.1 Principles to keep in mind in evaluating the uses and activities of a place

- The more activities that are going and those children have an opportunity to participate in, the better.
- There is a good balance between men and women (women are more particular about the spaces that they use).
- People of different ages are using the space (retired people and people with young children can use a space during the day when others are working).
- The space is used throughout the day.
- A space that is used by both singles and people in groups is better than one that is just used by people alone because it means that there are places for people to sit with friends, there is more socializing, and it is more fun.
- The ultimate success of a space is how well it is managed.

Children's use of public places depends on age, gender and socio-economic status of the family. Unaccompanied commuting to and from school, alone or with other children visiting parks, shops, etc., crossing main streets alone, cycling alone and traveling downtown without a guardian all increase with age. Boys are generally more independent and mobile than girls of the same age (Mackett et al., 2008).

There are increased parental concerns over traffic safety (i.e. – children getting hit by a car) and personal safety (i.e. – children getting abducted by a stranger (Timperio et al., 2004). International research on environmental attributes of active travel and children’s independent mobility have found that there are key built environment signifiers of car traffic danger, such as amount of traffic, width of roadway, availability of footpaths and dangerous crossings; as well as a set of built environment signifiers of stranger danger, such as poor maintenance of buildings

and public spaces (dog muck, broken bottles, graffiti), and the vicious circle of fewer people on the street being seen as a threat to those who do use public space (Prezza et al., 2005).

However, the extent to which children engage in outdoor play and how they learn through play is strongly influenced by their physical and social contact with the outdoor environment. Ferre et al. (2006) explained, Playgrounds are generally designed with a high user limit and mainly consist of children aged 3-10 years. The design of the cameras and equipment are generally not suitable for other potential users, such as young children, and youth cameras are not intended for use by these age groups.

2.4.2 Parameters Affecting Children Play Activity

Various studies have shown that accessibility and functionality, openness, visual cues, cleanliness, walkability and adventurousness help children use space effectively (Kumar, 2021).

Playground content, variety, complexity and handling have been identified as important features affecting the value of play and children's sense of place. Hart (1979) cited in Jansson (2010).

- **Area**: total area of the play space and area available for play (Parrish et al., 2016).A large space is needed to accommodate many activities and to facilitate play by boys and girls Karsten (2003) cited in Jansson (2010).
- **Fixed and Non-fixed Equipment's**: Children's opportunities to make playing choices are emphasized in playground settings (Jansson, 2010). Equipment installation has an impact on the way children play (Parrish et al., 2016). Children become active when they have free access to non-fixed equipment's (Ibid).
- **Complexity and variation of activity:** To create new play possibilities play equipment should be placed with careful thought (Jansson, 2010). Flexible playgrounds should be proposed to manipulate by children or to be changed over time Wuellner (1979) cited in Jansson (2010).
- **Surface type:** Surface materials have different level of risk of injury and affect the type of activity (Parrish et al., 2016). Playground surface issues that negatively impact children's play, such as unsafe materials and/or equipment; are vital to consider in the initial design or retrofitting a playground (Kennedy et al., 2020).

- **Weather and Time:** Temperature affects the availability of play spaces (Jansson, 2010). Thermal comfort within a playground setting dictates both the activity levels during play and duration of time spent there (Kennedy et al., 2020). Depending on climatic conditions, play areas and activities should be located to either avoid or take advantage of the shading effects of buildings and evergreen tree clusters (Şensoy and İnceoğlu, 2020, Yu and Hien 2006).
- **Shade:** in play spaces that have trees and shrubbery plants protect children from unhealthy amounts of solar radiation, while also increasing their physical activity (Jansson, 2010)
- **Topography:** Changing the topography or level of the area can create a more complex and varied play experience, which reduces the speed and uncontrolled movement of the players. (Friedberg, Playgrounds for City Children, 1969).
- **Safety, security and liability:** have become major factors in determining the quality of children's outdoor play environments and play programs (Şensoy and İnceoğlu, 2020).

2.4.3 Barriers of Open Space Use by Children

According to different literatures, a variety of issues limit the opportunities for outdoor play and activities in outdoor places for children in cities, including the following:

- **Safety**: Some of the dangers that urban children face are increased traffic, stray dogs, stagnant water and open sewage (Ahmed, 2005).
- **Parents' concerns**: A parent's attitude towards the physical outdoor environment can influence the decision to allow their child to play outside alone. Research has shown that one of the main reasons for keeping children at home is parents' fear of emotional harm or physical abuse (e.g. antisocial behavior, kidnapping or sexual abuse) outside the home, particularly against girls (Blakely 1994; McKendrick et al. 2000). According to Amiri et al. (2013) only one third of parents had a positive opinion about the safety of neighborhoods where children play after school. As a result, parents' fears prevented many children from playing outdoors.
- **New patterns of family life**: Parents work all day to earn a living and have little time to play with their children outside. Because parents do not have enough time and energy to play with their children, their children spend more time in organized indoor programs.

From another perspective, children spend less time playing outside, taking into account the excessive study effort and school results. This practice can negatively affect the child's development (White and Stoecklin, 1998).

- **Technology**: The appeal of today's technological innovation is to change children's play behavior and look within. "There is little time left for children to play. And if children have free time, they often spend time at home in front of a television or computer" (White and Stoecklin, 1998). To alleviate children's fears about outdoor safety, parents provide their children with an indoor playground (Hart, 1992). As a result, children are disconnected and deprived of their natural environment, and appear to think less critically as a result of playing computer games and watching television (Lobo and Olson, 2000).
- **Poor design:** After modernization, which created formal spaces for children's play activities, designers began to provide desirable playgrounds. However, the needs of children playing in these places are not met, so some children prefer to find their own informal playground. As play is an important part of children's lives, children may consider any informal play space regardless of their safety, health or health status (Marouf et al., 2015).
- **Deficiency in education and awareness of play benefits:** there is a lack of knowledge among designers, architects, planners and educators about the benefits of outdoor play for children and the types of spaces suitable for children. In general, designers and planners build environments seen by adults rather than children (Marouf et al., 2015).
- **Poor accessibility:** Today, children rarely go out alone. As Hillman (1999) points out, when children are given parental permission to explore the outdoor environment on their own, the separation of streets for traffic and parking reduces public space for social and recreational activities. Children should also be able to meet their peers and play independently. However, playgrounds that are far from family, colleagues and neighbors do not fit into this concept of play. Most apartment buildings do not have outdoor spaces accessible to children (White and Stoecklin, 1998). "There is substantial evidence that children's freedom to independently explore their neighborhood has declined significantly over the last generation" (Hillman 1999; Tranter and Doyle 1996).

2.4.4 Sociability

The quality of this position is difficult to achieve, but once achieved it becomes an undeniable quality. When people see friends, meet and greet neighbors, and feel comfortable interacting with strangers, they feel a strong sense of belonging to the community and the place these social interactions contribute (Project for public Space, 1999).

Outdoor play provides children with many unique developmental opportunities (Project for public Space, 1999). It plays a role in reducing the long-term health consequences of a sedentary lifestyle and allows you to learn important social, emotional and life skills (Ibid).

Huttenmoser (1995) reported that young children who do not regularly play outdoors with their friends have limited social interactions, are less likely to engage in leisure activities, and spend more time watching TV. It's not like children play in the streets or parks closer to home. This study found that good playgrounds help foster better community relationships because parents where children play together gets to know their neighbors and contribute to neighborhood "Social Capital."

2.4.5 Case Studies: Global Approaches to Play Spaces in Mass Housing

Urban environments worldwide have adopted varied strategies to integrate child-friendly play spaces within mass housing developments. These interventions reflect different socio-economic, spatial, and policy-driven approaches to addressing the challenges of limited land, safety concerns, and urban densification. Examining these case studies provides a comparative framework for analyzing how play spaces can be effectively incorporated into high-density residential settings.

2.4.5.1 Case Study 1: Nairobi, Kenya – Play Streets in Low-Income Housing Estates

Urban spaces in low-income settlements of Nairobi are often characterized by overcrowding, informal development, and limited recreational areas for children. In response, Nairobi introduced the Play Streets initiative, a temporary urban intervention that involves closing selected residential streets to traffic for designated periods, transforming them into safe play spaces (UN-HABITAT, 2011).

This initiative aligns with the concept of temporary urbanism, where public spaces are repurposed to address the immediate needs of marginalized urban populations. Studies indicate that Play Streets promote not only child engagement but also community cohesion and localized urban governance (McAllister, 2008). However, the long-term sustainability of such interventions depends on policy integration, local enforcement, and coordinated urban planning (Whitzman, 2015).

2.4.5.2 Case Study 2: São Paulo, Brazil – Integrated Community Parks in Mass Housing Projects

São Paulo has implemented a sustainable urban model by integrating community parks and open spaces within mass housing developments. These parks function as shared urban spaces that cater to multiple recreational needs while enhancing ecological sustainability (Claudio et al., 2021). Research on green space accessibility suggests that such interventions positively influence children's physical health, cognitive development, and overall urban well-being (Cilliers and Cornelius, 2019).

The planning of São Paulo's community parks follows participatory design principles, ensuring that stakeholder input guides the spatial arrangement of play areas. However, urban scholars highlight challenges related to maintenance responsibilities, equitable access, and long-term infrastructure sustainability (Bornat, 2025).

2.4.5.3 Case Study 3: Singapore – Vertical Playgrounds in High-Density Residential Developments

Due to land scarcity and high-density living conditions, Singapore has developed vertical playgrounds, integrating play structures into rooftops, building facades, and shared residential spaces (Yang, 2007). This vertical urbanism approach aligns with compact city planning principles, ensuring that children have access to safe and supervised play spaces without requiring additional land allocation (Whitzman and Mizrachi, 2012).

Urban studies suggest that vertical playgrounds contribute to children's social and cognitive development by introducing multi-level spatial interactions (Krishnamurthy, 2019). However,

concerns regarding accessibility for younger children, structural safety, and potential restrictions on usage remain key considerations for urban designers and policymakers (Gill, 2021).

2.4.5.4 Case Study 4: Amsterdam, Netherlands – Legal Mandates for Playground Accessibility

Amsterdam has established one of the most comprehensive child-friendly urban policies, requiring that every child must have access to a playground within 300 meters of their home (Lai et al., 2019). This urban framework is based on a rights-based approach to child development, ensuring that play spaces are evenly distributed across neighborhoods and designed with inclusivity standards.

Studies on urban mobility and public space accessibility reveal that structured policies on playground inclusion significantly influence children's autonomy, outdoor activity levels, and urban integration (Nykiforuk et al., 2019). Nonetheless, the practical enforcement of such policies relies on municipal investment, regulatory oversight, and community engagement in public space management (Wang, 2023).

2.4.5.5 Comparative Insights from Case Studies

A synthesis of these case studies reveals that child-friendly urban planning in mass housing developments employs diverse strategies, ranging from temporary interventions (Play Streets) to regulatory mandates (Amsterdam's policy-driven approach). Table 2:1 below presents a comparative summary of these interventions:

Table 2:1: *Comparative Insights from Case Studies*

Case Study	Urban Strategy	Key Features	Challenges and Considerations
Nairobi, Kenya	Play Streets	Temporary closure of roads for play use	Requires strong enforcement and community participation
São Paulo, Brazil	Integrated Community Parks	Multi-functional green spaces in housing projects	Maintenance costs and equitable access challenges
Singapore	Vertical Playgrounds	Space-efficient play spaces in high-rise housing	Structural safety, design integration, and supervision
Amsterdam, Netherlands	Legally Mandated Play Spaces	Universal access to playgrounds in urban areas	Requires consistent policy enforcement and funding

Note. Adapted from multiple case studies, *e.g., UN-Habitat, 2011; UNICEF, 2018; Gleave, 2009*

These global examples contribute to the broader academic discourse on child-friendly urbanism, demonstrating that space constraints, economic disparities, and policy limitations are factors that shape the evolution of play spaces in mass housing developments.

2.4.6 Strategies for Enhancing Play Activities in Mass Housing

The integration of play spaces within mass housing developments has been widely recognized as a critical factor in fostering healthy child development, social interactions, and community well-being. However, ensuring the effectiveness of these spaces requires strategic planning and design approaches that align with both urban density challenges and children's spatial needs. Various studies suggest that successful play environments in high-density residential settings incorporate age-appropriate zoning, multi-functional design, safety measures, and ecological integration (Jansson, 2010; Kumar, 2021).

2.4.6.1 Zoning for Different Age Groups

The spatial needs and play behaviors of children vary significantly by age, necessitating age-specific zoning within play spaces. Research indicates that segregating play areas based on developmental stages enhances both safety and engagement, allowing younger children to play in environments suited to their cognitive and motor skills while providing older children with more challenging, physically engaging spaces (Gibson, 1979; Hart, 1997).

Urban design principles advocate for dedicated play areas for toddlers, young children, and teenagers, reducing conflicts between age groups and promoting inclusive participation (Lester and Russell, 2010). Studies have also emphasized that transitional play areas, which allow for gradual interaction between different age groups, facilitate social learning and peer mentorship (Shackell et al., 2007).

2.4.6.2 Multi-Use Play Spaces

Modern urban planning emphasizes the importance of flexible play environments that accommodate varied forms of play, including physical activity, social interactions, and imaginative exploration (Gill, 2021). Multi-use play spaces encourage diverse play behaviors by incorporating:

- Open areas for free movement (e.g., running, ball games).
- Interactive structures that promote role-play and creative engagement (e.g., sand pits, climbing walls, storytelling zones).
- Quiet spaces that allow for individual reflection and sensory experiences (e.g., shaded gardens, tactile pathways) (Prezza et al., 2005).

Studies on adaptive urban design suggest that multi-use play spaces are particularly beneficial in high-density housing, where land availability is constrained (Whitzman and Mizrachi, 2012). Such spaces provide opportunities for multiple activities within a limited footprint, ensuring that children with different play preferences find meaningful engagement (Cilliers and Cornelius, 2019).

2.4.6.3 Safe and Secure Playgrounds

Safety remains a primary concern in the design of children's play spaces, particularly in mass housing environments, where traffic congestion, inadequate supervision, and poor infrastructure pose potential hazards (Timperio et al., 2004). Research highlights several key safety measures that enhance children’s confidence and parental trust in outdoor play:

- Adequate lighting to ensure visibility during evening hours (Jansson, 2010).
- Fencing and controlled access points to prevent unauthorized entry and reduce exposure to urban risks (Ferre et al., 2006).
- Pedestrian pathways and traffic-calming measures that create child-friendly movement corridors within residential neighborhoods (Prezza et al., 2005).

Studies have further emphasized that psychological safety is just as important as physical safety. Environments that incorporate natural surveillance, community oversight, and well-maintained equipment tend to foster greater engagement and reduce anxiety among children and caregivers (Gill, 2021).

2.4.6.4 Integrating Natural Elements in Play Spaces

The presence of natural elements within play spaces has been shown to enhance children's sensory and cognitive development while promoting environmental stewardship (Jansson, 2010). Urban ecological research suggests that green play environments contribute to emotional well-being and encourage more varied play behaviors than traditional playgrounds with fixed equipment (Lester and Russell, 2010).

Key natural elements integrated into child-friendly urban planning include:

- Green spaces and tree cover, which offer shaded, thermally comfortable play environments (Şensoy and İnceoğlu, 2020).
- Sand pits and water features, which provide tactile engagement and creative exploration opportunities (Hart, 1997).
- Diverse topography, such as gentle slopes, boulders, and climbing structures, which encourage risk-taking and motor skill development (Friedberg, 1969).

Research on urban play environments suggests that nature-based play spaces facilitate greater social interactions and enhance children's attachment to outdoor environments, fostering a long-term appreciation for natural settings (Kumar, 2021).

2.5 Comforts of Children's Play Space

The comfort of play spaces significantly influences children's engagement, frequency of use, and overall well-being. Research highlights that physically and psychologically comfortable environments encourage prolonged play duration, enhance social interaction, and contribute to cognitive and motor skill development (Chawla, 2015). Comfort in play spaces is shaped by three primary factors:

1. **Physical Comfort** – The impact of temperature, seating, shade, and surface materials on usability.
2. **Psychological Comfort** – Feelings of safety, social interaction, and emotional attachment to the space.

3. **Environmental Comfort** – The role of natural elements, noise control, and spatial arrangement in fostering a positive play experience.

2.5.1 Physical Comfort in Play Spaces

The physical design of play areas significantly impacts children's willingness to engage in outdoor activities. Studies indicate that temperature regulation, seating options, and ground surfaces are among the most critical determinants of comfort in play spaces (Herrington and Studtmann, 1998; Heschong, 2002).

2.5.1.1 Thermal Comfort and Shade Provision

Children are particularly sensitive to heat exposure, and extreme temperatures can discourage outdoor play, especially in tropical and semi-arid climates (Heschong, 2002). Research indicates that optimal play temperatures range between 20–26°C, while excessive heat (>30°C) significantly reduces play engagement due to thermal discomfort and health risks (Ibid).

Despite the well-documented importance of thermal regulation, studies show that many playgrounds lack sufficient shade structures, leaving children exposed to direct sunlight for prolonged periods (Olsen et al., 2019). Contemporary urban play areas with artificial surfaces tend to absorb and retain heat, contributing to higher surface temperatures (Vanos et al., 2016). Studies highlight that incorporating shade elements—such as mature trees, pergolas, and artificial canopies—can reduce thermal discomfort and increase the duration of play activities (Vanos et al., 2017a).

2.5.1.2 Seating and Resting Areas

The availability and orientation of seating areas influence comfort and usability in play spaces. Research suggests that play areas should incorporate diverse seating options, including:

- Benches positioned near play zones to allow parental supervision (Matthew et al., 2007).
- Movable seating elements that encourage flexibility in space usage (White, 1980).
- Shaded resting areas to prevent fatigue and heat exposure (Madden and Bussard, 2007).

Poorly designed playgrounds often lack dedicated seating for children and caregivers, reducing the time spent in outdoor spaces and limiting social interactions (Marouf et al., 2015).

2.5.1.3 Ground Surfaces and Safety

The quality of playground flooring significantly affects safety and comfort. Research supports the use of impact-absorbing materials such as:

- **Rubberized flooring** – Reduces injury risks and enhances physical engagement (Tovey, 2007).
- **Grass and wood chips** – Provide a natural, cushioned surface that supports different types of play (Fjortoft, 2004).

Conversely, hard surfaces such as concrete and asphalt can increase the likelihood of injuries and reduce play engagement due to higher impact risks (Prezza et al., 2005). Additionally, poor drainage and uneven surfaces create hazardous conditions, particularly in mass housing developments, where space constraints and cost limitations often lead to low-quality playground designs (Kennedy et al., 2020).

2.5.2 Psychological Comfort in Play Spaces

Beyond physical conditions, comfort in play spaces is also shaped by children's sense of security, social interaction, and emotional connection to the space. Studies emphasize that psychological comfort plays a crucial role in determining whether children engage in outdoor activities (Chatterjee, 2005).

2.5.2.1 Perceived Safety and Security

A sense of safety and security in play spaces is vital for both children and caregivers. Research highlights several design strategies that enhance perceived safety:

- Fencing and controlled entry points improve parental confidence and prevent unwanted intrusions (Prezza et al., 2005).
- Well-lit playgrounds enable safe use during early mornings and evenings (Jansson, 2010).

- Visual transparency and open sightlines allow easy supervision, reducing the risk of crime or bullying (Saelens et al., 2003).

Crime and personal safety concerns are common barriers to children's independent play, particularly in urban settings (Rivlin et al., 1986). Research suggests that women and children feel more secure in informal, neighborhood-based play areas, where trusted neighbors and familiar faces create a protective social network (Ibid).

2.5.2.2 Social and Emotional Belonging

Children tend to feel more attached to play spaces that support peer interactions and community engagement. Studies suggest that playgrounds designed with:

- Interactive elements (e.g., murals, themed structures, and movable objects) promote imaginative play and social bonding (Lester and Russell, 2010).
- Participatory design approaches, where children have input in playground planning, increase emotional attachment to spaces and promote long-term usage (Gibson, 1979).

In contrast, standardized playgrounds that lack child-centered design features often result in low engagement levels and poor utilization (Lai et al., 2019).

2.5.3 Environmental Comfort in Play Spaces

The surrounding environment plays a crucial role in shaping children's play experiences, comfort levels, and cognitive development (Ulrich, 1984). Research on urban ecological design emphasizes that nature-integrated playgrounds provide a richer sensory experience and greater play variety than those with artificial features alone (Louv, 2008).

2.5.3.1 Green Play Spaces and Sensory Engagement

Studies suggest that green elements in playgrounds provide multiple benefits, including:

- Cognitive stimulation and creativity – Exposure to natural elements enhances exploratory play (Hart, 1997).
- Stress reduction and improved mood – Green spaces have been linked to lower anxiety levels in children (Cilliers and Cornelius, 2019).

- Increased physical activity – Children move more freely in landscaped environments than in rigid, structured spaces (Rivkin, 1995).

2.5.3.2 Noise and Sensory Comfort

Noise pollution in urban play areas negatively impacts children's ability to engage in outdoor activities (Van Kamp et al., 2004). Research suggests that:

- Playgrounds near high-traffic roads experience reduced child engagement due to excessive noise levels (Lai et al., 2019).
- Dense vegetation barriers help buffer noise pollution and improve sensory comfort (Şensoy and İnceoğlu, 2020).

2.6 Optimization of activities in playing space

2.6.1 Play Space Design and Its Role in Child Development

The design of children's playgrounds is a fundamental aspect of child-friendly urban planning, influencing children's physical, social, and cognitive growth. Studies emphasize that user-centered and inclusive design approaches foster better engagement and long-term usability of play spaces (Sensoy and İnceoğlu, 2015).

Research highlights that successful playgrounds are developed through a participatory design process, where local children and caregivers contribute insights into their specific needs and preferences (Shackell et al., 2007). Playgrounds designed with age-inclusive features allow for interactions between different age groups, fostering social development and skill-sharing.

Play is an environment where children test their limits, navigate risks, and develop resilience. Literature suggests that incorporating elements of manageable risk—such as climbing frames, varying terrains, and obstacle courses—enhances children's problem-solving abilities and confidence (Sensoy and İnceoğlu, 2015). Additionally, accessible playgrounds should integrate adaptive equipment that enables children with and without disabilities to interact in the same space, ensuring social inclusion and equal opportunities for play (Shackell et al., 2007).

2.6.2 Principles for Designing Successful Play Spaces

Research highlights several principles that define successful and inclusive play environments. These principles are derived from urban design studies and child development research, emphasizing that playgrounds should be interactive, flexible, and developmentally enriching (Moore, 2014).

- ✓ **Well-located and accessible** – Playgrounds should be integrated into residential neighborhoods, ensuring that children can access them safely and independently (Shackell et al., 2007). The placement of play spaces should consider pedestrian safety, proximity to homes, and connectivity to green spaces.
- ✓ **Multi-functional and adaptable** – Effective playgrounds offer diverse play experiences, allowing children to engage in physical, imaginative, and social play within the same space (Gleave, 2009). Literature suggests that modular and multi-purpose equipment increases usability and prevents playground monotony (Sensoy and İnceoğlu, 2015).
- ✓ **Integration of natural elements** – Research supports the inclusion of greenery, sand, water features, and natural materials to enrich sensory experiences (Louv, 2008). Studies indicate that playgrounds incorporating natural elements foster greater creativity, exploration, and problem-solving skills compared to standardized, prefabricated equipment (Shackell et al., 2007).
- ✓ **Age-inclusive and diverse play experiences** – Playgrounds should support children of different ages and skill levels, providing spaces for younger children, adolescents, and caregivers to interact (Shackell et al., 2007). Research suggests that certain play structures, such as climbing nets, tunnels, and open-ended activity zones, allow for multi-age engagement.
- ✓ **Incorporation of manageable risk** – Academic findings emphasize that successful play spaces provide challenges that encourage physical and cognitive growth (Sensoy and İnceoğlu, 2015). Safe exposure to calculated risk in play activities helps children develop risk assessment skills, resilience, and confidence.
- ✓ **Universal design for inclusivity** – Literature highlights that playgrounds should be accessible to both disabled and non-disabled children, incorporating ramps, tactile paths, adaptive swings, and multi-sensory play equipment (Casey, 2007). Research suggests that

children with disabilities thrive in inclusive environments, where they can engage alongside their peers without segregation (Shackell et al., 2007).

- ✓ **Encouraging social interaction** – Play spaces serve as hubs for community engagement, promoting cooperative play, peer negotiation, and conflict resolution (Herrington and Studtmann, 1998). Findings suggest that open layouts, shared play zones, and interactive features create opportunities for social bonding.

2.6.3 Play Space Optimization Strategies in Mass Housing

Urban mass housing developments present unique challenges for play space planning, as land scarcity, high-density living, and limited communal areas often restrict the availability of dedicated playgrounds. Studies have explored various strategies to enhance play opportunities in such environments, ensuring that children have access to safe and stimulating play areas despite spatial constraints (Moore, 2014).

2.6.3.1 Multi-Use and Compact Play Spaces

Research highlights the effectiveness of compact, adaptable playgrounds in high-density settings. Findings suggest that:

- Hybrid play spaces, combining structured play equipment with open-ended activity zones, promote versatility and inclusivity (Gleave, 2009).
- Modular playground structures that serve multiple purposes (e.g., climbing frames doubling as resting areas) improve space efficiency (Sensoy and İnceoğlu, 2015).

2.6.3.2 Incorporation of Natural Play Environments

Studies emphasize that nature-integrated playgrounds provide cognitive and emotional benefits, offering a more immersive play experience compared to artificial play structures (Louv, 2008). Research suggests that:

- Green play environments stimulate higher levels of exploration and problem-solving (Lester and Russell, 2010).
- Elements such as logs, water features, sand areas, and vegetation buffers enhance multi-sensory engagement (Kennedy et al., 2020).

2.6.3.3 Accessibility and Inclusive Design Strategies

Equity in play space access is a critical urban planning consideration. Studies emphasize that proximity to playgrounds, well-designed pedestrian routes, and inclusive facilities impact children's mobility and play habits (WHO, 2017).

Findings highlight that, accessible playgrounds:

- Incorporate universally designed elements, such as tactile flooring, wheelchair-friendly surfaces, and multi-sensory interaction points (Casey, 2007).
- Ensure clear pedestrian connectivity, allowing safe and independent movement for children (Jansson, 2010).

2.6.4 Case Studies: Global Innovations in Play Space Design

Several case studies illustrate global best practices in optimizing play spaces within high-density urban housing:

2.6.4.1 Barcelona, Spain – Superblocks for Child-Friendly Play

Barcelona's superblock model prioritizes play-friendly streets, reducing car traffic and expanding pedestrian space for recreation (Rueda, 2019). Findings suggest that child-friendly urban zoning fosters greater social interactions and active play.

Bogotá, Colombia – Play Street Initiatives

Bogotá's Ciclovía program transforms road networks into temporary play spaces, fostering community engagement and active mobility (Montezuma, 2005). Research indicates that re-purposing urban infrastructure for play increases play space access in dense environments.

2.6.4.2 Tokyo, Japan – Compact Playground Integration in High-Rise Developments

Tokyo incorporates space-efficient play solutions, including rooftop playgrounds, vertical play structures, and pocket-sized play zones (Hirano, 2016). Studies suggest that layered play spaces maximize land efficiency while maintaining diverse play options.

2.7 Methods of integrating Children's Play Space

2.7.1 Children as an Urban Issue

The rapid pace of urbanization has significantly transformed the structure of cities, often reducing children's access to safe and engaging play spaces. Urban development trends have prioritized transportation efficiency, leading to a decline in sidewalks, parks, and playgrounds near residential areas (Marouf et al., 2015).

Gunawardena et al. (2003), cited in Memik (2004), state that as cities expand and prioritize economic and infrastructural growth, they become less accommodating to children's needs, creating barriers to socialization, recreation, and overall development. Similarly, Bartlett et al. (1999) highlight that rapid population growth, housing shortages, sanitation issues, and urban congestion have deprioritized children's play areas in urban planning discussions.

One of the core objectives of sustainable urban development is to conserve resources while ensuring the well-being of future generations. However, urban planners often struggle to involve children in decision-making processes, failing to allocate sufficient space and resources for child-friendly environments (Marouf et al., 2015).

2.7.1.1 Case Study: Bogotá, Colombia – The Ciclovía Initiative

Bogotá's Ciclovía program is an internationally recognized urban planning strategy that reclaims streets for play and recreation. Every Sunday and on public holidays, over 120 kilometers of roads are closed to motor vehicles, allowing children and families to walk, cycle, skate, and engage in recreational activities (Montezuma, 2005).

- ✓ Encourages outdoor play and community interaction.
- ✓ Reduces traffic congestion and improves urban air quality.
- ✓ Enhances children's access to safe, car-free play spaces.

2.7.2 Child-Friendly Urban Landscapes

Modern urban planning practices increasingly emphasize the importance of child-friendly environments. Children's vulnerability in urban areas makes it crucial to integrate safe, inclusive, and accessible play spaces into city designs (Marouf et al., 2015).

2.7.2.1 Key Principles of Child-Friendly Urban Landscapes

- ✓ Inclusivity – Play spaces should be accessible to children of all ages, abilities, and backgrounds.
- ✓ Safety and Security – Play areas should be protected from traffic hazards, well-lit, and regularly maintained.
- ✓ Variety in Play Experiences – Public spaces should incorporate both structured and natural play opportunities, including gardens, sand areas, and water features.
- ✓ Community Participation – Local residents, educators, and children should be engaged in the planning and design process to create meaningful play spaces (Marouf et al., 2015).

2.7.2.2 Case Study: Amsterdam, Netherlands – Integrated Play Spaces

Amsterdam is globally recognized for its progressive urban planning policies, particularly in the development of child-friendly neighborhoods. The city requires each residential area to have a playground within 300 meters of homes, ensuring equitable access to safe play environments (Karsten, 2003).

- ✓ Traffic-calmed streets minimize risks for child pedestrians.
- ✓ Pocket parks and green play areas enhance community play opportunities.
- ✓ Participatory design initiatives involve families in playground planning.

2.7.3 Criteria for Effective Play Space Integration

For play environments to be effective, they must meet key urban planning and design criteria. Marouf et al. (2015) highlight the following essential factors in optimizing children's play spaces:

- ✓ **Proximity and Accessibility** – Playgrounds should be within a safe walking distance from residential neighborhoods and linked by pedestrian-friendly pathways.
- ✓ **Government Involvement** – Municipalities should play an active role in funding, maintaining, and expanding play areas.
- ✓ **Participatory Design** – Children and families should have a say in the planning process, ensuring spaces reflect their needs and preferences.

- ✓ **Environmental Stimulation** – Playgrounds should incorporate natural elements that encourage exploration and creativity.

2.7.4 Recognition of Children's Rights in Urban Spaces

Children are recognized as integral members of urban society, with the right to access and use public spaces freely and safely. According to Moore (1987), outdoor play is both a fundamental human right and a critical aspect of child development.

- ✓ **The United Nations Convention on the Rights of the Child** (1989) formally acknowledges children's right to play, leisure, and cultural participation.
- ✓ **General Comment No. 17** (2013) requires governments to ensure that children have access to inclusive, safe, and stimulating environments for play.

2.7.4.1 Case Study: Singapore's Housing Development Board (HDB) Play Spaces

Singapore has successfully integrated child-friendly principles into its public housing developments, ensuring that every residential complex includes accessible, high-quality play areas.

- ✓ Over 80% of Singapore's population lives in HDB flats, where playgrounds are strategically positioned within walking distance of homes.
- ✓ Advanced safety features such as soft flooring, fencing, and shaded structures enhance usability.
- ✓ Adaptive play equipment ensures accessibility for children with disabilities.

2.7.5 Evaluating Open Spaces for Play

Despite the widespread construction of playgrounds, there is a lack of evaluation and empirical research on their effectiveness, accessibility, and impact on child development (Marouf et al., 2015). Studies indicate that:

- ✓ Urban parks in developing nations experience higher playground usage rates than those in developed nations.
- ✓ Local authorities often lack structured policies for upgrading and maintaining play spaces.

- ✓ Children's participation in playground design remains limited, despite being primary users of these spaces.

2.7.6 Rethinking Open Space Provision for Children

Marouf et al. (2015) propose several key design and policy recommendations to improve urban play environments:

- ✓ **Accessible Locations** – Playgrounds should be easily reachable from homes, schools, and community hubs.
- ✓ **Municipal Investment** – Governments must prioritize the development and maintenance of open spaces for children.
- ✓ **Collaborative Knowledge Sharing** – Urban planners, educators, and parents should exchange expertise to enhance play environments.
- ✓ **Diverse and Stimulating Playgrounds** – Play spaces should encourage multi-sensory engagement, creativity, and social interaction.
- ✓ **Safety-First Design** – Risk assessments and child-focused safety measures must be central to urban playground planning.

2.7.6.1 Case Study: Tokyo, Japan – Compact Playgrounds in High-Density Areas

Due to Tokyo's high-density urban environment, planners have introduced compact and modular play structures to maximize space efficiency while providing dynamic play experiences (Hirano, 2016).

- ✓ Vertical playgrounds and rooftop play areas maximize limited urban space.
- ✓ Nature-infused play designs incorporate tactile, interactive, and sensory-stimulating elements.
- ✓ Integrated child-friendly urban zoning policies ensure that every neighborhood includes accessible play spaces.

2.8 Planning Options for Children's Play Space in mass housing condominiums

The provision of well-planned children's play spaces in mass housing condominiums is essential for fostering healthy childhood development, enhancing social interaction, and improving urban

livability. In high-density housing environments, where outdoor spaces are often constrained, proper planning ensures that children have safe, accessible, and engaging spaces for recreation and exploration (Mayor of London, 2012).

Planning children's play spaces requires adherence to benchmark standards, assessment of population needs, evaluation of accessibility and quality, and community involvement to ensure that play areas are meaningful, safe, and well-integrated into the urban fabric.

2.8.1 Recommended Planning Steps in the Application of Benchmark Standards

Providing attractive play spaces for all children within walking distance from their homes depends on the application of planning benchmarks within a structured approach. These benchmarks consider three fundamental aspects:

1. Quantitative requirements – The amount of space allocated for play.
2. Accessibility – The ease of reaching play areas safely.
3. Quality of play provision – The adequacy of play space design and maintenance (Mayor of London, 2012).

The following steps outline a structured methodology for integrating play spaces into mass housing developments:

2.8.1.1 Step 1: Assessing the Population Profile

Understanding the demographic composition of an area is essential for determining play space needs. A comprehensive analysis should include:

- Population distribution and age segmentation (0–5 years, 6–11 years, 12+ years).
- Household structure, focusing on families with children.
- Existing availability of play spaces within the neighborhood.

According to Medellín's Urban Acupuncture strategy, urban interventions in areas with a high density of children led to the creation of small-scale play areas in underutilized spaces, effectively addressing the shortage of recreational spaces (Brand and Dávila, 2011).

2.8.1.2 Step 2: Determining Play Space Requirements

Once the population profile is assessed, planners must determine the amount of play space required to accommodate current and future child populations. A benchmark standard recommends a minimum of 10 square meters of dedicated play space per child (Mayor of London, 2012).

Considerations for play space planning include:

- Ensuring age-appropriate zones for toddlers, young children, and teenagers.
- Designing multi-functional spaces that serve play, relaxation, and social interactions.
- Repurposing underutilized spaces such as rooftops or parking lots for playgrounds in high-density condominiums.

In Tokyo, Japan, where space constraints are common, planners have introduced rooftop playgrounds in high-rise residential complexes, ensuring safe play areas without requiring extensive ground space (Hirano, 2016).

2.8.1.3 Step 3: Accessibility and Connectivity

Accessibility is a critical determinant of play space usability. For children to engage in outdoor play regularly, play areas should be located within a safe and reasonable walking distance from their homes. Nevertheless, determining appropriate walking distances for children varies based on age, developmental stage, and individual capabilities. While specific guidelines may not be universally established, several sources provide insights into reasonable expectations:

- **General Rule of Thumb:** Some experts suggest that children can walk approximately 1 mile per year of age. For instance, a 4-year-old might comfortably walk up to 3 miles (*Mumsnet, n.d.; Backpacker, n.d.; Reddit, n.d.*).
- **Physical Activity Recommendations:** The NHS recommends that children and young people aged 5 to 18 engage in at least 60 minutes of moderate to vigorous physical activity daily, which can include walking (*National Health Service [NHS], 2022*).

- **Hiking Guidelines:** For activities like hiking, it's noted that school-age children can often handle distances up to **5 miles**, provided the pace is suitable and includes breaks (*Backpacker, n.d.).*

In whatever context, well-connected pathways and proximity encourage independent mobility and frequent use. The following benchmarks (Figure 2:2) present recommended walking distances by age group:

Table 2:2. *Recommended Walking distances for age groups*

Age Group	Maximum Walking Distance from Home
Under 5 years	100 meters
5–11 years	400 meters
12+ years	800 meters

Note. Adapted from *Urban Child Mobility and Planning Guidelines and Mayor of London, 2012*

Barriers to accessibility include:

- Busy roads and lack of pedestrian crossings.
- Physical obstacles, such as railways, water bodies, or construction zones.
- Social barriers, including safety concerns in public areas.

Curitiba, Brazil, has addressed these challenges by establishing green pedestrian corridors, which connect residential areas with parks and play spaces, ensuring that children can safely navigate to recreational areas (Rabinovitch, 1992).

2.8.1.4 Step 4: Evaluating the Quality of Play Spaces

The quality of play spaces directly influences children's engagement and their ability to explore, socialize, and develop physical and cognitive skills. Play spaces should be:

- Inclusive – Accommodating children of all abilities.
- Engaging – Offering a range of play activities.
- Safe – Featuring secure fencing, proper lighting, and routine maintenance.

Key indicators of quality include:

- Integration of natural elements such as trees, sand, and water for sensory play.
- Provision of seating and shaded areas for caregivers and children.
- Active community involvement in play space maintenance.

In Seoul, South Korea, the “Pocket Park” initiative converted small urban spaces into high-quality play areas equipped with interactive play elements, greenery, and resting areas for parents (Kim and Ellis, 2012).

2.8.2 Community Participation in Play Space Planning

Engaging local communities in the planning and maintenance of play spaces fosters long-term sustainability and increased usage. Participatory approaches enhance the design process by allowing residents to contribute ideas that reflect local needs (Mayor of London, 2012).

Key strategies for community participation include:

- Workshops and focus groups with children to understand their play preferences.
- Public meetings and surveys to involve parents and neighborhood residents.
- Participatory design sessions, enabling local families to collaborate with planners and designers.

In Nairobi, Kenya, informal settlements successfully converted vacant spaces into playgrounds through resident-led projects, using recycled materials and volunteer efforts, which helped ensure long-term maintenance and community ownership (Mutisya and Yarime, 2011).

2.8.3 Integrating Play Spaces into Mass Housing Designs

Ensuring that play spaces are integrated into mass housing developments from the initial planning phase is crucial for creating child-friendly environments.

Strategies for integration include:

- Designing courtyards and green roofs as dedicated play spaces.
- Creating multi-use open spaces that accommodate both recreational activities and social gatherings.
- Utilizing vertical space for play areas (e.g., climbing walls, rooftop play zones).

Singapore's Housing and Development Board (HDB) has implemented policies requiring all residential complexes to include dedicated play areas, integrating them within courtyards and ground-floor spaces, and enhancing recreational accessibility (Yuen, 1996).

2.9 Contextual Case Reviews: International, African and Ethiopian Experiences in Child-Friendly Urban Planning

This section examines both international, African and Ethiopian case studies that explore the integration of children's play spaces within urban environments, particularly in mass housing developments. The review includes open space standards, community engagement practices, and urban planning strategies that provide insights into the effective provision of play spaces in high-density settings.

2.9.1 International Case Reviews

Internationally, open space planning follows four key implementation dimensions: quantity, accessibility, quality, and locality. The quantity standard generally refers to the total area of publicly accessible green and open space per individual, typically expressed in hectares per 1,000 people. The United Kingdom follows a standard of six acres of open space per 1,000 residents, which translates to approximately 24 square meters per person, as outlined by the National Fields Association, now known as Fields in Trust (Theobald, 1984).

The United States and Australia employ similar guidelines, allocating four acres and 2.83 hectares per 1,000 residents, respectively (Jafrin and Beza, 2018). Both countries emphasize the importance of regional parks and neighborhood-level playgrounds as an essential component of urban development.

Germany has adopted a more constrained model, reducing its open space standard to 0.5 hectares per 1,000 persons, reflecting its compact urban structure and focus on high-quality, safe, and accessible green recreational spaces (Jafrin and Beza, 2018).

Singapore's Housing and Development Board (HDB) has implemented a structured approach to integrating play spaces into public housing developments. Playgrounds are placed within 150 meters of residential units, ensuring accessibility for young children. The country's planning model emphasizes inclusivity, incorporating play spaces designed to accommodate children with diverse abilities. Multi-functional areas are common, integrating green spaces, seating, and fitness zones to cater to different age groups within a single environment (HDB, 2019).

Similarly, in Tokyo, where land scarcity is a major constraint, urban planners have developed compact playgrounds through rooftop installations and modular play areas within high-rise residential complexes. These play areas are designed to maximize limited space while maintaining safe and interactive environments, often incorporating small gardens and water features to enhance play opportunities (Matsumoto, 2020).

In Latin America, Medellín, Colombia, has implemented a localized approach to play space development through a strategy known as "Urban Acupuncture." This initiative focuses on small-scale interventions that revitalize neglected urban spaces by introducing pocket parks and play spaces in underutilized areas (Londoño, 2018). Community participation is integral to the planning and design process, ensuring that play spaces align with local needs. Additionally, the city has enhanced connectivity by integrating these spaces into public transportation corridors, allowing for broader accessibility (Brand and Dávila, 2011).

The World Health Organization (WHO) recommends a minimum of nine square meters of green open space per person, while UN-Habitat suggests that 15 percent of total urban land should be designated for open spaces, green areas, and public facilities (WHO, 2016; Kumar et al., 2021). These guidelines are aimed at ensuring sufficient recreational opportunities and environmental sustainability within urban planning frameworks.

These international examples illustrate a range of strategies for incorporating play spaces into high-density urban developments. The approaches vary from mandatory spatial allocations in

Singapore to adaptive solutions such as rooftop playgrounds in Tokyo and small-scale community-driven interventions in Medellín. Each model highlights the importance of integrating child-friendly spaces into urban environments through planned, accessible, and inclusive designs (Matsumoto, 2020; HDB, 2019).

2.9.2 African Case Reviews

Despite limited research, urban environments in African cities frequently experience rapid growth, often without adequate planning for dedicated children's play spaces. However, several community-led initiatives have demonstrated how informal and adaptive strategies can support children's play needs within constrained urban landscapes (UN-Habitat, 2018).

In Accra, Ghana, community-driven play spaces have been integrated into marketplaces, reflecting the reality that many children accompany caregivers to commercial areas. Market environments, traditionally dominated by female vendors, often function as informal childcare spaces where children play in close proximity to their mothers. Recent initiatives have sought to formalize this relationship by designing play-friendly marketplaces (Amowi, 2022). The development process involved extensive community engagement, ensuring that designs aligned with local routines and spatial needs. Interactive elements were introduced using locally sourced materials, incorporating play structures into existing market layouts without disrupting commercial activities. This intervention underscores the role of children as place-makers, actively shaping urban spaces through their presence and engagement (Amoako and Korboe, 2011).

In Nairobi, Kenya, informal settlements have adopted an alternative approach by transforming streets into temporary play areas. Through the "play street" initiative, selected roads are periodically closed to traffic, allowing children to use them as recreational spaces (Wanjiru and Opiyo, 2021). This model requires minimal infrastructure, relying on temporary barriers and community supervision to ensure safety. The approach has been particularly effective in areas with high population densities and limited access to formal playgrounds. The conversion of streets into temporary play spaces reflects an adaptable strategy that maximizes available infrastructure while addressing the need for child-friendly urban environments (Mutisya and Yarime, 2014).

Johannesburg, South Africa, has focused on inclusivity in playground design by integrating accessible features into public recreational spaces. Wheelchair-accessible pathways, tactile play elements, and sensory engagement zones have been introduced to accommodate children with disabilities (Mukwada and Simatele, 2019). These efforts have been supported by partnerships between local governments and non-governmental organizations, ensuring that play spaces remain well-maintained and responsive to community needs. The incorporation of natural features, such as sandpits and gardens, further enhances the recreational experience by providing a diverse range of play opportunities (Donald et al., 2014).

The African case studies highlight how community-led initiatives and adaptive urban planning can facilitate the development of child-friendly play spaces, even in environments where formal playgrounds are scarce. Whether through the conversion of market areas in Accra, temporary play streets in Nairobi, or the inclusive design of playgrounds in Johannesburg, these examples demonstrate practical methods for integrating play into everyday urban life.

2.9.3 Comparative Analysis: African versus International Trend

The case reviews demonstrate the diversity of strategies used to integrate children's play spaces into urban settings. In developed countries, policies often mandate the inclusion of playgrounds in housing projects, as seen in Singapore and Tokyo, where play areas are embedded within high-density environments (HDB, 2019; Matsumoto, 2020). Meanwhile, cities such as Medellín employ small-scale revitalization strategies to repurpose underutilized spaces (Londoño, 2018). In contrast, African cities tend to rely on community-driven models, where informal adaptations of existing spaces create functional play areas. The Accra market-based approach, Nairobi's temporary play streets, and Johannesburg's inclusive playgrounds illustrate how local social and economic contexts shape play space development (UN-Habitat, 2018; Mukwada and Simatele, 2019). These case studies collectively underscore the importance of flexible and context-specific planning in designing accessible play environments.

2.9.4 Local Case Reviews: Addis Ababa

Addis Ababa, Ethiopia's capital, has undergone rapid urbanization in recent decades, resulting in large-scale mass housing developments aimed at mitigating the city's housing shortages. These government-led housing initiatives have successfully increased homeownership opportunities,

yet they often fail to integrate essential public amenities, including dedicated children's play spaces. As a result, children residing in these high-density housing environments frequently resort to playing in unsafe, informal spaces such as streets, parking lots, and building corridors. The absence of structured and well-maintained playgrounds has raised concerns regarding child safety, physical activity levels, and the overall livability of these residential areas (AAMPO, 2002; AACPO, 2017).

While urban planners have recognized the need for communal recreational spaces, implementation has remained inconsistent across different housing projects. Many developments allocate green spaces or courtyards, but these spaces are often too small, poorly maintained, or lack play infrastructure (MUD, 2006). Consequently, children are left with few or no dedicated areas for physical and social activities. The following case studies highlight the challenges, adaptations, and community-led responses within key housing projects in Addis Ababa.

2.9.5 Current Landscape of Play Spaces in Addis Ababa's Mass Housing

Several of Addis Ababa's largest mass housing developments, including Bole Bulbula, Yeka Abado, and Lideta, were designed with a primary focus on housing density, often neglecting the integration of public open spaces for children's play and social interaction (AAMPO, 2002). While some developments include small communal courtyards, these spaces tend to be poorly designed, inadequately maintained, and insufficient to meet the demands of the growing population. The limited planning for play areas has resulted in children utilizing alternative informal spaces such as building corridors, parking lots, stairways, and streets—areas that pose considerable safety risks (AACPO, 2017).

A major challenge in these housing developments is the absence of dedicated and age-appropriate play structures. Where playgrounds exist, they often fail to accommodate children of different age groups, leading to conflicts between older and younger children. Many play areas are also inadequately equipped, often featuring only basic climbing frames, swings, or slides, if any at all. The lack of diversity in recreational equipment limits the types of physical activities children can engage in, reducing the developmental benefits of play (MUD, 2006).

Beyond the issue of play space allocation, safety concerns are a primary challenge. Many informal play areas lack protective barriers, proper lighting, or designated pedestrian zones, increasing the likelihood of accidents and injuries (Wondimu, 2014). Children playing in parking lots or along narrow roads are exposed to moving vehicles, while uneven surfaces and unmaintained structures pose tripping hazards and physical risks (AACA, 2021).

Another critical issue is poor maintenance and sanitation. In many condominiums, communal spaces are not regularly cleaned or repaired, leading to playgrounds and green spaces being left in a deteriorated state. Parents often express concerns over broken play equipment, unhygienic conditions, and the accumulation of waste in open areas, discouraging them from allowing children to use these spaces (Wondimu, 2014). Lack of maintenance policies and insufficient municipal oversight further exacerbate these problems, preventing sustained improvements in existing recreational facilities (AACPO, 2017).

The key challenges identified across these housing projects include:

- **Limited space allocation** – Many condominium developments lack dedicated play areas, and when provided, these spaces are often too small to accommodate the number of children living in the area (AAMPO, 2002).
- **Safety concerns** – The absence of fencing, traffic-calming measures, and adequate lighting exposes children to hazardous conditions, including moving vehicles and criminal threats (MUD, 2006).
- **Lack of maintenance** – In places where playgrounds exist, they are often poorly maintained, featuring damaged equipment, inadequate sanitation, and overgrown vegetation (Wondimu, 2014).
- **Absence of age-appropriate play structures** – Existing playgrounds, if available, do not cater to children of different age groups, limiting the inclusivity and diversity of play experiences (AACA, 2021).

These factors combined have led to underutilized or completely neglected play spaces, forcing children to seek alternative, often unsafe environments for recreation.

2.9.6 Community-Led Initiatives and Adaptations

In response to the lack of formal play spaces, many condominium communities have initiated grassroots efforts to create informal playgrounds using available open spaces. These initiatives, driven by residents and local associations, reflect a strong communal desire to improve children's play environments despite limited municipal support (AACA, 2021).

In Bole Bulbula**,** one of Addis Ababa's largest mass housing projects, parents organized a fundraising initiative to install basic play equipment in one of the condominium courtyards (AACA, 2021). This effort involved the purchase of swings, seesaws, and small climbing structures, offering children a much-needed space for recreational activities. However, these adaptations remain limited in scope, and without formal municipal approval and maintenance plans, they face risks of deterioration over time.

Similarly, in Lideta**,** residents collaborated to designate vehicle-free hours in communal areas, allowing children to safely use shared spaces for play at specific times of the day (Wondimu, 2014). This initiative, though informal, has proven effective in minimizing accident risks and providing a structured play environment. However, challenges remain, particularly regarding enforcement and sustainability, as some residents and businesses continue to use these spaces for parking and commercial purposes during restricted hours.

While these community-driven efforts highlight local resilience and adaptability, they also underscore larger systemic challenges. The lack of governmental intervention, policy support, and dedicated funding means that these initiatives remain small-scale and dependent on voluntary action. Many parents and residents express frustration over the absence of municipal support in ensuring that play spaces are properly designed, regularly maintained, and safely accessible (Wondimu, 2014).

2.9.6.1 Policy and Structural Implications

Despite the significant role of community-led adaptations, the long-term sustainability of play spaces in mass housing developments requires structural interventions at the policy level. A comprehensive urban planning approach is necessary to:

- **Incorporate designated play spaces in all future mass housing projects**, ensuring that these areas are adequately sized and integrated into residential layouts (MUD, 2006).
- **Establish municipal maintenance programs** for existing play spaces, ensuring that playgrounds remain functional, clean, and safe for children (Wondimu, 2014).
- **Introduce urban zoning policies** that protect and preserve communal play areas from encroachment or repurposing for non-recreational uses (AACPO, 2017).
- **Enhance community participation** by involving residents in the design, development, and management of public play spaces, ensuring that facilities reflect local needs and cultural preferences (AACA, 2021).

Without coordinated action from urban planners, policymakers, and local governments, Addis Ababa's mass housing developments will continue to fall short in providing safe and accessible play spaces. While community-driven solutions offer temporary relief, a policy-backed, citywide approach is essential to ensure that every child has access to a safe and stimulating play environment.

3 CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research design, data collection methods, and analytical techniques used to examine children's play spaces in Summit Condominium. A mixed-methods approach was employed, integrating both quantitative and qualitative research methods to ensure a comprehensive assessment of accessibility, usability, and overall quality. The sampling strategy, data processing techniques, and ethical considerations are discussed to establish the scientific rigor of the study.

3.2 Study area

Addis Ababa is one of the diplomatic quarters of the world following Geneve, New York and Rome. It is also the political capital of Africa and the most important commercial and cultural center of Ethiopia which is geographically located at the heart of the nation. Addis Ababa is located at $9^{o}2$'N latitude and $38^{o}45$'E longitude and its average altitude is 2,400 meter above sea level, with the highest elevations at Entoto Hill to the north reaching 3,200 meters. This makes Addis Ababa one of the high-altitude capital cities of the world (ATLAS, 2011).

According to The World Bank Group, Addis is home to 25% of the urban population in Ethiopia. It is known that due to population growth and urbanization the city is expanding and sprawling horizontally. The growth of the city cover is increasing faster than the population growth and the city urban land expansion rate is 3.2% per year, out of 520 km of the city 46% of the land is undeveloped or vacant (World Bank Group and GFDRR, 2015).

The capital city Addis Ababa is divided into eleven sub cities (ATLAS, 2011), and the study area is located in Summit Condominium, Woreda 05 of Lammi Kura sub-city, which is 179.5 Sqkm. In Summit condominium there are three districts: Kolfe, Arada and Kirkos. In particular, the study area is located in Arada district, which has the most condominium houses that have started giving service since 2012 G.C. A detail study was conducted by selecting two blocks of mass housing condominiums based on the density of residences, the composition and use of green space, and the level of green space development – both developed and semi-developed.

Justification points for the research site selection are:

- Mass housing developments accommodate the majority of city dwellers, particularly low-income urban residents (sometime referred to as the ‘urban poor’), who seek affordable facilities including housing options and other infrastructure
- Lammi Kura Sub-City, the new Sub-City formed from some merged Woredas of Bole Sub-City and Yekka Sub-City, is where the majority of the mass-housing projects were constructed.
- This area is categorized under city expansion zone and the residents in this area cannot access the inner-city children spaces easily due to distance.
- The Summit Condominium site was transferred to users not too early or too late for evaluation of any development including the playground facility, which makes the site an ideal place for the study.
- The size of the site is still appropriate and representative.

The location of the study area is indicated below (Figure 3:1):

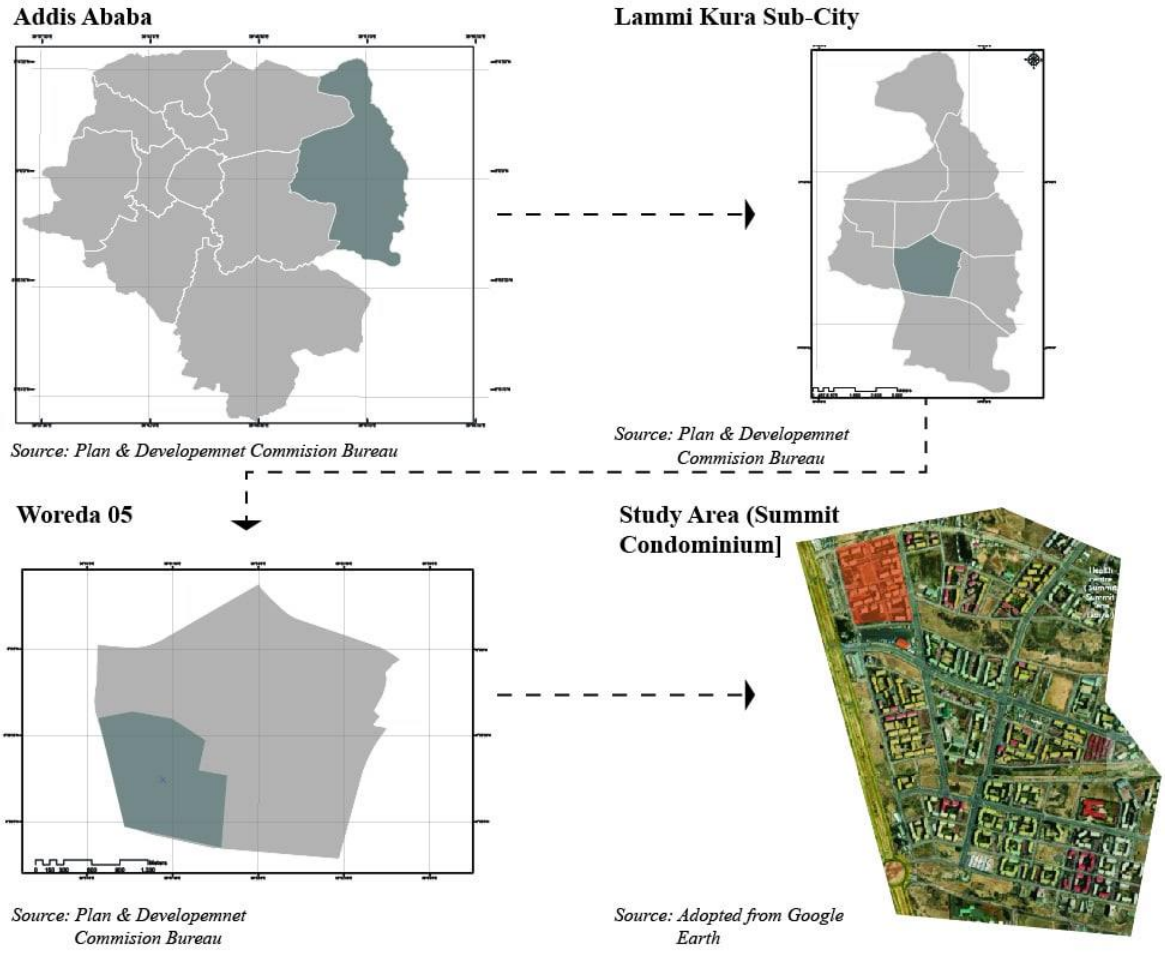


Figure 3:1 *Location Map of the Study Area*

(*Adapted from Addis Ababa Plan and Development Commission Bureau, GIS Cadaster and Google Earth*)

3.3 Research design

This research used the mixed approach by employing both qualitative and quantitative research methods. According to Creswell (2017), quantitative methods involve the collection, analysis, interpretation, and presentation of research findings. The quantitative research was used to determine the current status of Children's Play Space in summit condominium, explore the availability, optimization and accessibility; uses and activities and comfort of Children's Play Space in summit condominium. Different parameters are used to evaluate the Children's Play Space in summit condominium.

In this research, the ‘What?' questions are used for the research questions which require a descriptive explanation, comparison and correlation on the topic under study, this is based on the statement of Kothari (1990), the methods of research applied in descriptive research are survey methods, comparative and correlational methods. This research examines the current state of current state of Children’s Play Space in summit condominium. It is due to this that the study followed both quantitative and qualitative approaches in order to bring light to the objectives of the study.

3.4 Data type and source

3.4.1 Data type

Since Children’s Play Space has quantitative (measured) and qualitative (unmeasured) integral parts, both primary and secondary data types were correspondingly significant. Qualitative character of the research implements more of qualitative data, which helps to analyse the quality of the place using users ‘responses while quantitative data will be used to do the rest. Therefore, analysis carried out by evaluation of collected data through theoretically reviewed analytical tools.

3.4.2 Data sources

To assess quality of Children’s Play Space in Summit condominium residents reliable and good quality data are required. Therefore, this study used both primary and secondary data source.

- **Primary data Source**: The sources of primary data obtained from key informants and Summit condominium residents (children and parents) by employing questionnaires, in-depth interviews, and observation methods.
- **Secondary data source**: In order to strengthen the primary data, ranges of secondary data were used. Different reports, files, documents and publications like, books, journals, proclamations, directives, manuals, norms and standards which have a direct link with the issue will supplement the study. In addition, satellite images and cadastral maps are also used.

3.5 Sampling methods

This study employed non-probability sampling, specifically quota sampling, to ensure the representation of different age groups of children residing in the Summit Condominium.

Quota sampling is a non-random sampling technique where the researcher ensures that specific subgroups are proportionally represented according to predetermined characteristics (Kumar, 2011). This method is often used when probability sampling is not feasible due to resource constraints or the unavailability of a complete sampling frame (Kothari, 2004).

In this research, quota sampling was chosen because it allowed the study to systematically include children of different age groups, ensuring that the play space needs of all developmental stages were fairly assessed.

3.6 Sampling frame

The sampling frame for this study is defined based on households with children residing within the 6.2-hectare spatial boundary of the study area in Summit Condominium. The selection criteria focused on families with children aged 0–14 years, ensuring that the study accurately reflects the needs and experiences of the primary users of play spaces.

This approach allows for the inclusion of diverse family structures and captures a representative sample of children's play behaviors, accessibility issues, and space utilization patterns within the condominium environment.

3.7 Sampling size determination

Sample size refers to the number of subjects selected from the target population to form a representative sample, ensuring valid and reliable results (Kumar, 2011). According to Kothari (2004), an optimal sample size should be neither excessively large nor too small but sufficient enough to provide statistically meaningful insights while maintaining an acceptable confidence level for the estimates.

This study employed quota sampling (QS), a non-probability sampling technique that ensures the sample composition reflects the structure of the target population based on predefined characteristics. Quota sampling is particularly useful in studies where random sampling is impractical due to resource constraints (Kumar, 2011). In this study, children were categorized into three age groups (0–4, 5–9, and 10–14 years) to assess how play spaces in mass housing developments accommodate different developmental stages.

The study was conducted in two blocks of the Arada district within Summit Condominium, which consists of 200 households. According to Atlas (2011), the average household size in Addis Ababa is five (5) individuals per household, resulting in an estimated total population of 1,000 residents in the study area.

Since quota sampling does not rely on a fixed mathematical formula, the sample size was determined based on population proportions reported in the Ethiopia Demographic and Health Survey (DHS, 2000):

- Children aged 0–4 years make up 11.9% of the urban population → Sample size: 119
- Children aged 5–9 years make up 11.5% of the urban population → Sample size: 115
- Children aged 10–14 years make up 13.6% of the urban population → Sample size: 136

Thus, the total sample size for children included in this study was 368, ensuring proportional representation of each age group in the assessment of play space accessibility and utilization.

3.8 Methods of data collection

Given that children are the primary users of the play spaces, their perspectives were prioritized in assessing the quality and usability of these environments. To meaningfully capture their experiences and perceptions, the researcher employed a range of child-friendly and age-appropriate methods, including:

- Drawings
- Interviews
- Behavioral observations
- Essay writing

These participatory tools were carefully designed and adapted to align with the cognitive and emotional capacities of different age groups, ensuring children could express their views freely, creatively, and comfortably.

Ethical Considerations in Engaging Children: Special attention was given to ethical considerations throughout the research process, recognizing children as a vulnerable group requiring protection. Informed consent was obtained from both children and their parents or

guardians prior to participation. Additionally, all activities were designed to be non-intrusive and child-friendly, ensuring the children's safety, dignity, and voluntary participation at all stages. Anonymity and confidentiality were maintained to protect the identity of the child participants.

Beyond data collection, this approach aimed to empower children by valuing their voices in shaping the spaces they use daily—a principle aligned with the United Nations Convention on the Rights of the Child (UNCRC) which emphasizes children's right to express their views in matters affecting them (United Nations, 1989).

Parental Involvement: Parents were also engaged as key informants in the research. In the local context, children's use of outdoor spaces is often governed by parental permission and supervision. Parents provided critical insights regarding their children's outdoor activities, perceived safety risks, and the social norms influencing play behavior within the condominium environment.

3.8.1 Questionnaires

The household questionnaire was one of the data collection instruments so as to find out the current status of Children's Play Space in Summit condominium and the determinant factors to uses and activities and comfort of Children's Play Space in the same site.

3.8.2 In-depth interviews

The researcher interviewed children and parents of summit condominium. Since the main informants of this study were children, the study used unstructured interviews method, because this method is characterized by a flexibility of approach to questioning and believed to explore more on the facts related to the children spaces.

3.8.3 Focus group discussions

For the purpose of understanding what kind of children's space children want, the researcher conducted focus group discussions (FGDs) with children and asked them to imagine and draw their ideal play spaces.

3.8.4 Observations

The research used a non-participant observation method as well to identify the current state of the study area from the point of the objectives of the study for example to explore the use and

activity by observing and recording how and why people (specially children) use space, in particular, to find what physical features would encourage their use. Observations performed byPhotographing the site which is helpful to use as a point of reference for the later aspects of this process. In order to identify what aspects of the environment are missing or not present.

3.9 Methods of data analysis

This study employed a combination of quantitative and qualitative data analysis techniques to ensure a comprehensive assessment of children's play spaces in Summit Condominium. The analysis was structured into three key components: descriptive analysis, spatial analysis, and qualitative analysis. These methods provided both statistical insights and contextual understanding, ensuring that findings were accurate, reliable, and applicable to similar urban mass housing developments.

3.9.1 Descriptive Analysis

Descriptive statistical methods were used to process and interpret the quantitative data collected through surveys and structured questionnaires. The analysis included frequency distributions, percentages, and cross-tabulations, which helped in identifying key trends related to children's play behavior, accessibility of play spaces, and parental perceptions regarding safety, usability, and maintenance. These statistical computations were conducted using SPSS and Microsoft Excel, allowing for the organization of large datasets into structured and interpretable outputs.

The descriptive results were presented using tables, bar graphs, and pie charts, which provided a clear visualization of the data trends. These representations enabled the identification of disparities in play space distribution, frequency of usage, and the varying levels of satisfaction among residents. Additionally, statistical comparisons were made to assess whether play space usage differed based on age groups, gender, and accessibility constraints. The structured presentation of findings ensured that patterns and correlations in play space usage were effectively communicated.

3.9.2 Spatial Analysis

A spatial analysis was conducted using Geographic Information Systems (GIS) tools and computer-aided design (CAD) software to examine the physical distribution, accessibility, and

usability of play spaces within the study area. This method was crucial in determining how built environment configurations influenced children's ability to access and utilize play spaces safely.

The spatial analysis primarily focused on three key components:

1. **Proximity Analysis** – The distance between residential units and designated play spaces was mapped to determine whether these areas were equitably distributed and conveniently accessible for children across different age groups.
2. **Visibility and Connectivity Assessment** – A Space Syntax Analysis was performed using DepthmapX software to evaluate how spatial configuration and built environment factors impacted children's movement patterns and ability to access play spaces safely.
3. **Site Planning and Spatial Layout Evaluation** – AutoCAD was used to assess and refine site layout designs, ensuring that the spatial configuration of play areas met international design standards and local urban planning norms. The analysis helped determine whether existing open spaces were adequately sized, well-connected, and functionally effective in promoting children's recreational activities.

To present the findings, maps, spatial diagrams, and 3D models were generated, visually illustrating the distribution, accessibility, and visibility of play spaces within the Summit Condominium. These representations were crucial in highlighting areas with spatial deficiencies and identifying potential locations for future play space enhancements.

3.9.3 Qualitative Analysis

The qualitative component of the study focused on understanding user perceptions, behaviors, and lived experiences related to children’s play spaces. Data was collected through in-depth interviews, focus group discussions (FGDs), and non-participant observations, and was subsequently analyzed using thematic coding techniques.

Key themes were identified based on recurring patterns in the data, including:

- Parental and community perceptions regarding the safety, maintenance, and usability of existing play spaces.

- Challenges faced by children, such as limited play areas, overcrowding, and safety concerns related to traffic and poor infrastructure.
- Community-driven adaptations, such as the informal conversion of underutilized spaces into makeshift playgrounds and the role of residents in maintaining play areas.

The qualitative data was coded and analyzed using NVivo software, which facilitated the systematic categorization of responses and the identification of emerging themes and relationships. The findings were presented using narrative descriptions, thematic analysis tables, and visual documentation, including photographs and observational notes. Additionally, children's drawings and descriptions of their ideal play spaces were included to provide direct insights into their preferences and expectations.

By integrating descriptive, spatial, and qualitative analyses, this study was able to provide a holistic evaluation of play spaces in Summit Condominium, offering both quantifiable data-driven insights and contextually rich interpretations of user experiences. The triangulation of these methods strengthened the validity of the findings, ensuring that recommendations for play space improvements were based on empirical evidence and real-world user feedback and the detailed methodology is explained in Table 3:1 below.

3.10 Data Presentation Method

After data processing and verification, the results were systematically structured and presented in a logical sequence corresponding to each research question and study objective. The findings were organized to facilitate comparative analysis, pattern identification, and interpretative clarity, ensuring that both quantitative and qualitative data were effectively integrated to provide a comprehensive assessment of children's play spaces within the Summit Condominium.

For quantitative data, descriptive statistical methods such as frequency distributions, percentages, and comparative analyses were applied. These results were visually represented using tables, bar graphs, and pie charts to illustrate the current status of children's play spaces in the condominium area.

For qualitative data, non-numeric findings that cannot be measured statistically were analyzed and presented using thematic categorization, textual descriptions, and visual representations.

These included maps, photographs, and structured narrative analysis, ensuring a comprehensive understanding of the spatial and social dynamics of children's play environments.

3.11 Summary of Research Methodology

To ensure a systematic and structured approach to the study, various data collection, analysis, and presentation methods were employed. The following table provides a comprehensive summary of the research methodology, outlining the objectives, data requirements, sources, collection techniques, analytical tools, and presentation formats used to assess children's play spaces in Summit Condominium. This structured approach ensures that the findings are methodologically sound, reliable, and aligned with the study's research questions.

Table 3:1 *Summary of Research Methodology*

Research Objective	Data Required	Data Sources	Data Collection Methods	Analysis Techniques	Presentation Format
Explore the availability and accessibility of play spaces	Physical characteristics of the study area, building and open space configurations, proximity measurements	Resident interviews, cadastral maps, literature review	House-to-house surveys, GIS mapping	ArcGIS, DepthmapX, Microsoft Excel	Maps, graphs, tables, and descriptive summaries
Assess the sufficiency of play space uses and activities	Equipment availability, flexibility, space dimensions, surface material, play variety	Resident interviews, field observations, literature review, standard guidelines	Focus group discussions, direct field observations	Comparative analysis, spatial assessment	Photographs, thematic coding, graphical representations
Analyze the comfort of children's play spaces	Physical, social, and environmental factors affecting usability	Resident interviews, observational data, existing standards	In-depth interviews, field observations	Statistical analysis, qualitative coding	Thematic categorization, visual documentation
Propose renovations & optimized design approaches	International best practices, assessment of current conditions	Literature review, comparative case studies	Document review, expert consultation	Policy analysis, spatial modeling	Policy recommendations, design proposals

Note. *Researcher, 2022*

3.12 Ethical considerations

Different ethical issues were considered while conducting the study. Mainly the following were the main concerns that were taken into account:

- To conduct with the study, the researcher asked permission from summit Condominium committee and also Condominium residents. All participants of the study were asked their volunteerism to be involved in answering the questionnaire.
- The objectives and purposes of the study were explained to the respondent. Parents' permission was solicited before the enquiries for Children who participated in the interview and also parents who participated in the interview and questionnaire were informed and approved that they were used as participants in this study.
- The researcher followed the appropriate procedures in attaining permission for this study. Furthermore, anonymity of participant was guaranteed (their name will not be exposed) the right of withdrawal from the study was also permitted.

3.13 Limitations of the Study

While this study provides valuable insights into the quality and accessibility of children's play spaces in mass housing developments, certain limitations must be acknowledged:

1. **Sampling Constraints:** Due to the use of non-probability sampling, the findings may not be fully generalizable to all mass housing projects in Addis Ababa.
2. **Time and Resource Limitations:** Field observations were conducted over a limited timeframe, which may not fully capture seasonal variations in children's play behaviors and space utilization.
3. **Participant Bias:** Survey and interview responses may have been influenced by social desirability bias, leading some participants to overstate or understate certain issues related to play spaces.
4. **Data Gaps:** Limited access to government planning documents and updated demographic data may have affected the depth and comprehensiveness of the secondary data analysis.

4 CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter presents the empirical findings of the study, organized thematically to address the research objectives. The results highlight the general conditions of children spaces in Addis Ababa and proceeds to physical availability, accessibility, usability, and optimization challenges of children's play spaces within Summit Condominium. The findings are systematically analyzed at the macro, meso, and micro scales, providing a multi-layered understanding of spatial provisions and socio-environmental dynamics affecting children's outdoor play experiences. Quantitative results are integrated with qualitative insights from field observations, interviews, and parental narratives.

The chapter concludes by synthesizing findings into thematic challenges directly feeding into the subsequent discussion on their alignment or divergence from international urban planning standards, child development theory, and case studies from comparable global contexts

4.2 Socio-Economic Description and Response Rate of Respondents of Summit Condominium Residents

4.2.1 Age of Respondents

A total of 368 children (representing approximately 19% of the total estimated child population) and 37 parents (10% of total parents in the community) participated in the household survey. The sample was selected to ensure diverse representation across age groups, gender, and living conditions within the Summit Condominium.

Given that children constitute an estimated 37% of the total population of 52,060 residents, the approximate total number of children in Summit Condominium is 19,262. The surveyed 368 children thus represent:

- 1.9% of the total population in Summit Condominium.
- 19% of the estimated child population within the community.

To ensure a representative sample, the children were categorized into three age groups:

- 0–4 years: 57 children, constituting 15.5% of the surveyed children (compared to 11.9% of the estimated child population).
- 5–9 years: 142 children, making up 38.6% of the surveyed children (compared to 11.5% of the estimated child population).
- 10–14 years: 136 children, accounting for 45.9% of the surveyed children (compared to 13.6% of the estimated child population).

This distribution highlights that older children (5–14 years) make up the majority of play space users, reflecting a greater emphasis on active outdoor engagement. Understanding these demographic characteristics is crucial for assessing play space preferences, accessibility challenges, and overall usage patterns within Summit Condominium.

This balanced representation is critical in capturing variations in spatial usage across age and social roles. Younger children primarily offered insights into immediate environmental factors influencing play, while parents contextualized safety concerns and accessibility barriers within broader socio-economic realities.

From the assessments, toddlers (0–4 years) require safer, enclosed areas, children in the 5–14-year range demand more dynamic play environments that accommodate both active and social play. This underscores the need for age-appropriate play facilities that balance safety for younger children with opportunities for exploration, movement, and peer interaction for older age groups. Chart 4.1 below illustrates the detailed breakdown of age composition among the surveyed children.

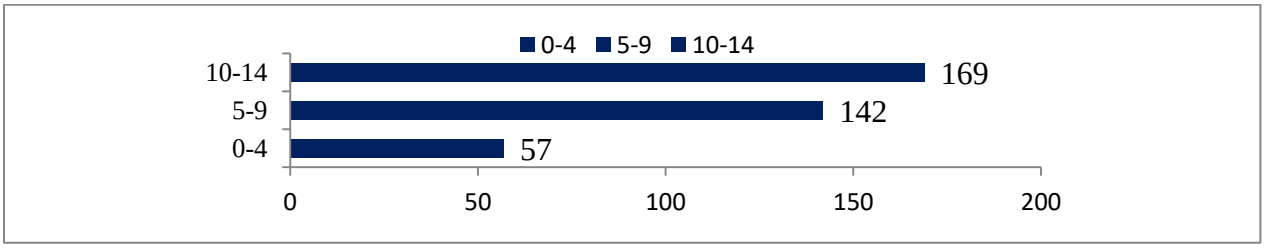


Chart 4:1 *Age Composition of respondents*

(*Source: Researcher's Own Analysis*)

4.2.2 Sex composition of respondents

The survey revealed the following gender distribution among child respondents (See Chart 4:2):

- Boys: 198 (53.8%)
- Girls: 170 (46.2%)

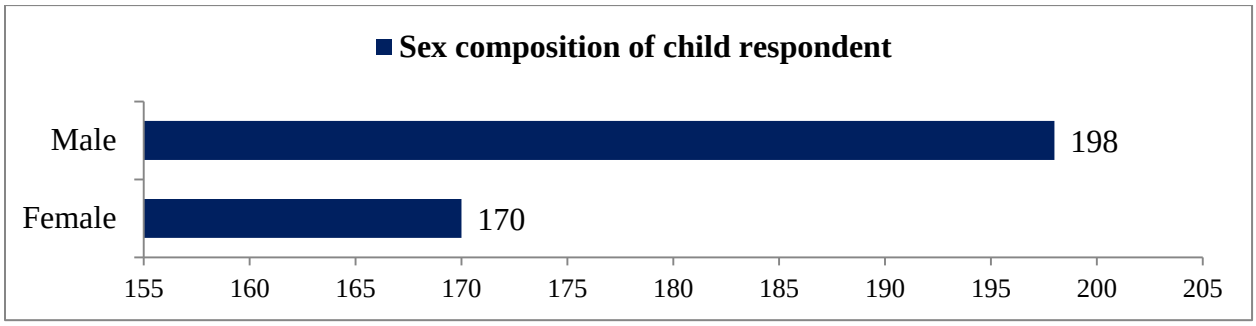


Chart 4:2 *Sex Composition – Children*

(*Source: Researcher's Own Analysis*)

The survey also revealed the following gender distribution among parent respondents (See Chart 4:3):

- Mothers: 27 (73%)
- Fathers: 10 (27%)

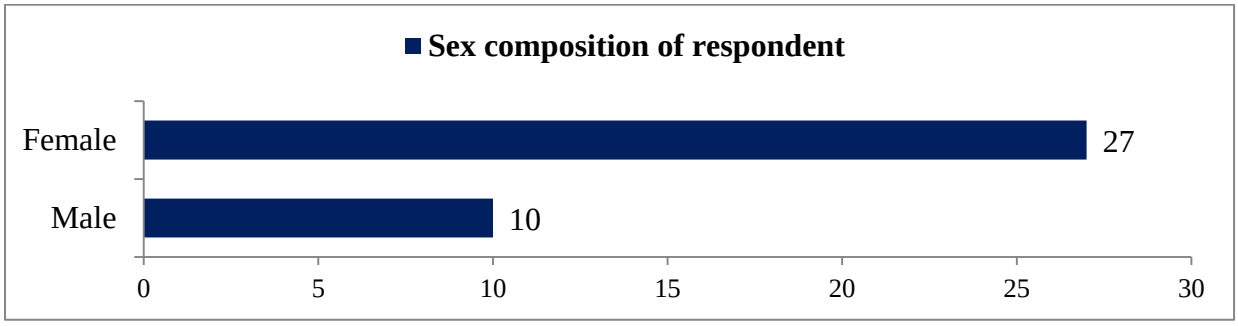


Chart 4:3 *Sex compositions – Parents*

(*Source: Researcher's Own Analysis*)

The higher participation of mothers reflects traditional caregiving roles, suggesting that mothers' perspectives were more prominent in evaluating play space safety and accessibility. This is particularly relevant, as parental restrictions often play a significant role in where children are allowed to play.

4.3 Availability and accessibility of children space

4.3.1 Availability of Open Spaces

The city-level assessment reveals that Addis Ababa, like many rapidly urbanizing African cities, faces critical shortages in dedicated play spaces for children. While official urban plans and policy documents indicate the provision of open spaces, field observations and secondary data review reveal that the actual *per capita* open space falls below 5 m²—well below the World Health Organization (WHO) recommendation of 9 m² per child.

This discrepancy reflects what Jafrin and Beza (2018) describe as "illusory availability"—a condition where spaces exist on paper but are either inaccessible, repurposed, or unsuitable for children's play due to poor maintenance or competing land uses. In the context of Ethiopian mass housing projects, this challenge is compounded by weak implementation, where designated spaces are often encroached upon, neglected, or diverted to other uses.

To examine this issue in greater detail, the study assessed the availability and condition of open spaces across three spatial scales within the Summit Condominium site to better understand their distribution, functionality, and usability for children's play activities:

- Macro-scale (City/Neighborhood Level)
- Meso-scale (400m Catchment of Study Blocks)
- Micro-scale (Within the Selected Condominium Blocks)

4.3.1.1 Macro Scale: Urban Level Context

a) Spatial Context and Planning Intentions in Summit Condominium

Summit Condominium spans 276.9 hectares, accommodating 559 building blocks, of which 476 are residential/mixed-use buildings and 83 are communal buildings. The area houses approximately 52,060 residents across 10,412 households, making it a high-density urban settlement where access to public spaces, particularly children's play areas, is essential.

During the initial neighborhood design (Figure 4:1), efforts were made to promote a hierarchy of open spaces, including:

- Community parks
- Communal internal greeneries

- Sports and recreational centers

Figure 4:1 ***Proposed Land Use***

(*Source: AAHDPO Report*)

A total of 57.8 hectares (20.9% of the total area) was designated for green spaces, comprising two community parks, four sports fields, and internal green areas. These spaces were intended to provide recreational opportunities and promote social interaction within the community (Figures 4:2 and 4:3).

Figure 4:2 *Open spaces used as sport field by youth*

(*Source: Researcher, 2022*)

Figure 4:3 *River Green*

(*Source: Researcher, 2022*)

b) Per Capita Open Space Availability

According to planning standards, the gross population density in the study area is 9 people per square meter, and the per capita availability of open space is 11 square meters per person. While this figure exceeds the World Health Organization (WHO) urban greenery standard of 9 m² per person, field observations indicate that many designated play spaces have not been fully developed or are no longer serving their intended function.

c) Current Use of Open Spaces

Despite the positive intentions in the original land-use plan, many open spaces have been repurposed or remain underdeveloped, leading to a significant discrepancy between planning and reality. As illustrated in Figures 4:8–4:11, the following issues were observed:

- **Conversion of Proposed Community Parks into Farmland**

- Some areas originally designated for community parks have been repurposed for informal farming, limiting children's access to play spaces.

- **Transformation of Green Spaces into Built-Up Areas**
  - Several designated green spaces have been converted into residential or commercial structures, reducing overall open space availability.
- **Play Spaces Used for Alternative Purposes**
  - Open spaces intended for children's play are frequently used as parking areas or waste disposal sites, making them unsuitable for recreational activities.

Figures 4:4 and to 4:5 below illustrate these transformations in land use, highlighting the discrepancy between planned and actual play space availability.

a)  b)  c) 

Figure 4:4 *Proposed Community Park but serving as farmland*

(*Source: Researcher, 2022*)

a)  b)  c) 

Figure 4:5 *Open spaces converted to built-up area*

(*Source: Researcher, 2022*)

In summary, within Summit Condominium, spatial analysis indicated three areas initially designated for children's play. However, two of the three spaces have been repurposed—one as a parking lot and the other as a storage area for small businesses. This reflects Kristiánová's (2018)

findings in Slovakian mass housing, where spatial competition gradually erodes recreational spaces. The only partially functioning space lacks adequate maintenance, confirming Hughes (1996) that spaces without active programming or investment gradually lose their social function as play areas.

Key Insight: *Despite an adequate amount of open space being designated in the plan, ineffective implementation and competing land uses have significantly reduced children's access to formal play areas.*

4.3.1.2 Meso Scale analysis: Neighborhood Context

This scale assesses play spaces within a 400-meter walking radius, a reasonable distance for a child to travel independently.

- One community park (3.6 ha) was proposed within this neighborhood catchment area.
- However, site observations revealed that the park is now encroached upon and used as farmland, further limiting children's recreational options. (Figure 4.7)

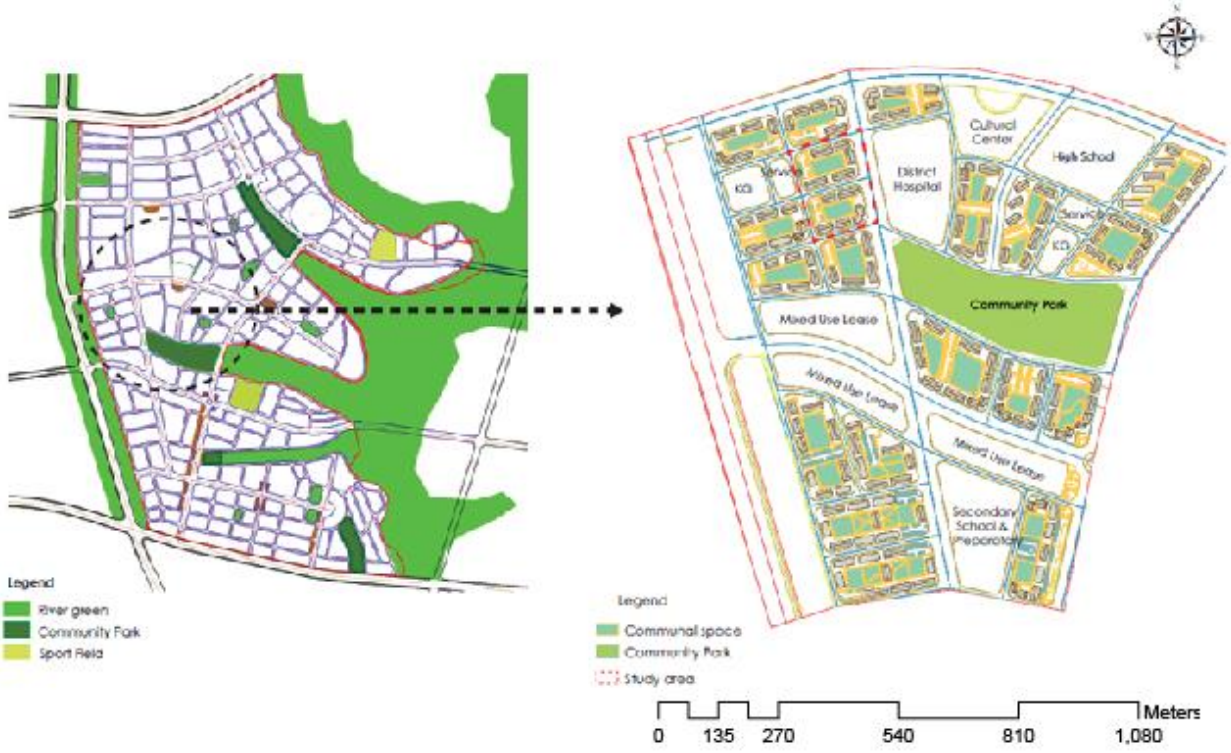


Figure 4:6 *Neighborhood Scale Green Area*

(*Source: AAHDPO Report*)

Key Insight: *Although the neighborhood design intended to provide accessible community play spaces, encroachments and alternative land uses have reduced their functionality for children.*

4.3.1.3 Micro Scale Analysis: Site-Specific Analysis

To thoroughly analyze the availability of children's play spaces at the micro-scale, the study examined two residential blocks (Block A and Block B) within the Summit Condominium. The analysis focused on building morphology, population density, and per capita open space availability as key indicators.

The total area of the two selected blocks (i.e. – Five stand-alone buildings each) is 18,273 m², of which 15,350 m² is designated as open space, including surrounding roads and internal pathways. The combined building footprint covers 2,923 m², with Block A occupying 1,514 m² and Block B covering 1,409 m². This results in built-up area ratios of 24% for Block A and 23.8% for Block B, indicating a moderately dense development.

The gross population density of the study area was calculated at 5.47 persons per m². Based on this, the per capita availability of open space within the two blocks stands at 15 m² per person—which is above the World Health Organization's (WHO) recommended minimum standard of 9 m² per person (WHO, 2016). This suggests that, quantitatively, sufficient open space exists; however, its actual usability and function as children's play space requires further assessment. Table 4:1 summarizes the morphological analysis of the study area.

Table 4:1 *Morphological Analysis*

Indicator	Value
Total Area	18,273 m²
Open Space	15,350 m²
Built-Up Ratio (Block A)	24%
Built-Up Ratio (Block B)	23.8%
Population Density	5.47 persons/m²
Per Capita Open Space	15 m²/person

Note. *Researcher's Own Analysis, 2022*

Based on the building configuration and spatial arrangement, the researcher classified the available open spaces within the study area into four distinct categories:

1. Open spaces overlooking the street

2. Open spaces enclosed by the blocks
3. Open spaces located behind the blocks
4. Open spaces situated between the buildings

Site observations confirmed the presence of a variety of open spaces, reflecting a certain degree of spatial zoning intended for diverse activities. However, despite this apparent spatial adequacy, functional accessibility and utilization remain limited.

Field observations revealed that many of these spaces have been repurposed for alternative uses, such as vehicle parking, drying clothes, or storing household items and cereals. As a result, only a small fraction of the available open spaces is actually used as play areas, primarily those located between or behind buildings. Even so, these zones often remain marginalized, poorly designed, and lack essential child-friendly features such as safety elements, visibility, or appropriate play infrastructure.

These conditions significantly limit children’s access to meaningful outdoor play, as illustrated in Figures 4.7 and 4.8.

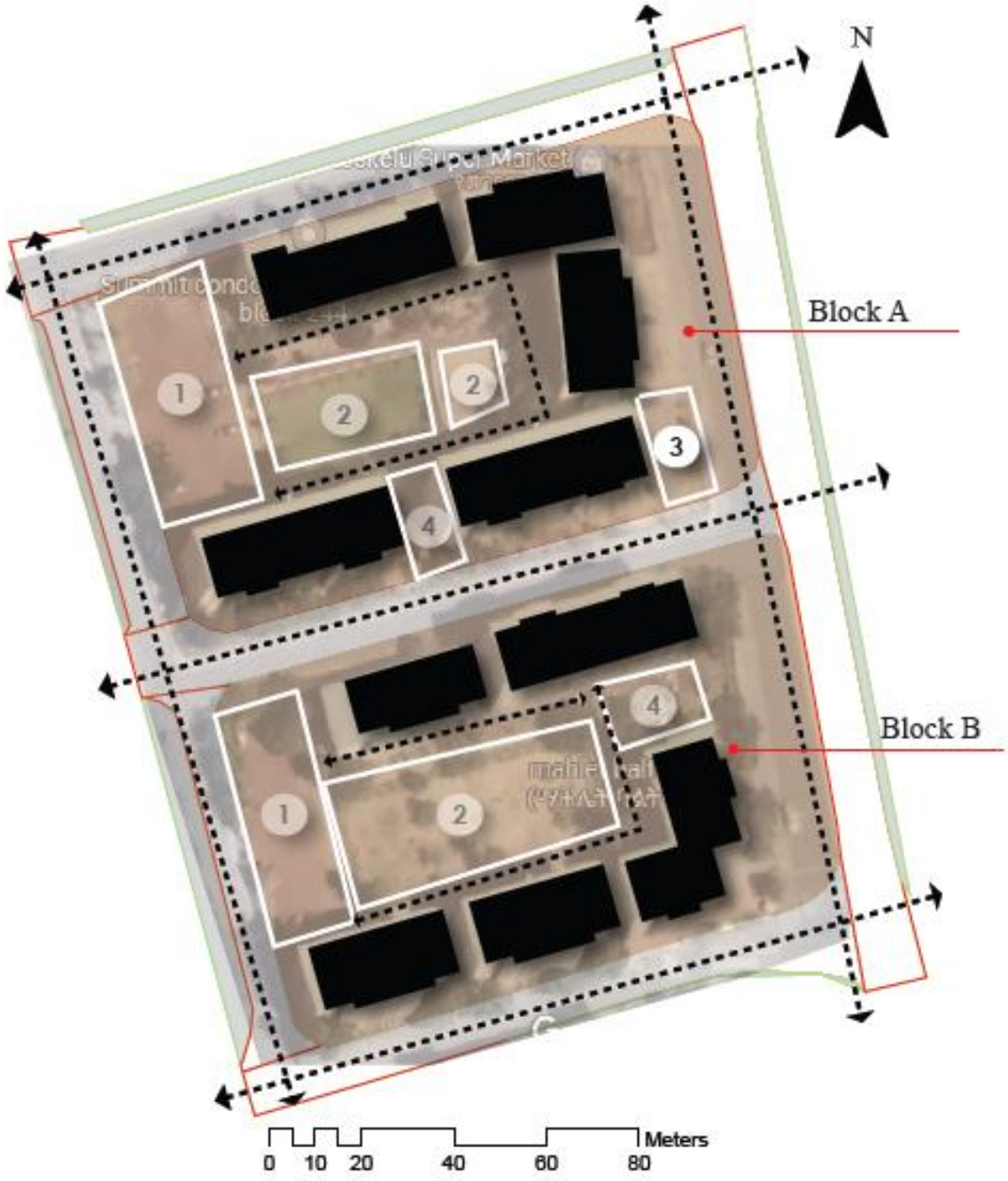


Figure 4:7 *Open Spaces in the Study Area*

(*Legend: 1. open spaces overlooking the street; 2. Open spaces enclosed by the blocks; 3. Open spaces behind the blocks and 4. Open spaces between the buildings) (Source: Adapted from Google Earth, GIS cadaster and researcher's field observation, 2022.*)

Open Spaces enclosed by the blocks

Open spaces behind the blocks

Open spaces between the buildings

Figure 4:8 *Open spaces in study area*

(*Source: Researcher, 2022*)

Moreover, detailed field observations revealed also that even the remaining space was functionally compromised due to uneven surfaces, lack of equipment, and absence of protective fencing. The surface was largely bare earth, susceptible to erosion and dust pollution, further deterring use (See Table 4:2).

Table 4:2 *Condition and Usability of Play Areas in Summit Condominium*

Play Area	Surface Condition	Safety Rating (1-5)	Utilization Rate	Key Issues
Main Courtyard Play Area	Concrete (worn)	2.5 (Low)	Low	Converted to parking, no equipment
Vacant Grass Plot	Grass (patchy)	3.8 (Moderate)	Moderate	Partial usage, lack of shade
Repurposed Parking Lots	Bare earth	1.9 (Very Low)	Minimal	Erosion, no boundaries, unsafe for play

Note. *Researcher's Own Analysis, 2022*

These findings in general confirms the observation by Karsten (2003) that spaces labeled "playgrounds" in urban housing often fail to serve their intended purpose due to poor material conditions and design neglect.

4.3.2 Accessibility

4.3.2.1 Macro scale Analysis

How accessible is proposed play spaces?

Accessibility of proposed play spaces was analyzed at the macro scale, focusing on the distribution and ease of access to community parks within the Summit Condominium site. A walking distance of 400 meters was used as the reasonable benchmark, considering that children

are generally comfortable walking up to this distance to reach outdoor play areas (Prezza et al., 2005; El-Geneidy et al., 2006).

Based on the original neighborhood design, four distinct community parks were designated within the site layout, as presented in Table 4:3. The total combined area allocated for these parks is approximately 78,342 square meters.

Table 4:3 *Areas of community parks*

Community Park	Area in m^2
Park 1	22,687
Park 2	35,595
Park 3	3,977
Park 4	16,083
Total	**78,342**

Note. *Researcher's Own Analysis*

However, spatial barriers limit the effective accessibility of these parks for children. As illustrated in Figure 4:9, despite being spatially distributed, the parks are physically separated by wide roads, particularly 30-meter-wide vehicular corridors that children must cross to reach them. This presents significant safety concerns and hinders direct access, especially for younger children.

Moreover, field observations indicated that some parks had been repurposed or left underdeveloped, further reducing their functionality as safe, accessible play spaces.

Figure 4:9 *Macro scale accessibility analysis*

(*Source: AAHDPO report*)

Key Observations:

- Designated park areas exist, but actual usage is constrained by physical obstacles.
- Vehicular roads act as barriers, reducing walkable and child-friendly accessibility.
- Lack of safe pedestrian crossings exacerbates the challenge, requiring children to depend on adults or avoid the parks altogether.
- This gap between planned availability and practical accessibility indicates a critical flaw in the spatial design of the neighborhood.

Hence, while the master plan allocated sufficient land area for community parks, the functional accessibility remains poor due to disconnects in urban design—underscoring the need for safe crossings, traffic calming measures, and child-friendly pathways in future planning interventions.

4.3.2.2 Physical accessibility – Micro scale analysis

a) The connection between the space and the adjacent buildings

At the micro-scale, the study assessed the physical accessibility of children's play spaces within the two selected condominium blocks. Field observations and questionnaire results indicated that well-defined walkways and internal paths exist, connecting the buildings and adjacent spaces. These pathways provide relatively easy movement for residents, allowing children to access the available open spaces without major physical obstacles.

Figure 4:10 *Sidewalks*

(*Source: Researcher, 2022*)

When the children asked how far their homes are from play space, most of them answered play space is very close to their home and also majority of respondent said that, they live on adjacent buildings. Nevertheless as Chart 4:4 illustrates, when questioned about ease of access to play spaces, 228 children (62%) responded YES, while 140 children (38%) responded NO.

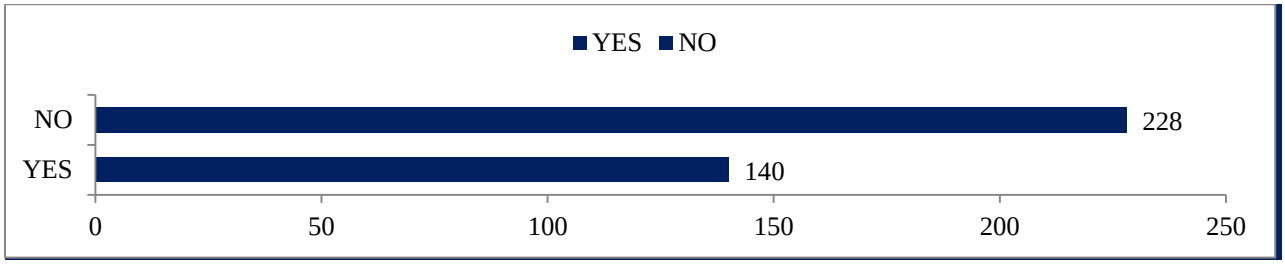


Chart 4:4 *Physical Accessibility*

(*Source: Researcher's Own Analysis*)

However, despite the presence of these connections, functional accessibility is constrained by community-imposed restrictions and competing land uses. Children reported that some spaces are off-limits for play—either formally by condominium committees or informally by parental guidance. Areas designated for greenery or used as parking lots are commonly restricted.

One child from Block A shared:

"If we play on the green area, the grass will get damaged, therefore the Resident Committee does not allow us to play on green area. Parking areas are for cars only. The only spaces left for us are between or behind buildings and the road outside the compound."

Additionally, more than half of the surveyed parents (54%) restrict their children from playing near streets or outside the compound due to safety concerns. These concerns primarily include fear of traffic accidents, strangers, and potential negative peer influences.

Furthermore, the level of children's independence is strongly age-dependent. Younger children (ages 0–9) are largely confined to spaces near home under parental supervision, while older children (10–14) enjoy relatively more freedom. Still, limited safe, designated play zones negatively impact children's ability to engage freely in outdoor play.

b) Areas for Parental Restrictions

Regarding places which area is restricted for children play by their parents, 57 (15.4%) of children said nowhere is restricted to play – but they simply have to tell their parents where they are going to play while 198 (53.8%) of children responded that, they are not allowed to play on the roads (outside of compound) and 113 (30.7%) of them said they are restricted to play in any place perceived as danger by their parents, thus, not allowed to go outside of their home (See Chart 4.5 below).

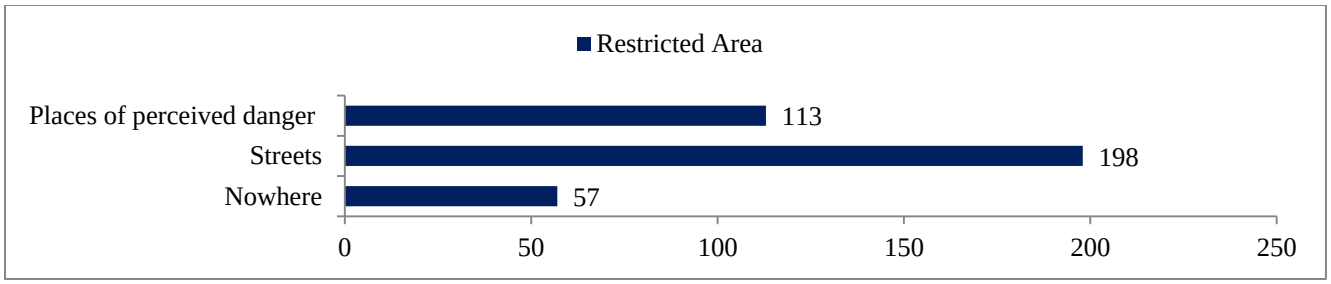


Chart 4:5 *Restricted areas for Play*

(*Source: Researcher's Own Analysis*)

c) Reasons for Parental Restrictions

As shown in Chart 4:6, Regarding why parents restrict their children from playing outside their house (i.e. – inside the compound and/or outside the compound):

- 51% cited physical dangers (strangers, traffic) as their main concern.
- 27% allowed free play if children informed them of their whereabouts.
- 22% worried about negative peer influence or safety.

Here are some of the direct quotations from the parents:

"The reason why I won't let my children play outside our house is that we live in the upper floors and it's difficult for me to watch over them when they play. They might fall down; besides, the pavement material is not comfortable for the kids, and I believe the most important thing here is safety and well-being of my children." — Parent

"Although I know outdoor play is important, I only take my younger daughter outside when I can supervise her closely. My older son is allowed to play after school, but only if I'm around. I worry about their safety if they're left unattended." — Parent

"I'm scared to let my child to play outside because I don't know most of the people around here and it's difficult for me to let my child to play outside. He might get into fight with other children; he might also learn bad habit or got hurt somehow, because of these, I won't let him out at all." — Parent

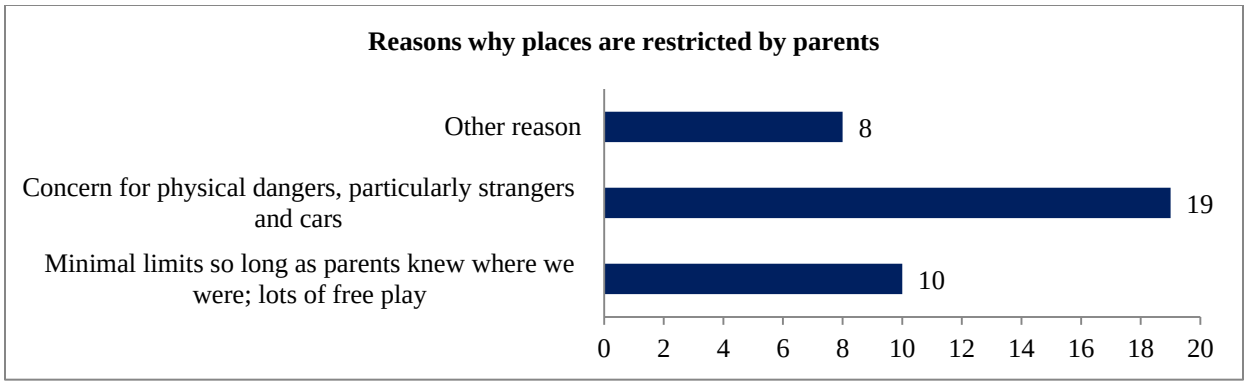


Chart 4:6 *Reasons why parents restrict children from playing outside*

(*Source: Parents Interview and Own Analysis*)

d) Children's Level of independence

As stated by parents, children's level of independence was one of the main perceived influences on their ability to play outside of their home. As shown on Chart 4:7, parents of younger children (0-4 years) and (5-9 years) have replied that their children have limited independence and very low independence for their kids respectively – meaning, they won't allow their children to play outside; whereas, parents with older children (10-14 years) stated that they allow their children greater freedom or full independence.

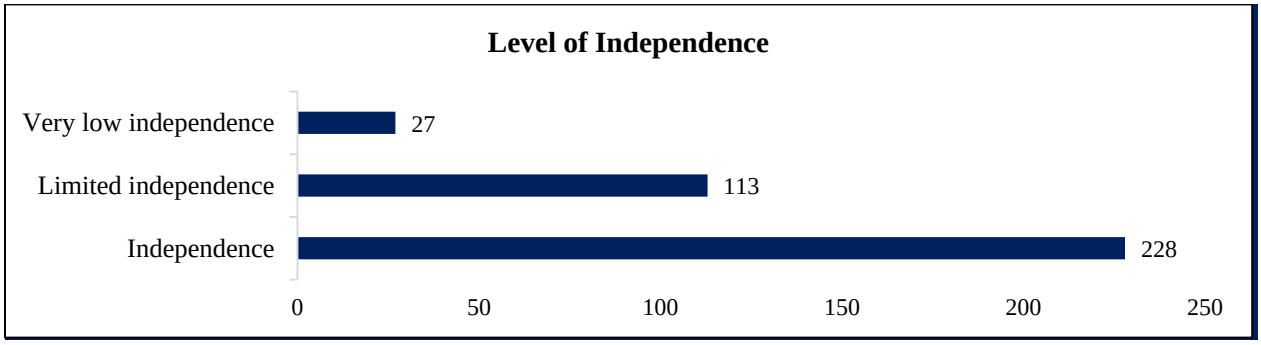


Chart 4:7 *Level of independence*

(*Source: Parents Interview and Own Analysis*)

In general, accessibility mapping revealed that more than 60% of children experienced physical barriers when attempting to reach the remaining play area. Barriers included parked cars, discontinuous pathways, uneven ground, and distances exceeding 300 meters—beyond the recommended safe walking distance for children.

These findings corroborate Mackett et al. (2008), who emphasize that poor pedestrian design directly reduces children's access to recreation, thus increasing sedentary behaviors and parental restriction.

4.3.2.3 Visual Access

a) Interior play spaces visibility

Regarding the question for parents, if interior play spaces are visible from the outside, 250 (68%) of respondent stated that some of the spaces are partially visible, 80 (22%) respondents replied 'Yes, play spaces are visible' and the other 38 (10%) answered 'No, the play spaces are not visible. 'Parents also mentioned that they prefer children to play in visible spaces so that they can monitor the movement of their children easily and protect them from a distance as well.

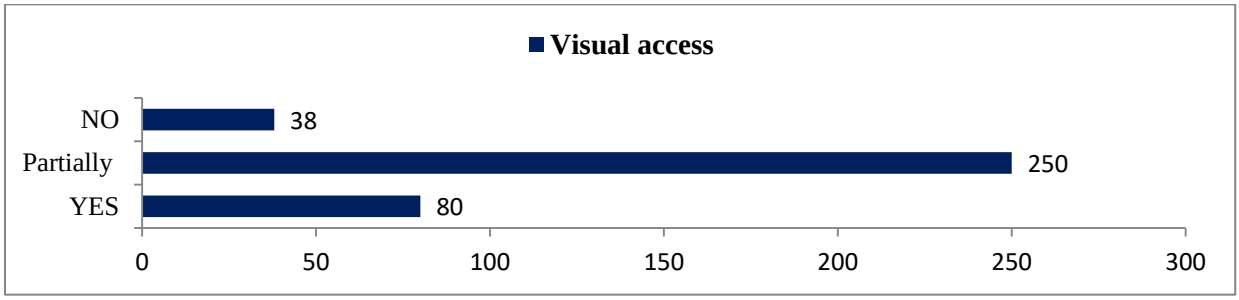


Chart 4:8 *Visual accessibility*

(*Source: Parents Interview and Own Analysis*)

4.3.2.4 Space Syntax Analysis : Visibility and Accessibility Evaluation

To deepen the understanding of spatial accessibility and visibility within the study area, the research employed Space Syntax analysis tools—specifically, Visibility Graph Analysis (VGA) and Fewest Line Analysis (FLA) using DepthmapX software. This method allows the quantification of inter-visibility and potential movement patterns within the condominium blocks, offering both visual and numeric insights into the spatial system.

a) Visibility Graph Analysis (VGA) Findings

The VGA results revealed distinct variations in spatial visibility across the site. Spaces in front of buildings, particularly green areas and parking zones, emerged as the most visually integrated

and connected, highlighted by higher integration values and connectivity scores. In contrast, areas between and behind buildings were identified as the least visually accessible, indicated by lower scores and reduced inter-visibility. (Figure 4:11).

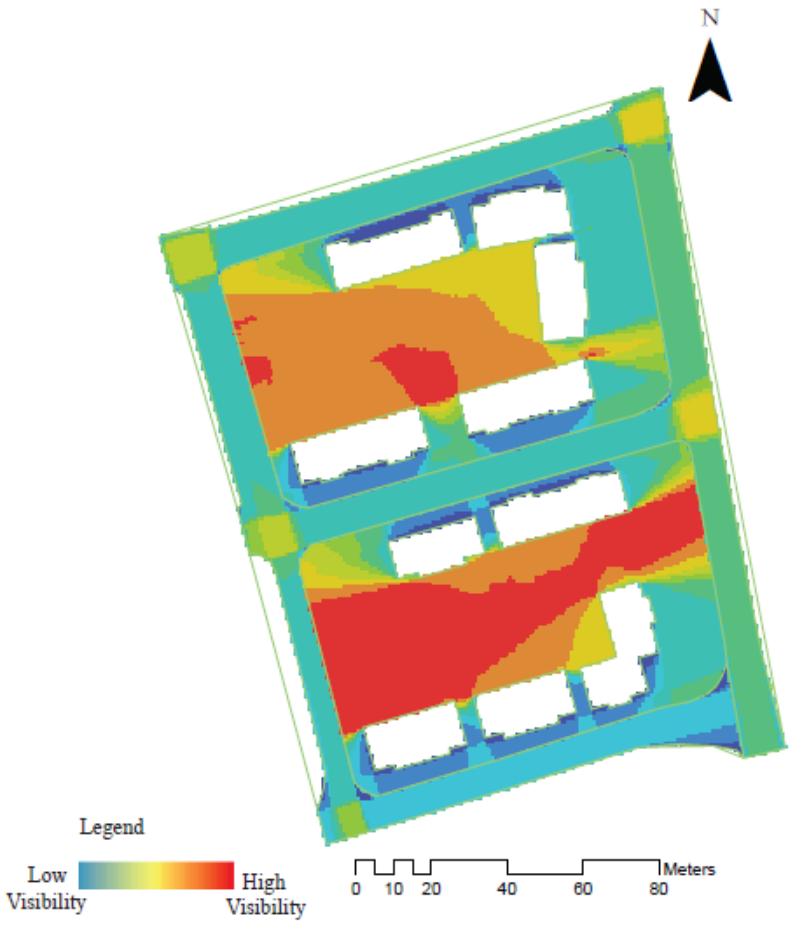


Figure 4:11 *Visibility Graph Analysis*

(*Source: Adapted from GIS cadaster using Depthmapx Software*)

According to analysis, the most visually integrated and connected areas are located in front of the blocks (green areas) and spaces overlooking the street (parking areas). This signifies that these spaces are more accessible and well connected to other spaces (the one with red and yellow colours). On the other hand, the spaces between the buildings and areas behind the blocks are the least visually connected and the areas with the low value (the one with blue colour) as far as this analysis is concerned.

4.3.2.5 Fewest Line Map Analyses (FLMA)

In addition to VGA, the study conducted Fewest Line Map Analysis (FLMA)—also known as Axial Map Analysis (AMA)—to examine the potential movement structure and spatial connectivity of the site. This method highlights the strength of linear paths and their relationship to spatial objects, providing a clearer understanding of accessibility corridors within the compound. (See Figure 4:12).

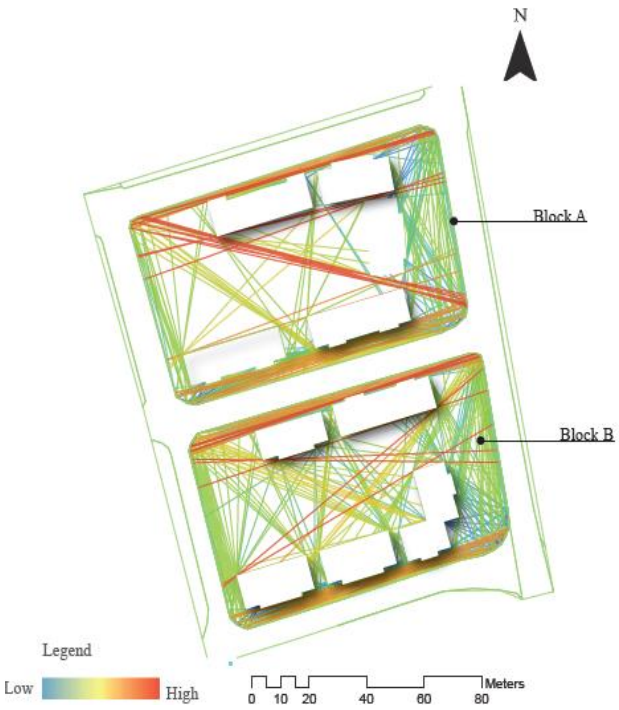


Figure 4:12 *Few Lines Map analysis*

(*Source: Adapted from GIS cadaster using Depthmapx software*)

The FLMA results indicate that the highest connectivity values—represented in red—are concentrated along the axis connecting the north-west to the east and south-east in Block/Parcel A. These pathways serve as primary movement corridors, facilitating better flow and accessibility (Figure 13).

However, less connected and poorly integrated axes—shown in blue—are located behind buildings or in blocked areas, where accessibility is minimal. Similarly, in Block/Parcel B, the most connected axis runs from the north-east to the north-west, while the remaining paths exhibit limited integration.

Key Insights:

- High visibility zones correspond to green spaces and parking lots.
- Low visibility zones are found between and behind buildings—limiting safe play opportunities.
- Main movement corridors are well-integrated, but hidden back areas pose accessibility challenges.
- This visual analysis highlights that spatial configuration directly impacts children's access to safe play spaces, reinforcing the importance of visibility and connectivity in urban design, particularly in mass housing environments.

In general, qualitative responses indicated that 70% of parents expressed significant concerns regarding the visibility of play spaces. Most playgrounds were located away from main sightlines or obscured by buildings, preventing parents from monitoring their children—a critical factor influencing children's outdoor freedom (Jansson, 2010).

Additionally, crime, stranger danger, and traffic were cited as reasons for restricting children's outdoor activities, consistent with Tranter and Doyle (1996), who argue that environmental fear leads to the privatization of childhood indoors (Look at the following Table 4:4 for details).

Table 4:4 *Parental Safety Concerns*

Concern	% of Respondents	Related Literature
Stranger Danger / Crime	75%	Jansson (2010); Tranter & Doyle (1996)
Traffic Risk	65%	Mackett et al. (2008)
Lack of Lighting	58%	Jansson (2010)

Note. *Researcher's Own Analysis, 2022*

a) Quantitative Results: Integration and Connectivity Scores

The following table (Table 4:5) summarizes key Space Syntax metrics—Global Integration values (Rn) and Connectivity scores—for critical space segments within the condominium:

Table 4:5 *Space Syntax Metrics*

Space Segment	Integration Value (Rn)	Connectivity
Central Green Space	2.10	15
Play Area A (Between Blocks)	1.70	12
Parking Lot (Street-facing)	0.80	6
Rear Open Space (Behind Blocks)	0.65	4
Peripheral Pathways	1.25	9

Note. *Space Syntax DepthmapX Analysis, 2022*)

b) Interpretation

Higher integration values indicate better spatial visibility and potential for social interaction. The analysis highlights that spaces designed for parking or passive greenery perform better in terms of visibility than areas allocated for children's play. Play spaces located between buildings and rear zones remain the least integrated and most disconnected, limiting children's independent access and active use.

This quantitative evidence reinforces the need for strategic reconfiguration of child play spaces within mass housing, prioritizing visibility and accessibility during planning and design phases.

4.4 Uses and activities of children space

Uses and Activities of places are some of the major reasons driving children and/or parents to come outside of their home. According to site observation, even though there are plenty of open spaces in the condominium compounds, out of those open spaces, there is a limited number of Children's Play Spaces and activities available.

4.4.1 The Use of Open Public Spaces

Over 60% of surveyed children reported difficulty reaching play spaces due to unpaved pathways and obstacles such as parked cars, fences, stairs, or lack of pathways.. WHO accessibility guidelines recommend a maximum distance of 300m from residential units, yet most play areas in Summit exceed this range.

The use of play spaces by children in condominium also varies based on the age of the children. Therefore, the method of behavioral mapping was carried out to understand way of using these spaces and the reasons why they use the space. During site observation, children counting considered both static children (Passive who were seated or in standing positions) and also dynamic (Active who engage in playing) children.

As shown in Figure 4:13, some places like streets are busier and used mainly by older children (10-14), open spaces behind the blocks in the compound used mainly by children between 5-9 years of age, while open spaces enclosed by the blocks are primarily used by young children (0-4 years) under the surveillance of their parents.

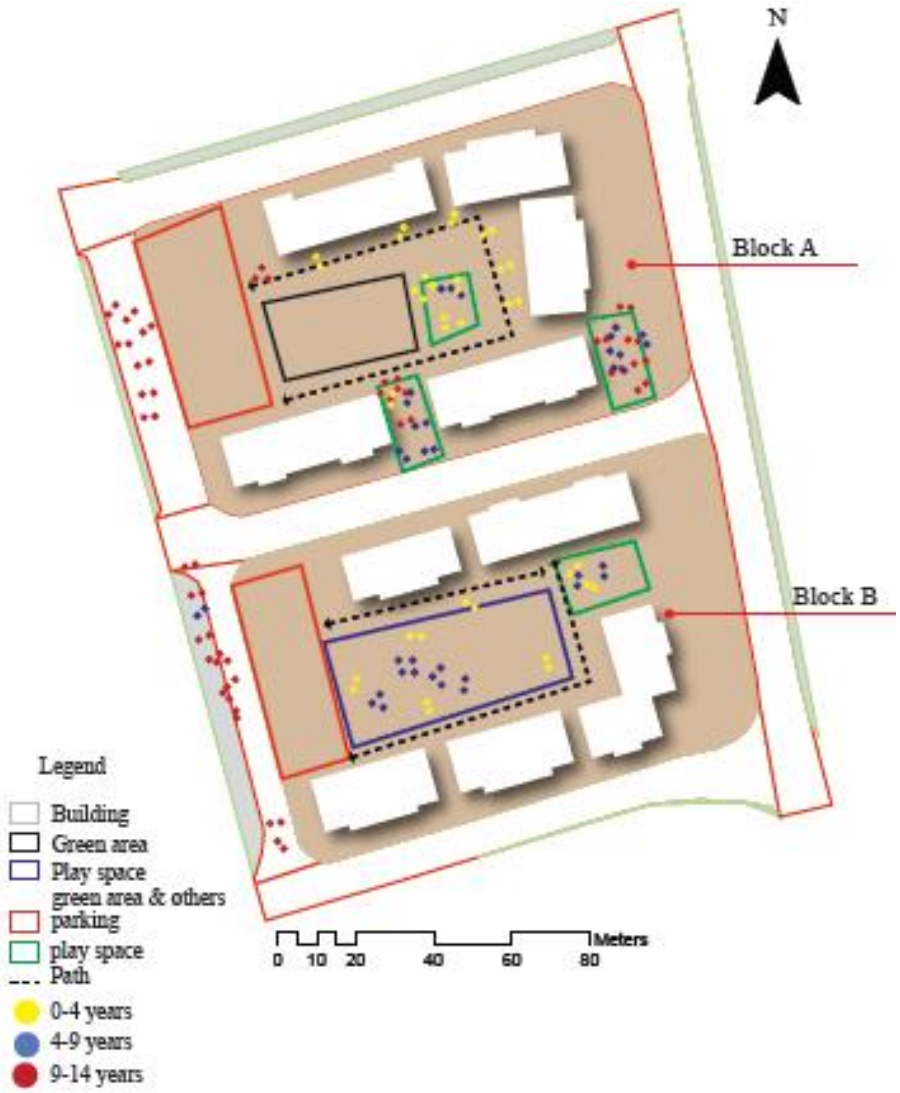


Figure 4:13 *Behavioral mapping on use of space*

(*Source: Adapted from GIS cadaster and researcher's field observation, 2022.*))

4.4.2 Zoning of activities in the space Visual Accessibility & Parental Supervision

Based on the interview and site observation, there is a zoning of activities in the open spaces of condominium compound. As shown in Figure 4:14, open spaces coloured in red is designated for parking, open spaces coloured in green is where children play; open spaces coloured in black is place is designated for green area only and open spaces coloured in blue is space for cloth and

cereal drying and for other activities. Some of the open spaces behind the buildings are considered leftover spaces and Children's Play Space. The spaces between the buildings are also designated for children place space.

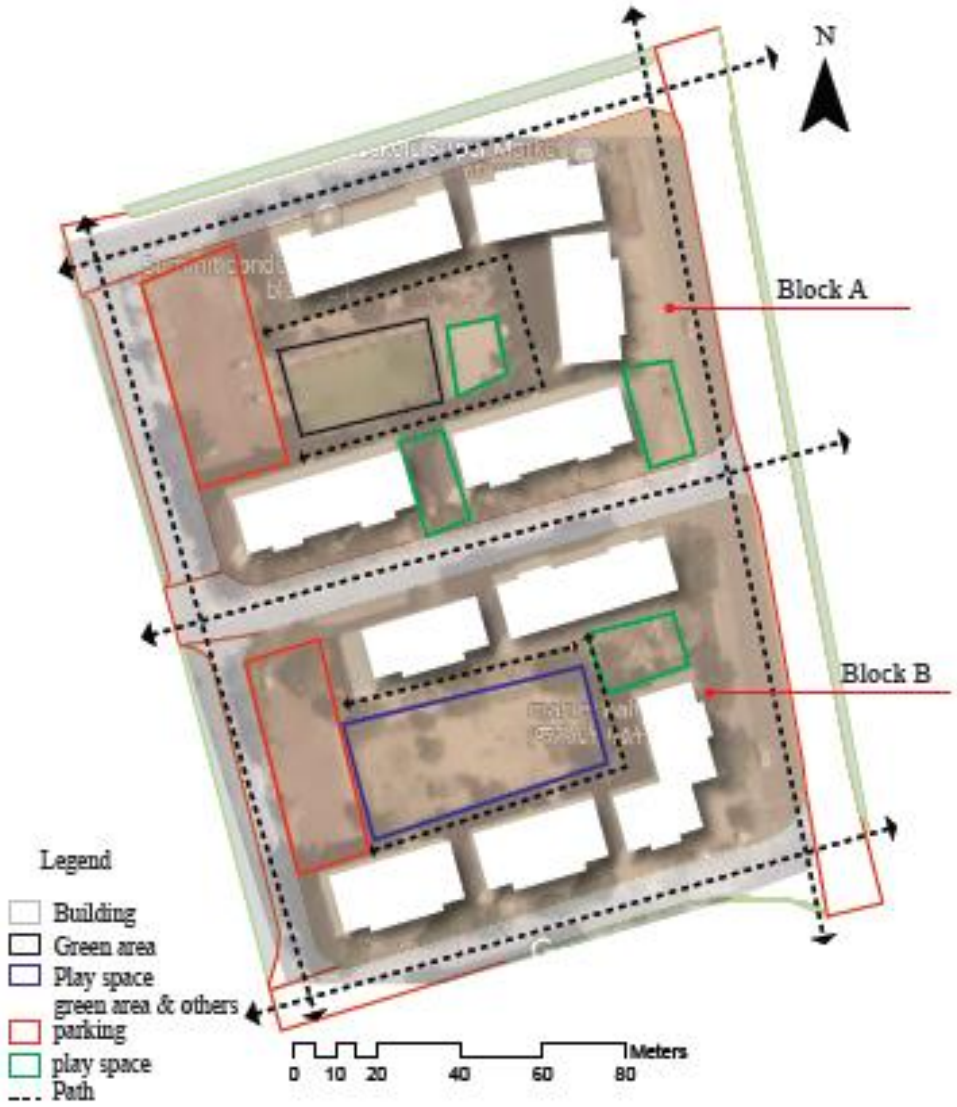


Figure 4:14 *Zoning of activities*

(*Source: Adapted from Google Earth and researcher's field observation, 2022.*))

4.4.3 Visual Accessibility & Parental Supervision

Visual accessibility plays a critical role in enabling safe, independent outdoor play for children. The analysis revealed that only 40% of designated play spaces within the study area are directly visible from adjacent residential balconies or windows. This limited visibility significantly

impacts parental supervision practices and consequently, children's freedom to engage in outdoor activities.

According to responses from the parental survey, poor visibility of certain play areas increases perceived risks, including bullying, physical accidents, and the potential presence of strangers. This fosters a culture of overprotection, further discouraging children's independent use of available play spaces.

The comparative assessment of play spaces based on visual accessibility and parent-reported safety ratings is summarized in Table 4:6.

Table 4:6 *Visual Accessibility and Parental Supervision*

Play Space	Visibility from Housing	Safety Rating (Parent Survey)
Park	Low (Blocked by Buildings)	Poor (3.2/5)
Open Field	High (Near Entrance, Overlooked by Housing)	Good (4.5/5)

Note. *Parent's Survey and Field Observation, 2022*

The above table (Table 4:6) demonstrates that play areas with high visibility, such as the open field near the entrance, are perceived as significantly safer. These spaces receive a mean safety rating of 4.5 out of 5 from parents. In contrast, parks obstructed by building structures receive lower safety scores, averaging 3.2 out of 5, primarily due to limited sightlines and reduced natural surveillance.

4.4.4 Key Observations:

- Visibility is a decisive factor for parental comfort and willingness to allow independent play.
- Poorly visible spaces are underutilized due to heightened safety concerns.
- Enhanced visual connectivity between residential units and play areas could promote greater usage and reduce parental anxiety.
- Design recommendations include positioning play spaces in open, overlooked areas to ensure natural surveillance.

This finding reinforces the importance of visual integration in the planning of children's play areas, highlighting that physical availability alone is insufficient. Without thoughtful design that

prioritizes parental oversight opportunities, children's independent use of outdoor spaces remains significantly constrained.

4.5 Spaces where children prefer to play: Play Behaviors and Activity Patterns

Regarding question where children would like to play, 84 (23%) of children answered they like playing on the streets; 141 (38.5%) answered that, they prefer to play in the compound; 29 (16%) answered that they like to stay and play at their home or a friend's home and the rest of the kids, 84 (23%), answered that, they like playing at any other place or some combinations of these choices (Chart 4.).

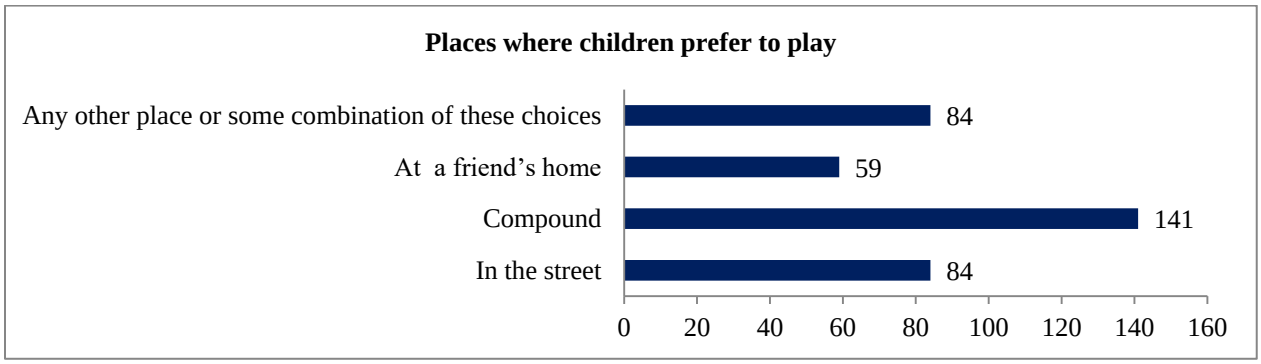


Chart 4:9 *Places where children prefer to play*
(*Source: Researcher's Own Analysis*)

4.6 Type of Activities - play or game

Children were asked types of things (games) they like to do when playing outside. They mentioned varieties of games they would like to play: footballs, running, cycling, rope jumping, drama play ('ኢቃቃ' or '*Iqa`qa*' in Amharic), hide and seek, thief and police, climbing, *Jiraf Machoh* (whip snapping) and so on.

As shown in Table 4:7 below, type of game they play varies based on their age. Most of the time, the younger children (0-4 years) like to play games such as drama play; the next age category (5-9 years) of children like playing games such as football, running, hide and seek and so on while the older children (10-14 years) mostly like to play football.

When these kids are asked what types of activities they like, here are a few responses:

"Every time I'm outside playing, I enjoy playing football with my friends, both boys and girls. My dream is to become a professional football player one day." — Child

"I enjoy playing climbing things like trees or any standing elements but there is no proper equipment for climbing in this playing area and my parents don't allow me to climb things since they are afraid that I might fall off and get injured. For me to play freely, I wish to have proper climbing equipment in the playing area." — Child

Given the availability of amenities in the playing area, children's play choices are restricted. However, there are still some variety of the games and play they refer to. Here they are (Chart 4:10).

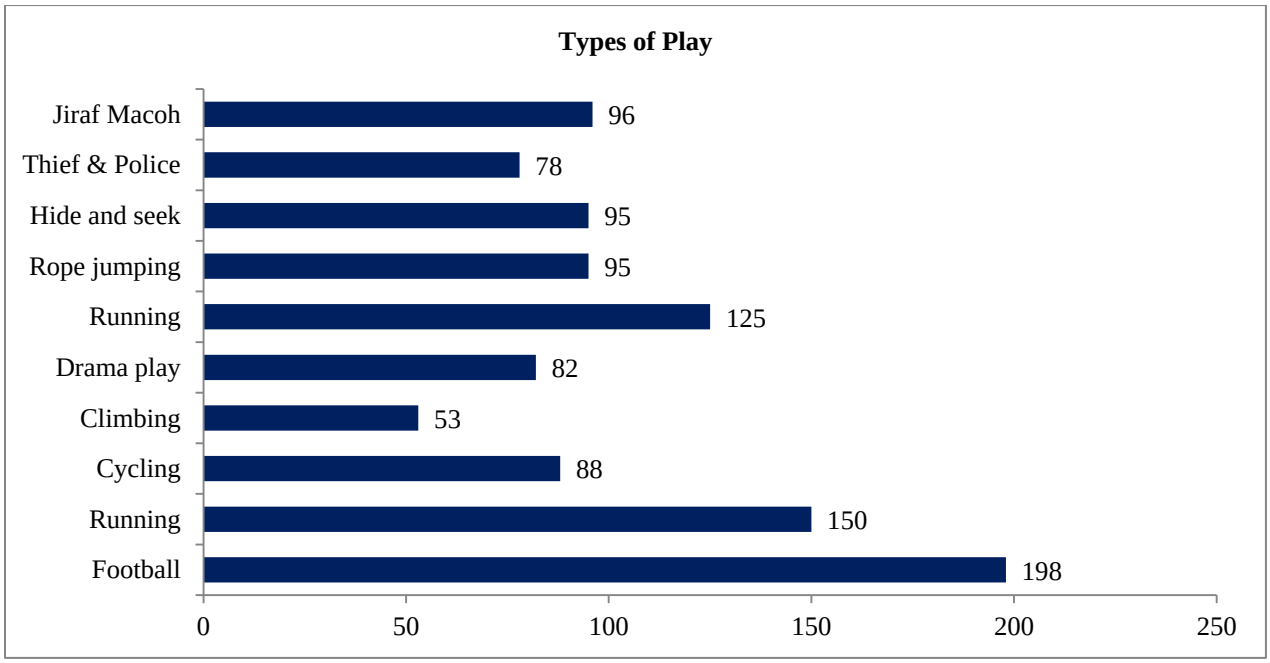


Chart 4:10 *Types of play*

(*Source: Researcher's Own Analysis*)

When the play activities are described in pictures, they look like the followings (See Figure 4:15 below):

Figure 4:15 *Types of play activities*

(*Source: Researcher, 2022*)

4.6.1 Types of Play Activities Across Children's Age Group

Understanding the variety of play activities children engage in—according to their age groups—is essential for designing inclusive play environments that meet diverse developmental needs. The survey results reveal distinct patterns in play preferences that correlate strongly with age.

As summarized in Table 4:7, younger children (age 4) tend to engage more in activities requiring less physical strength or complex coordination, such as running and drama play. Meanwhile, older children (ages 5 to 14) participate more frequently in organized sports and competitive games like football and cycling.

Table 4:7 *Play type versus Children's Age Category*

Type of play activity	Age			Total frequency
	4	5	14	
Football	10	54	109	198
Running	55	53	42	150
Cycling	-	35	53	88
Climbing		53	-	53
Drama play	55	27	-	82
***Abbarrosh* [Cops and robbers]**	21	62	42	125

Rope jumping	-	44	51	95
Hide and seek	-	64	31	95
Thief andPolice	-	35	43	78
***Jiraf Machoh* [Whip Snapping]**		44	52	96

Note. *Researcher's Own Analysis, 2022*

In summary, the activity audit revealed a dominance of football (55%) and informal running (30%), while creative and cognitive play was minimal. Interviews indicated that the absence of diverse play structures limited children's engagement and social interaction.

This is aligned with Nicholson's "Loose Parts Theory" (1971), which argues that the quality and variety of materials provided directly influence the complexity of children's play. Similarly, Shackell et al. (2007) emphasize that playgrounds failing to support creative play undermine children's cognitive and emotional development.

4.6.2 Time versus play

Children were asked at what time or when they play – from their free time after school or over the weekends. Based on the interviews; majority of the children, 228 of them which is equal to 62% of the total children, use the spaces in the morning and also in the afternoon, while 113 (30.7%) of the children play only in the afternoon. A few or 27 (7.3%) of the children responded that they prefer to play in morning time alone.

Here is the comparison Chart:

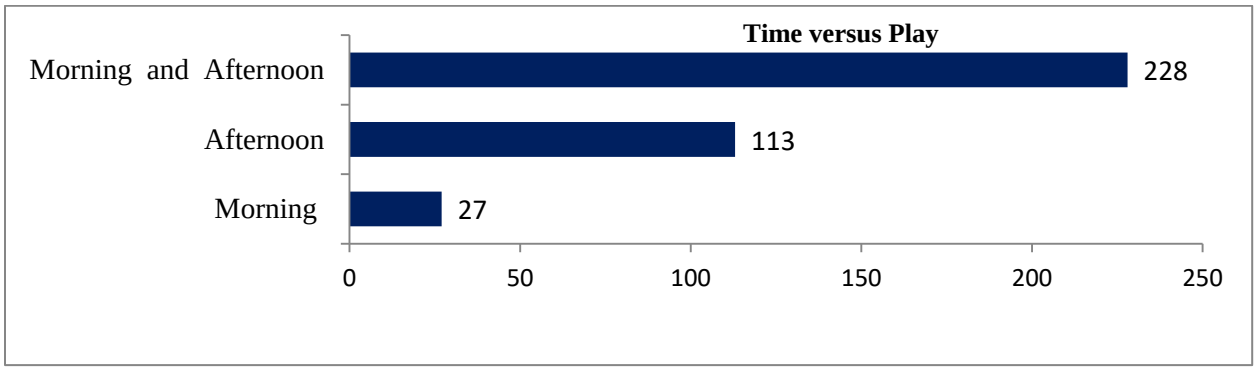


Chart 4:11 *Time versus Play*

(*Source: Researcher's Own Analysis*)

4.6.3 Sociability

According to some parents social interaction is one factor to let their child to play outside. A mother responded: "*People who live in condominium come from different areas and most of us don't know each other. Even though, our faces might be familiar to one another, we don't know each other by name and that is one of the reasons why I don't let my child play outside*."

4.7 Comfort of Children's Play Spaces

To analyze comfortability of the play space the perception of the children and the parents and also on-site observations were interchangeably used.

4.7.1 Preference time to use the space

Majority of the children, around 276 (75%) of them, play during the afternoon time. There are only 74 (20%) of the children play in the morning time. When parents were asked at what time would they allow their children to play 227 (60%) of the family allow their children to play in the afternoon time (See Charts 4:12 and 4:13).

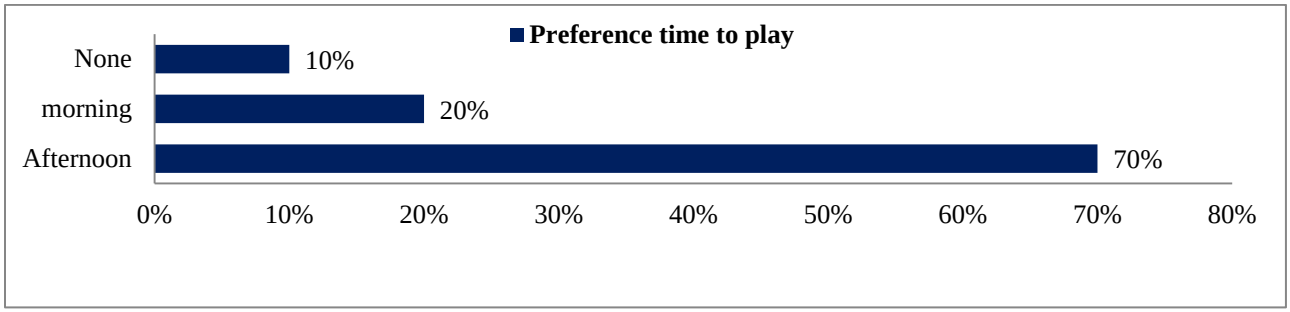


Chart 4:12 *Preference time – Children's Perception*

(*Source: Researcher's Own Analysis*)

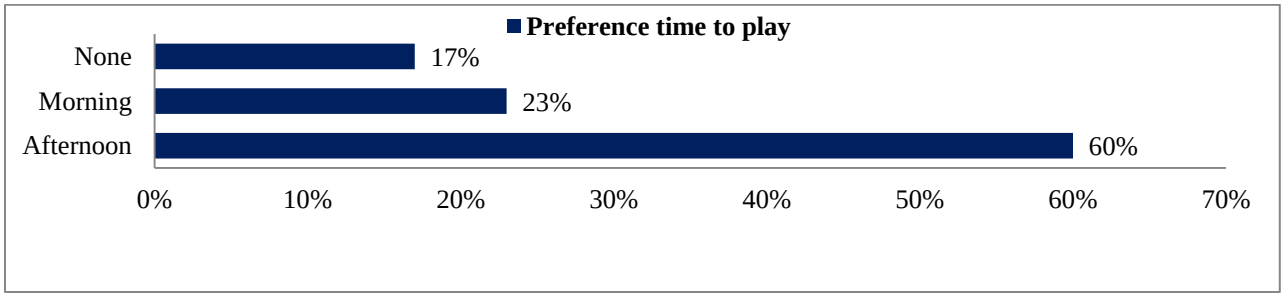


Chart 4:13 *Preference time – Parent's Perception*

(*Source: Researcher's Own Analysis*)

4.7.2 Hours spent on the outdoor space

Regarding the time, around 151 (41%) of the children spend more than three hours playing in the play area. In total, there are about 122 (33%) children who play in the play area for three hours each day. The children who spend longer time playing are those who play in the afternoon, while those who cannot play outdoors spend shorter time, usually less than an hour, on which, they will be assisted by their family members. Most of the children in this category are children below the age of five and those children who are above nine spend more time in the play space.

Graphically, here is how the time spent by the kids is illustrated (Chart 4:14).

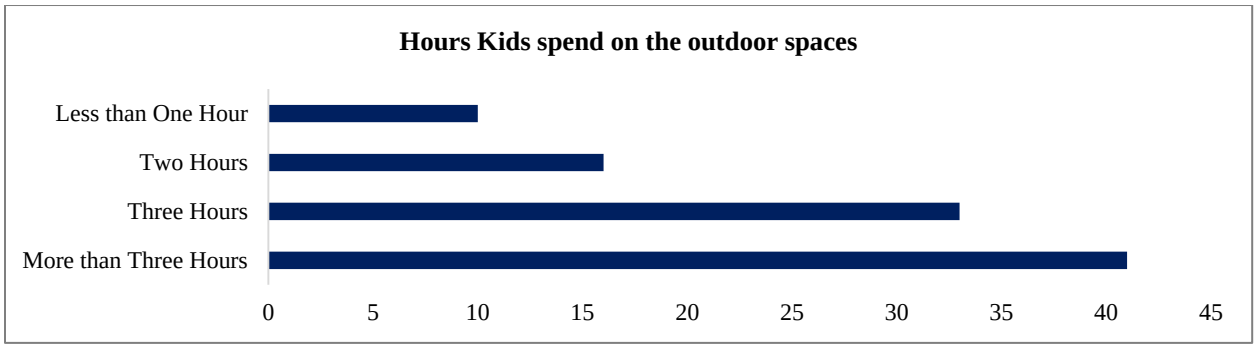


Chart 4:14 *Hours spent on the outdoor space*

(*Source: Researcher's Own Analysis*)

In addition to the restricting the children from the play space, some parents prefer having alternatives in letting their kids play. Here is how a kid had reacted about her condition and the mother that restricts him from playing outside.

"My mother prohibits me from playing outside at any time. Instead of letting me play in the outdoor space, she prefers that I watch TV." Child

4.7.3 Food and drink services on the places

As illustrated in Chart 4:14, in both compound there is no food services that will provide food for children. Indeed, their house is closer to playing space if they need food, they will have to go to their house.

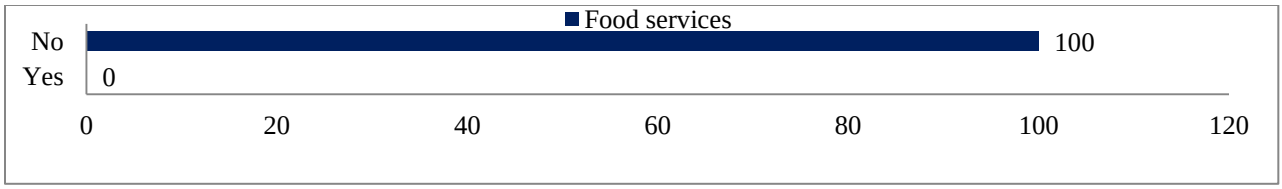


Chart 4:15 *Food and drink service in the outdoor space*

(*Source: Researcher's Own Analysis*)

4.7.4 Sense of security

Depending on the children playing location or spot of the place – their level of security varies. In both compounds, children feel unsafe and insecure when they play in the parking lots, whereas when they play in a playfield or on the spaces between buildings or in the backyard of the building, they feel safe. In general, most children feel more secure while they play in the compound.

Parents were asked if they feel secure or not while they let their children play in the play space. Most of the parents feel secure when their children play in the playing area. However, a few parents feel insecure to let their children play in the field for the fear of the children especially toddlers eating dirty things [referring that play spaces are not clean] from the ground; and then learning foul words and behaviors from their friends (See Charts 4:16 and 4:17).

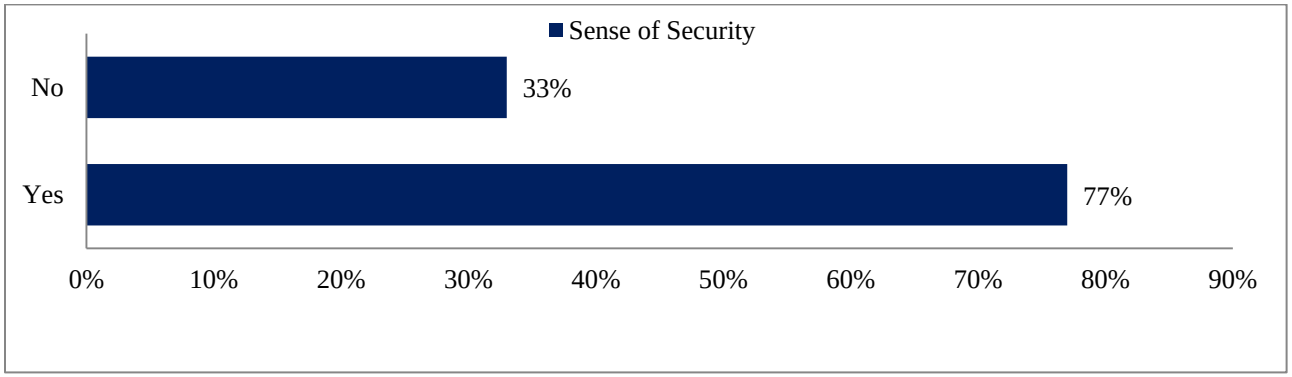


Chart 4:16 *Sense of Security – Children's Perception*

(*Source: Researcher's Own Analysis*)

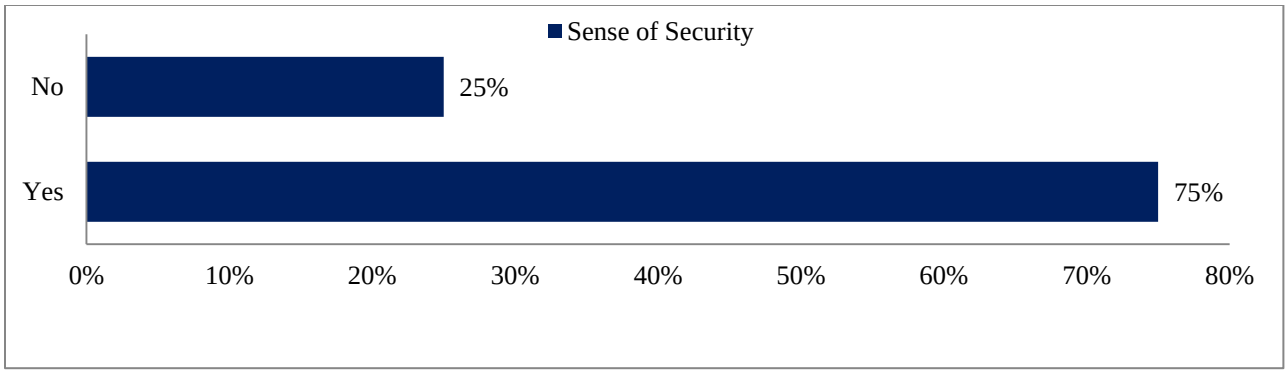


Chart 4:17 *Sense of Security – Parents' Perception*

(*Source: Researcher's Own Analysis*)

4.7.5 Comfortable playing pavement material

Based on the interview most of the children want to play in a grassed space area (Chart 4:18). They feel comfortable and would be happy if they can play in a grassed field. Fewer children want to play in the dusty earth field area. Children choose this type of pavement material based on the possibility of being injured.

Regarding the pavement material, most of the family members who had children below four don't feel comfortable letting go of their children to play in outdoor space (Chart 4:19); the stair and hard surface cover pavement won't give them security compared to children above the four years of age.

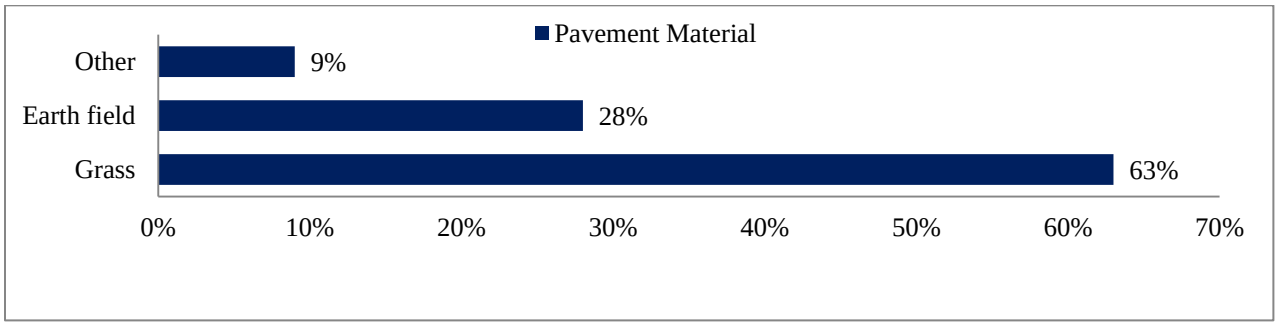


Chart 4:18 *Comfortable Pavement – Children's Preference*

(*Source: Researcher's Own Analysis*)

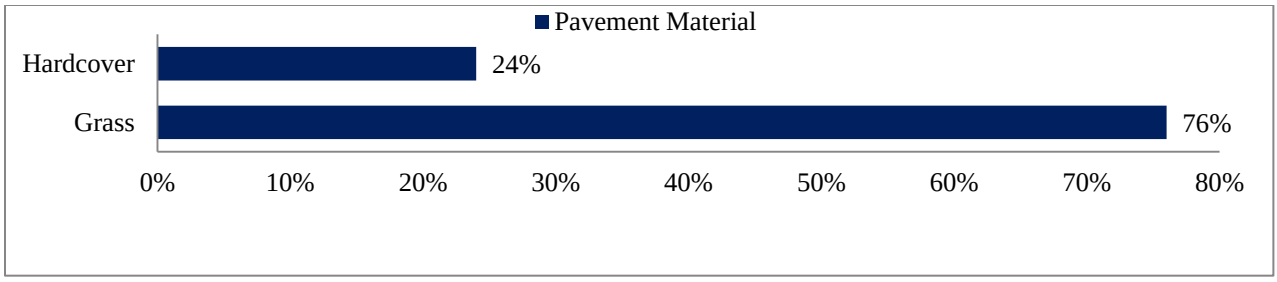


Chart 4:19 *Comfortable Pavement – Parents' Preference*

(*Source: Researcher's Own Analysis*)

4.7.6 Sufficient seating

Based on the field observation there is no properly designed seating furniture for both the children and parents. However, both the children and the parents use the edge of the fence or sidewalk edge as a seating spot. Children use these spaces for interaction, playing games or to be passive observant. The parents use space to watch over their children while they play. During field observations, there was no crowded seating in the play space area (Figure 4:16).

Figure 4:16 *Seating Spaces*

(*Source: Researcher, 2022*)

4.7.7 Play Space Orientation

Most of the play space areas in both compounds are exposed to the sun only on one side; three sides are covered by buildings. These provide shade for the play space; only one side is exposed to harsh sunlight. However, on the harsh sun direction, the play areas do not have any natural features or buildings that provide shade for the playground (See Figure 4:17 below).

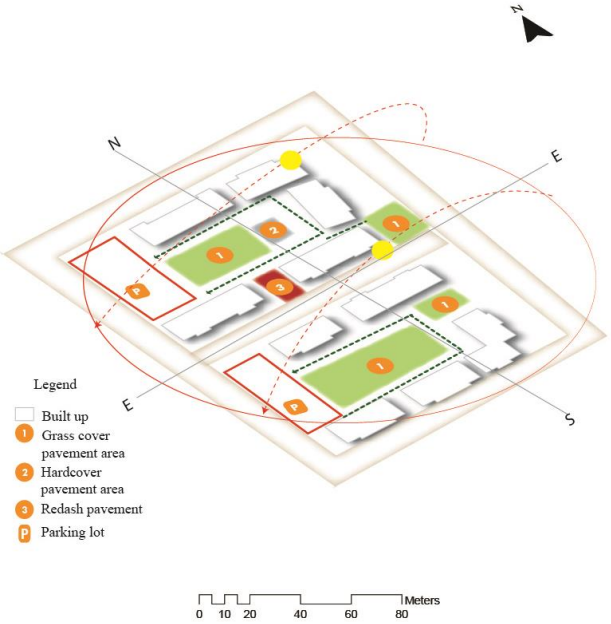


Figure 4:17 *Sun Path Diagram*

(*Source: Researcher's Own Analysis*)

4.8 Optimized design approach for Children's Play Space

A total of 37 children were selected to draw and express their wish on what kind of play space they wish to have. The children age categories (above five years old) were asked to draw. The reason why this age group was selected is because of the basis of the thought that children over five years can be able to express their thoughts or needs through drawing. In addition to this, younger children were also asked if they want to draw and in what kind of play space they wanted to play in. To avoid assumptions and misleading information from what they drew, all the children regardless to the age category they fall in, they were asked to describe and interpret their drawing.

Based on the drawing, most of the children wish to have a football, volleyball and basketball court spaces. Additionally, climbing equipment is also wished by the children to have in their playing space so that they can engage in extra physical activity other than the ballgames. And most of the children preferred and emphasized playing in a grassed cover playing area, only a few children explained their interest that they want to play in an environment where there is the presence of birds and butterflies. Based on the children's drawings, the way they described social interaction is by drawing people gathered at a certain place – meant to be either standing or playing. Therefore, based on their drawing the children do wish to have social interaction or

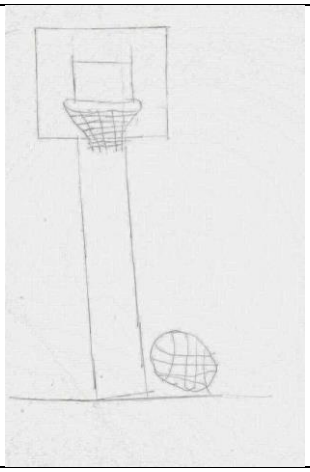
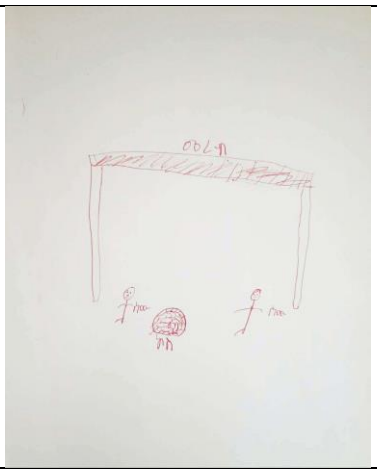
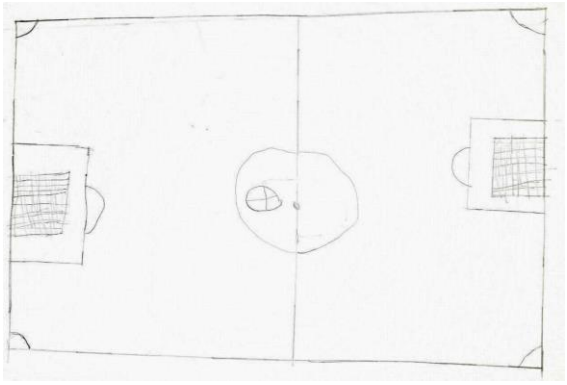
some form of gatherings in their playing area with their friends. According to the drawing analysis, only a few children want defined space activities, while most of them want the amenity and are okay if the activity is not separated (See Tables 4:8 and 4.9).

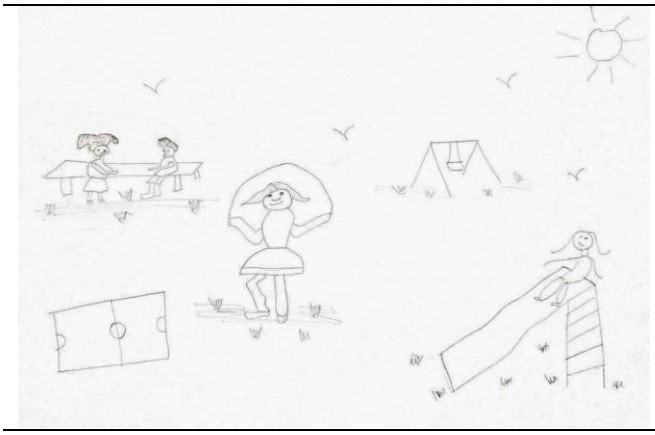
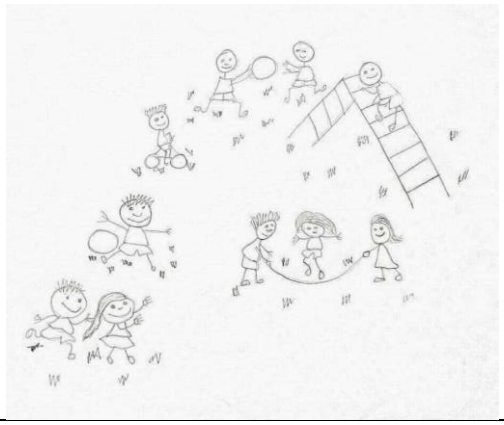
Table 4:8 *Children's Play Spaces wish list*

SN.	Parameters	Sub-Categories	Drawing Details	Frequency
1.	Physical	Amenities and facilities	Volleyball court	19
			Football court	28
			Basketball court	23
			Sliding	13
			Climbing	17
			Swings	13
			Hockey	1
			Ground tennis	2
			Running	9
			Riding cycle route	7
			Skipping rope	11
2.	Cognitive	Play variety	Role playing (*Iqa`qa`*)	13
3.	Perception	Biotic, surface material elements	Tree	11
			Flower	12
			Grass	15
			Butterfly	8
			Birds	7
4.	Social interaction		Singing and clumping	9
			Gathering and talking	9
			Skipping rope	7

(*Source: Researcher's Own Analysis, 2022*)

Table 4:9 *Children's Wish List Drawing*

		
Different kind of actvities wishes to have in one place [presence of tree/flowers in playing area prefer to have proper seating area]	Only one activity	Only one activity [social interaction with their friends]
		
Different kind of actvities wishes to have in one place [presence of tree/flowers, butterfly in playing area]	only one activies [a defined play space]	

	
Different kind of actvities wishes to have in one place with the grass covered pavement, seating and talking in play area seen as they want to have social interaction with friend	Different kind of activities wishes to have in one place with the grass covered pavement and the children want to play with their firends

Note. *Researcher's Own survey, 2022*

4.9 Summary of Key Findings

The results illustrate a systemic failure in translating policy intentions for child-friendly spaces into practice. Despite designated land, functional availability, accessibility, safety, and diversity remain inadequate, reflecting similar challenges in global mass housing contexts (Table 4:10).

Table 4:10 *Summary of Key Findings*

Theme	Major Finding	Literature/Case Alignment
Availability	Spaces exist but are repurposed or degraded	Jafrin & Beza (2018); Hughes (1996)
Accessibility	Barriers (physical and social) limit use	Mackett et al. (2008); Tranter & Doyle
Safety	Visibility and environmental fears reduce usage	Jansson (2010); Bada (2012)
Play Variety	Limited to football and running	Nicholson (1971); Karsten (2003)

Note. Table compiled by the author based on field findings and aligned with supporting literature *(Jafrin & Beza, 2018; Hughes, 1996; Mackett et al., 2008; Tranter & Doyle, 1996; Jansson, 2010; Bada, 2012; Nicholson, 1971; Karsten, 2003*.

5 CHAPTER FIVE: DISCUSSIONS

5.1 Introduction

This chapter critically interprets and analyzes the findings presented in Chapter Four, situating them within broader theoretical frameworks, child development literature, and global urban planning practices. The discussion explores key themes emerging from the data, including the adequacy and functionality of play spaces, community perceptions, and the impact of spatial planning on children's recreational opportunities.

By reflecting on empirical evidence from Summit Condominium, the analysis examines both consistencies and divergences with international experiences, offering insight into the structural, design, and policy challenges shaping the accessibility, safety, and usability of children's play spaces in mass housing environments. The discussion also identifies opportunities for improvement, linking local findings to global best practices and theoretical perspectives relevant to child-friendly urban development.

5.2 Availability of Play Spaces and Functional Failures in Summit Condominium

The researcher calculated/examined building morphology, population density and per capita availability of open spaces versus the numbers of the residents. As cited in Addis Ababa structural plan 2017, the World Health Organization (WHO) standard of urban greenery should be 9 Square meter per person and that of Africa is still 7 Square meter per person. The researcher couldn't find any specific standard regarding per capita play space for children. Therefore, to examine availability of play space, the urban greenery standard is used in this paper.

Based on the morphological analysis result, per capita availability of open spaces in study area it is 15Square meter per person, it is above the standard (which is 9 Square meter per person). Therefore, the study confirmed that, there is plenty of open space in condominium compound of the study area. However, there is limited number of Children's Play Spaces because; some of the available open spaces are not being used for play spaces for children.

The study revealed that while play spaces exist nominally within Summit Condominium, their functional usability is highly compromised. This mirrors what Jafrin and Beza (2018) describe as "illusory availability" — a condition where spatial allocations in urban plans fail to translate into meaningful, usable spaces for children due to competing land uses or neglect.

Globally, Kristiánová (2018) documented similar trends in Slovakian mass housing, where designated recreational spaces were gradually eroded by commercial and parking needs. This is indicative of a broader pattern in high-density urban settings where economic priorities overshadow child-centric urban design.

Hughes (1996) posits that play spaces require not just physical allocation but continuous investment and programming to maintain their social function. The lack of active maintenance at Summit validates this argument, reducing these spaces to "dead zones" rather than vibrant child-friendly environments.

The findings align with Prezza et al. (2005), who assert that mere spatial provision is insufficient without attention to quality, safety, and usability — a critical gap observed in Summit's degraded play areas.

5.3 Accessibility and Safety: Structural Barriers to Play

Accessibility of a place is determined by its connections to its surroundings, both visually and physically. A successful public space is easy to get to and get through; it is visible both from a distance and up close (Project for public Space, 1999).

The study tried to analyse both physical and visual accessibility of Children's Play Space in Summit Condominium, regarding physical analysis the research tried to analyse many factors such as: connection between the space and the adjacent buildings, the use of space by dwellers of adjacent buildings and also roads and paths through the space in condominium by using interviews and site observations.

5.3.1 Physical Accessibility Challenges, Safety and Parental Concerns

The analysis of physical accessibility within Summit Condominium reveals a complex intersection of design flaws, environmental obstacles, parental concerns, and community perceptions—all of which significantly limit children's independent use of outdoor play spaces.

Observations confirmed that while some walkways and internal paths were clearly defined within certain blocks, allowing relatively easy passage to adjacent areas, this was not consistent throughout the compound. In some sections, pathways led directly to functional destinations, providing children access with minimal challenges. However, other routes were discontinuous, poorly maintained, or obstructed, forcing children to navigate unsafe crossings or share space

with parked vehicles. This aligns with Mackett et al. (2008), who assert that poor pedestrian planning in urban environments directly curtails children's mobility and reduces opportunities for outdoor play.

Further spatial analysis indicated that most play areas exceeded the globally recommended 300-meter maximum distance from residences, a standard designed to ensure safe, walkable access for children (Mayor of London, 2012). The compounded effect of long distances and weak enforcement of Ethiopian housing policies, which nominally mandate access to safe recreational spaces, severely limits children's independent play.

In contrast, global best practices such as Amsterdam's "*Speelruimte*" policy ensure that play spaces are legally mandated within walking distance of every home, fostering independent mobility and a child-friendly urban environment. Summit's layout and regulatory oversight starkly diverge from such models, reflecting broader systemic gaps in Ethiopia's mass housing design.

Beyond physical and design-related challenges, parental safety concerns emerged as a critical barrier. According to the findings (Chart 4:5), 54% of parents explicitly stated they would not allow their children to play on the streets, citing fear of traffic accidents, crime, and the general unsafe nature of the environment. These anxieties resonate with Jafari et al. (2011), who noted that safety concerns, particularly among mothers, frequently result in restrictions on children's outdoor activities. This safety-driven limitation also underscores the role of gendered perceptions in parental decision-making around children's spatial autonomy.

Age was another determining factor influencing the level of freedom granted to children. As illustrated in Chart 4:7, 62% of parents reported that they allow older children (ages 10-14) more independence, indicating that parental control lessens with increased child age. This reflects an implicit recognition of older children's perceived ability to navigate risks, while younger children remain heavily supervised or restricted.

Significantly, the study uncovered a deep-rooted lack of community awareness and prioritization of children's spatial needs. Even when physical spaces for play were available, their accessibility was socially and culturally limited by community attitudes. Field observations revealed that community members often prioritized parking spaces and green areas over children's recreational needs, actively discouraging children from playing in certain open spaces. This

behavior reflects a pervasive belief that children's activities are secondary or disruptive to other uses of the communal environment.

This dynamic reinforces Moore's (1987) argument that children are frequently marginalized in urban land use decisions, despite being integral members of the urban society. Moore contends that individuals responsible for land use should view the needs and rights of children as central to planning processes, rather than peripheral. However, within Summit Condominium, this principle remains largely unacknowledged, as community attitudes and behaviors continue to deprioritize children's access to usable recreational spaces.

Ultimately, the combination of environmental barriers, weak regulatory enforcement, safety fears, age-based restrictions, and community resistance results in a highly constrained play environment. Children's access to space is limited not only by physical obstacles but also by social norms and community perceptions that restrict their right to use open areas for play.

5.3.2 Visual Accessibility Challenges, Safety and Parental Concerns

The study examined visual accessibility of play spaces within Summit Condominium by assessing the visibility of recreational areas from residential blocks and common circulation paths. This analysis combined parental interviews with Space Syntax methods, specifically Visibility Graph Analysis (VGA) and Fewest Line Analysis (FLA), to understand the relationship between spatial configuration and social behavior.

Space Syntax was chosen due to its robust capacity to analyze spatial arrangements and their effects on human movement and use patterns. As Durson (2007) asserts, Space Syntax allows researchers to link spatial aspects of the built environment directly to social behaviors, reflecting the theory that space significantly influences how people navigate, use, and experience their surroundings. Several studies, including Bada (2012), have demonstrated a strong correlation between visibility measures and the frequency and type of space usage.

The Space Syntax analysis revealed that the most visually integrated and connected areas within Summit are the green areas and parking lots located in front of the residential blocks. These areas are highly visible and accessible, leading to more frequent passive use. In contrast, the streets and spaces behind buildings were found to be the least integrated, offering minimal visibility

from surrounding residences or pathways (see Figure 4:3). These back areas suffer from isolation and, consequently, reduced usage by children due to safety concerns.

This finding directly ties to parental perceptions captured through interviews. Limited visual accessibility of play spaces exacerbated parental fears of crime, traffic accidents, and social hazards. In line with Jansson (2010), the study found that visibility is central to creating parental trust—parents are more willing to allow their children independent play when they can easily observe them. Summit's poor sightlines—particularly in rear and peripheral spaces—have resulted in parents imposing strict limitations on their children's outdoor activities. This observation resonates with global trends, where fears around safety privatize childhood, keeping children indoors (Tranter and Doyle, 1996).

Further compounding the issue is the absence of lighting, active supervision, and surveillance measures in most of these low-visibility zones. These conditions validate Bada's (2012) argument that parental perception of neighborhood safety is a powerful determinant of children's spatial freedom. The lack of visual security infrastructure intensifies parental reluctance to grant children autonomy outdoors.

Comparative global cases offer critical insights. In Singapore, for example, vertical playgrounds are integrated into residential towers, allowing parents to maintain visual contact with children while ensuring their safety within controlled environments (Cheng, 2021). This model, however, is absent in Summit, where neither design considerations nor policy measures support visual supervision, ultimately limiting children's outdoor play opportunities.

Overall, the study underscores that poor visual integration of play areas, coupled with weak lighting and surveillance, significantly reduces children's independent access to outdoor spaces. Designing for visibility and safety is essential not only for promoting active usage of play areas but also for addressing deep-rooted parental concerns that limit children's mobility and their right to play.

5.3.3 The Implications of Open Space Misallocation on Children's Play Areas

The misallocation of open spaces in Summit Condominium has significant implications for children's physical activity, socialization, and overall well-being:

- ✓ **Limited Safe Play Spaces** – The reduction of green/open areas has left children with fewer designated spaces for play, increasing their reliance on informal and potentially unsafe spaces.
- ✓ **Conflicts with Other Land Uses** – The use of open spaces for parking, waste disposal, and farming has led to competition between different users, further restricting children's opportunities for outdoor activities.
- ✓ **Need for Better Implementation and Management** – The findings highlight the gap between planning and execution, stressing the importance of properly managing and enforcing land-use policies to ensure children's right to play is upheld.

5.4 Uses and Activities of children space

The study revealed that, out of open spaces in study area, some places like streets (roads) are busier and mainly used by the older children (10-14), open spaces behind the blocks in the compound mainly used by children between the age of 5-9 years while the open spaces enclosed by the blocks are mostly used by young children who are 0-4 years old being kept under their parents' surveillance.

Concerning the zoning of activities in the space, site observations and interviews were used to understand the activities in the place. As confirmed from the analyses, there is a zoning of activities in open spaces of the study area such as parking, green area, multi-purpose spaces (e.g. – spaces for drying clothes, drying cereal crops and for other occasional activities). However, due to the functional zoning there is a limited area designated for children to play.

Based on the interview with children on the spaces where they prefer to play, most children 309 (84%) answered that, they prefer to play in the compound, on the street or any other place or some combination of these choices. only 29 (16%) of children like to stay and play at their home or at their friend's home.

Regarding the type of Activities (play or games), children mentioned different types of games such as footballs, running, cycling, rope jumping, drama play,hide and seek, thief and police, climbing, *jiraf machoh* (whip snapping) and so on. However, the researcher understands from the interview the type of play they like is varied based on their age. For example, the younger children (0-4 years) like to play games such as Drama play; the next category of children (5-9

years) like play games such as football, running, hide and seek and so on while the older children (10-14 years) mostly like to play football.

To summarize:

- Football is the most dominant activity, especially among older children, with a total frequency of 198. This suggests the need for spacious, open fields that support group sports.
- Running remains popular across all ages but is most frequent in the younger age group (age 4) due to its simplicity and minimal need for equipment.
- Cycling, rope jumping, and games like “Thief and Police” gain popularity as children grow older, indicating increasing physical competence and desire for competitive activities.
- Drama play and traditional games like *Abbarrosh* are significantly practiced by younger children, reflecting imaginative play needs.
- The traditional game *Jiraf Machoh* (whip snapping) also remains popular, especially among older children.

Implications for Design:

- Diverse play areas catering to both active sports and imaginative play are necessary.
- Safe, open spaces for running, cycling, and football should be prioritized.
- Shaded corners or quieter zones should be incorporated to support games like drama and hide and seek, which require less physical exertion but foster social and creative skills.
- Design should accommodate age-appropriate zones, ensuring safe play for younger children while offering more challenging spaces for older ones.

5.5 Playing Time

About at what time (when) they prefer to play in the weekend or in their free time, most of them prefer to use the spaces in the morning and also in the afternoon for long hours. Regarding social interaction, the research finds out that, it is one of the major influential factors on the use of space. In consistence with the findings of Veitch et al., (2007), this research also discovers that for the parents, social factors such as having friends or peers to play with are important

contributors to outdoor play for their children. A social network between children leads to social cohesion within the community; a family will feel safe to let their children play outside if they have a social network among them.

5.6 Play Behavior: The Loss of Creative and Cognitive Engagement

The dominance of football and informal running games at Summit reflects a lack of diverse, stimulating play options. This aligns with Karsten (2003), who observed that in poorly designed urban spaces, children resort to repetitive activities due to limited play materials.

Nicholson's (1971) "Loose Parts Theory" provides a compelling framework here, arguing that the richness of play experiences depends on the variety and manipulability of materials. Summit's barren play environments fail this test, offering no interactive features to stimulate creativity, imagination, or cognitive engagement.

Shackell et al. (2007) further contend that play spaces focusing solely on physical exertion — like fields for football — miss the developmental potential of creative and sensory play. This is evident in Summit, where the absence of equipment like climbing structures, sand pits, or water play areas limits experiential diversity.

International best practices, such as nature-based playgrounds in Scandinavian cities, integrate sensory elements that support cognitive and emotional development — offering a stark contrast to Summit's minimalistic and monotonous play setting.

5.7 Comforts of Children's Play Space

According to Vanos et al. (2017), comfortable thermal conditions at playgrounds can affect the number of visitors, duration of visits, and activity levels of play. Despite the harsh sun in the afternoon, most of the children, around 276 (75%), want to play in the afternoon and around 74% stay up to or longer than three hours. According to this, most children feel comfortable playing in the play space and the locations where they play vary depending on the thermal comfort. Another factor to consider is what time the children should play is parent's perception. Most parents allow their children to play after school, during free time.

As Parrish et al. (2016) stated, different types of surface matertials affect the type of activitiesin the Children's Play Spaces and risk of injury level. While most children play football and run

around, there is a risk of them being injured playing on hard surfaces. For instance, in the study area, around 240 of children would prefer and be more comfortable playing on grass-covered surfaces. Parents also restrict their toddler children's play activities because the pavement material is not comfortable and there are no varieties of activities for the children to choose from. Therefore, the existing surface pavements create discomfort and have an impact on the type of playing activities children do.

According to Şensoy and İnceoğlu (2020), outdoor play environments and play programs quality are affected by safety and security issues. In this specific area, 284 among the children playing in the play area, feel secure and safe. This means most of the children have the sense of safety and security while playing in these areas. Generally, children feel more secure while playing in the community compound except for those under nine years of age, who fear getting hurt in the parking lot. Since the play area has social and psychological comfort, most parents feel secure regarding crime aspects of the spaces as well.

5.8 Optimization Failures and Missed Design Opportunities

The empirical evidence suggests systemic failures in urban planning, design, and policy implementation. Summit's case exemplifies what Riggio (2002) terms the "passive provision" model — where spaces are allocated but not developed or programmed, rendering them non-functional.

Comparative international examples demonstrate feasible alternatives:

- Singapore's vertical playgrounds overcome space constraints while ensuring safety and supervision (Cheng, 2021).
- Amsterdam's play space legislation mandates both proximity and quality — embedding play into the urban fabric (Mayor of London, 2012).
- Nairobi's Play Streets Model transforms temporary street closures into vibrant child-centered spaces, reflecting innovative, low-cost solutions (UN-Habitat, 2010).

These examples show that with political will, policy enforcement, and community engagement, mass housing developments can integrate safe, diverse, and accessible play spaces — a lesson Summit Condominium has yet to internalize.

5.9 Planning Options and Design Reflections for Children's Play Space

5.9.1 How much space is required to serve the needs of the existing population of Summit Condominium?

There are about 52,060 populations live in summit condominium in 276.9 ha area of land According to Ethiopia DHS (2000), proportion of children in different age group is 11.9% children age from 0-4 lives in urban area, 11.5 and 13.6 % children age from 5-9 and 10-14 lives in urban area, therefore it is assumed that 37% of study area population are children, therefore it is assumed that about 19262 children live in summit condominium.

According to the literature review, the spatial standard recommends a minimum of 10 Square meter of dedicated play space per a child. From this, 192,620 Square meter (19.2 ha) space/area is required for the estimated number of children in Summit Condominium. According to the first land use proposal of Summit Condominium, out of 276.9 ha about 57.8 ha area of land was designated for community park, sport center, cluster green space, street side green and riverside green. However, currently due to lack of proper implementation, the spaces are not giving their intended purpose rather serving almost different function. (See Figures 4:8, 4:9, 4:10 and 4:11 for more details)

5.9.2 Are there existing areas of deficiency and where should the new provision be located?

While assessing original design proposal of the research area, plenty of spaces were proposed and those areas (spaces) are accessible within reasonable and walking distance – not more than 400 m from home. Therefore, there is no need of providing or proposing additional children space. Nevertheless, there should be some considerations regarding the location or accessibility of those spaces since there are safety barriers to children accessing those areas – in order to access those community parks, children have to cross 30m width of roads. These feared by parents as it might expose their children for a car accident and ultimately affect the perception of those public spaces and their utilization by the community around there.

5.10 Theoretical Reflections and Broader Implications

5.10.1 The Right to Play as a Planning Priority

The UN Convention on the Rights of the Child (1989) recognizes play as a fundamental right. However, Summit's scenario reflects a systemic neglect of this right within urban planning. As

Rivkin (1995) and Pellegrini (2005) argue, play deprivation risks stunting social, emotional, and cognitive development.

5.10.2 Ethiopian Urban Planning Gaps towards Children-Friendly Space Provision

While Ethiopian policy frameworks nominally include provisions for recreational spaces in mass housing, weak enforcement and lack of specificity on usability criteria perpetuate these failures. This gap aligns with findings by Ucfudun (2015), who highlights the inadequacy of African urban policies in safeguarding child-friendly environments. The following section presents comparative analysis of Play Space Typologies and Ethiopian Context.

5.10.3 Comparative Analysis of Play Space Typologies and the Ethiopian Context

The assessment of Summit Condominium's children's play spaces reveals a complex interaction between global typologies of open spaces and Ethiopia's local realities. The study findings demonstrate that while formal play spaces are theoretically accounted for in planning documents, their practical implementation remains minimal or functionally compromised.

Globally, as put in the Literature Review section, children's play spaces are classified into formal, informal, semi-formal, and nature-based categories (Dina et al., 2021; Jafrin & Beza, 2018). Within the Ethiopian context—and specifically Addis Ababa—this classification resonates but with distinct challenges and adaptations shaped by urbanization, cultural norms, and limited resources.

5.10.3.1 Formal Play Spaces

Summit Condominium lacks fully functional formal playgrounds with dedicated equipment like swings or slides. Instead, general green spaces intended for communal use are either repurposed for parking or domestic uses (e.g., drying clothes). This reflects a wider issue in Addis Ababa's mass housing projects where formal play provisions are underserved or underdeveloped despite being planned (Wondimu Consult, 2014). For instance, large-scale formal parks such as Ambassador Park or Friendship Square exist at the city level, but they are not integrated into residential compounds—making them inaccessible for daily child play.

5.10.3.2 Informal Play Spaces

Children predominantly utilize informal spaces such as:

- Corridors between buildings
- Roadside areas
- Undeveloped plots within the compound

Such use reflects patterns also seen in wider Addis neighborhoods where children claim streets, riverbanks, and church compounds for play. However, these spaces often lack safety measures, increasing children's exposure to traffic risks and environmental hazards (AACPO, 2017).

5.10.3.3 Semi-Formal / Multi-Use Spaces

Semi-formal play areas in the study area include shared green spaces designed for multi-use but informally adapted by children. Similar patterns are observed in Addis Ababa's Abrehot Library's Knowledge Garden, which offers both reading and play areas, and in market spaces where children play during off-peak hours. However, such multi-functional spaces remain underutilized or contested, limiting their potential as reliable child-friendly zones.

5.10.3.4 Nature-Based and Adventure Play

Nature-based or adventure play areas are largely absent in Summit Condominium. Unlike international examples where hills, water features, and natural materials are integrated, the local context lacks similar provisions. Efforts like Zoma Park and Entoto Park introduce nature-based play but are too far removed from children's daily environments in mass housing.

5.10.3.5 Reflections and Gaps

This comparative analysis highlights critical gaps:

- Planned vs. actual space usage diverges significantly due to competing land uses
- Visibility and safety concerns restrict free play, particularly for younger children
- Lack of diverse play types—football dominates, while imaginative or exploratory play is missing
- Nature-based experiences are rare within walking distance of mass housing

- Additionally, emerging initiatives such as Addis Ababa's Early Childhood Development (ECD) strategy recognize the importance of play but remain nascent in practical application at the community level.

5.10.3.6 Linking to Design Interventions

Understanding these local realities justifies the need for context-sensitive design interventions that:

- Prioritize diverse play types beyond football
- Integrate safe, visible, and age-appropriate spaces within residential compounds
- Encourage community management models to maintain usability
- Incorporate nature-based elements aligned with Ethiopia's evolving green space policies

Based on these facts, the following chapter presents spatial design solutions at both the block and neighborhood levels, and discusses Policy Recommendations, informed by these comparative insights.

5.11 Design Interventions and Policy Recommendations for Child-Friendly Urban Planning

5.11.1 Design Interventions: Spatial Solutions for Child-Friendly Play Spaces

As previously discussed, although designated open spaces exist within the compound, the overall design does not adequately prioritize children's needs. As a result, children often resort to repetitive movements in areas primarily designed for other functional activities. According to Yogman (2018), "During different types of play, children learn and practice key social, thinking, physical, and emotional skills, including creativity, imagination, and problem-solving."

To create an effective and meaningful play environment, spaces must be designed intentionally to support the holistic development of children—enhancing their motor skills, reasoning, creativity, imagination, and emotional resilience. Play is not only a source of joy but also a vital part of healthy child development. It fosters progressive learning, where skills gained through playful activities build upon each other, strengthening children's cognitive and social capabilities over time (Yogman, 2018).

Before presenting the proposed design interventions, Figure 5.1 below illustrates the built-up areas, block arrangements, existing play space locations, parking zones, and pavement materials within the study area – to give the context to the following proposals.

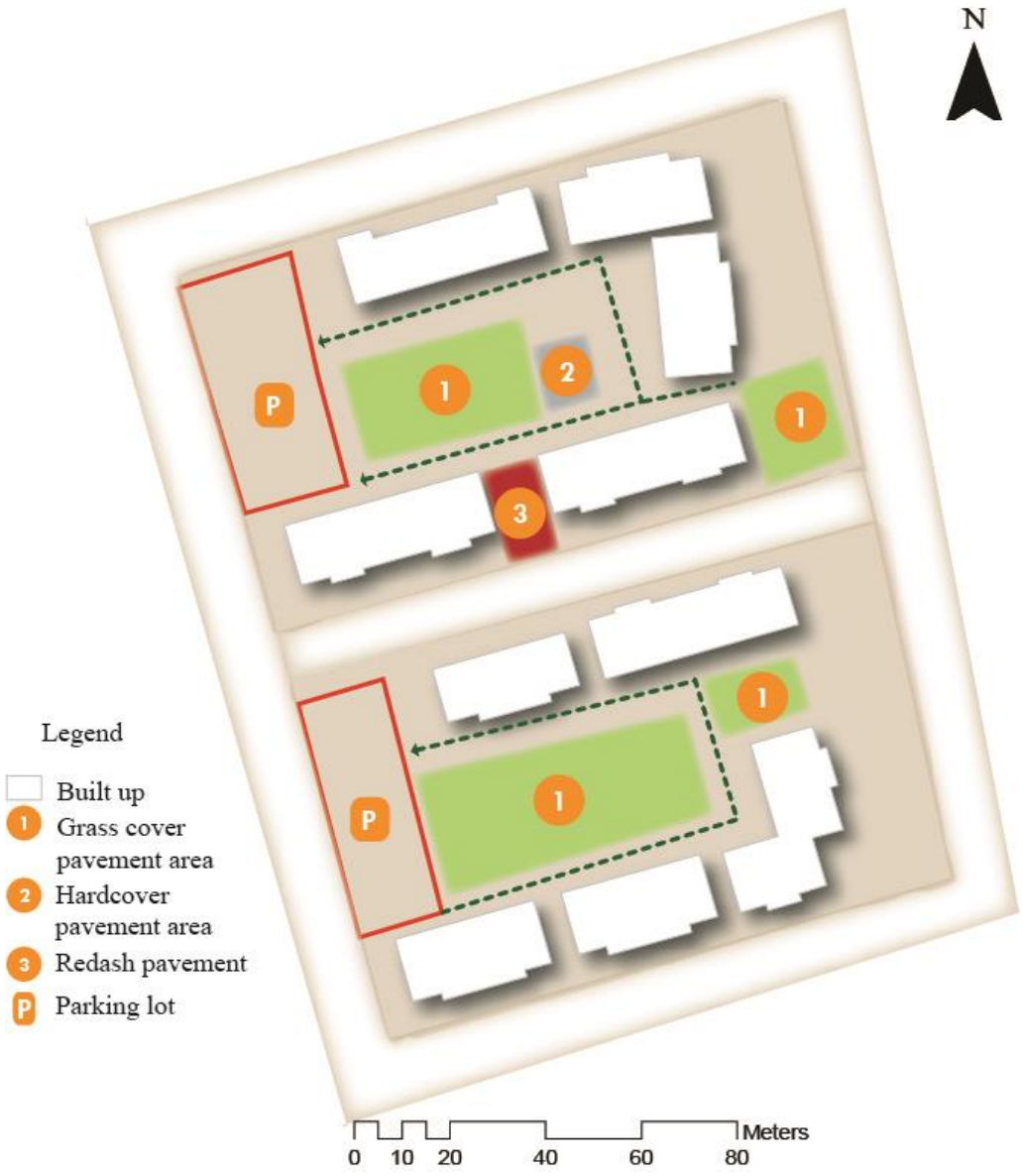


Figure 5:1 *Built-up Area, Block Arrangements, Play Space Location, Parking Zones, and Pavement Material*

(*Source: Adapted from GIS cadaster and researcher's field observation, 2022.*)

Based on the local context and research findings, a series of spatial design interventions are proposed to enhance the inclusivity, usability, and developmental value of children's play spaces

within the study area. These interventions aim to create environments where children can play, learn, and develop essential cognitive, social, and physical skills. The proposed design solutions are structured into two levels: (1) Block Level Design Interventions and (2) Neighborhood-Level Reflections and Broader Urban Context. These combined interventions aim to serve as scalable models for improving children's play environments in other mass housing developments across Addis Ababa and similar urban settings.

5.11.1.1 Block-Level Design Interventions:

There are four major interventions at the Block-Level Design Interventions. Here

1. Intervention 1: Spatial Expansion and Enhancement
2. Intervention 2: Addition of Basic Play Elements
3. Intervention 3: Incorporation of Advanced Play Features
4. Intervention 4: Landscape Improvement and Nature Integration

For each intervention, a comparative analysis is presented, assessing the existing conditions against the proposed design solutions. The evaluation focuses on five key spatial quality dimensions—Space Use, Play Value, Safety and Supervision, Social Interaction, and Environmental Impact—along with considerations of scalability and future applicability.

The following section provides a detailed explanation of the four Block-Level interventions, outlining their design objectives, features, and anticipated impacts on children's play experiences and the broader community.

a) Intervention 1: Spatial Expansion and Enhancement

Observations and parental feedback revealed that many families—particularly those with younger children—perceive the existing play area as lacking meaningful engagement opportunities. Most parents believe that "*there is nothing the kids could do in the space except run around or pass time.*" This limited perception underscores the need for spatial enhancements that stimulate children's cognitive development and imaginative play.

To address this, interactive painted pavement artwork is proposed as a minimal yet impactful intervention. These creative ground markings—such as hopscotch, number grids, or alphabet

trails—are designed to encourage problem-solving, physical activity, and learning through play. By integrating these elements, the space becomes multifunctional, offering both cognitive and physical stimulation for children.

Recognizing the shared nature of the open space, the intervention maintains flexibility for diverse uses. Condominium residents can continue utilizing the area for traditional activities like drying grains and clothes, while children benefit from the enriched play environment. This affordable solution is designed to be inclusive, ensuring usability across different age groups without disrupting existing communal practices. Figure 5:2 below presents the minimal intervention approach, integrating creative pavement artwork to enrich the space while maintaining its shared use.

(a) Before: Existing Condition **(b) After:** Proposed Additional Playing Spaces

Figure 5:2 *Intervention 1– Additional Playing Spaces for Spatial Expansion and Multi-Use Enhancement*

a) Existing: Current constrained play space dominated by non-play uses.
b) Proposed: Proposed expansion creating multi-functional, age-appropriate zones with improved safety and accessibility.

(Source: Researcher's field photos and 3D design illustration, 2022)

This intervention ensures age segregation in play design, enhances spatial capacity, and reduces conflicts between children's activities and other functional uses. (Figure 5:1)

Table 5:1 Intervention 1 Comparative Analysis

Aspect	Existing Space (Fig. 5:2 – a)	Proposed Intervention (Fig. 5:2 – b)
Space Use	Undesignated space encroached by competing services – shared with drying clothes and at times parking	Dedicated multi-use play zones
Play Value	Minimal	Supports both active and passive play
Safety & Supervision	Poor visibility and frequent conflicts	Defined zones with improved sightlines and enhanced visual corridors

Social Interaction	Fragmented and isolated	Encourages interaction among children
Environmental Impact	Neutral impact	Introduces landscaping and soft surfacing

Note. *Researcher's Own Analysis*

This minimal intervention enhances the underutilized open space by introducing flexible, multi-use design features such as painted pavement artworks that stimulate children's imagination and cognitive engagement. It transforms the monotonous space into a vibrant area supporting both children's play and community activities like drying grains or clothes. Importantly, this approach raises parental awareness about the educational value of play, fostering acceptance of shared space usage. Its cost-effectiveness and adaptability make it a scalable solution suitable for other mass housing sites with similar socio-cultural dynamics in Addis Ababa.

b) Intervention 2: Addition of Basic Play Elements

Incorporating topographic and landscape variations within children's play spaces is essential for fostering diverse play experiences and enhancing motor skill development. Such variations not only stimulate physical activity but also allow children to explore their physical abilities and limits.

To address the observed lack of stimulating features, this intervention introduces mounded landscapes and basic play elements such as climbing structures, slides, and swings. Field observations confirmed that children instinctively seek out objects to climb and frequently expressed their desire for dedicated spaces for sliding, swinging, and climbing.

The proposed design integrates these features into the existing space, transforming the barren ground into an interactive, child-friendly environment that promotes physical activity, exploration, and imaginative play.

Refer to Figure 5:3 below for visual comparison of the current condition and the proposed intervention.

(a) Before: Existing Condition **(b) After:** Proposed Addition of Basic Elements

Figure 5:3 *Intervention 2 – Addition of Basic Playing Activity*

(a) *Existing:* Unused barren ground, lacking any play structures or engaging features. (b) *Proposed:* Redesigned space with integrated walkways, mounded landscapes, and essential play elements (swinging, sliding, climbing) to support physical activity and skill development.

(Source: Researcher's field photos and 3D design illustration, 2022)

Table 5:2 below provides a structured comparison of Intervention 2 against baseline conditions across key metrics such as effectiveness, cost-efficiency, participant outcomes, implementation feasibility, and long-term sustainability.

Table 5:2 *Comparison Analysis – Intervention 2*

Aspect	Existing Space (Fig. 5.3 – a)	Proposed Intervention (Fig. 5.3 – b)
Space Use	Unused barren ground with no defined purpose	Dedicated play zones with mounds and basic play structures
Play Value	Highly limited, no facilities for physical activity	Encourages climbing, sliding, and swinging; improves motor skills
Safety & Supervision	Poor visibility, unsafe surfaces	Defined play areas with better sightlines and child-friendly materials
Social Interaction	Minimal, isolated play	Promotes group play, interaction, and social cohesion
Environmental Impact	Neutral, dusty and unattractive	Improved aesthetics with greenery and interactive landforms

Note. *Researcher's Own Analysis*

By adding landscape mounds, climbing, sliding, and swinging features, this intervention directly responds to children's natural desires for physical activity and exploration. It enhances motor skill development, spatial awareness, and creativity while providing safer and more engaging play opportunities. The design of the basic play elements and topographical variations in this intervention is cost-effective and easy to replicate in other mass housing projects, promoting active outdoor play and reducing children's reliance on unsafe or non-designated spaces.

c) Intervention 3: Incorporation of Advanced Play Features

This intervention focuses on integrating structured and organized play activities that introduce rules and foster self-regulation skills among children. Observations from the study area revealed a strong interest in group games such as volleyball; however, the available space is insufficient to accommodate all desired activities simultaneously.

To address this, a movable volleyball court is proposed within the play area situated between the buildings. The design allows flexibility—volleyball posts and nets can be installed when needed and removed afterward, enabling the space to be used for other activities such as football or free play. This multi-use approach maximizes limited space while promoting diverse physical and social engagement opportunities (Figure 5:4).

(a) Before: Existing Condition **(b) After:** Proposed Advanced Play Features

Figure 5:4 *Intervention 3 – Incorporation of Advanced Play Features*

(a) *Existing*: Unregulated, underutilized space.

(b) *Proposed*: Flexible sports zone added, allowing volleyball, football, and other social activities that enhance communication, collaboration, and physical skills. *(Source: Researcher's field photos and 3D design illustration and Pexel, 2022)*

In addition to the sports activity area, a gathering zone is proposed along the edge of the play space. This area offers children a place to socialize, observe, engage in pretend play, or simply rest. Designed for inclusivity, the space can serve different age groups at varying times, supporting both active and passive recreational activities.

The following table evaluates the intervention's potential impact by comparing existing conditions with the proposed multi-functional play area (Table 5:3).

Table 5:3 *Intervention 3 - Comparison Analysis*

Aspect	Existing Space (Fig. 5.4 – a)	Proposed Intervention (Fig. 5.4 – b)
Space Use	Undefined open space	Multi-use: Volleyball, football, social space
Play Value	Limited to free movement	Promotes rule-based games, teamwork, and self-regulation
Safety & Supervision	Low visibility, undefined zones	Clear activity zones, better supervision lines
Social Interaction	Minimal group engagement	Encourages team play, peer interaction, and group activities
Environmental Impact	Neutral	Enhances use of space without permanent structures

Note. *Researcher's Own Analysis*

This intervention transforms an underutilized open space into a flexible, multi-functional sports zone that accommodates various age groups and activities. By introducing a movable volleyball court, the design allows for dynamic use—supporting both structured sports like volleyball and football while maintaining adaptability for other social interactions. This approach promotes physical development, social cohesion, and inclusivity, while maximizing limited space within the compound. The flexible design makes it easily replicable in similar mass housing contexts across Addis Ababa, enhancing community engagement and offering sustainable recreational opportunities.

d) Intervention 4: Landscape Improvement and Nature Integration

Aesthetic quality and connection with nature are vital components of children's play environments, fostering creativity, cognitive development, and emotional well-being. To enhance the backyard play area, this intervention focuses on improving the surrounding terrain, introducing grassy play zones, and planting flowers along the edges to create a visually engaging and environmentally friendly space.

Figure 5.5 below presents a comparison between the existing barren playground and the proposed nature-integrated design. The intervention introduces child-friendly natural elements that enrich environmental quality while promoting children's physical, cognitive, and social development in line with child-centered urban design principles (UNCRC, 1989; Nicholson, 1971).

(a) Before: Existing Condition **(b) After:** Proposed Nature-Based Play Design

Figure 5:5 *Intervention 4– Existing Condition vs. Proposed Nature-Based Play Intervention*

a) Before: Current underutilized open ground, lacking defined play structures, greenery, and child-friendly features. The area exhibits signs of neglect, including litter and degraded environmental quality.

b) After: Proposed nature-based play area introducing landform variations (mounds), tunnels, and interactive natural features that support exploration, imaginative play, and physical activity.

(Source: Researcher's field photos and 3D design illustration, 2022)

The comparison highlights a clear transformation from a neglected, unsafe, and non-functional space into a vibrant, multi-functional, and nature-integrated play environment. Table 5:4 illustrates more on the comparison.

Table 5:4 *Intervention 4 Comparison Analysis*

Aspect	Existing Space (Fig. 5.5 – a)	Proposed Intervention (Fig. 5.5 – b)
Physical Condition	Bare soil, littered, undefined	Enhanced green cover, landform mounds, interactive structures
Play Value	Non-existent	Supports climbing, balance, exploration, imaginative play
Safety & Supervision	Poor visibility, unsafe surfaces	Clear sightlines, natural materials, defined play zones
Social Interaction	Minimal use, isolated	Encourages group play, social cohesion
Environmental Impact	Degraded urban land	Improved microclimate, nature connection

Note. *Researcher's Own Analysis*

This nature-integrated intervention revitalizes the barren play area into a vibrant, multifunctional, and eco-friendly space. By incorporating grassy mounds, natural play elements, and interactive features, the design supports children's physical, cognitive, and social development while fostering their connection with nature. The intervention also improves environmental quality and

microclimate, creating a more inviting and safe atmosphere for play and community interaction. Its adaptable design makes it scalable and applicable to other mass housing sites, promoting sustainable and child-friendly urban environments.

e) Summary of Interventions

Creating safe and engaging play spaces in mass housing requires targeted spatial interventions. Based on the study findings from Summit Condominium, the following design strategies address key challenges in availability, accessibility, safety, and usability. Each intervention incorporates community feedback, global insights, and essential features like shaded seating and visibility to enhance children's play experiences and community interaction.

Table 5.5 summarizes the four proposed interventions, outlining objectives, design elements, and expected impacts.

Table 5:5 *Summary of Proposed Design Interventions*

Intervention	Objective	Key Actions	Expected Impact	Figure Ref.
Intervention 1: Spatial Expansion and Enhancement	Increase the physical size of play areas	Reclaim underused zones, reorganize paths for better flow	Enhanced availability and connectivity of play spaces	Fig. 5:1
Intervention 2: Addition of Basic Play Elements	Introduce essential play structures	Install basic play tools: swings, seesaws, slides	Stimulates and supports diverse physical play and social interaction	Fig. 5:2
Intervention 3: Incorporation of Advanced Play Features	Promote creative and skill-based activities	Add courts, sports fields, interactive games	Fosters teamwork, creativity, skill development, and prolonged engagement	Fig. 5:3
Intervention 4: Landscape Improvement & Nature Integration	Improve environmental quality and comfort	Plant trees, add shaded zones, enhance green buffers	Boosts thermal comfort, safety, visibility, and ecological value	Fig. 5:4

Note. *Researcher's Own Analysis*

f) Scalability and Key Design Considerations

The following table summarizes the scalability potential and key design considerations for each proposed intervention. This ensures that the recommendations are adaptable, context-sensitive, and aligned with sustainable child-friendly design principles suitable for mass housing environments like Summit Condominium (Table 5:6).

Table 5:6 *Scalability and Key Design Considerations for Proposed Interventions*

Intervention	Scalability	Design Considerations
Intervention 1: Spatial Expansion & Pavement Artwork	Easily replicable in similar condominium settings; low-cost, minimal space demand.	- Use non-toxic, weather-resistant paints. - Ensure flexible use for children's play and residents' needs (drying area, gathering). - Prioritize low-maintenance materials.
Intervention 2: Addition of Basic Play Elements	Scalable to other compounds with small land adjustments; adaptable for various age groups.	- Integrate topographic mounds for climbing and motor skill development. - Include soft surfaces for safety. - Preserve clear sightlines for supervision.
Intervention 3: Advanced Play Features (Including Movable Volleyball Court)	Highly scalable; movable equipment allows space flexibility for multiple activities.	- Use lightweight, durable, and easy-to-relocate posts. - Ensure safety buffers around active zones. - Provide gathering spots for passive users. - Consider dual-use as football pitch.
Intervention 4: Landscape Improvement & Nature Integration	Scalable for larger and smaller spaces; replicable in diverse housing schemes.	- Use native plants to minimize maintenance. - Avoid dense planting that obstructs visibility. - Integrate landform variations for exploration. - Include shaded seating and child-friendly materials.

Note. *Researcher's Own Analysis*

g) Block-Level Standards and Regulations

Ensuring the functionality and safety of children's play spaces within mass housing compounds requires alignment with established urban design standards and child-friendly planning principles. At the block level, regulations should guide the allocation, design, and maintenance of play spaces to foster inclusivity, accessibility, and child development. This section presents key Ethiopian urban codes and international standards that inform the planning and implementation of block-level play spaces in Summit Condominium and similar contexts.

i. Ethiopian Context and Urban Design Codes

- According to the Addis Ababa City Structure Plan (2017–2027), *15% of total land area in mass housing projects must be allocated to communal green spaces*. A portion of this must explicitly accommodate children's play spaces with safety and accessibility considerations.
- The Addis Ababa Green Space Development Strategy (2015) emphasizes *environmental quality* and *child-sensitive design*, promoting visual accessibility and safe play environments within residential compounds.

ii. International Best Practices for Play Space Standards and Design

Globally, several guidelines, initiatives, and case studies shape best practices in the provision and design of child-friendly urban play environments. These practices emphasize spatial adequacy, inclusivity, accessibility, and developmental value of play spaces—principles highly relevant to emerging urban contexts like Addis Ababa.

1. Kenya – Nairobi Play Streets Program (2019)

As part of a pilot child-friendly city project, Nairobi introduced temporary street closures to create safe play environments in dense informal settlements. Key features include:

- Community-led initiatives reclaiming streets for play
- Low-cost, adaptable solutions requiring minimal infrastructure
- Promotes social interaction and inclusive play where formal playgrounds are absent

2. South Africa – National Guidelines for Early Childhood Development (ECD) Centers

South Africa's urban planning guidelines for ECD centers recommend:

- Minimum 5 m² outdoor play space per child
- Integration of natural features, shaded areas, and safe play equipment
- Proximity to residential zones for easy access
- Separation from vehicular zones to reduce accidents and improve air quality

3. UK Design Standards for Play Spaces (Play England, 2008)

The UK's national guidance recommends 7–10 m² of dedicated playable space per child within a safe walking distance from home, ideally 100–400 meters depending on age. The standards highlight the need for:

- Diverse play opportunities supporting physical, creative, and social development
- Integration of natural elements like trees, grass, and water features
- Accessibility for children with disabilities
- Safe, visible locations that enable parental supervision

4. Brazil – São Paulo's Integrated Community Parks (2015)

São Paulo developed multi-functional green spaces in low-income neighborhoods that combine:

- Active and passive recreational zones
- Community gardens and sports facilities
- Social gathering spaces for intergenerational use
- The approach improves social cohesion while addressing children's need for free play

5. Singapore – Vertical Playgrounds in High-Density Housing

Singapore's Housing Development Board (HDB) pioneered vertical playgrounds integrated into multi-story housing:

- Maximizes limited land in dense urban areas
- Combines play with safe observation decks and rooftop gardens
- Encourages physical activity, imaginative play, and social interaction within compact urban settings

6. UNICEF's Child-Friendly Cities Initiative (CFCI)

UNICEF's global framework advocates for embedding children's rights into urban design. It promotes:

- Accessible, inclusive, and age-appropriate play spaces
- Integration of play into housing, schools, and public spaces
- Child participation in planning
- Ensuring children's play is not an afterthought but central to urban development

To ensure the design of child-friendly play spaces aligns with international standards and contextual African experiences, the following table summarizes key parameters and best practices. These guidelines emphasize space adequacy, accessibility, safety, and community ownership—critical for supporting children's physical, cognitive, and social development in mass housing environments like Summit Condominium. (See Fig. 5:7)

Table 5:7 *Summary of Key Design Standards and Recommendations for Block-Level Child-Friendly Place Spaces (International and African Best Practices)*

Parameter	Standard / Recommendation
Per Capita Play Space	Minimum 7–10 m² per child within walking distance *(UK Design Standards, Play England 2008)*; South African ECD Policy (2015) recommends integrating child-specific spaces in urban planning.
Surface Materials	Use of soft, permeable, non-toxic materials (e.g., rubberized flooring, grass, sand) to minimize injury risk and improve environmental comfort.
Accessibility	Universal design principles—barrier-free access, ramps, wide pathways for children with disabilities *(UNICEF CFCI Guidelines).*
Visibility and Supervision	Ensure passive surveillance from nearby residential units; provide shaded observation areas for parents *(South African Guidelines, 2015).*
Activity Diversity	Design multi-functional zones for active play (climbing, running), social interaction (gathering spaces), and quiet zones (nature-based, sensory play areas).
Community Oversight	Establish resident-led committees for play space maintenance, safety monitoring, and programming *(Nairobi Play Streets Initiative, 2020).*

Note. Compiled by the researcher based on *Play England (2008); UNICEF CFCI Guidelines; South African ECD Policy (2015); South African Child-Friendly Guidelines (2015); Nairobi Play Streets Initiative (2020).*

iii. Relevance for Play Spaces in Addis Ababa's Mass Housing Context

These international and African best practices emphasize:

- Allocating dedicated, safe, and diverse play spaces
- Integrating play into both block-level and neighborhood planning
- Encouraging multi-use spaces that serve children and the broader community
- Community participation in planning and maintaining spaces
- Balancing natural landscapes and play infrastructure for holistic development

Adopting such approaches could significantly improve the design and management of children's play spaces in Addis Ababa's mass housing projects, ensuring children's right to play is realized within Ethiopia's urban growth trajectory.

h) Concluding Reflection on Block-Level Interventions

The block-level interventions proposed in this study demonstrate how spatial reconfiguration, inclusive design elements, and community-responsive features can transform underutilized spaces into vibrant, child-friendly environments within mass housing compounds. These interventions not only enhance the quality of children's play experiences but also promote social interaction, safety, and environmental sustainability at the micro-scale.

However, creating truly inclusive play environments demands extending this design thinking beyond individual blocks to the neighborhood scale. Children's daily experiences of play, mobility, and social connection often transcend the boundaries of their immediate residential compounds. Therefore, the next section advances the discussion by exploring neighborhood-level design reflections, illustrating how these block-level interventions can inform broader urban strategies. This shift ensures integrated, connected, and accessible play networks that align with child-friendly urban development principles.

5.11.1.2 Neighborhood-Level Design Reflections: Integrating Child-Friendly Spaces into the Broader Urban Context

Building on the block-level spatial interventions, this section expands the design reflections to the neighborhood scale, recognizing that children's play, learning, and social interactions extend beyond their immediate residential environments. The surrounding urban context—including parks, community green spaces, pathways, and shared public areas—plays a crucial role in shaping children's mobility, outdoor experiences, and sense of belonging.

The broader neighborhood presents both opportunities and challenges that significantly influence children's engagement with their community. Through neighborhood-level analysis and design illustrations, this section proposes interventions aimed at enhancing connectivity, safety, and the overall quality of play environments beyond the condominium compound. Integrating child-friendly plan ing principles at this scale is essential for fostering healthy, inclusive, and vibrant urban neighborhoods where play spaces are distributed, accessible, and support children's holistic development within their daily walking range.

This section presents spatial design proposals and illustrative visualizations that aim to:

- ✓ Strengthen physical and visual connectivity between children's play areas and residential spaces.
- ✓ Enhance safety, comfort, and usability of neighborhood parks and community green spaces.
- ✓ Promote equitable access to play spaces for all age groups and abilities.
- ✓ Reflect the needs of children, families, and the wider community in the use of public spaces.

The following sub-section illustrates specific neighborhood-scale interventions supported by visuals that detail how strategic planning can transform the broader environment into a child-friendly urban fabric.

a) Neighborhood-Level Design Illustrations and Proposed Interventions

To complement the block-level interventions, the following neighborhood-scale design proposals illustrate how broader spatial planning can enhance children's play experiences, safety, and social interaction within the Summit Condominium neighborhood.

i. Proposed Functional Zoning for Multi-Generational Use

The zoning map illustrated in Figure 5:6 presents the master plan layout for the neighborhood park, offering a spatial framework where diverse functional zones—active play areas, quiet green spaces, shaded seating zones, and pedestrian pathways—are clearly delineated. This design ensures harmonious use by children, youth, and adults, minimizing spatial conflicts while promoting safety and accessibility. The zoning strategy also carefully integrates pavement materials and green buffers to balance activity and rest areas.

Furthermore, the plan mirrors the block-level design interventions by emphasizing space optimization and conflict mitigation between vehicular and pedestrian movements. It directly aligns with Intervention 1 (Spatial Expansion and Enhancement) but extends its application to the neighborhood scale, reinforcing child-friendly urban design principles and creating an inclusive, multi-use public realm.

Figure 5:6 *Zoning Plan and Activity Mapping of the Proposed Community Park*

(*Source: Researcher's Design Illustration, 2022*)

ii. Enhanced Park Design with Inclusive Play and Social Spaces in Community Park

Figure 5:7 shows a three-dimensional visualization showing integrated play equipment, walkways, green cover, and communal spaces, promoting both active and passive recreation. The 3D illustration converts the abstract zoning into a tangible visual where materials, landscaping, and activity spaces are visible. This reinforces the participatory design idea, aiding community understanding. It supports the earlier emphasis on visual accessibility (Space Syntax results) and complements the shaded seating design (Figure 5:7) for parental monitoring.

Figure 5:7 *3D Perspective of the Redesigned Community Park*

(Source: Researcher's Design Illustration, 2022)

iii. Linking Residential Blocks to Playgrounds and Green Spaces

This map visualizes pedestrian pathways and green corridors designed to improve safe movement between homes, parks, and communal areas for children. The playground layout includes shaded seating, defined play zones, and observation points, ensuring safety while encouraging social interaction. (Figure 5:8)

(a) Location Map **(b)** Neighborhood Green Network and Connectivity Map

Figure 5:8 *Neighborhood Green Network and Connectivity Map*

(*Source: Adopted from GIS and Researcher's Computer Aided Design Simulation, 2022*)

iv. Design for Enhanced Supervision and Social Cohesion

Shaded Seating Space is an essential social infrastructure supporting supervision, especially for younger children. It responds directly to parental feedback from FGDs, where shade and visibility were raised as barriers to outdoor play. Therefore, the following picture (Fig. 5:9) highlights proposed layout changes aimed at eliminating hidden corners by improving sightlines for child safety and enhancing parental supervision throughout the playground. This also supports intergenerational interaction—elderly residents may use this space as well.

Figure 5:9 *Shaded Seating Space for Visibility Enhancement and Supervision for Play Areas*

(*Source: Researcher, 2022*)

v. Introduction of Commercial Refreshment Zone

By embedding economic activity, this design animates the play area, making it safer (increased footfall) and self-sustaining. The commercial node reflects global best practices like “eyes on the park” (Jacobs, 1961) and enhances sociability, indirectly reducing parental restrictions due to perceived isolation. (Fig. 5:10)

Figure 5:10 *Commercial Food and Drinks Zone*

(*Source: Researcher, 2022*)

vi. Integrating Cultural and Social Identity through Design and Diverse Play Features

Focused on cognitive and physical play elements, this figure extends Intervention 2 (Basic Play Elements) but at a larger scale. It ensures age-diverse usability, catering to both toddlers and older children, thus promoting equity in design. It also demonstrates the use of murals, art walls, and interactive installations to promote community ownership and create a vibrant atmosphere. (Fig. 5:11)

Figure 5:11 *Equipped Play Space with Diverse Play Features and Community Arts*

(*Source: Researcher, 2022*)

vii. Informal Play and Nature Interaction Zones

Green Cover Integration encourages spontaneous play. Figure 5.12 illustrates the use of shaded, grassy areas supporting unstructured play while enhancing the park's environmental quality and thermal comfort. This highlights nature-integrated play areas supporting unstructured, imaginative play—critical for cognitive and emotional development. It extends Intervention 4 (Nature Integration at Block Level) to the neighborhood scale. These zones also reduce play monotony (running/football-only) noted in Summit observations.

Figure 5:12 *Informal Play and Nature Interaction Zones*

(Source: Researcher's Field Observation and Design, 2022)

viii. Multi-Purpose Sport Field

A community-scale version of Intervention 3 (Advanced Play Features), this field enhances inclusivity—accommodating older children and youth. It encourages multi-age interaction and supports *organized games*, reinforcing social cohesion, and addressing parents' safety concerns by centralizing active play. (Fig. 5:13)

Figure 5:13 *Sample Neighborhood Playground Layout*

(Source: Adapted from GIS Cadaster and Researcher's Design, 2022)

ix. Embedding Natural Elements to Foster Cognitive and Sensory Development

This concept integrates trees, mounds, water features, and interactive landscapes to provide diverse and stimulating play opportunities. Figure 5:14 visualizes landform modifications for climbing and exploration, mirroring block-level recommendations. It taps into the motor skills development needs identified during field observations and creates age-graded excitement levels across the neighborhood.

Figure 5:14 *Nature-Integrated Play Concept at the Neighborhood Scale*

(Source: Researcher's Design Illustration, 2022)

x. Discovery and Puzzle Game Zone

A unique layer not previously highlighted in block interventions. It introduces problem-solving tasks, supporting Nicholson's Loose Parts Theory. This zone enhances cognitive diversity in play and aligns with UNCRC rights to mental development. (Fig. 5:15)

Figure 5:15 *Discovery and Puzzle Game Zone*

(*Source: Researcher, 2022*)

xi. Extended Play Equipment Zone

Extended Play Equipment Zone acts as a buffer and expansion to Figure 5:16, absorbing high play demand periods. Its scale addresses seasonal population variations (school holidays) and provides backup capacity, ensuring that play is not limited by physical crowding.

Figure 5:16 *Play space with equipment zone*

(Source: Researcher's Design, 2022)

b) Summary of Neighborhood Level Interventions

The neighborhood-level design reflections build directly upon the insights and spatial strategies developed at the block level, effectively scaling up interventions to ensure a cohesive, child-friendly urban fabric. While block-level interventions (First Part of Section 5.11) focused on reprogramming underutilized internal spaces—enhancing play value, integrating natural

elements, and introducing flexible multi-use zones—the neighborhood-scale proposals (Figures 5:6–5:16) extend these principles to larger, communal environments that influence children's broader spatial experiences.

For instance, the Zoning Plan (Figure 5:6) mirrors the spatial reorganization in Intervention 1, translating localized expansions into a comprehensive neighborhood layout that prioritizes child safety and usability. Similarly, the Nature-Integrated Play Concept (Play Mound Zone) (Figure 5:14) and Discovery and Puzzle Game Area (Figure 5:15) reinforce the block-level emphasis on cognitive and physical stimulation seen in Interventions 2 and 4, offering scaled-up opportunities for exploration, problem-solving, and nature interaction.

Moreover, features like the Shaded Seating Area (Figure 5:9) and Commercial Refreshment Zone (Figure 5:10) address parental concerns raised during the field study—echoing the supervision and safety themes that shaped the block-level design. These neighborhood components strengthen social cohesion, creating spaces where parents, caregivers, and children can engage simultaneously, thereby mitigating the isolation and safety risks observed in smaller play areas.

Finally, the Multi-Purpose Sport Field (Figure 5:13) expands the recreational scope for older children and youth, complementing the flexible sports provision proposed in Intervention 3 at the block level. By layering play functions across scales, the neighborhood design ensures that children's right to safe, inclusive, and stimulating play spaces—both immediate and extended—is fully integrated into the urban fabric.

c) Scalability and Design Recommendations

The proposed neighborhood-level design interventions demonstrate a scalable model that can be adapted and replicated across other mass housing developments in Addis Ababa and similar urban contexts. These interventions not only enhance children's outdoor play experiences but also improve community cohesion and environmental quality. The following considerations are vital for broader implementation:

i. Scalability Potential

Modular Design Approach: The neighborhood park zoning allows flexibility in scaling elements like play mounds, discovery zones, and informal play areas based on site size, budget, and community needs.

- **Community-Led Management Models:** Encouraging local committees and residents' associations to co-manage spaces ensures adaptability to different community structures and promotes ownership.
- **Integration with Green Infrastructure:** The design can be expanded as part of the city's larger green network, connecting parks, river corridors, and pedestrian pathways to form continuous child-friendly environments.
- **Policy Alignment:** The model aligns with Addis Ababa's urban planning policies and can be standardized as a requirement for future mass housing projects.

ii. Key Design Considerations

To ensure that neighborhood-level play spaces are functional, inclusive, and sustainable, a set of key design recommendations has been developed. These recommendations aim to guide the creation of child-friendly environments that balance play needs, safety, community integration, and environmental sustainability. Drawing from both global best practices and the specific context of Summit Condominium, the following principles prioritize accessibility, diverse play experiences, and long-term usability—laying the foundation for scalable child-centered urban spaces.

- **Diverse Activity Zones:** Ensure clear zoning for varied play experiences—ranging from physical activities (sports fields, play mounds) to cognitive and imaginative engagements (Discovery Zones, Puzzle Games).
- **Visibility and Supervision:** Maintain clear sightlines across play zones to enhance safety and provide parents with psychological comfort while children play independently.
- **Natural Integration:** Prioritize green elements such as shaded trees, grassy mounds, and water features to improve thermal comfort, environmental quality, and cognitive engagement.

- **Inclusive Design:** Design spaces to accommodate children of different age groups, abilities, and interests while remaining sensitive to local culture, such as incorporating Traditional Ethiopian Game Zones.
- **Sustainable Material Use:** Utilize eco-friendly, low-maintenance materials that can withstand intensive use and require minimal upkeep, ensuring long-term viability.
- **Accessibility:** Design pedestrian pathways, ramps, and gathering spots that promote inclusive access for children, parents, the elderly, and differently-abled individuals.
- **Multi-Use Flexibility:** Integrate spaces for communal events, family gatherings, and informal markets, allowing spaces to serve diverse community needs beyond children's play.

These considerations ensure that the neighborhood-level interventions transcend single-project solutions and serve as a replicable urban model for creating integrated, inclusive, and sustainable child-friendly spaces in Addis Ababa's expanding mass housing projects. By embedding flexibility, safety, and community ownership at the core, the design framework enhances both the physical and social fabric of emerging neighborhoods.

d) Neighborhood-Level Standards and Regulations

Beyond individual compounds, the neighborhood environment significantly shapes children's outdoor experiences, mobility, and social interaction. Effective urban planning at this scale must integrate child-centered standards that ensure safe, connected, and inclusive play environments within the broader community fabric. This section outlines relevant Ethiopian policies and global best practices that support the creation of accessible, equitable, and sustainable neighborhood play networks.

i. Ethiopian Context & Urban Codes

- The Local Development Plan (LDP) Guidelines (2015) mandate that:
    - 15% land allocation is required for public green and recreational spaces.
    - Children's play areas must be within 400 meters walking distance from residences.
- The National Urban Development Policy (2005) promotes inclusive planning to serve vulnerable groups, including children.

ii. International Standards and Global Lessons

- UNCRC Article 31 (United Nations, 1989): Guarantees children's right to rest, leisure, and play in safe, accessible environments.
- European Commission Urban Play Guidelines (2019):
    - Minimum play space ratio: 1 playground per 1,000 children
    - Incorporate green corridors and safe pathways connecting residential areas to parks and play zones.

iii. Key Neighborhood-Level Requirements

Table 5:8 *Summary of Key Design Standards and Recommendations for Child-Friendly Place Spaces for Neighborhood- Level Interventions (International and African Best Practices)*

Parameter	Standard / Recommendation
Walking Distance	Maximum 400 meters safe walking distance for children under 11 years (Ethiopian LDP Guidelines, 2015); Supported by Play England (2008) urban standards.
Green Connectivity	Establish continuous green corridors linking homes, play spaces, parks, and schools; shaded pedestrian pathways to encourage walking and safe independent mobility (UNICEF CFCI).
Public Safety & Visibility	Integrate passive surveillance features (natural visibility), CCTV monitoring, and well-lit pathways; design with clear sightlines to enhance parental supervision (South African Urban Guidelines, 2015).
Inclusive & Multi-Functional Design	Ensure spaces serve multiple age groups (toddlers, children, youth, adults); include nature play zones, sports fields, social gathering spaces, and quiet reflection areas (UNICEF CFCI).
Activity Diversity & Flexibility	Create modular zones adaptable for community events, informal play, and educational activities (e.g., edible gardens, discovery zones) (Nairobi Play Streets Initiative, 2020).
Community Ownership & Maintenance	Establish local resident committees partnered with Woreda-level urban greening offices for regular maintenance, ensuring sustainability and community stewardship.
Environmental Sustainability	Incorporate local flora, permeable surfaces, and shade-providing trees to improve microclimate, reduce heat stress, and enhance environmental education (Addis Ababa Green Strategy, 2015).

Note. Adapted from *Addis Ababa Green Space Strategy (2015), Ethiopia LDP Guidelines (2015), UNICEF (2018), Play England (2008), South African Cities Network (2015), and Nairobi Play Streets Initiative (2020).*

iv. Relevance for Neighborhood-Level Play Spaces in Addis Ababa's Mass Housing Context

Drawing from international and African best practices, the neighborhood-level design reflections highlight the following critical principles for Addis Ababa's mass housing environments:

- **Integration of Distributed Play Spaces:** Ensuring that play areas are not concentrated in one location but interwoven throughout the neighborhood to promote accessibility within safe walking distances.
- **Multi-Functional Public Spaces:** Designing parks, green corridors, and communal spaces that support diverse age groups while prioritizing children's developmental needs.
- **Safe and Connected Mobility Networks:** Establishing child-friendly pedestrian pathways and green linkages that connect residential blocks to play areas, schools, and communal facilities.
- **Community Engagement and Oversight:** Encouraging local participation in the design, use, and maintenance of neighborhood play spaces to foster a sense of ownership and sustainability.
- **Balancing Built and Natural Environments:** Integrating natural elements, shading, and vegetation to create environmentally sustainable and stimulating play environments.

Adopting these neighborhood-scale principles will not only enhance children's access to safe and inclusive outdoor environments but also support broader community cohesion and well-being. In the context of Addis Ababa's rapidly growing mass housing developments, such approaches are essential for safeguarding children's right to play and promoting holistic urban resilience.

v. Concluding Reflections on Neighborhood-Level Interventions

In summary, the neighborhood-level design reflections emphasize that child-friendly spaces must transcend isolated interventions and function as an integrated system within the urban fabric. The proposed spatial strategies prioritize children's mobility, safety, and inclusive access while enhancing environmental quality and social interaction at the community scale.

These neighborhood-scale interventions demonstrate scalable and adaptable solutions tailored to Addis Ababa's mass housing context, ensuring that children's play, learning, and exploration are

fully embedded in the broader urban experience. Building on this foundation, the subsequent section advances policy and strategic recommendations necessary to institutionalize child-centered urban planning and design within city-level development frameworks.

5.11.2 Policy and Strategic Recommendations for Child-Friendly Urban Planning

Building upon the site-specific design interventions, this section expands the discussion toward broader policy and strategic considerations essential for creating sustainable, child-friendly urban environments within mass housing developments like Summit Condominium. While physical improvements are crucial, ensuring long-term usability, inclusivity, and safety of children's play spaces demands robust planning frameworks, clear regulations, and active community engagement.

This need is particularly relevant in the context of Addis Ababa, where rapid urban expansion frequently overlooks children's spatial and developmental needs. Existing city guidelines allocate 10–15% of the total area in mass housing projects for communal green spaces (Addis Ababa City Administration, 2015). However, dedicated zoning for children’s play spaces is largely absent, forcing children to share these areas with other users—often limiting opportunities for age-appropriate, skill-enhancing activities.

In contrast, international standards such as the UK Play England guidelines recommend 7–10 m^2 of designated play space per child within safe walking distances (Play England, 2008). Similarly, UNICEF’s Child-Friendly Cities Initiative (CFCI) advocates for integrating safe, inclusive, and developmentally appropriate play areas within urban neighborhoods to uphold children's rights to play, learn, and socialize (UNICEF, 2018).

Although Summit Condominium’s master plan includes four community parks, documentation lacks clarity regarding their specific functions, particularly in supporting diverse forms of children’s play. Moreover, current city standards focus predominantly on providing sports fields, which, while valuable, fail to cover the broader spectrum of exploratory, cognitive, and imaginative play necessary for holistic child development (MUD, 2006).

5.11.2.1 Key Design Considerations for Neighborhood-Level Child-Friendly Play Spaces

In designing neighborhood-scale play spaces, the following critical factors should guide planning and implementation:

- Population Size: Determine the target number of children and families the play space is designed to serve (UN-Habitat, 2013).
- Road Hierarchy & Connectivity: Locate play spaces with safe access points, away from major roads, considering pedestrian-friendly connectivity (Ethiopian LDP Guidelines, 2015).
- Types of Play Activities: Integrate a balance of static and dynamic, quiet and active play areas, supporting both individual and group activities (Jansson, 2010).
- Surface Materials: Use soft, permeable, and non-toxic materials to reduce injuries and enhance comfort, as recommended by South African Urban Guidelines (2015).
- Skill-Enhancing Play: Include elements that foster physical, social, and cognitive development.
- Cultural Context & Local Games: Reflect Ethiopia's traditional children's games, enhancing relevance and promoting cultural preservation (Dina et al., 2021).
- Children's Voices: Incorporate findings from participatory activities (drawings, FGDs) where children express their preferences (UNCRC, 1989).
- Parental Supervision: Ensure shaded, comfortable seating areas to facilitate supervision and social interaction (Jafrin & Beza, 2018).
- Climatic Adaptation: Provide natural and artificial shading for thermal comfort, especially important in high-density urban neighborhoods.
- Essential Amenities: Design spaces for supporting services, including restrooms, drinking water, and snack vendors (UNICEF, 2018).
- Buffer Zones & Safety Features: Include greenery, fencing, and setbacks to safeguard children from nearby roads or conflicting uses (South African Urban Guidelines, 2015).

5.11.2.2 Implementation Strategies for Sustainable Management

Sustainable neighborhood-level play space development requires a multi-stakeholder, phased approach:

1. **Community Ownership**: Empower resident committees to co-manage the space with Woreda-level Green Development Offices and River Basin Authorities (UPSBB, 2016).
2. **Utilize Local Expertise**: Collaborate with registered Micro and Small Enterprises (MSEs) skilled in urban greening and park maintenance.
3. **Public-Private Partnerships**: Engage local schools, fast-food vendors, and private actors for support in financing, programming, and activation of spaces.
4. **NGO & CSR Involvement**: Seek partnerships with NGOs and corporate social responsibility (CSR) programs to fund and maintain facilities (UNICEF, 2018).
5. **Volunteer Engagement**: Mobilize local youth groups and volunteers to assist with construction, monitoring, and community programs.
6. **Phased Development**: Implement in stages—prioritize essential components while allowing for future expansion based on demand and resources.

5.11.2.3 Concluding Remark

Integrating these strategic recommendations within Addis Ababa's urban planning frameworks is essential to bridging the persistent gap between policy and practice. Prioritizing child-specific design, fostering local partnerships, and embedding flexibility will transform mass housing neighborhoods like Summit Condominium into vibrant, safe, and inclusive environments—ensuring every child's right to play is protected and promoted as part of Ethiopia's urban development agenda

5.12 Comparative Case Study Reflection: Global Insights and Local Relevance

This research explored international best practices in child-friendly urban design. Selected global cases such as Nairobi's Play Streets, Singapore's vertical playgrounds, and Amsterdam's legally mandated play spaces provide useful models that could inform planning in Addis Ababa. These cases demonstrate scalable solutions addressing challenges similar to those identified in this

study. Table 5:9 below summarizes these insights and their potential relevance to the Addis context.

Table 5:9 *Linking Global Insights to Local Applicability*

Case Study	Global Insight	Relevance / Lesson for Addis Ababa
Nairobi, Kenya - Play Streets	Temporary closure of streets to create safe play spaces.	Pilot 'Play Street' initiatives in inner-city neighborhoods during weekends or festivals.
Singapore - Vertical Playgrounds	Space-efficient vertical playgrounds integrated into high-density housing.	Explore vertical or rooftop play structures in dense condominium projects.
Amsterdam, Netherlands - Mandated Play Spaces	Legal requirement for accessible playgrounds within residential areas.	Advocate for formal policy integration of children's right to play within Addis housing regulations.

(*Source: Compiled from global case studies and adapted for Addis context.*)

5.13 Summary of Discussions

The Ethiopian urban context reveals a dominance of informal and semi-formal play spaces due to limited investment in formal playgrounds. Children in mass housing projects like Summit Condominium frequently adapt streets, open plots, or shared green areas for play—raising safety concerns (UN-Habitat, 2011; AACPO, 2017).

Moreover, new national and city-level initiatives, such as the Early Childhood Development (ECD) strategy and Beautifying Sheger Project, reflect an emerging shift toward integrating child-friendly and nature-based spaces into Addis Ababa's urban development (AACA, 2021).

Integrating these typologies into urban design standards and policies is critical for creating equitable, safe, and developmentally rich environments that prioritize children's right to play, as stipulated in the United Nations Convention on the Rights of the Child (UNCRC, 1989).

The findings from Summit Condominium underscore a broader pattern where structural design flaws, policy gaps, and safety concerns undermine children's right to play. Comparative global cases also illustrate that alternative models are not only possible but essential for creating inclusive, livable cities. These examples emphasize the need for Addis Ababa to move beyond policy intentions toward actionable, localized strategies. The next chapter presents tailored recommendations grounded in both local findings and global experiences.

6 CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Building on the study findings and inspired by successful global case studies, this chapter outlines strategic recommendations designed to enhance the availability, accessibility, and safety of children's play spaces in Addis Ababa. This research investigated the availability, accessibility, usability, and optimization of children's play spaces within Summit Condominium—representative of Ethiopia's mass housing developments shaped by rapid urbanization and densification. Employing a mixed-method approach, the findings reveal a significant gap between policy intentions embedded in condominium plans and the lived experiences of children in these environments.

While the site's original plan designated green spaces, the responsibility for their development was assigned to Woreda-level urban greening offices. However, field observations confirmed that—except for a few developed areas within the compound—most designated green spaces remain either undeveloped or underutilized. This highlights a critical challenge: local government alone cannot achieve holistic and inclusive development of such spaces. The research underscores the need for multi-stakeholder engagement, including community members, private developers, and policymakers, in the creation, maintenance, and management of children's play spaces.

Despite sufficient physical open spaces, functionality is compromised by community perceptions, competing land uses, and a lack of awareness. Many open spaces originally intended for play have been repurposed for parking or passive green zones. This reflects broader socio-cultural attitudes that often deprioritize children's play needs, echoing Moore's (1987) assertion that children's interests are frequently marginalized in urban land use decisions.

The concept of "illusory availability" (Jafrin & Beza, 2018) is evident—spaces exist in plans but remain practically unusable. Poor design, inadequate maintenance, and weak enforcement of urban policies exacerbate this problem. Additionally, children's outdoor activities are restricted by structural barriers, safety concerns, and socio-cultural norms that limit their independent mobility and freedom to explore (Mackett et al., 2008; Jansson, 2010).

Spatial and visibility analyses revealed that the most visually integrated and accessible areas—green zones and parking lots—are not designed for play. Conversely, designated play spaces suffer from poor visibility, heightening parental fears of crime and accidents. Parental comfort is closely linked to visibility and safety; where visibility is low, outdoor play is restricted.

Age, time of day, thermal comfort, and social cohesion significantly influence children's space use. Older children (10–14 years) enjoy more freedom, while younger children remain under close supervision. Play patterns shift based on temperature, with afternoons preferred for moderate conditions. Children also adaptively seek shade from buildings or trees throughout the day, balancing comfort and activity. However, tree placement must consider visibility, allowing parents to monitor their children even from a distance.

Surface materials further influence play safety and activity types. Hard, inflexible paving discourages diverse play and increases injury risk, whereas flexible, child-friendly materials promote safer, more engaging activities.

Sociability and social trust within the community also emerged as key factors. Strong neighborhood ties enhance children's freedom and outdoor engagement, while weak social cohesion leads to greater parental restrictions, reducing children's access to outdoor spaces.

Crucially, children were observed using non-designated spaces for play, signaling a lack of dedicated, flexible, and multifunctional play areas. This aligns with Nicholson's (1971) Loose Parts Theory, which posits that environments rich in diverse materials stimulate creativity and exploration. However, in Summit, football dominates play, while imaginative and exploratory activities are limited.

The study recommends future play spaces prioritize flexibility and multi-functionality, accommodating various age groups and promoting cognitive stimulation, physical development, and nature interaction. Design features such as natural elements, varied topography, planting activities, and interactive landscapes are essential for enhancing children's motor skills, memory, and environmental connection.

Comparative reflections from Singapore's vertical playgrounds, Amsterdam's legally mandated play spaces, and Nairobi's community-led Play Streets demonstrate that child-centered urban

design, enforceable policy frameworks, and community participation can significantly improve children's play environments.

In conclusion, the study finds that current mass housing models in Ethiopia inadequately address children's spatial and developmental needs. Achieving child-friendly urban environments requires holistic planning, policy enforcement, inclusive and adaptable designs, and active community engagement. Prioritizing these dimensions will protect children's right to play while fostering healthier, more vibrant, and socially cohesive communities.

6.2 Recommendations

6.2.1 Recommendations Based on Research Findings

Drawing from the study's findings, the following key recommendations are proposed to enhance the quality, accessibility, and functionality of children's play spaces in mass housing condominiums:

1. Prioritizing Child-Centered Play Space Design

- Play spaces should be intentionally designed to foster children's physical, cognitive, and social development by providing diverse play opportunities.
- The design should accommodate various age groups, ensuring that toddlers, young children, and older children have appropriate play environments tailored to their needs.
- Incorporating flexible, multi-use spaces that can allow different types of play while ensuring the effective use of limited urban land and
- Most importantly the National Play Space Standards shall be established.

2. Enhancing Visual and Physical Accessibility

- Accessibility should be a key consideration in the planning, construction, and renovation of play spaces, ensuring ease of movement, visibility, and safety – by install lighting, cameras and appropriate use of community surveillance.
- Play areas should be well-connected to pedestrian-friendly pathways and placed within a reasonable walking distance from residential units.

- Urban planning and design regulations should integrate universal accessibility standards and barriers removed, sensory and diverse equipment added and zoning for age groups to cater to children with different physical abilities.

3. Strengthening Policy Integration and Urban Planning Approaches

- Urban planning policies and regulations should explicitly incorporate the needs and rights of children by mandating dedicated, safe, and accessible play areas in mass housing developments.
- Enforcing clear guidelines for play space allocation, minimum size requirements, and child-friendly design standards can ensure that play areas are not overlooked during development.
- Play spaces should be planned holistically within the urban environment, ensuring integration with green spaces, recreational zones, and community facilities.

4. Addressing Multi-User Needs in Shared Spaces

- Play areas in condominium settings are often shared by various user groups, including adults, elderly residents, and service personnel.
- The design must balance children's needs with those of other residents by ensuring clear zoning of activities, so that play spaces do not interfere with other functions such as parking, gardening, or communal gatherings.

5. Enhancing Play Experiences beyond Motor Skills

- Play spaces should not solely focus on physical activities but also provide opportunities for creative, imaginative, and social play.
- Elements such as sensory gardens, interactive installations, storytelling areas, and quiet reflection zones should be incorporated to stimulate children's creativity and cognitive development.
- Culturally relevant and traditional games should be encouraged to preserve indigenous play cultures and strengthen community identity.

6. Context-Sensitive Design Adaptation

- The design of play spaces should respond to the local environment, considering climate conditions, safety hazards, and socio-cultural factors.
- Natural elements such as trees for shade, grass for soft landings, and water features for sensory play should be integrated to enhance the comfort and usability of play spaces.
- Proper surface materials should be selected to minimize injury risks while promoting diverse forms of play.

7. Community Involvement and Ownership

- Community engagement is critical in the development, management, and maintenance of children's play spaces.
- Raising awareness among residents about the importance of child-friendly environments can foster a sense of ownership, ensuring better long-term maintenance.
- Local committees or resident associations should be involved in decision-making regarding play space upgrades and usage rules.

8. Scaling Up Play Space Interventions in Mass Housing

- The proposed design interventions in this study should be further refined, expanded, and implemented at a larger spatial scale to benefit citywide mass housing programs.
- Lessons from this study can inform national and municipal housing policies, ensuring that future residential developments prioritize child-friendly urban design.
- Governments, NGOs, and private developers should collaborate in financing, designing, and maintaining play spaces to promote sustainable and equitable urban development.

6.2.2 Recommendations for Future Studies

Further research is necessary to expand the knowledge base and inform better policy and design interventions for children's play spaces in mass housing in Ethiopia. The following areas warrant further investigation:

1. Legal and Policy Frameworks for Play Spaces

- Future studies should explore how children's play spaces can be institutionalized within urban planning policies and legal frameworks.
- Research should assess how regulatory enforcement can ensure that designated play areas are preserved, developed, and properly managed in mass housing projects.

2. Economic Viability and Cost-Benefit Analysis

- A comprehensive cost-benefit analysis is needed to assess the financial feasibility of investing in high-quality play spaces in low-cost mass housing projects.
- Research should identify economic models for sustainable funding, including public-private partnerships, community-led initiatives, and government subsidies.

3. Socio-Economic Factors and Play Space Utilization

- Future studies should examine how socio-economic conditions influence children's access to play spaces, parental perceptions of outdoor play, and community participation in maintaining play areas.
- A comparative study across different income groups and residential settings could provide insights into the equity challenges in urban play space provision.

4. Implementation Strategies for Play Space Management

- While this study proposes design and planning recommendations, further research is needed on practical implementation strategies for developing and managing play spaces effectively.
- A study on resident participation models can provide frameworks for community-led maintenance programs to ensure sustainability.

5. Indigenous Play Traditions and Their Spatial Configurations

- Further research is needed to document and analyze indigenous Ethiopian children's games, traditional play environments, and their spatial requirements.

- Understanding these socio-cultural dimensions can help integrate culturally relevant play elements into urban planning and design.

6.2.3 General suggestions on planning options and optimal standard while designing play space

6.2.3.1 Accessibility

1. The play area should be accessible to a large number of children within walking distance of schools, a populated area, and an outdoor shopping area. This helps to engage various stakeholders effectively during the design and implementation phases.
2. Play space should be connected to other green space through walking and cycling
3. Play space should be accessible for disabled children

6.2.3.2 Availability

4. The play space should have different type of equipment's and these play equipment's should promote physical, social and cognitive development skill of the children.

N.B: while selecting equipment's type different age group and safety of children shall be considered

5. Play space should be flexible to accommodate different type of activities

    i. **Active play**- Running, jumping, climbing, kicking, and punching. Twirling, swinging, spinning, and rolling around.
    ii. **Sensory play –** The play space design should be multifunctional that respond to the five human senses
        - Touching: Having different pavement texture material
        - Seeing: To make the play space attractive for children use colourful playing equipment's with the combination of natural features as well as using unique sculptures
        - Smelling: it should be away from pollution
        - Hearing; it should be way from traffic noise and from residential area to avoid noise disturbance

- Testing: planting edible plants and fruits

iii. **Social play** – where they can learn social rules such as providing playing sport fields

iv. **Reflective play** – provide space where children for resting, thinking and be a passive player/ watching

6. To add artificial topographic level difference (physical feature) for children to exercise their motor skill

6.2.3.3 Natural form

7. When selecting plays space location there should be an assessment that should be done on the topography, soil type and groundwater level. "*Unstable soil types such as peat, clay, loose silt, and fine water-bearing sands that can affect the integrity of your playground"*

6.2.3.4 Considering the climate-comfort

8. Play space should consider climate of the area and provide undercover shaded space so that it can be used without climate constrain.

6.2.3.5 Facilities

9. There should be bathroom, drinking and food facilities in nearby area

6.2.3.6 Materials

10. The play should have both combination of soft-cape and hardscape pavement material.
11. Pavement material should be considered for specific type of activities in order to prevent injuries from occurring, for activities like climbing and walking on edges.

6.2.3.7 Safety and Security

12. Play space area should be designated in area away from environmentally sensitive area like landslide, gully and stream places.
13. Play space should be located along the collector roads; away from busy traffic junction

14. Children must be protected from going into other areas by a buffer zone and it shouldn't have a visual barrier for families to watch while they are playing.

6.2.3.8 Equipment position

15. To create more shade plant tree on south and west side of the play area and place the equipment's accordingly where it can get more shade.

6.2.3.9 Zoning of activities

16. In order to avoid overcrowding of space and injuries, there should be zoning of activities in play space area such as moving and static equipment's. Therefore, different types of equipment should have different use zones.
17. The play space should have a combination of both active and passive space for children. There should be a separated place for active playing and passive playing, because some children might prefer so sit in a quiet place.
    - **Quiet play area:** it should be away from noisy playground area, should have bench/seating area with shade, and design the space with neutral and calming colour.
    - **Active play:** area for sport field and playground equipment's should be located in different section. In order to differentiate the section different colour or pavement material can be used.

6.2.4 Summary of Recommendations

The following table (Table 6:1) summarizes key interventions aimed at enhancing the availability, accessibility, and quality of children's play spaces in mass housing environments like the Summit Condominium:

Table 6:1 *Children Play Recommendations Summary*

Intervention	Short-Term (1-2 years)	Long-Term (5+ years)
Pedestrian Access	Improve internal pathways and remove physical obstructions to ensure safe and direct access to play areas.	Integrate children's play spaces into broader urban master plans, prioritizing connectivity and accessibility.
Safety Enhancements	Install adequate lighting, safety fences, and promote community-based supervision to improve perceived and actual safety.	Develop and enforce formal security guidelines and policy frameworks for child-friendly spaces.
Play Space Diversification	Introduce multi-sensory and	Establish larger nature-based play

	inclusive play features suitable for all age groups and abilities.	areas that foster environmental learning and imaginative play.

Note. *Author's synthesis based on field research and best practice recommendations.*)

6.3 Alignment with Local Policy and Urban Planning Frameworks

While the study presents comprehensive recommendations for enhancing children's play spaces, integrating local urban planning policies and regulatory frameworks strengthens the practical applicability of these proposals.

6.3.1 Addis Ababa Urban Development Context

The Addis Ababa Green Space Development Strategy (2015) mandates that a minimum of 15% of the total land area in residential neighborhoods has to be allocated to communal green spaces. However, this provision often lacks explicit consideration for dedicated children's play spaces within that quota. To ensure accessibility and usability for children, these guidelines require refinement, mandating a specific allocation for child-friendly play areas (Addis Ababa City Administration, 2015).

Likewise, the Addis Ababa City Structure Plan (2017–2027) recognizes the significance of green spaces but falls short in detailing the unique spatial and safety needs of children. Strengthening local urban codes to incorporate child-centered design principles—including clear visibility standards and safety measures in condominium compounds—is essential to address these gaps.

Specifically, the Structure Plan provides that:

- 15% of land in mass housing developments must be reserved for communal green spaces.
- Playgrounds and recreational areas for children should be integrated within this allocation, ensuring safety, accessibility, and age-appropriate design.

Furthermore, the Addis Ababa Local Development Plan (LDP) Guidelines (2015) underscore the importance of:

- Allocating dedicated child-friendly spaces within all residential neighborhoods.
- Ensuring that such spaces are located within a 400-meter walking distance of every household.

- Incorporating natural elements, shade, and environmental sustainability features to promote child protection and well-being.

Together, these urban policies and guidelines provide a foundation but highlight the urgent need for more targeted, enforceable measures to ensure children's right to safe and accessible play spaces in Addis Ababa's mass housing developments.

6.3.2 Policy Gaps and Implementation Challenges

Despite these planning regulations, field observations and community feedback indicate:

- Repurposing of designated play spaces for parking or other uses.
- Weak enforcement mechanisms for protecting children's spatial rights.
- Absence of clear design standards for child-focused public spaces in mass housing contexts.

6.3.3 Actionable Recommendation

To bridge the gap between policy and practice, it is essential to:

1. Enforce the existing 15% communal green space rule, ensuring a defined portion is reserved exclusively for children's play.
2. Integrate design guidelines from the Ethiopian National Urban Development Spatial Planning Manual (2012), which encourages:
    a. Inclusive designs accommodating children, elderly, and persons with disabilities.
    b. Natural surveillance principles to improve visibility and safety in play areas.

6.4 Final Remarks: Reflection and Policy Implication

Summing up, the research affirms that children's play spaces are integral to urban livability and child well-being. Addressing identified barriers requires a holistic approach that combines policy enforcement, inclusive design, community involvement, and sustained investment.

Ensuring that children in Ethiopian mass housing projects have access to safe, diverse, and engaging play environments is not merely an urban design task but a societal responsibility towards nurturing future generations.

6.5 Call to Action

Policymakers, planners, and communities must collaborate to embed child-friendly principles into urban development. According to the researcher, doing so will not only uphold children's rights but also cultivate safer, more cohesive, and resilient neighborhoods.

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Annex 1: Draft Journal Article for Publication

The Availability and Accessibility of Children Spaces in Mass Housing - *The case of Summit Condominium Sites of Addis Ababa, Ethiopia*

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Abstract

Children's Children's access to adequate outdoor play spaces is increasingly constrained in modern urban settings, particularly within mass housing developments. This study examines the availability and accessibility—both physical and visual—of children's play spaces in Summit Condominium, Addis Ababa. Employing a mixed-methods approach, the research integrates physical site analysis, spatial analysis using Space Syntax tools, observations, questionnaires, and focus group discussions. Findings reveal that while ample open spaces exist, most are underutilized for children's play due to safety concerns, poor visual integration, and community prioritization of parking and greenery. The study highlights the urgent need for child-centered planning in mass housing and recommends inclusive design strategies, policy interventions, and community engagement to enhance children's play opportunities and rights within urban residential environments.

Keywords: Accessibility, Availability, Mass Housing, Children's Play Space, Urban Design, Addis Ababa

1. Introduction

Availability and accessibility of children's play spaces are crucial indicators of a child-friendly urban environment. Availability refers to the provision and presence of designated spaces intended for children's play, while accessibility concerns how easily and safely children can reach and utilize those spaces—physically, visually, and socially.

Play is fundamental to children's development, requiring outdoor spaces near homes, schools, or neighborhoods where children can move freely, interact with peers, and explore their surroundings. These spaces should be purposefully designed to support physical, emotional, and social well-being. The adequacy and distribution of such spaces represent a city's commitment to spatial equity and livability (El-Geneidy et al., 2006).

Key aspects of accessibility studies include the attractiveness of spaces, their connectivity to road networks, and the ease of movement through these spaces. Availability, on the other hand, highlights whether such spaces exist, their quantity, and whether they are reserved specifically for children's play rather than being general-purpose open spaces.

Globally, children's outdoor play opportunities have declined due to urban densification and shrinking dedicated play areas. The current typology of many playgrounds fails to meet the play needs of modern children, contributing to reduced physical activity and increased indoor confinement (Cheng, 2021; Nurul & Sabarinah, 2016). In particular, mass housing schemes struggle with open space provision, raising concerns about both the presence of play spaces and how residents—especially children—use them (Bendjedid et al., 2018).

In Addis Ababa's mass housing developments, especially condominium projects, planning often neglects the specific spatial needs of children. The shift from low-rise dwellings to high-density condominiums has reduced available outdoor play areas. Instead, green spaces—typically covering 10-15% of project land—are treated as multipurpose zones without specific designations for children's play (Ucfudun, 2015). International guidelines suggest allocating 7–10 square meters per child, but local standards fail to make such distinctions, forcing children to compete with parking, greenery, or other uses.

The absence of defined play spaces, coupled with accessibility barriers like safety concerns, poor visual connections, and limited mobility, constrains children's outdoor activities. Ensuring availability of dedicated play spaces, alongside physical and visual accessibility, is essential for nurturing active, healthy, and socially engaged children.

This study investigates the availability and accessibility of children's play spaces within the Summit Condominium, Addis Ababa. It critically examines how spatial planning, design configurations, and community perceptions influence children's opportunities for independent outdoor play in mass housing environments.

2. Method and Materials

2.1. Study area

Addis Ababa is located at $9^{o}2'$N latitude and $38^{o}45'$E longitude and its average altitude is 2,400 meter above sea level, with the highest elevations at Entoto Hill to the north reaching 3,200 meters. This makes Addis Ababa one of the high-altitude capital cities of the world (ATLAS, 2011).

The capital city Addis Ababa is divided into eleven sub cities (ATLAS, 2011), and the study area is located in Summit Condominium, Woreda 05 of Lammi Kura sub-city, which is 179.5 Sqkm. In Summit condominium there are three districts: Kolfe, Arada and Kirkos. In particular, the study area is located in Arada district, which has the most condominium houses that have started giving service since 2012 G.C.

A detail study was conducted by selecting two blocks of mass housing condominiums based on the:

- Density of residences,
- Composition and use of green space, and
- Level of green space development – both developed and semi-developed.

2.2. Justification points for the Research Site Selection

The selection of Summit Condominium as the study site is based on the following considerations:

- Mass housing schemes are home to the majority of urban residents, particularly low-income groups who rely on these developments for affordable living.
- Lemi Kura Sub-City, a newly formed administrative area from merged woredas of Bole and Yeka Sub-Cities, hosts the highest concentration of mass housing projects in Addis Ababa.
- The site falls within the city expansion zone, where access to established inner-city children's spaces is limited due to distance.
- The timing of the site transfer provides an ideal context for evaluation, as the development — including playground facilities — is neither too new nor fully matured.
- The size, density, and representativeness of the site make it suitable for assessing typical mass housing conditions in Addis Ababa.

The location of the study area

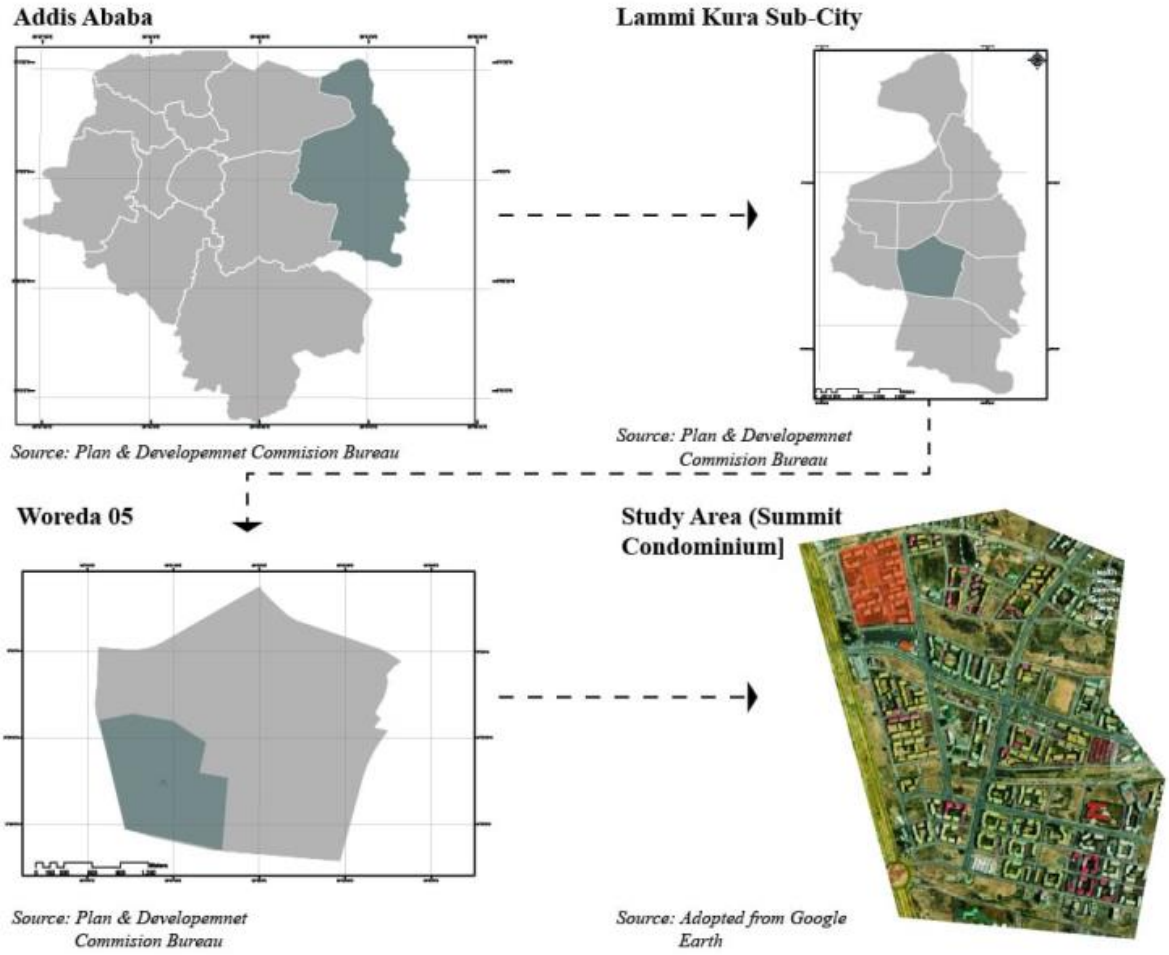

Figure 1: Location Map of the Study Area (Adapted from GIS cadaster and Google earth)

2.2 Research Design and Methodology

A mixed-methods approach was employed, combining qualitative and quantitative strategies to ensure comprehensive data collection on both the availability and accessibility of children's play spaces.

a) Data Collection

Primary and secondary data sources were used:

- **Primary tools:** structured questionnaires, in-depth interviews, focus group discussions (FGDs), children's sketches, essays, and direct observations.
- **Secondary sources:** architectural plans, policy documents, and official statistics.

A child-centered participatory approach was employed to capture children's perspectives as the primary users of play spaces. Age-appropriate methods allowed children to express their experiences creatively and comfortably. Parental input was also prioritized, reflecting local norms where children's outdoor activities require adult permission.

Ethical considerations were strictly observed. Informed consent was obtained from both children and their guardians. Activities were designed to be safe, non-intrusive, and respectful of children's rights. Anonymity and confidentiality were ensured. This approach aligns with the UN Convention on the Rights of the Child (UNCRC, 1989), affirming children's right to express their views on matters affecting them.

b) Sampling and Sample Size

Sampling targeted families with children within a 6.2-hectare spatial boundary of the two selected blocks. Following Kothari (2004), sample size was optimized for reliability and precision. Quota sampling (QS) was used to capture age-based perspectives, dividing children into three groups:

- 0–4 years (11.9% of urban children)
- 5–9 years (11.5%)
- 10–14 years (13.6%) (Ethiopia DHS, 2000)

Out of 200 households (average household size: 5), the population was estimated at 1,000 residents. The total sample size for children was 368, proportionally distributed across age groups.

c) Data Analysis Techniques

Quantitative and qualitative data were analyzed using:

- Descriptive statistics (frequencies, percentages, charts, and graphs) for availability and usage patterns.
- Spatial analysis tools (AutoCAD, ArcGIS, Adobe Suite, and Microsoft Excel) for mapping open space availability.
- Space Syntax techniques including Visibility Graph Analysis (VGA) and Fewest Line Analysis (FLA) to assess visual and physical accessibility.

Observational data and children's input provided qualitative insights into the quality and usability of available spaces. The integrated approach allowed a robust evaluation of how much play space exists, how it is configured, and whether it meets children's needs.

3. Result

3.1. Availability of Open Spaces

This study systematically examined the availability of open spaces intended for children's play within the Summit Condominium site, applying a three-tiered spatial analysis: macro, meso, and micro scales. This approach aimed to capture the variations in space allocation and usability at the city-wide, neighborhood, and block levels.

- At the macro scale, the assessment covered the entire Summit Condominium site, encompassing 276.9 hectares, to identify all available or designated open/play spaces.
- At the meso scale, the analysis focused on the availability of children's play spaces within a 400-meter catchment radius—a reasonable walking distance for children—surrounding the two selected residential blocks.
- At the micro scale, a detailed evaluation was conducted on the two specific residential blocks within the study area to measure the actual conditions and usability of spaces for children's play.

This multi-scale analysis provided a comprehensive understanding of the quantity and distribution of open spaces intended for children across the condominium development.

a) Macro Scale (Urban Level Analysis)

At the macro scale, this study assessed the overall availability of open spaces within the Summit Condominium that could serve as children's play areas. According to the neighborhood design, several open spaces were proposed to accommodate recreational needs (see Figure 2).

The Summit Condominium spans 276.9 hectares, comprising approximately 559 building blocks. Of these, 83 blocks are communal facilities, while the remaining 476 are residential units. Each residential building houses an average of 22 households, resulting in a total of 10,472 households across the site. Based on this estimation, the total population of Summit Condominium is approximately 52,060 residents.

This large population density underscores the critical importance of assessing not only the number of open spaces but also their actual availability and suitability as functional play areas for children within this urban-scale mass housing development.

Figure 2: Proposed Land Use (Source: AAHDPO report)

In the initial Summit Condominium neighborhood design, particular emphasis was placed on providing a hierarchy of open spaces—including green areas, communal internal greeneries, community parks, sports fields, and recreational centers. These elements reflected the positive planning intentions toward creating functional open spaces for residents. Accordingly, the plan proposed four community parks and two sports fields.

The total designated green space—including communal greenery, parks, and sports fields—amounts to 57.8 hectares, covering approximately 20.9% of the entire Summit Condominium area. With a gross population density of 9 persons per square meter, the per capita open space availability is calculated at 11 square meters per person, which meets general urban planning benchmarks.

However, as illustrated in Figures 3-6, the current situation starkly contrasts with the initial design. Many of these originally designated play and open spaces have been repurposed or degraded. Some have been converted into built-up areas, while others now serve unintended functions such as urban farming plots, waste disposal sites, or temporary uses unrelated to recreational or children's activities. This deviation highlights a significant gap between planning and implementation concerning children’s accessible play spaces.

Figure 3: Open spaces used as sport field by youth (Source: Picture taken by the Researcher, 2022)

Figure 4: River Green (Source: Picture taken by the Researcher, 2022)

Figure 5: Proposed Community Park but serving as farmland (Source: Picture taken by the Researcher, 2022)

Figure 6: Open Spaces converted to built-up area (Source: Picture taken by the Researcher, 2022)

b) Meso scale analysis (Neighborhood level analysis)

At the neighborhood level, the study assessed the availability of children's play spaces within a 400-meter catchment radius of the actual study area, considering 400 meters a reasonable walking distance for children.

According to the original neighborhood design (Figure 7), one community park covering approximately 3.6 hectares was proposed within this radius. This park was intended to serve as a dedicated recreational and play area for the surrounding residential blocks.

However, field observations revealed a significant deviation from the plan. The proposed park area has been encroached upon and is currently utilized as farmland. This transformation has eliminated the intended recreational function of the space, directly impacting the availability and accessibility of safe outdoor play areas for children in the surrounding neighborhood.

The case highlights a recurring issue in urban mass housing developments—the gradual conversion of planned green and play spaces into other uses, often driven by community needs or neglect of urban development regulations.

Figure 7: Neighborhood scale green area (Source: AAHDPO report)

c) Micro scale (Actual Study Area) Analysis

To assess the availability of children's play spaces at the micro scale, the study analyzed building morphology, population density, and per capita open space. The selected area includes two blocks (Block A and Block B), comprising 10 residential buildings in total.

The combined area of both blocks is 18,273 m², with 15,350 m² designated as open space, including surrounding roads. Specifically, Block A covers 6,238 m² and Block B 5,915 m², with building footprints of 1,514 m² and 1,409 m², respectively.

The built-up area ratio is 24% for Block A and 23.8% for Block B. The gross population density is calculated at 5.47 persons per m², while the per capita open space stands at 15 m² per person, surpassing common urban greenery standards.

Table 1: Morphological analysis

Indicator	Value
Total Area	18,273 m²
Open Space	15,350 m²
Built-Up Ratio (Block A)	24%
Built-Up Ratio (Block B)	23.8%
Population Density	5.47 persons/m²
Per Capita Open Space	15 m²/person

(Source: Researcher's Own Analysis, 2022)

The analysis revealed a gross population density of 5.47 persons per m² and a per capita open space availability of 15 m² per person, exceeding WHO's general urban green space standards. However, despite this favorable ratio, the actual use of these spaces rarely prioritizes children's play needs.

Spatially, open spaces were classified into four functional types:

1. Spaces facing streets—primarily used for parking.
2. Enclosed spaces within the blocks—allocated for greenery or domestic uses like drying clothes.
3. Spaces behind buildings—underutilized or leftover spaces, occasionally used by children.
4. Spaces between buildings—most commonly used for children's play, albeit limited.

Observations confirmed zoning of activities where priority is given to parking and greenery over play areas. While physical open spaces exist, functional availability for children's play is compromised due to competing uses and lack of designated play zones.

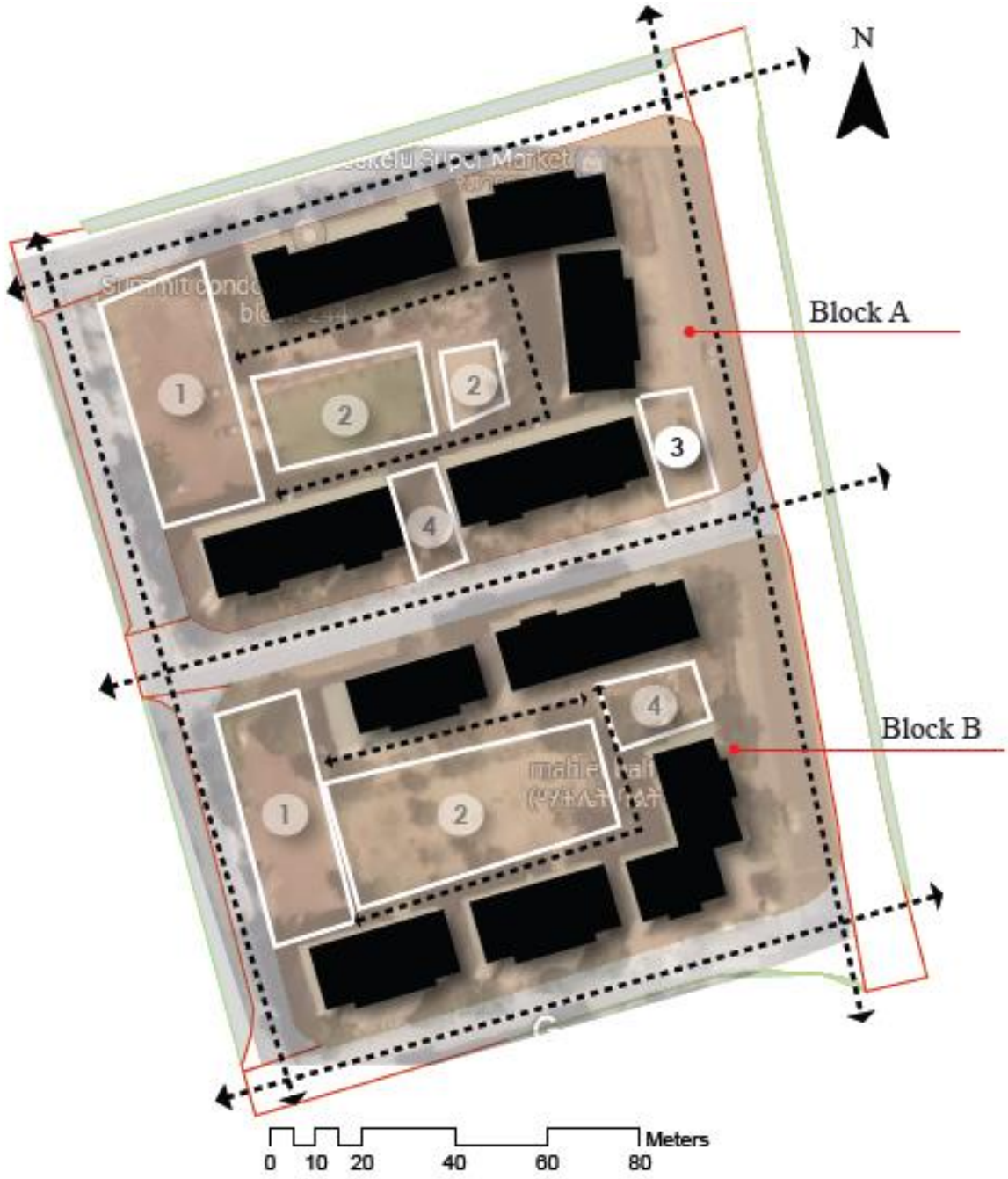

Figure 8: Open Spaces in the study area

(Legend: 1. open spaces overlooking the street; 2. Open spaces enclosed by the blocks; 3. Open spaces behind the blocks and 4. Open spaces between the buildings)(Source: Adapted from Google Earth, GIS cadaster and researcher's field observation, 2022.)

Open Spaces enclosed by the blocks the buildings

Open spaces behind the blocks

Open spaces between

Figure 9: Open spaces in study area (Source: Picture taken by the Researcher, 2022)

3.2. Accessibility of Open Spaces

a) Accessibility (Macro Scale Analysis)

The study analyzed the accessibility of designated community parks within a 400-meter walking distance, which is considered a reasonable range for children's daily outdoor activities. According to the original neighborhood design (Figure 10), four distinct community parks were proposed as recreational spaces. However, field observations and spatial analysis revealed significant barriers that hinder children's access to these facilities.

A critical physical barrier identified was the need for children to cross roads as wide as 30 meters to reach these parks—posing safety risks and limiting independent access for younger children. This spatial disconnect highlights a design oversight where physical proximity did not equate to functional accessibility. Despite the parks being technically within walking distance, such infrastructural barriers significantly compromise their usability by the intended child users.

Table 2: Areas of Proposed Community Parks

Community Park	Area in m^2
1	22687
2	35595
3	3977
4	16083
Total	78342

Source: Adapted from AAHDPO Report

This finding underscores the importance of considering not just the location but also safe and direct connectivity when planning children's play spaces within dense urban and mass housing developments.

Figure 10: Macro scale accessibility analysis (Source: AAHDPO report)

b) Micro-Scale Physical Accessibility – Internal Connectivity and Barriers

At the micro-scale, the study assessed the physical accessibility of children's play spaces within the two selected condominium blocks. Field observations and questionnaire results indicated that well-defined walkways and internal paths exist, connecting the buildings and adjacent spaces. These pathways provide relatively easy movement for residents, allowing children to access the available open spaces without major physical obstacles.

Figure 11: Sidewalks (Source: Picture taken by the Researcher, 2022)

When the children asked how far their homes are from play space, most of them answered play space is very close to their home and also majority of respondent said that, they live on adjacent buildings. Nevertheless as Chart 1 illustrates, when questioned about ease of access to play spaces, 228 children (62%) responded YES, while 140 children (38%) responded NO.

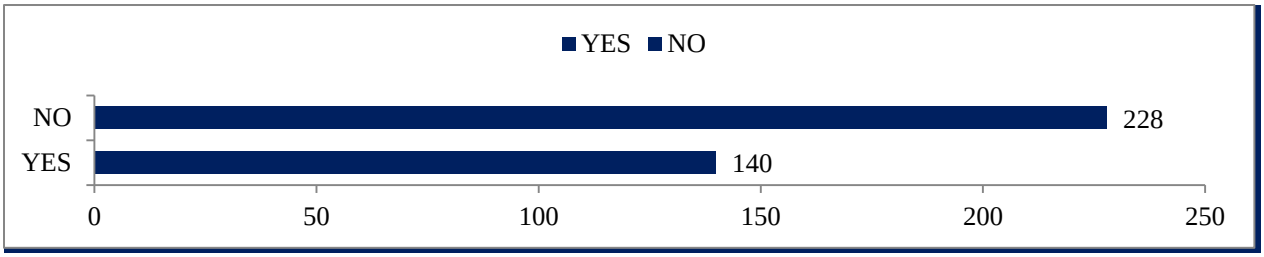

Chart 1: Physical Accessibility (*Source: Researcher's Own Analysis*)

However, despite the presence of these connections, functional accessibility is constrained by community-imposed restrictions and competing land uses. Children reported that some spaces are off-limits for play—either formally by condominium committees or informally by parental guidance. Areas designated for greenery or used as parking lots are commonly restricted.

One child from Block A shared:

"If we play on the green area, the grass will get damaged, therefore the Resident Committee does not allow us to play on green area. Parking areas are for cars only. The only spaces left for us are between or behind buildings and the road outside the compound."

Additionally, more than half of the surveyed parents (54%) restrict their children from playing near streets or outside the compound due to safety concerns. These concerns primarily include fear of traffic accidents, strangers, and potential negative peer influences.

Furthermore, the level of children's independence is strongly age-dependent. Younger children (ages 0–9) are largely confined to spaces near home under parental supervision, while older children (10–14) enjoy relatively more freedom. Still, limited safe, designated play zones negatively impact children's ability to engage freely in outdoor play.

c) Areas restricted for play by parents

Regarding places which area is restricted for children play by their parents, 57 (15.4%) of children said nowhere is restricted to play – but they simply have to tell their parents where they are going to play while 198 (53.8%) of children responded that, they are not allowed to play on the roads (outside of compound) and 113 (30.7%) of them said they are restricted to play in any place perceived as danger by their parents, thus, not allowed to go outside of their home.

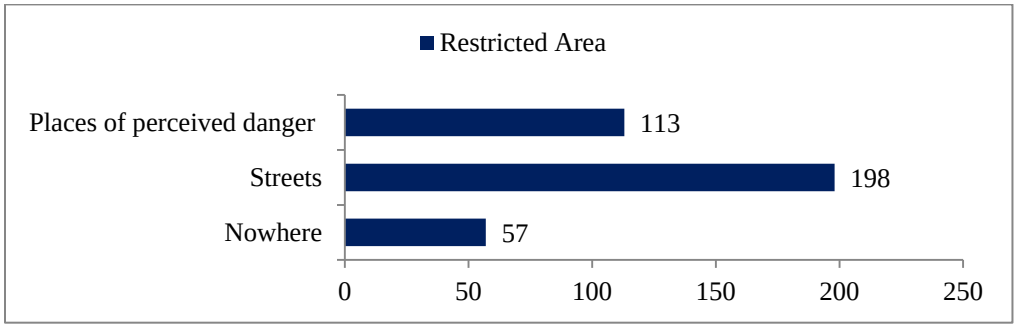

Chart 2: Restricted areas for Play (*Source: Researcher's Own Analysis*)

d) Reasons for Parental Restrictions

Parents were further asked why they limit outdoor play. As shown in Chart 3, the results were:

- 51% cited physical dangers (strangers, traffic) as their main concern.
- 27% allowed free play if children informed them of their whereabouts.
- 22% worried about negative peer influence or safety.

Sample Parental Quotes:

"We live on upper floors. It's hard to supervise the kids. I worry they might fall or get hurt. Safety is my biggest concern."

"I do take my younger daughter outside daily, and my older son plays after school. I believe outdoor play is important."

"I don't know many people here. I'm scared my child might get hurt or learn bad habits from other kids."

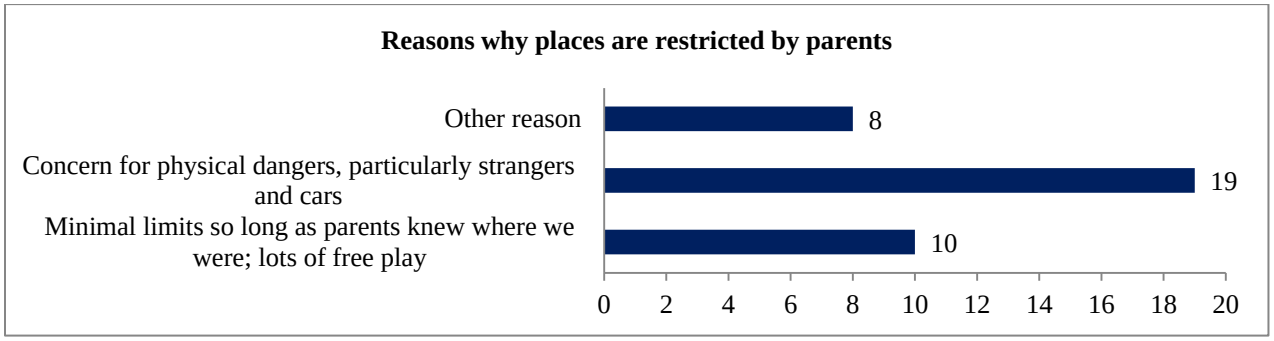

Chart 3: Reasons why parents restrict children from playing outside (*Source: Researcher's Own Analysis*)

e) Children's Level of Independence

The study also examined how children's age influenced their independence in accessing outdoor spaces. As Chart 4 shows:

- Parents of children aged 0–4 and 5–9 reported granting limited or no independence.
- Parents of children aged 10–14 provided greater freedom or full independence to play outdoors.

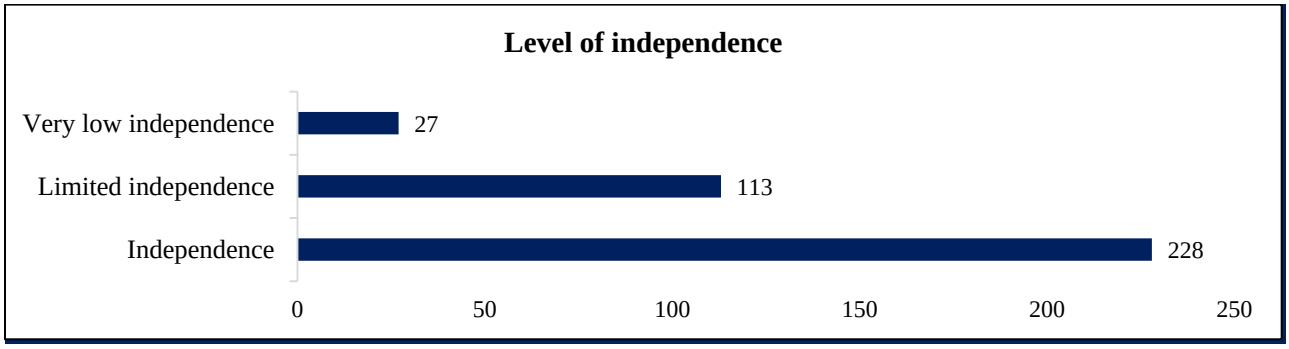

Chart 4: Level of independence (*Source: Researcher's Own Analysis*)

Key Findings:

- Connectivity exists through sidewalks and pathways.
- Community restrictions reduce usable play space.
- Safety concerns dominate parental decisions.
- Age significantly influences children's independence and access.

This reflects that accessibility is not solely about physical connectivity but also influenced by social norms, safety perceptions, and competing spatial functions—highlighting the need for child-centered planning in mass housing projects.

3.3 Visual Access

a) Interior play spaces visibility

Visual accessibility is a critical factor influencing children's independent use of play spaces and parents' willingness to permit outdoor play. To assess this, parents were asked whether interior play areas within the condominium compound were visible from their homes or surrounding vantage points.

- 68% of respondents (250) reported that *some play spaces are only partially visible*, limiting their ability to supervise children continuously.
- 22% (80 respondents) confirmed that *play areas are fully visible* and thus easier to monitor.
- 10% (38 respondents) stated that *certain play spaces are entirely hidden from view*, raising safety concerns.

Parents consistently emphasized that visibility directly influences their decision to allow children independent access to these spaces. For many, lack of visibility equates to increased risks—either from strangers, peer conflicts, or physical hazards in hidden corners.

"If I cannot see my child from the window or balcony, I don't let them play there. It's hard to trust what's happening in hidden places." — Parent respondent

Such concerns force children to limit their play to areas visible from their home or avoid outdoor play altogether, undermining the usability of otherwise available spaces.

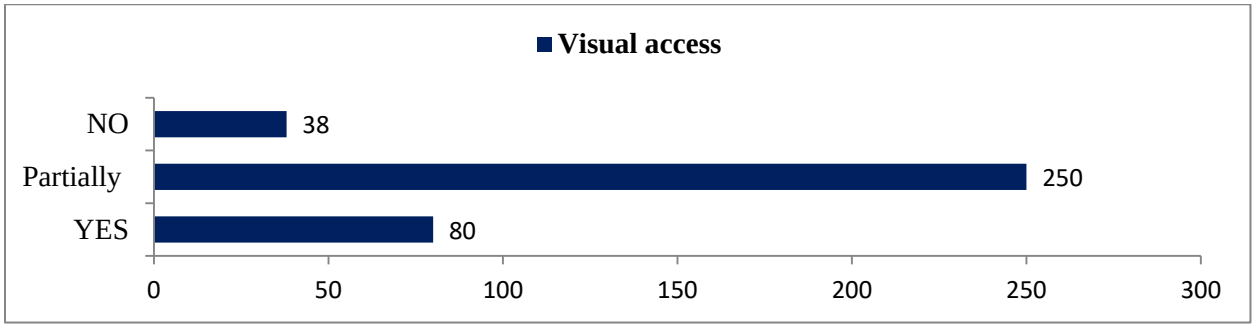

Chart 5: Parental Perception of Play Space Visibility (*Source: Researcher's Own Analysis*)

This finding highlights that mere physical availability of play spaces is insufficient; visual integration within the compound is equally essential. Planning and design interventions must prioritize clear sightlines, minimize hidden corners, and incorporate features that allow parental supervision to enhance safety and usability.

3.4. Space syntax

Space Syntax (SS), specifically Visibility Graph Analysis (VGA), was employed in this study to evaluate the visual accessibility and inter-visibility within the Summit Condominium compound. This method effectively maps how visible certain areas are from various vantage points, providing valuable insight into which spaces are most exposed or hidden.

The analysis reveals that the darkest red zones on the visibility map represent areas of highest visual connectivity—spaces that are visible from most parts of the compound. In contrast, yellow and green areas indicate moderate visibility, while blue zones represent spaces that are least visible or hidden.

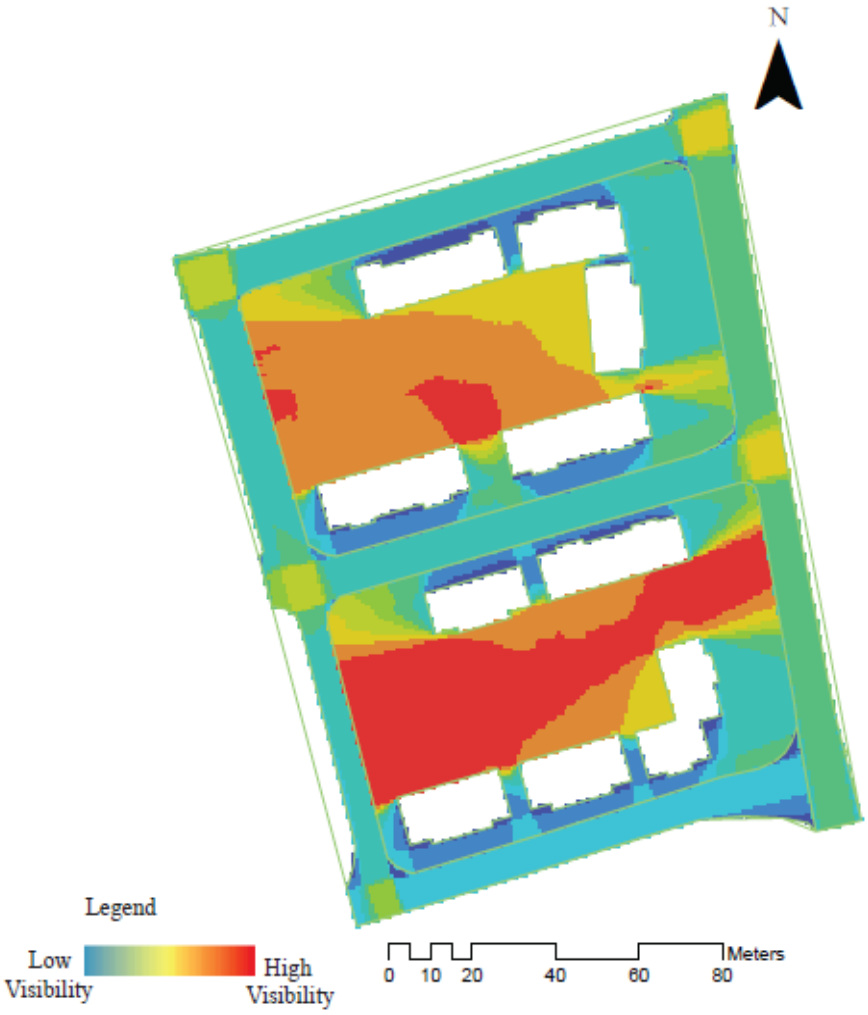

Figure 12: Visibility Graph Analysis (Source: Adapted from GIS cadaster using Depthmapx software)

According to the analysis, the most visually integrated and connected areas are located in front of the residential blocks, including green areas and parking spaces facing the streets. These spaces are easily visible and accessible from surrounding zones, making them more integrated into the daily movement paths of residents.

Conversely, spaces between the buildings and behind the blocks register as least visually integrated. These hidden zones, highlighted in blue, are secluded and less connected, potentially limiting their use as safe play areas for children.

3.5. Fewest Line Map Analysis (FLMA)

In addition to VGA, the study conducted Fewest Line Map Analysis (FLMA)—also known as Axial Map Analysis (AMA)—to examine the potential movement structure and spatial connectivity of the site. This method highlights the strength of linear paths and their relationship to spatial objects, providing a clearer understanding of accessibility corridors within the compound.

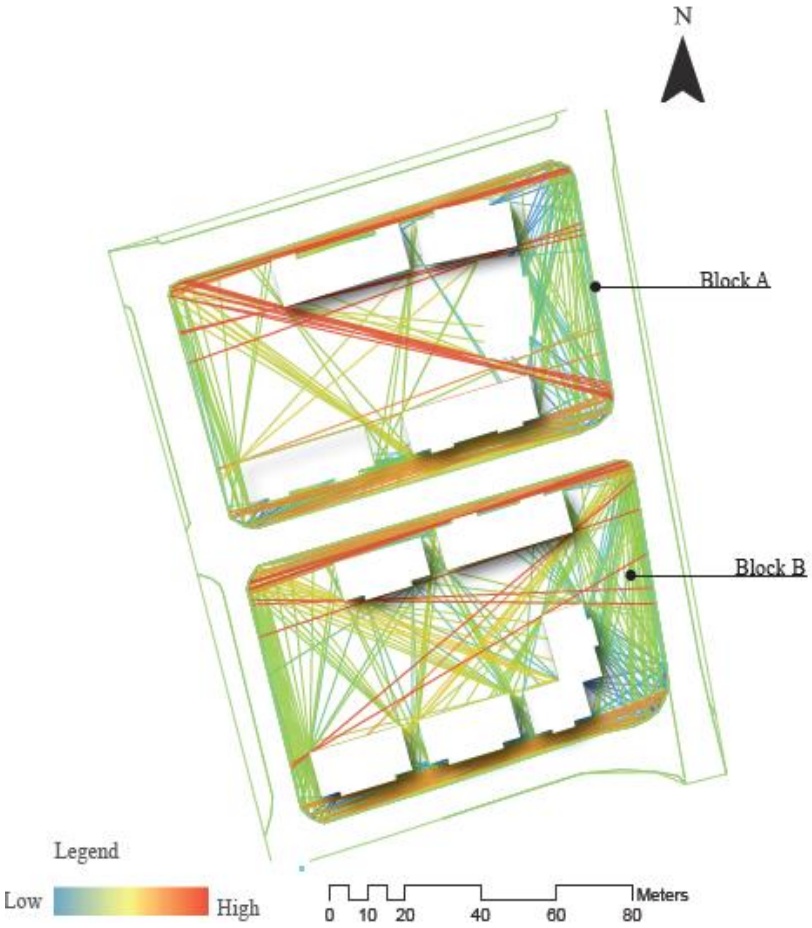

Figure 13: Few Lines Map analysis (Source: Adapted from GIS cadaster using Depthmapx software)

The FLMA results indicate that the highest connectivity values—represented in red—are concentrated along the axis connecting the north-west to the east and south-east in Block/Parcel A. These pathways serve as primary movement corridors, facilitating better flow and accessibility (Figure 13).

However, less connected and poorly integrated axes—shown in blue—are located behind buildings or in blocked areas, where accessibility is minimal. Similarly, in Block/Parcel B, the most connected axis runs from the north-east to the north-west, while the remaining paths exhibit limited integration.

Key Insights:

- High visibility zones correspond to green spaces and parking lots.
- Low visibility zones are found between and behind buildings—limiting safe play opportunities.
- Main movement corridors are well-integrated, but hidden back areas pose accessibility challenges.
- This visual analysis highlights that spatial configuration directly impacts children's access to safe play spaces, reinforcing the importance of visibility and connectivity in urban design, particularly in mass housing environments.

4. Result

The study explored the availability and accessibility of children's play spaces within Summit Condominium, a representative mass housing site in Addis Ababa. Despite the presence of open spaces in design plans, several factors diminish their usability for children's outdoor play.

4.1. Availability of open space

The research confirms that the per capita availability of open space within the study area is 15 square meters per person, exceeding the World Health Organization (WHO) standard of 9 square meters per person. This indicates that, quantitatively, there is sufficient space allocated for public use.

However, the functional availability of these spaces for children's play is limited. Many of the designated open areas have been repurposed or misused, now serving as:

- Parking lots
- Farming areas
- Waste disposal sites
- Built-up zones

These conversions compromise the intended role of these spaces as child-friendly environments. Shared green areas, though beneficial for general community use, do not inherently serve children's play needs unless designed with specific activities and safety considerations in mind.

4.2 Physical Accessibility and Community Perceptions

While internal pathways and sidewalks exist and support physical connectivity, the study reveals that functional accessibility is significantly shaped by social norms, parental concerns, and competing spatial uses.

Key findings include:

- 62% of children reported that they could physically access play spaces within their compound.
- However, 53.8% of children stated that their parents restrict access to roads or outside areas due to safety concerns.
- Parental fear of traffic accidents, strangers, and negative peer influences further limits children's ability to use available spaces.
- Children under 9 years old face severe restrictions, while older children (10–14) enjoy slightly more freedom but still encounter barriers.

Additionally, the lack of designated play zones leads to the reallocation of green areas as parking or private spaces, reflecting a community-level disregard for children's spatial needs.

4.3 Visual Accessibility and Spatial Configuration

The space syntax analysis reinforces the disparity between physical presence and practical usability of open spaces:

- Green zones and parking lots are highly visible and integrated within movement networks.

- Spaces behind buildings and between blocks, which could offer more secure play areas, are visually disconnected and often marginalized.

Parents overwhelmingly prefer their children to play in highly visible areas for easier monitoring. However, the current layout pushes children into less visible, riskier spaces due to usage restrictions in green and parking areas.

4.4 Implications for Urban Design and Child-Friendly Planning

The study highlights a critical gap between planned open space and child-centered play space in Addis Ababa's mass housing projects. The availability of space alone does not guarantee its use for children's play without deliberate design, management, and community engagement strategies.

Barriers to accessibility are not purely physical; they are also social and perceptual. Parents' and residents' attitudes significantly shape children's outdoor experiences, underscoring the need for inclusive planning that integrates:

- Child-specific design standards
- Safety considerations
- Community sensitization on children's rights to play

5. Recommendations

To enhance availability, accessibility, and usability of children's play spaces in mass housing developments, the following recommendations are proposed:

5.1 Urban Planning and Design Strategies

- Integrate child-centered design principles into mass housing projects, ensuring that play spaces are safe, designated, and adequately distributed.
- Prioritize visibility in spatial planning by ensuring that play areas are located in well-integrated zones, minimizing the need for children to navigate through unsafe or visually isolated spaces.
- Establish pedestrian-friendly environments by improving pathways, sidewalks, and crossings, reducing vehicular conflicts near play spaces.
- Ensure inclusive design to accommodate children of all abilities, incorporating universal accessibility in playground structures and pathways.

5.2 Community Awareness and Engagement

- Raise awareness among residents about the importance of child-friendly spaces and the impact of restricted play on child development.
- Encourage community participation in the management and preservation of play spaces to prevent their misuse as parking lots or private extensions.
- Develop local policies that empower parents and children to advocate for play spaces, ensuring their needs are prioritized in housing developments.

5.3 Policy and Institutional Interventions

- Enforce regulations that protect open spaces designated for children's recreation, preventing their repurposing for other functions.
- Develop urban policies that mandate a minimum standard for children's play areas in housing projects, similar to green space regulations.
- Encourage multi-stakeholder collaboration between the government, urban planners, and community organizations to support sustainable play environments.

6. Conclusion

This study highlights the disconnect between planned open spaces and functional children's play spaces in Summit Condominium, Addis Ababa. While per capita open space availability exceeds WHO's urban greenery standards, functional usability remains low due to spatial repurposing, accessibility barriers, and safety concerns.

The findings emphasize that accessibility is not solely a physical issue; it is shaped by social norms, parental concerns, and urban design choices. The lack of safe, dedicated play areas forces children into undesirable or risky environments, affecting their ability to engage in outdoor activities.

To address these challenges, urban planning strategies, community awareness programs, and policy enforcement must work together to ensure child-friendly environments in mass housing developments. Only by prioritizing children's spatial rights can cities create inclusive, sustainable, and engaging urban spaces for future generations.

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Annex 2: Interview for Children and Parents

QUESTIONS FOR CHILDREN RELATED WITH ACCESSIBILITY

This questionnaire is part of the research study titled:
"Children's Play Spaces in Mass Housing Developments: Accessibility and Usability in Summit Condominium, Addis Ababa."

The study aims to investigate the availability, accessibility, and conditions of children's play spaces within the condominium housing environment. Your responses will help assess current practices and provide recommendations for improving child-friendly urban planning.

Participation is voluntary, and all responses will be kept strictly confidential. The information you provide will be used solely for academic and research purposes.

Please answer each question based on your knowledge, experience, and honest opinion. There are no right or wrong answers.

Thank you for your valuable participation.

Here we go!

1. Where do you play?

2. How far is a play space from your house?
   a) Far
   b) Fair
   c) Close
3. Can you access the place easily?
   a) Yes

   b) No

4. Do dwellers of adjacent buildings use the space?

    a) Yes

    b) No

5. What are places which are restricted for play for children?
    a) Nowhere: simply has to tell a parent
    b) The streets
    c) Places of perceived danger
6. What are reasons why places restricted for play for children to play?
    a) Minimal limits so long as parents knew where we were; lots of free play
    b) Concern for physical dangers, particularly from cars or strangers
    c) Another reason
7. The nature of play outside their compound?
    a) Active/investigative play
    b) Play under surveillance
    c) Play only in the compound
8. Level of independence
    a) Independent(greater freedom)
    b) Limited independent (lesser freedom)
    c) Very low (Not independent at all)

QUESTIONS FOR PARENTS

9. Where your children usually play in their free time after school or on weekends?
    a) Compound/yard
    b) Home
    c) Street
10. What are reasons why places restricted for play for children to play?
    a) Minimal limits for the parents to know the whereabouts of their kids; lots of free play
    b) Concern for physical dangers, particularly from cars and strangers
    c) Concern for natural dangers, e.g., rivers or flooding, etc.

11. Is there any crime on the place?
    a) Yes
    b) No
12. Does the place make a good first impression?
    a) Yes
    b) No
13. Do children or parents have a choice of places to sit, either in the sun or shade?

    _____

    _____

    _____

14. Are spaces clean and free of litter? Who is responsible for maintenance? What do they do? When?

    _____

    _____

15. Does the area feel safe?
    a) Yes
    b) No
16. Is there a security presence? If so, what do these people do? When are they on duty?
    a) Yes
    b) No

    _____

    _____

    _____

17. Do vehicles dominate people use of the space, or prevent them from easily getting to the space?

    _____

    _____

_____

_____

18. At what time would you allow your children to play outside? Would you mind specifying the reason, please?

_____

_____

QUESTIONS TO CONSIDER ON USES AND ACTIVITIES

19. Where do you like to play?
    a) In the street
    b) In the compound
    c) At home or friends' home
    d) Any other place or some combination of these choices
20. What type of things do you like to do when you play outside?
    a) soccer
    b) climbing
    c) running/running
    d) all
21. Do you have choices of things to do?

_____

_____

22. What do you choose to do on your free time after school or over the weekends?

_____

_____

_____

23. What type of activities and games do you prefer on the places?

_____

_____

_____

QUESTION FOR CHILDREN RELATED WITH COMFORT AND IMAGE

24. When do you prefer to use the space?
    a) Morning
    b) Afternoon
    c) Evening
    d) AandB
    e) All
25. How many hours do you spent each day playing
    a) Less than one hour
    b) Two hours
    c) Three hours
    d) More than three hours
26. Is there any food and/or drink service on the places?
    a) Yes
    b) No
27. Do you feel a sense of security?
    a) Yes
    b) No

QUESTIONS TO CONSIDER ON SOCIABILITY

28. Where do you choose to play?

29. Is this a place where you would choose to meet your friends?

30. Do parents bring their children and relatives to see the place?

31. Do people use the place regularly and by choice?

Annex 3: Observation Checklist

This observation checklist was developed as part of the research study titled: "Children's Play Spaces in Mass Housing Developments: Accessibility and Usability in Summit Condominium, Addis Ababa."

The purpose of this tool is to systematically observe and record the physical conditions, accessibility, safety, usability, and actual usage of designated and informal children's play spaces within the Summit Condominium compound. The checklist serves to complement data collected from residents by capturing objective, real-time observations of the environment and how children and community members interact with these spaces.

Observations were conducted during different times of the day and week to ensure a comprehensive understanding of play space utilization, physical barriers, social dynamics, and environmental factors affecting children's outdoor play.

The findings from this observation will provide practical insights into the existing challenges and opportunities related to children's play in mass housing developments, supporting the study's goal of informing child-friendly urban planning and design.

Here they are:

- **General Overview:**
    - Is the play space formal or informal?
    - Accessibility - Can people easily walk to, through and from the place?
    - Proximity (How far is play space?)
    - Is there any equipment?
    - Is it Suitable to all kinds of children and is there any equipment?
    - Is the equipment flexible or not?
- Zoning:
    - What kind of activities happening in there? Is there any variation of activities?
    - Is it open for any kind of play; such as organized sports,diverse topography, diverse vegetation, and diverse surface materials?

- Comfort:
    - Are the seats provided around comfortable?
    - Are those seats enough in number?
    - Does it have good orientation?
    - Is there connection between the space and the adjacent buildings, or is it surrounded by blank walls?
    - Can people see the space from a distance?
    - Do people make eye contact with each other?
    - Are the people smiling?
- Safety Perspectives:
    - What is existing pavement material? Does it cause injury to children? Is this reason parents won't let the children play outside?
    - Nearby open ditches, obstacles, vehicular movement
- Security perspective and visibility of the open space?
    - Is it defined Field: fenced or not
    - Does the fence influence the children's playing habit?
    - Why the fence is used, is it to segregate playing area?
    - Seating and gathering areas provide settings
    - Do sidewalks lead to and from the adjacent areas?
- Natural environment:
    - Are there any shading places, common areas for gathering together
    - Does the space design and use consider climate?
- Different Considerations:
    - Do the spaces function for people with special needs?
    - Are children using the space or is it empty?
    - Is it used by people of different age categories?
    - Are the people use spaces in groups?
    - How many different types of activities are occurring – people walking, eating, playing soccer, relaxing, reading?
    - Which parts of the space are used and which are not?
    - Is there any sun attack or any natural hazard on the place?

Annex 4: Parameters used to assess the outdoor spaces

This section presents the set of parameters employed to assess the quality, accessibility, usability, and safety of outdoor spaces within the Summit Condominium as part of the research study: "Children's Play Spaces in Mass Housing Developments: Accessibility and Usability in Summit Condominium, Addis Ababa."

The parameters were developed based on a review of relevant urban design guidelines, child-friendly environment standards, and empirical studies related to children's play spaces. They aim to provide a structured framework for evaluating the physical and social attributes of the outdoor spaces that affect children's ability to engage in play and recreational activities.

The assessment focuses on key dimensions including:

- Physical accessibility and connectivity
- Safety and security features
- Environmental quality and maintenance
- Availability of play equipment and diversity of activities
- Visual accessibility and parental surveillance

These parameters serve as an analytical tool to systematically identify the strengths and limitations of the outdoor spaces in accommodating children's play needs, contributing to the overall findings and recommendations of the study.

Parameters	Purpose
Character and overall design	(Area size, complexity, zoning)
Size and space for approach and use	Playgrounds need to be designed to offer suitable space for access, reach, and use regardless of the user's body size, posture, or mobility.
Content	(Play equipment (fixed or non-fixed), textures, materials, natural elements)

	Scale of Play Equipment
Time and change	(Seasons, weather, constant development, wear resistance)
Children's possibilities and perspectives	(Fun, preferences, challenge, control, manipulation)
Children's development and training	(Social, cognitive, and motor skills, health, learning)
Support for particular play activities	(Dramatic play, imaginative play, etc.)
Geographical context	(Placement, accessibility)
Methods for planning, design, and management	(User involvement, site-specific adaptation)
Equitable use	Playgrounds need to be designed so that all users can access and use
Flexibility in use	Community playground is accessed and used by diverse user group's people of different ages, abilities, sizes, and gender
Social and Inclusive Spaces	Facilitate opportunities for social interaction and gatherings
Two kinds of environmental factors; Physical factors Social factors	The amount of green space, the walkability and traffic safety of the neighborhood, and the presence and quality of play facilities include social safety, social environment (social cohesion and social capital) and the presence of friends
Surface materials	Hardscape and softscape ground covers
Accessibility	How close people should be to their nearest public usable open space

Annex 5: Focus Group Discussions (FGDs) with children

This annex presents the Focus Group Discussions (FGDs) conducted with children as part of the research study:

“Children’s Play Spaces in Mass Housing Developments: Accessibility and Usability in Summit Condominium, Addis Ababa.”

The FGDs were designed to gain in-depth insights directly from children regarding their experiences, preferences, challenges, and perceptions of outdoor play spaces within the condominium environment. This qualitative method provided an opportunity for children to express their views in their own words, offering a rich understanding of how they interact with and experience the available play areas.

Discussions focused on the following themes:

- Children’s favorite play spaces and reasons
- Perceived barriers to accessing play areas
- Feelings of safety and freedom while playing
- Desired improvements and suggestions for better play environments

The FGDs were conducted in a child-friendly and participatory manner, ensuring that children felt comfortable sharing their honest opinions. Ethical considerations, including informed assent and the presence of guardians where necessary, were strictly observed.

The information gathered through these discussions significantly enriches the study’s findings by integrating children’s voices into the assessment of play spaces in mass housing environments.

  	Children drawing their wish list about the play space they want to have

***** THE END *****