An-Najah National University

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PLANNING AND DESIGNING OPEN PUBLIC SPACES IN RESILIENT CITIES: RAMALLAH CITY AS A CASE STUDY

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Dedication

To My Mother, the strong and determined woman who one morning woke me up with a surprise that she had enrolled me in a Master's program in Urban and Regional Planning.

Acknowledgements

The Researcher may thank people, institutions and different parties who helped him in accomplishing his work.

Declaration

I, the undersigned, declare that I submitted the thesis entitled:

PLANNING AND DESIGNING OPEN PUBLIC SPACES IN RESILIENT CITIES: RAMALLAH CITY AS A CASE STUDY

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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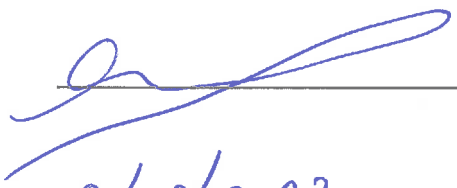
Signature: 

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PLANNING AND DESIGNING OPEN PUBLIC SPACES IN RESILIENT CITIES: RAMALLAH CITY AS A CASE STUDY

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Abstract

Planning and designing open public spaces (OPS) in Ramallah city is crucial to fit for resilient cities' strategies. This study aims to evaluate the current state of open public spaces in Ramallah city during the COVID-19 pandemic and identify the existing challenges. A comprehensive methodology and framework were developed, including literature review, data collection, key indicators development, framework development, field assessment, and recommendations. The findings show that the OPS in Ramallah are distributed at a rate of around 1.28% of the total area of Ramallah, represented by 18 parks and 17 linear squares only and 115 fragmented parcels, with a total area percentage of 0.98% of total built-up area. Upon assessing 19 parks, it was discovered that one of them does not physically exist, and 72% of the parks are unsuitable for Disaster management or mitigation with 45% of them failing to meet the requirements of being Loose-fitting Spaces for all aspects, including disaster relief. The assessments highlight the need for significant improvements in various areas to make the parks more accessible, safe, and engaging for the local community. It is essential to restructure the parks and schedule their hours of operation to provide people with access to outdoor areas throughout the year. By improving the parks, Ramallah can provide its residents with safe, accessible, and enjoyable outdoor spaces.

The study recommends that Ramallah need more public parks, and the existing parks require improvement to provide people with access to outdoor areas throughout the year. The comprehensive approach proposed in this study can help the relevant authorities prioritize their efforts in making the parks more accessible, safe, and engaging for the local community. By improving the parks, Ramallah can provide its residents with safe, accessible, and enjoyable outdoor spaces, making the city more resilient and sustainable.

Keywords: COVID-19 Pandemic; Disaster Management; Open Public Spaces (OPS); Ramallah City; Sustainability.

Chapter One
Introduction

1.1 Preface

What comes to our minds when we say open spaces? What are open spaces in the first place, and how did they form and develop into an important part of spatial space? And how can we say about a city that it is a resilient city?

From the time humans first defined private spaces, public spaces served as places where people come together to interact and exchange ideas. However, urban society has changed radically both socially and in spatial sense in recent decades, (BAL, September 2008), where litman describes Resilience as system's ability to efficiently absorb shocks (Litman, 2020).

All people who live in a specific residential area can define open spaces as they see fit. For example, I define it as a spacious place not surrounded by residential buildings and far from the noise of the streets, which I can enjoy the calm and beauty of nature, and from what I see if the city is more centralized and moves towards urbanization, it is necessary in any future planning to have sufficient open spaces, not only that, but also must be prepared to face any future obstacles and flexible to absorb any shocks.

In 2015 the United Nations Member States adopted the 17 Sustainable Development Goals, targeting progress by 2030. Particularly relevant to this paper is **Goal 11: 'Make cities and human settlements inclusive, safe, resilient and sustainable'** (SDG, 2015). Resilience being the 'ability of any urban system to maintain continuity through all shocks and stresses while positively adapting and transforming towards sustainability (UN-Habitat, 2020).Concerning resilience and sustainability, public open spaces can play a crucial role in enhancing the adaptive capacity of urban areas to cope with shocks and stresses, such as climate change, natural disasters, and pandemics. In summary, public open spaces are essential components of inclusive, safe, resilient, and sustainable urban areas. Achieving the SDG 11 targets requires integrating the development and management of public open spaces into urban planning and design processes.

Urban planning practice and experience in Palestine which stemmed back to mid-19th Century had passed through various changes and developments in terms of characteristics, policies, principles, and management. In addition, the urban planning system in Palestine seems to be unique in its composition and context. This uniqueness is related to the fact that planning practice was controlled and experienced by external forces (or foreigners) and not by native bodies (the Palestinians themselves). This, of course, is due to the long period of mandate and occupation for the Palestinian land by several nations. (Abdelhamid, 2006).

Open public spaces are often used as a mode to make cities sustainable from all its three counts: economic, environmental, and social. They are considered as a center for their surrounding localities as well as for the whole West Bank, we can say that the **urban sprawl** and the **population growth** in Ramallah, has greatly affected the available open spaces, and with the COVID-19 epidemic, the situation has become much more difficult. these circumstances made us look at the planning process from a whole different perspective and may have made our task as planners much more difficult. This epidemic has revealed new levels of planning that do not overlook resiliency, and perhaps, resiliency is what planning all about. This study will provide an assessment of the current situation of Ramallah City, as this evaluation will examine open spaces and how their distribution and design in the current manner has been affected by the spread of the epidemic.

It is the responsibility of planners to make the city more Resilient to face any future risks that expose its inhabitants to danger, by utilizing the existing spaces by 100%. Regardless of the existed chaos, planners must start considering open spaces as an integral part of any future urban expansion and seek an approach to fix the existed one.

1.2 Study Problem

The spread of this epidemic woke us up to the utmost necessity to rearrange priorities, at both levels, individually and regionally, and it has become very necessary to take pre-planned measures before the occurrence of any event, whether expected or sudden.

Palestine faces many problems related to urban planning process, while other cities around the world have reached advanced stages in planning to cope with climate change, natural disasters, and other global changes. The planning process is considered an integrated work that includes all aspects that would upgrade the city to a new appropriate, sufficient, and flexible level.

Among these problems, it is worth mentioning that the open public spaces in the city do not take their share of the planning process when designing and building or opening any street, and most certainly no great effort is put into the process of designing and distributing them.

Ramallah city suffers from many problems related to the flexible functioning of the planning process, Ramallah municipality, as a starting point, plans separately from the municipalities of Al-Bireh and Betunia, and this, in my opinion, essentially hinders the planning process. And when we address to include open spaces in this matter, we can only separate them.

Main problem is: **Planning and designing open public spaces in Ramallah city does not align with resilient cities' strategies and this is due to:**

1. Lack of efficiency: as open spaces are designed and planned in a manner that does not consider sudden emergencies, open spaces, parks, etc. have not been used efficiently during the Corona pandemic.
2. The ratio of open spaces to buildings is very Low: the need for an outlet outside the buildings during the quarantine increased and there weren’t enough spaces with all the precautionary measures, to accommodate with the population of Ramallah.
3. Lack of Resiliency measurements during planning phase and inability to mitigate with all-natural disaster including epidemics.

Therefore, it is important to study the current situation to make recommendation on how to adopt more resilient strategies in planning for open public spaces to have a pandemic resilient city.

1.3 Study Objectives

This study aims to investigate the current planning process in Ramallah's City, as what the citizen lives is the product of what planners make. This study will focus on assessing the current use of open spaces in Ramallah city. This study will also translate the current design of open spaces into a more resilient urban language, as it will provide recommendations in addition to a new structure for exploiting open spaces and developing them in a more resilient manner.

So, the main objective is to Develop a framework that investigates Open public spaces resiliency in Ramallah city and that includes:

1) Develop a set of key indicators for evaluating open public spaces during the pandemic.
2) Conduct a field assessment of open public spaces in Ramallah city using the developed framework.
3) Provide recommendations for improving open public spaces to be more resilient and sustainable.

1.4 The significance and importance of the Study

The study on planning and designing open public spaces in resilient cities, with Ramallah City as a case study, is significant and important for several reasons:

1. Addressing a pressing issue: The study focuses on the development of resilient cities, which is a critical issue given the current challenges facing urban areas, such as climate change, natural disasters, and pandemics. By studying Ramallah City as a case study, the study can provide valuable insights into the planning and design of public open spaces in cities facing similar challenges.
2. Enhancing urban resilience: The study can contribute to enhancing the resilience of Ramallah City by providing recommendations for improving the design and

management of public open spaces. Well-designed and well-maintained public open spaces can enhance the ecological, social, and economic resilience of cities, and the study can help Ramallah City achieve these benefits.

3. Promoting sustainable development: The study aligns with the United Nations' Sustainable Development Goals, particularly SDG 11, which aims to make cities and human settlements inclusive, safe, resilient, and sustainable. By providing insights into the planning and design of public open spaces, the study can promote sustainable development in Ramallah City and other urban areas.
4. Providing a case study for future research: The study can serve as a valuable case study for future research on the planning and design of public open spaces in resilient cities. Researchers can build on the findings and recommendations of this study to investigate the effectiveness of different design and management strategies in enhancing urban resilience.

1.5 Study Questions and hypothesis

1.5.1 Study Hypothesis

- The lack of consideration for open spaces during the planning process in Ramallah city has resulted in a low ratio of open spaces to buildings, making it difficult for the population to access open spaces during the covid-19 pandemic.
- The absence of resiliency measurements in the planning phase has made the city vulnerable to natural disasters, including epidemics like covid-19.
- There is a need for a more integrated approach to urban planning in Palestine to make cities more resilient and sustainable.

1.5.2 Study Questions

1. How has the lack of consideration for open spaces during the planning process in Ramallah city affected the population's ability to access open spaces during the covid-19 pandemic and in what ways has the absence of resiliency measurements in the planning phase made Ramallah city vulnerable to natural disasters, including epidemics like covid-19?
2. What is the current approach to urban planning in Palestine, and how could it be improved to make cities more resilient and sustainable?
3. How could the inclusion of resiliency measurements in the planning phase help Ramallah city prepare for future pandemics or other natural disasters?

1.6 Methodology of the study

The evaluation of open public spaces during the pandemic in Ramallah city requires a comprehensive methodology and framework. The following steps can be taken to build this framework:

1. Literature Review: a comprehensive review of relevant literature was conducted, including research studies and reports, to gain a better understanding of the current state of open public spaces in Ramallah city during the pandemic and to identify any existing challenges.
2. Data Collection: data was collected from various sources such as government agencies, local NGOs, community organizations, and local residents to understand the current usage patterns and needs of open public spaces in the city. Through survey of (385 random sample).
3. Key Indicators: key indicators were developed to help assess the effectiveness of Parks and gardens of Ramallah. These indicators include the accessibility, safety, and quality of open spaces, as well as the level of engagement of local communities.
4. Framework Development: Based on the data collected and the indicators identified, a framework was developed for evaluating open public spaces during the pandemic in Ramallah city. This framework included a set of criteria for evaluating the performance of open public spaces and a set of methods for data analysis.
5. Field Assessment: a field assessment was conducted of the open public spaces in Ramallah city using the framework developed. This assessment provided valuable insights into the current state of these spaces and identified areas for improvement.
6. Recommendations: Based on the findings of the field assessment, recommendations were given for improving the open public spaces in Ramallah city during the pandemic. These recommendations took into account the needs of local communities and the unique challenges Posed by the pandemic. This methodology and framework provided a structured and systematic approach for evaluating open public spaces in Ramallah city and helped to ensure that these spaces are going to be safe, accessible, and well-utilized by local communities.

1.7 Thesis Organization

Chapter one: The Study topic is introduced, background information is provided, and the Study question and objectives are presented. The problems of the Study are outlined, and an overview of the structure of the thesis is provided.

Chapter Two: An overview of the existing study on the topic of open public spaces during the pandemic is provided, and the gaps in the literature that this study aims to address are identified. This chapter is considered a crucial part of the thesis.

Chapter Three: Ramallah city is comprehensively overviewed, with a focus on its urban planning development. The challenges faced by the city in terms of growth and development are highlighted, and the need for a methodology and framework to address these challenges is emphasized. This chapter provides the foundation for the analysis of open public spaces in Ramallah city during the pandemic.

Chapter 4: The methodology and framework used to evaluate the open public spaces in Ramallah city during the pandemic are outlined in this chapter. The data collection techniques used, including maps, surveys, observations, and existing data analysis, are presented, as well as the criteria used to evaluate the public open spaces. The steps involved in conducting the evaluation, from the initial data collection to the final analysis and presentation of the results, are also detailed.

Chapter Five: The open public spaces in Ramallah city during the pandemic are evaluated in depth based on the methodology and framework developed in the previous chapter. A range of criteria, such as accessibility, safety, and quality, are used to evaluate the public open spaces, and both qualitative and quantitative data are analyzed.

Chapter Six: conclusion and recommendations the key findings and implications of the study are summarized, and recommendations for future action are provided in the conclusion chapter of the thesis.

1.8 Summary

In summary, this study aims to provide a comprehensive analysis of the issue of open public spaces during the pandemic in Ramallah city and to develop a methodology and framework for evaluating these spaces. The results of this study will contribute to the understanding of the challenges faced by cities during the pandemic and provide valuable insights for improving open public spaces in Ramallah city.

Chapter Two
Literature Review

2.1 Introduction

Open public spaces are critical components of cities and are increasingly being recognized as essential for promoting community engagement, social inclusion, health and wellbeing, and environmental sustainability. As cities face increasing threats from epidemics, climate change and other global challenges, the importance of designing and planning resilient public spaces that can adapt to and withstand shocks and stresses has become more apparent. This literature review will examine existing research on planning and designing open public spaces in resilient cities, with a focus on Ramallah city as a case study.

2.2 Planning and Designing Open Public Spaces

Planning and designing open public spaces involves multiple considerations, including the needs of different user groups, the environmental context of the site, and the social and cultural context of the city. Researchers have identified several key principles for effective planning and design of public spaces. One of these is the need to involve local communities in the planning and design process to ensure that the space meets the needs of the people who will be using it (Carmona M. , 2010). This can involve methods such as participatory design, which enables community members to actively participate in the design process and contribute their perspectives and ideas. Another important principle is the need to consider the ecological context of the site and integrate sustainable design practices, such as green infrastructure, into the design (Mark A. Benedict, 2006).

public spaces are essential elements of urban life that can provide many benefits to the community, such as promoting social interaction, enhancing the quality of life, and improving the environment. The design and planning of public spaces are critical components in creating livable, resilient, and sustainable cities. In this literature review, we will explore the different perspectives, concepts, and practices related to planning and designing open public spaces. (Gehl J. , Cities for People. Island Press, 2010)

2.2.1Theoretical Framework

To design and plan open public spaces, urban designers and planners need to consider various factors, such as spatial layout, accessibility, user needs, and environmental conditions. The following are some of the key concepts related to public space design:

1. Spatial Layout: Spatial layout refers to the physical arrangement of elements within the public space, including pathways, seating areas, lighting, and vegetation. The spatial layout can affect the users' experience of the space, their behavior, and their perception of safety and security. A well-designed spatial layout can also encourage social interaction and create a sense of community.
2. Accessibility: Accessibility refers to the ease of movement and use of the public space by different groups of users, including people with disabilities, the elderly, and children. Providing accessible public spaces can promote social inclusion and enhance the quality of life for all members of the community.
3. User Needs: User needs refer to the diverse needs and preferences of the users of the public space, including the type of activities, amenities, and services they require. Understanding user needs can help designers and planners create public spaces that are attractive, functional, and responsive to the users' needs.
4. Environmental Conditions: Environmental conditions refer to the physical and natural elements that surround the public space, such as weather, noise, air quality, and vegetation. Considering environmental conditions is essential in creating comfortable, healthy, and sustainable public spaces.

2.2.2 Case Studies

Several case studies have been conducted to examine the planning and designing of open public spaces in different cities around the world. Here are some of the notable examples:

1. The High Line, New York City: The High Line is an elevated park built on a former railway line in New York City. The park's design includes a variety of seating areas, planting beds, and walking paths. The project has transformed the surrounding neighborhood, increased property values and promoting economic growth. The High Line is an excellent example of how public space design can contribute to urban revitalization and community development.
2. The Greenway, Boston: The Greenway is a linear park system built on a former highway in Boston. The park's design includes a variety of public amenities, such as

fountains, art installations, and food trucks. The Greenway has become a popular destination for tourists and locals, promoting economic development and community engagement.

3. The Cheonggyecheon Stream, Seoul: The Cheonggyecheon Stream is a 5.8-kilometer urban renewal project in Seoul that transformed a concrete-covered waterway into a natural stream. The project has improved air quality, reduced noise pollution, and created a new public space for the city's residents. The Cheonggyecheon Stream is an excellent example of how public space design can enhance environmental sustainability and public health.

In conclusion, Planning and designing open public spaces are critical components of creating livable, resilient, and sustainable cities. By considering key concepts such as spatial layout, accessibility, user needs, and environmental conditions, urban designers and planners can create public spaces that promote social interaction, enhance the quality of life, and improve the environment. The case studies presented in this literature review demonstrate how public space design can contribute to urban revitalization, economic development, community engagement, and environmental sustainability.

2.3 Resilience and Open Public Spaces

Resilience is the ability of a system to absorb shocks and stresses and adapt to changing conditions while maintaining its essential functions and identity. In the context of cities, resilience is becoming increasingly important as cities face increasing risks from climate change, natural disasters, and other global challenges. Researchers have identified several key principles for designing and planning resilient public spaces. One of these is the need to consider the multiple functions that public spaces can serve, such as providing recreational opportunities, supporting local biodiversity, and mitigating the urban heat island effect (Solecki & Marcotullio, 2013). Another important principle is the need to integrate green infrastructure and other sustainable design practices into the design of public spaces to enhance their resilience and ability to adapt to changing conditions (Colding & Barthel, 2013).

Open public spaces are essential to the livability of cities, providing a range of benefits, including environmental, social, and economic benefits. However, these spaces can be threatened by a range of factors, including climate change, urbanization, and economic

pressures. Planning and designing open public spaces that are resilient to these threats is therefore critical to ensure the sustainability and quality of life in urban areas.

One approach to planning and designing resilient open public spaces is through the use of green infrastructure. Green infrastructure refers to the network of green spaces, including parks, gardens, and green roofs, that can be used to mitigate the impacts of climate change and provide a range of benefits to urban communities (Mark A. Benedict, 2006). The use of green infrastructure in open public space design has been found to provide benefits such as improved air and water quality, reduced urban heat island effects, and increased biodiversity (Chiesura, 2004) (De la Barrera, Reyes-Paecke, & Banzhaf, 2016).

Another approach to designing resilient open public spaces is through the use of participatory planning processes. Participatory planning involves engaging community members in the planning and design process to ensure that the resulting spaces meet their needs and are well-used (Arnstein, 2007). Studies have found that participatory planning processes can result in more successful and sustainable open public spaces ((Carmona, 2010)

In addition to green infrastructure and participatory planning, there are other design features that can contribute to the resilience of open public spaces. These include the use of multi-functional spaces that can serve a range of purposes, the incorporation of water management features to mitigate flooding and other water-related risks, and the use of materials and designs that can withstand extreme weather events (Garmestani, 2015); (Rumbach, 2013).

One case study that illustrates the use of these approaches to design resilient open public spaces is the transformation of the High Line in New York City. The High Line is an elevated railway that was transformed into a linear park through a participatory planning process that involved community members, local organizations, and the city government. The resulting park incorporates green infrastructure, multi-functional spaces, and water management features to create a resilient and sustainable public space that has become a model for other cities.

In conclusion, planning and designing resilient open public spaces is critical to ensure the sustainability and quality of life in urban areas. The use of green infrastructure, participatory planning processes, and other design features can contribute to the resilience of these spaces, and case studies such as the High Line in New York City illustrate the successful implementation of these approaches.

2.3.1 Planning and designing open public spaces as a strategy for disaster resilient cities: a review of literature by Jayakody, Amaratunga, & Haigh, 2016.

2.3.1.1 Introduction

Natural disasters have been on the rise, causing significant damage to urban areas, and their populations. Resilience has emerged as a critical factor in urban planning and design, and open public spaces have been identified as a key component of disaster-resilient cities. The purpose of this literature review is to provide an overview of the key principles and strategies for planning and designing open public spaces as a strategy for disaster-resilient cities.

2.3.1.2 Resilience and Disaster Risk Reduction

Resilience is the ability of a system or community to resist, adapt and recover from the impacts of a disaster or crisis. Disaster risk reduction is the systematic process of identifying, analyzing, and reducing the risks of disasters to minimize their negative impacts. The integration of both concepts is critical in creating disaster-resilient cities. Resilience is built through effective planning and management of physical, social, economic, and environmental systems, and open public spaces play a vital role in each of these systems.

2.3.1.3 Open Public Spaces as a Strategy for Disaster-Resilient Cities

Open public spaces are essential components of disaster-resilient cities as they can provide safe, accessible spaces for social interaction, physical activity, and community engagement. They also serve as green infrastructure, helping to manage storm water and reduce the urban heat island effect. The literature has identified several key principles and strategies for planning and designing open public spaces as a strategy for disaster-resilient cities.

2.3.1.4 Design Principles for Disaster-Resilient Open Public Spaces

The literature has identified several design principles that can enhance the resilience of open public spaces. These principles include designing for multiple uses, creating adaptable spaces, ensuring accessibility and inclusivity, and providing connections to the wider urban context. Designing for multiple uses is critical in ensuring that open public spaces are utilized year-round and during times of crisis. Adaptable spaces can be transformed to meet the changing needs of the community during and after a disaster. Ensuring accessibility and inclusivity is essential in creating open public spaces that are available to all members of the community, including those with disabilities and special needs. Connections to the wider urban context are crucial in creating open public spaces that are integrated into the urban fabric and provide a network of green infrastructure.

2.3.1.5 Management and Governance of Open Public Spaces

Effective management and governance of open public spaces are critical in creating disaster-resilient cities. The literature has identified several strategies for management and governance, including engaging the community in the planning and management process, fostering partnerships between the public and private sectors, and creating monitoring and evaluation frameworks. Engaging the community in the planning and management process is essential in ensuring that open public spaces meet the needs of the community and are utilized effectively. Partnerships between the public and private sectors can help to mobilize resources and expertise to support the development and management of open public spaces. Monitoring and evaluation frameworks can help to track the performance of open public spaces and identify areas for improvement.

As illustrated in the study conducted by R. Jayakody, D. Amaratunga, and R. Haigh in 2016, a framework Figure B.1 was developed to guide the planning and design of open public spaces for sustainable disaster-resilient cities. The figure depicted the various components and considerations involved in this process. Please refer to Appendix B for Figure B.1, which provides a visual representation of the framework mentioned.

2.3.2 Open Public Spaces – Design Guidelines for Resilient and Healthy Cities by Martin Berchtold, Detlef Kurth, Andreas Beulich, Lutz Eichholz, and Marie Turgetto

The design of open public spaces plays a critical role in creating resilient and healthy cities. Such spaces serve as vital components of urban ecosystems, promoting social interaction, improving physical and mental health, and contributing to overall urban sustainability. This literature review discusses some of the key issues related to the design of open public spaces for resilient and healthy cities, based on the study by Berchtold, Kurth, Beulich, Eichholz, and Turgetto (2018).

Designing Resilient and Healthy Open Public Spaces The design of open public spaces for resilient and healthy cities requires a comprehensive approach that considers a range of factors, including urban morphology, climate, biodiversity, and social dynamics. The design guidelines proposed in the study provide a framework for creating open public spaces that promote resilience and health in urban contexts (Berchtold, 2018).

As cities strive for increased efficiency and sustainability, the concept of the '15-minute city' has gained significant attention. This concept, depicted in Figure B-2, envisions urban areas where residents can meet their daily needs within a 15-minute walk or bike ride from their homes. It promotes the integration of essential amenities, such as housing, schools, workplaces, shops, and green spaces, within close proximity to reduce travel times and enhance quality of life.

Figure B.2, representing the '15-minute city' concept, provides a visual illustration of its core principles and components. For a detailed view, please refer to Appendix B, where Figure B.2 is included.

Some of the key considerations for designing resilient and healthy open public spaces include:

Site and context analysis: Conducting a thorough analysis of the site and its context, including the physical, environmental, social, and cultural characteristics of the area. This analysis should inform decisions related to site selection, layout, and design.

Access and connectivity: Ensuring that open public spaces are accessible to all members of the community and that they are well-connected to other parts of the city, including public transport networks and other open spaces.

Diversity and inclusivity: Designing open public spaces that reflect the diversity of the community and promote social inclusion. This includes considering the needs and preferences of different user groups, including children, elderly people, and people with disabilities.

Biodiversity and ecosystem services: Incorporating biodiversity into open public space design to support ecological functions and services, such as air purification, climate regulation, and soil conservation.

Health and well-being: Designing open public spaces that promote physical and mental health and well-being, through features such as green infrastructure, active transport options, and opportunities for social interaction.

Designing open public spaces for resilient and healthy cities is a critical and ongoing process that requires a multidisciplinary and evidence-based approach. By incorporating the design guidelines proposed in the study by (Berchtold, 2018), urban planners and designers can create open public spaces that contribute to urban sustainability, support community health and well-being, and enhance the resilience of cities in the face of future challenges.

2.4 Case Studies

2.4.1 Local Case Studies

The design and planning of public open spaces are a critical aspect of creating resilient cities, and the success of these spaces depends on the local context in which they are implemented. In the case of Ramallah City, several local studies have been conducted to assess the design and planning of open public spaces and identify ways to improve their resilience. This literature review aims to highlight some of these studies and their findings.

One study conducted by (Abu-Saa, 2019) analyzed the spatial distribution and accessibility of public open spaces in Ramallah City. The study found that while the city

has a relatively high number of public open spaces, their distribution is uneven, with some neighborhoods having limited access to these spaces. The study suggests that the city should prioritize the design of new public open spaces in these areas to improve accessibility and promote social cohesion.

Another study conducted by (Awad, 2020) assessed the current state of Ramallah's public parks and identified several challenges facing these spaces. The study found that the lack of maintenance and inadequate infrastructure were the primary challenges facing these parks. The study recommends that the city should invest in the maintenance and rehabilitation of existing parks and prioritize the inclusion of green infrastructure and sustainable design features in new park developments.

Additionally, a study by (Makhoul, 2018) analyzed the perceptions of residents towards public open spaces in Ramallah City. The study found that residents highly value the accessibility and safety of these spaces and suggest that future developments prioritize these features. The study also recommends that the city should focus on promoting cultural and social activities within these spaces to enhance their value to the community.

Finally, a study conducted by (Al-Haddad, 2017) assessed the role of public open spaces in promoting community resilience in Ramallah City. The study found that public open spaces play a vital role in promoting community cohesion and resilience, especially in times of crisis. The study recommends that the city should prioritize the design of resilient public open spaces that can serve as community hubs and provide essential services during emergencies.

Overall, these local studies highlight the importance of prioritizing the design and planning of resilient public open spaces in Ramallah City. The studies recommend that the city should focus on improving accessibility, promoting sustainability, enhancing community engagement, and prioritizing the needs of residents in the design of these spaces.

2.4.2 International Case Studies

This section presents a literature review of case studies from international researches on planning and designing open public spaces in resilient cities. The aim is to examine and synthesize relevant examples of resilient cities that have successfully implemented urban

design strategies to improve their open public spaces. This section is organized into three parts. The first part focuses on the concept of resilient cities and its relation to urban design. The second part discusses the case studies of open public spaces in resilient cities, and the third part examines the key design strategies and planning principles employed in these case studies.

2.4.2.1 Resilient Cities and Urban Design

Resilient cities are defined as cities that are capable of withstanding and recovering from shocks and stressors such as climate change, natural disasters, and economic crises. Urban design is recognized as a critical component in creating resilient cities, as it can provide the necessary infrastructure, amenities, and public spaces to help communities cope with these challenges. Research has shown that well-designed public spaces can enhance community resilience by promoting social cohesion, providing a sense of identity and belonging, and improving physical and mental health outcomes (Nadin & Stead, 2017)

2.4.2.2 Case Studies of Open Public Spaces in Resilient Cities

Several international case studies illustrate the successful implementation of urban design strategies in creating open public spaces in resilient cities. One of the most notable examples is the transformation of New York's Times Square, which was once a congested and dangerous intersection, into a vibrant pedestrian plaza that has become a major tourist attraction. The redesign of Times Square incorporated several design features, such as movable seating, LED lighting, and plantings, to create a flexible and adaptable space that can be used for a variety of activities (Gehl J. , 2011).

Another example is the High Line in New York City, a linear park built on a former elevated railway line. The park has been credited with revitalizing the surrounding neighborhoods and has become a popular gathering space for locals and tourists alike. The park's success is attributed to its unique design features, such as the use of native plants and the integration of public art, which have helped to create a sense of place and community (Stokes & Newell , 2014).

In Copenhagen, Denmark, the redesign of a major arterial road into a pedestrian and bicycle-friendly promenade, Stroget, has transformed the city center into a vibrant public space. The redesign incorporated several design strategies, including the use of

cobblestone paving, street furniture, and greenery, to create a pleasant and safe environment for pedestrians and cyclists (Gehl J. , 2013)

In Seoul, South Korea, the Cheonggyecheon Stream was revitalized by removing a major highway that had been built over it and restoring the stream to its natural state. The restoration project not only improved the city's environmental quality but also created a new public space that has become a popular destination for locals and tourists (Kim, 2010).

2.4.2.3 Key Design Strategies and Planning Principles

The success of these case studies can be attributed to the implementation of key design strategies and planning principles, such as:

1. Flexibility and adaptability in design to accommodate different activities and events.
2. Integration of green infrastructure, such as trees and plants, to improve environmental quality and provide shade.
3. Use of lighting and public art to create a sense of place and identity.
4. Incorporation of seating and street furniture to provide comfortable and inviting public spaces.
5. Engagement with local communities and stakeholders to ensure that the design responds to their needs and aspirations.

2.5 Study consistency with the previous studies

The previous literature review has highlighted the key elements and factors that contribute to planning and designing open public spaces in resilient cities, which can be applied to Ramallah city. Based on the literature review, it is important to consider the socio-cultural, environmental, and economic factors when planning and designing open public spaces in resilient cities.

Furthermore, the literature review emphasized the importance of community engagement and participation in the planning and design process, as it can lead to more successful and sustainable open public spaces. This is particularly relevant to Ramallah city, as it has a rich cultural and historical heritage, and community involvement can help preserve and enhance the city's identity.

Moreover, the literature review highlighted the need to incorporate climate change adaptation and mitigation strategies into the planning and design of open public spaces in resilient cities. This is crucial for Ramallah city, as it faces various environmental challenges such as water scarcity and heatwaves.

Therefore, the study on planning and designing open public spaces in resilient cities in Ramallah city is consistent with the previous literature review, as it takes into consideration the key elements and factors identified in the literature review. The study also aims to apply these factors to the specific context of Ramallah city, taking into account its unique socio-cultural, environmental, and economic characteristics.

Based on the previous studies, and according to data viability, this study will:

- Depend on using of AutoCAD drawings to analyze and evaluate the current situation of the open public spaces and the urban development of Ramallah between (1962-2022).
- Use two of determining Factors for disaster resilience that can be achieved through public open spaces: (Loose Fit space) or planning for everyday use, and (Disaster management and Mitigation), where these factors will be integrated in planning and designing for Public open spaces.
- Use of main factors in planning and designing for Public open spaces from the study point of view are :(**Accessibility, Safety, Quality of Open public spaces and level of engagement of local communities**). **Accessibility** is a crucial factor to consider as it ensures that public open spaces are available and easily reached by all members of the community, including those with disabilities or limited mobility. This factor helps to promote inclusivity and equality in urban spaces. **Safety** is also an essential factor to consider as it ensures that public open spaces are secure and free from hazards that could harm visitors. This factor is crucial in promoting a sense of security and well-being among the community. **The quality of public open spaces** is also important as it contributes to the attractiveness and functionality of urban spaces. High-quality public open spaces can provide a range of benefits, such as improved physical and mental health, increased social cohesion, and economic benefits. Lastly, **the level of engagement of local communities** in the planning and design of public open spaces is essential to ensure that the spaces are responsive to

the needs and preferences of the community.

- Built a framework that contains these determining factors to analyze and evaluate the open public spaces based on the determined indicators. Through these components, this study will analyze and evaluate each of the factors and determine the most affective and functional way to design for an everyday use and disaster resilience public open spaces.

Chapter Three
Methodology and Building Framework for Evaluating Public Open Space in the Resilient City of Ramallah

3.1 Introduction

Ramallah City, located in the heart of the West Bank, faces a unique set of challenges that require innovative solutions for creating a more resilient and sustainable urban environment. As a city that is subject to political instability and economic constraints, Ramallah City has limited resources to address the needs of its growing population. One critical aspect of creating a resilient city is the availability and accessibility of public open spaces. These spaces play a vital role in enhancing the physical, social, and environmental well-being of city dwellers, and they can help address various challenges facing urban areas, including population growth, climate change, and public health crises. This chapter aims to present a methodology and building framework for evaluating public open spaces in Ramallah City, with the goal of enhancing their resilience and contributing to the city's overall resilience. The proposed framework considers various factors that affect the quality and accessibility of public open spaces, such as accessibility, Quality, safety, and social interaction. By evaluating public open spaces in Ramallah City, this chapter seeks to provide a better understanding of the challenges and opportunities for enhancing the resilience of urban areas in the region.

3.2 Methodology of Building the Evaluation Framework

The methodology for building the resiliency evaluation framework for Ramallah city can be divided into three main steps:

1. Literature review and data collection: This step involved conducting a comprehensive literature review of existing frameworks and studies related to public open spaces and resilience in urban areas. It also involves collecting data on the current state of public open spaces in Ramallah City, such as their location, size, design, accessibility, and amenities.
2. Framework development: Based on the literature review and data collection, a conceptual framework is developed to guide the evaluation of public open spaces in Ramallah City. The framework will consider various resilience factors, such as social,

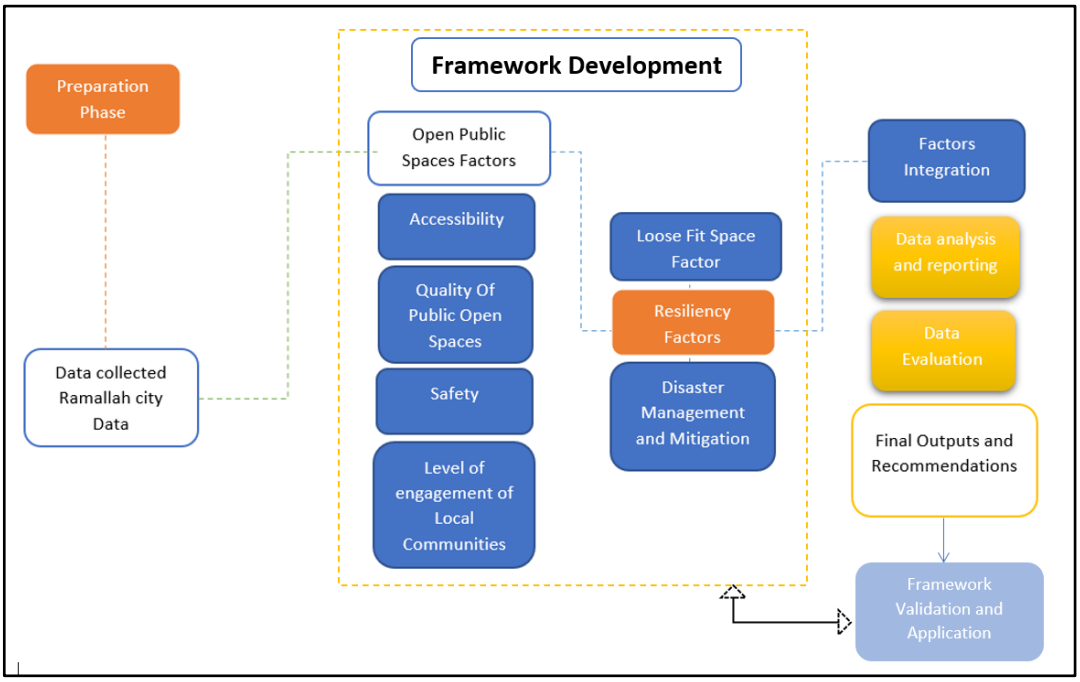
economic, and environmental factors, and will provide a systematic and comprehensive approach to evaluate the resilience of public open spaces in the city.

3. Framework validation and application: The final step involves testing the framework by applying it to a sample of public open spaces in Ramallah City. The framework's validity and reliability will be assessed through expert review and feedback, and the results of the evaluation will be used to identify strengths and weaknesses in the current state of public open spaces in the city. The findings will also provide insights into potential strategies for enhancing the resilience of public open spaces in Ramallah City.

The evaluation framework was developed to consider both quantitative and qualitative data and took into account factors involving OPS resiliency such as accessibility, safety, and availability of amenities, as well as the community's overall perception of the open spaces. The framework is flexible enough to allow for ongoing monitoring and evaluation of the open spaces.

Figure1

Proposed methodology of building evaluation framework



Source: Author 2022

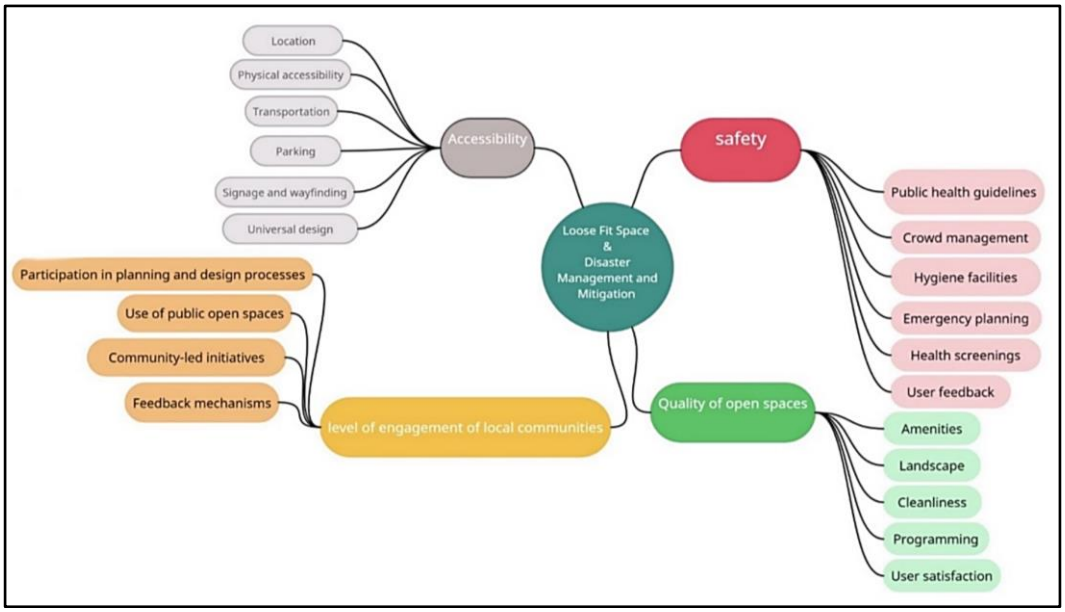
3.3 Determinant Factors and Indicators

3.3.1 Parks and Gardens

The following factors will be integrated to achieve both, everyday use and Disaster resilience at the same time:

Figure 2

Determining Factors integration for Public Parks and gardens



Source: Author 2022

3.3.1.1 Accessibility

Accessibility is an important aspect of open public spaces and can be evaluated using a range of indicators. Some key indicators of accessibility include:

1. Location: The proximity of open public spaces to public transportation, housing, and other community amenities can impact their accessibility for people of all ages and abilities.
2. Physical accessibility: This includes factors such as the availability of sidewalks, crosswalks, and curb cuts, as well as the accessibility of buildings and structures within the open space.
3. Transportation: The availability of public transportation options, such as bus or train lines, and the proximity of bike lanes or pedestrian pathways can impact accessibility
4. Parking: The availability and accessibility of parking near open public spaces can impact accessibility for people with disabilities or mobility challenges.

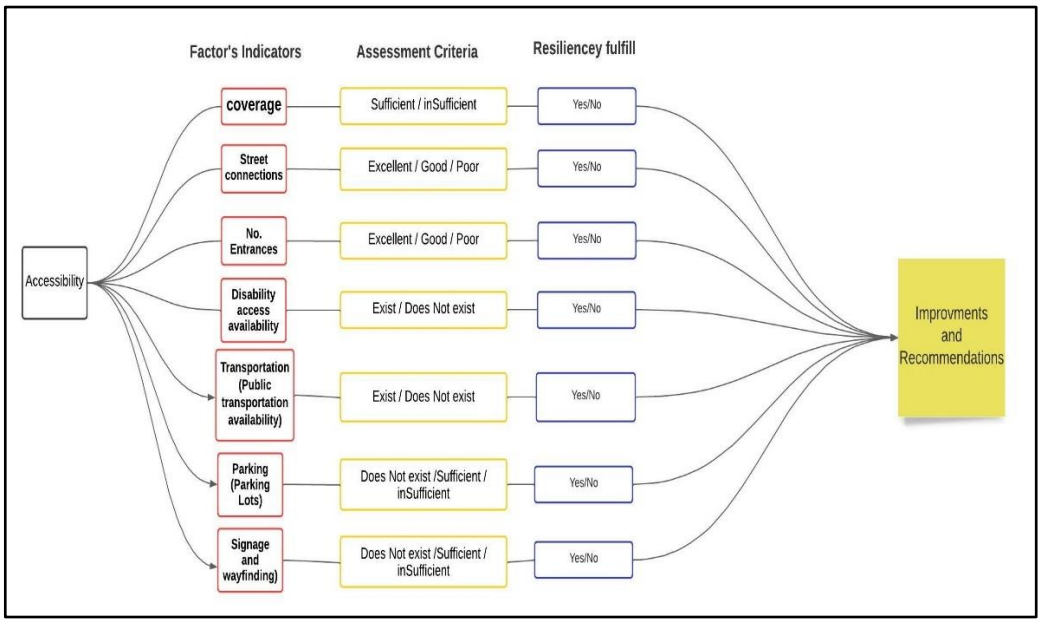
5. Signage and wayfinding: Clear and well-placed signage, as well as a well-designed wayfinding system, can help to make open public spaces more accessible to all visitors.

It is important to consider all of these factors when evaluating the accessibility of public open spaces, as well as the unique needs and perspectives of different groups, such as people with disabilities, older adults, and children.

In assessing the accessibility of urban areas, various factors and indicators play a significant role. Table (A.1), included in Appendix A, and presents an overview of these accessibility factors and corresponding indicators, providing valuable insights for evaluating the accessibility of different locations. It serves as a comprehensive reference to understand the key components that contribute to enhancing accessibility within cities. For a detailed view of the accessibility factors and indicators, please refer to Appendix C, where Table (A.1).1is included.

Figure 3

Accessibility factor's indicators and assessment criteria



Source: Author 2022

3.3.1.2 Quality of open spaces

The quality of open public spaces can be evaluated using a range of indicators, including:

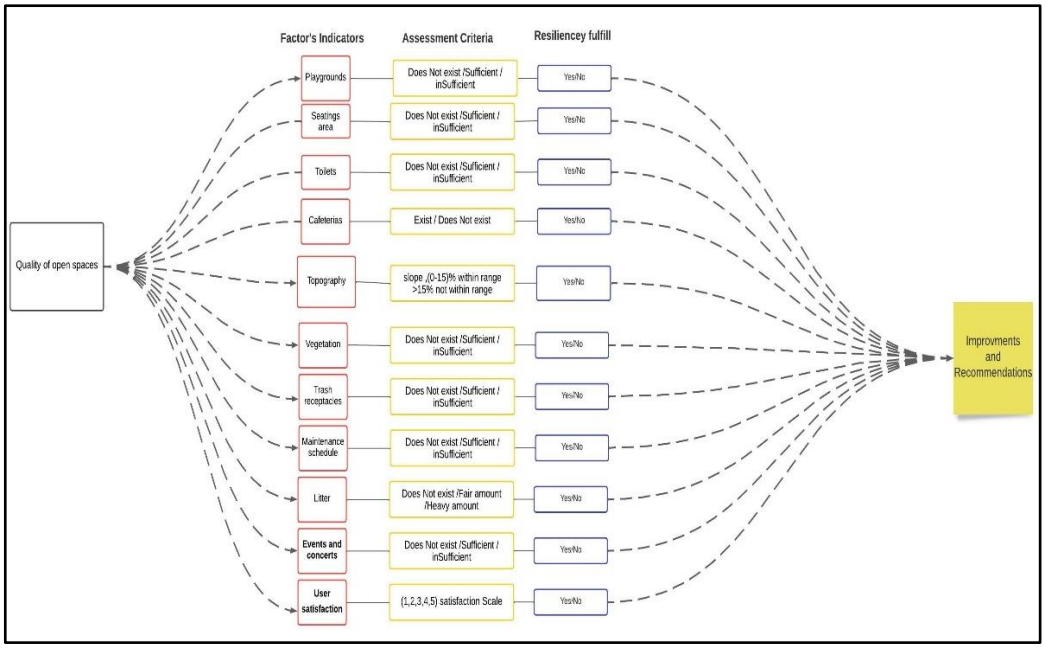
1. Amenities: The availability of amenities such as restrooms, water fountains, seating, shade, and playground equipment can impact the overall quality of public open spaces.

2. Landscape: The quality of the landscape, including the maintenance of trees, vegetation, and other green spaces, can have a significant impact on the overall quality of public open spaces.
3. Cleanliness: The cleanliness of public open spaces, including the availability of trash and recycling bins, and the frequency of litter pickup, can impact the overall quality of the space.
4. Programming: The availability of programmed activities and events, such as concerts, festivals, and community gatherings, can contribute to the overall quality of public open spaces.
5. User satisfaction: User satisfaction with open public spaces can be measured through surveys, interviews, or other methods, and can provide valuable insights into the quality of the space from the perspective of the users.

Table (A.2), included in Appendix A, outlines the factors and indicators used to assess the quality of open spaces. It provides valuable information for evaluating the characteristics that contribute to the overall quality of these spaces.

Figure 4

Quality of open spaces factor's indicators and assessment criteria



Source: Author 2022

3.3.1.3 Safety

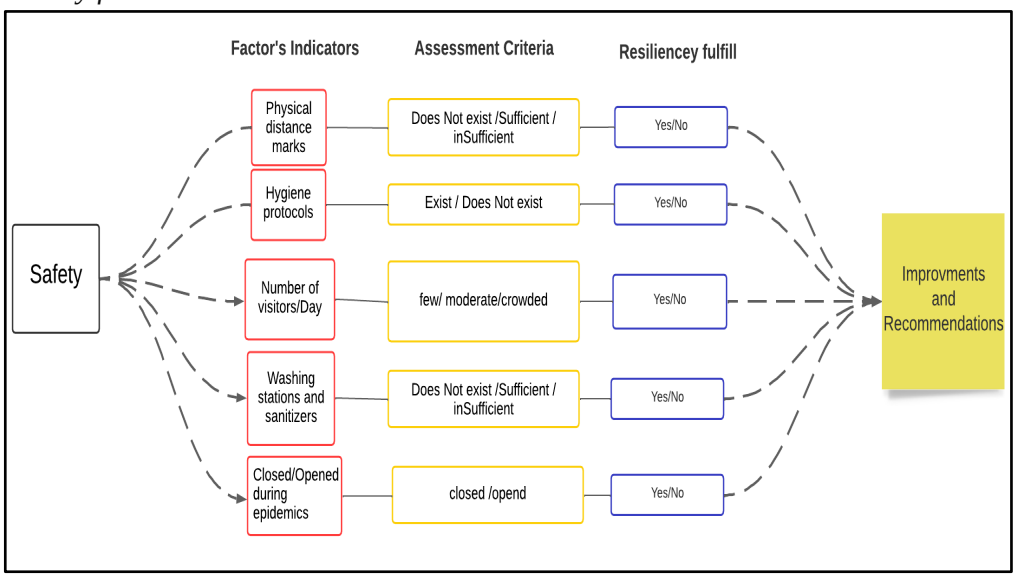
Assessing the safety factor of open public spaces during an epidemic requires considering additional factors beyond those for general safety. Some methods for assessing safety during an epidemic include:

1. Public health guidelines: Adherence to public health guidelines, such as wearing masks, maintaining physical distance, and following hygiene protocols, can help to reduce the risk of disease transmission.
2. Crowd management: Observations of crowd management practices, such as crowd control measures and the ability to regulate the number of people accessing public open spaces, can provide insight into the safety of the space.
3. Hygiene facilities: An assessment of the availability and usage of hygiene facilities, such as hand washing stations and sanitizers, can help to evaluate the level of safety during an epidemic.
4. Emergency planning: Evaluation of emergency plans, including contingency measures for shutting down open public spaces in the event of a health crisis, can provide insight into the level of preparedness for managing safety during an epidemic.
5. User feedback: Surveys and interviews with users of open public spaces can provide valuable insights into their perceptions of safety during an epidemic, including their experiences and any incidents of disease transmission.

It is important to remain vigilant and adapt to changing conditions during epidemics to ensure the safety of open public spaces and the community.

Figure 5

Accessibility factor's indicators and assessment criteria



Source: Author 2022

included in Appendix A, Table A.3 highlights the factors and indicators related to safety within urban areas. It offers insights into the key elements that contribute to creating safe environments for residents and visitors.

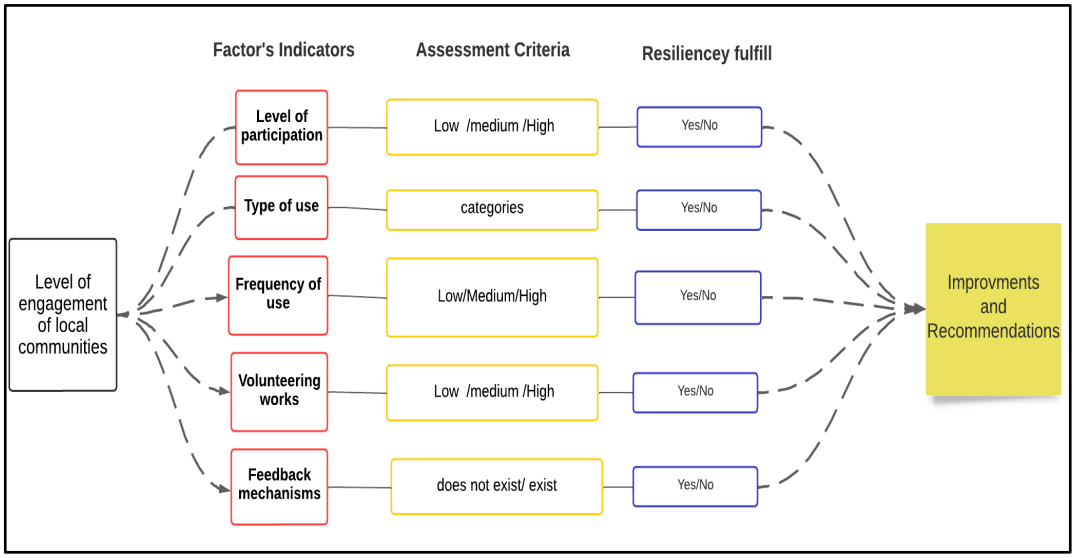
3.3.1.4 The level of Engagement of Local Communities

The level of engagement of local communities in open public spaces can be evaluated using a range of indicators, including:

1. Participation in planning and design processes: The level of participation of local communities in the planning and design processes for open public spaces can provide insight into their level of engagement.
2. Use of public open spaces: Observations of the frequency and diversity of use of open public spaces can provide insight into the level of engagement of local communities.
3. Community-led initiatives: The presence of community-led initiatives, such as volunteer clean-up efforts or neighborhood watch programs, can indicate a high level of engagement of local communities.
4. Feedback mechanisms: The availability and usage of feedback mechanisms, such as suggestion boxes or community meetings, can provide insight.

Figure 6

Accessibility factor's indicators and assessment criteria



Source: Author 2022

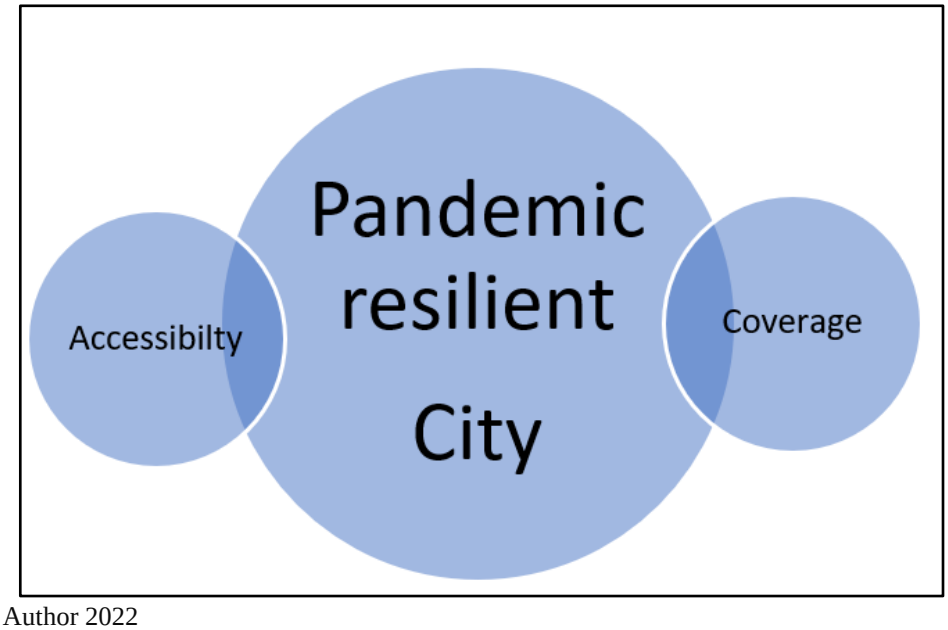
Appendix A includes Table A.4, which presents the factors and indicators that assess the level of engagement of local communities. It provides valuable information for understanding the factors that contribute to active community involvement.

3.3.2 Public Squares

Public squares in Ramallah can be assessed as pandemic resilient based on several factors and this study focused on the accessibility and the size of these squares.

Figure 7

Public Squares resilient city factors



Source: Author 2022

3.4 Resiliency Factors

3.4.1 Disaster Management and Mitigation Factor

Disaster management and mitigation can be achieved through Open public space by considering the following factors: accessibility, quality of public open spaces, safety, and level of engagement of local community. Here are some ways in which each of these factors can contribute to disaster management and mitigation:

1. Accessibility: Open public spaces that are easily accessible to the local community can serve as gathering places during disasters. People can use these spaces to receive assistance, access vital resources, and coordinate with emergency response teams. Additionally, open public spaces that are accessible to people with disabilities and other marginalized groups can ensure that everyone has equal access to support and resources during disasters.
2. Quality of public open spaces: The quality of open public spaces can influence their effectiveness in disaster management and mitigation. Well-designed public open spaces can accommodate large numbers of people, provide shade and shelter, and have appropriate lighting for night-time use. They can also be equipped with facilities such as toilets, water fountains, and waste disposal bins, which are essential during disasters.
3. Safety: Safety is a critical factor in disaster management and mitigation, and open public spaces can play an important role in ensuring people's safety during disasters. Public open spaces that are located away from hazardous areas, such as flood-prone areas or areas at risk of landslides, can provide safe spaces for people to seek refuge. Additionally, public open spaces that are well-lit and have clear sight lines can help deter criminal activity and enhance overall safety.
4. Level of engagement of local community: Engaging the local community in disaster management and mitigation efforts can help build community resilience and reduce the impact of disasters. Open public spaces can serve as venues for community meetings and training sessions on disaster preparedness and response. Additionally, involving local residents in the design and maintenance of public open spaces can help build a sense of ownership and encourage community members to take an active role in ensuring the spaces are safe and accessible during disasters.

3.4.2 Loose Fit Space Factor

Loose Fit Space is a planning approach that emphasizes the flexibility and adaptability of open spaces. This approach can be achieved through Open public space by considering the following factors: accessibility, quality of public open spaces, safety, and level of engagement of the local community.

1. Accessibility: Open public spaces that are easily accessible to the local community can provide opportunities for diverse activities and uses. By making public open spaces accessible to different groups of people, including those with disabilities, the spaces become more inclusive and can accommodate a wider range of activities.
2. Quality of public open spaces: High-quality public open spaces can be designed with multiple functions in mind and can be adapted to suit different activities and events. Open public spaces that are well-designed and equipped with amenities, such as seating, lighting, and shade, can provide a comfortable environment for a wide range of activities.
3. Safety: Safety is an important consideration in Loose Fit Space planning. By designing open public spaces with safety in mind, such as ensuring clear sight lines and designing spaces to minimize crime opportunities, they can be more flexible in their use and accommodate a wider range of activities.
4. Level of engagement of local community: Engaging the local community in the planning and design of public open spaces is essential to achieving Loose Fit Space. By involving community members in the design and planning process, spaces can be designed to meet the needs and preferences of local residents. This can result in open public spaces that are more adaptable, flexible, and responsive to changing needs and uses.

3.5 Scope of Assessment

assessments at both the neighborhood and city level were conducted to provide a comprehensive understanding of the state of **Parks and gardens** in Ramallah. As following:

Neighborhood level assessment: detailed assessment was Conducted of open public spaces within a few selected neighborhoods in Ramallah. Focus on evaluating the accessibility, safety, and the quality of these spaces.

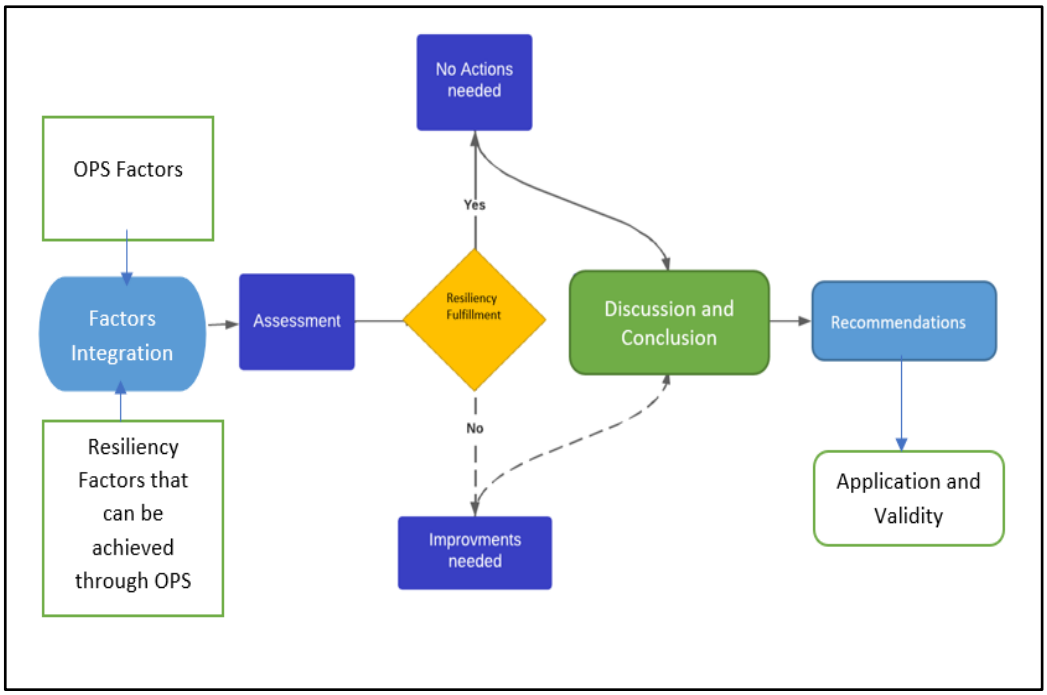
City-level assessment: the scope later was expanded to cover open public spaces across the entire city of Ramallah. By using the data collected at the neighborhood level, along with data from other sources, to conduct a comprehensive evaluation of the open public spaces in the city.

As for the Public squares, it will be an overall assessment at the level of the city.

The evaluation process will go through the following developed framework:

Figure 8

OPS Evaluation Framework for Ramallah City



Source: Author 2022

3.6 Data Collected

The data collected for the evaluation of open public spaces (OPS) in Ramallah during and after the pandemic will depend on the specific goals and objectives of the assessment. However, some common types of data wase collected include:

1. **Maps and satellite imagery:** maps and CAD drawings were used to visualize the locations of open public spaces in Ramallah and to assess their size, layout, and surrounding context.
2. **Existing reports and studies:** existing reports, studies, and surveys related to open public spaces in Ramallah, were used to gather information regarding the categorization of the spaces and their adequacy.

3. **Site visits:** in-person site visits to all OPS were conducted to assess the current state of the spaces in person. that included taking photographs, making observations, and gathering other data such as usage patterns, some accessibility factors and maintenance needs, note to mention, safety measures observations.
4. **Stakeholder engagement:** views and opinions through a (380 P sample) survey from relevant stakeholders, including local residents regarding OPS in Ramallah during, before, and after the pandemic.

2.7 Summary

A framework is developed to evaluate OPS in Ramallah, including their accessibility, quality, safety, and the level of engagement of local communities. Accessibility factors include location, physical accessibility, transportation, parking, signage. Quality factors include amenities, landscape, cleanliness, programming, and user satisfaction. Safety factors include public health guidelines, crowd management, hygiene facilities, emergency planning, health screenings, and user feedback. The level of engagement of local communities These factors are considered for the evaluation Process in the next chapter.

Chapter Four
Study Area Ramallah City:
Urban Planning Development

4.1 Background

Ramallah City is in the central West Bank, serving as the administrative capital of the State of Palestine. it became a place that attracts many people from various regions, environments, and religions, especially those who seek security and safety, Open public spaces are often used as a mode to make cities sustainable from all its three counts: economic, environmental, and social. They are considered as a center for their surrounding localities as well as for the whole West Bank, we can say that the urban sprawl and the population growth in Ramallah has greatly affected the existing open spaces, and with the Past COVID-19 epidemic, the situation has become much more difficult.

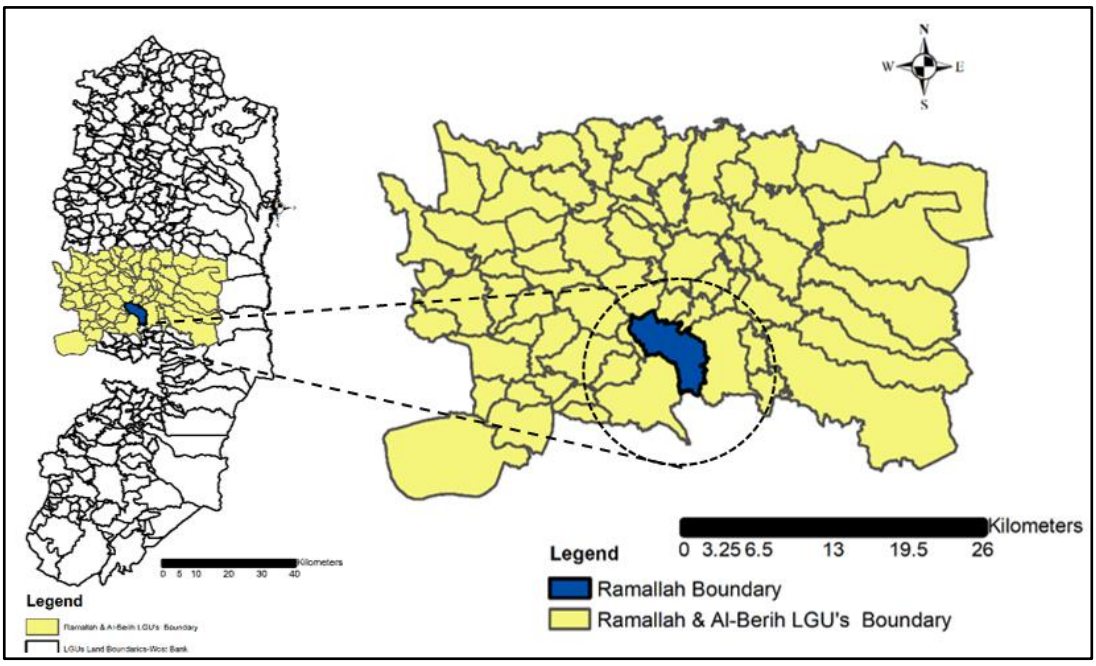
4.2 Ramallah City

4.2.1 Ramallah Location.

Ramallah is a city about 10 miles north of Jerusalem in Palestine. Its altitude is between 830 and 900 meters above sea level (Ghannam, 2006). Ramallah and Al-Berih Governate has 74 localities, having a population of 72117-person based on previous study conducted by (ICUD, 2022), map (1) illustrates the location of localities of Ramallah and Al-Bireh urban area.

Map 1

Ramallah Boundaries and Location



Source: Author 2022

According to the Integrated Cities and Urban Development project (2017-2022), The Palestinian Statistics Center population table A.5 has been modified based on a joint strategic spatial and investment plan that has been developed for Ramallah and Al-Bireh area[1]and by keeping the same percentage used by the Palestinian Statistics Center the correct population number was updated

4.2.2 Ramallah Population

Table (A.5), included in Appendix A, offers an analysis of the demographic changes occurring in Ramallah City and the surrounding areas over the period from 2017 to 2026. It provides valuable insights into population trends and shifts in the region.

The population data for Ramallah City between 2017 and 2026, as presented in this study, was constructed based on the Joint Strategic Spatial & Investment Plan (JSSIP) for Ramallah and Al-Berih Urban area (2021), for the Integrated cities and Urban Development project (ICUD).

In 2017, the population of Ramallah City was 87,473.698, and by 2026, it is projected to

[1] The Palestinian Statistics Center (PCBS) updated based on JSSIP2022

reach 97,310. This represents a significant increase of approximately 11.2% over a 9-year period.

The rate of population growth, however, is not constant across the entire period. The data suggests that the population growth rate is highest between 2017 and 2020, where the population increases by approximately 7.5%. The growth rate then slows down slightly between 2020 and 2026, with a projected increase of around 3.6% over the remaining 6 years.

The population data shows that the rate of population growth slowed down slightly between 2020 and 2022, with a projected increase of around 2.3% over the two-year period. This is significantly lower than the population growth rate between 2017 and 2020, which was approximately 5.5%. The pandemic has led to decreased migration to the city, reduced urbanization, and other factors that have contributed to the lower population growth rate.

The urban growth increase in Ramallah City can be attributed to various factors such as increased urbanization, migration to the city, improved healthcare and infrastructure, and economic growth. It is important to note that urban growth can have both Positive and negative impacts on the city and its residents, including increased pressure on infrastructure and services, environmental degradation, and social inequality. Thus, it is essential to monitor and manage urban growth to ensure its sustainable development and to address the potential negative impacts.

Appendix A Features Table (A.6) that shows the population, master-plan density, and built-up area density of Ramallah city from 2017 to 2033. The ideal density for Ramallah city is 150 persons per square kilometer (MOLG, 2021). Looking at the table, we can see that the master-plan density and built-up area density are both increasing each year. This means that the city's population is also increasing, and the existing built-up area is not keeping pace with the population growth.

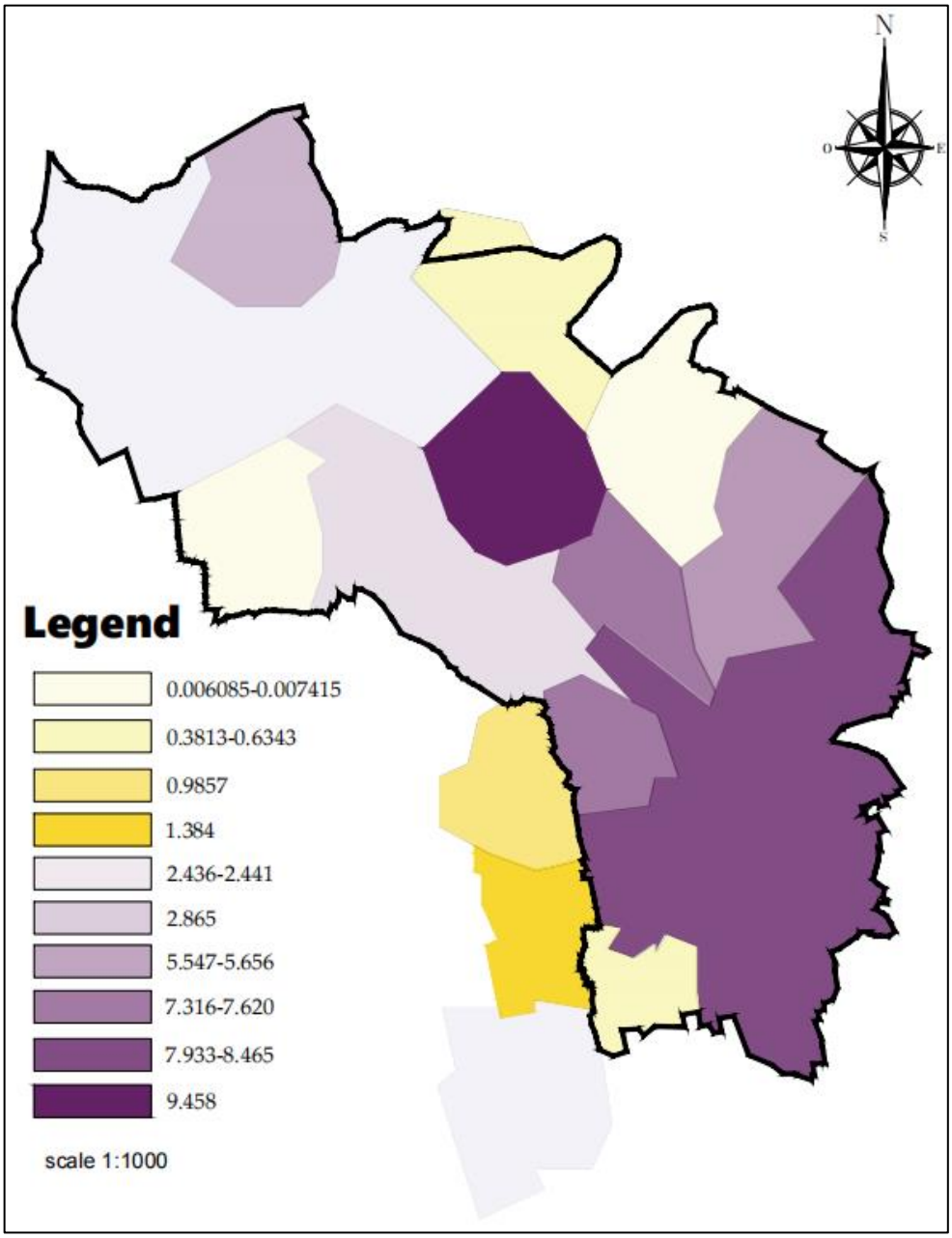
In 2017, the master-plan density was 4085 persons per square kilometer, and the built-up area density was 5409 persons per square kilometer. Both of these numbers are much higher than the ideal density of 150 persons per square kilometer. Over time, the master-plan density is projected to increase steadily, reaching 6275 persons per square kilometer

by 2033. The built-up area density is also projected to increase, reaching 8302 persons per square kilometer by 2033.

This indicates that unless there are changes to the city's planning and development, Ramallah will continue to face overpopulation and overcrowding.

Map 1

population density in relation to spatial distribution2018



Source: Author 2022

According to Ramallah Municipality’s GIS data released in 2018, it is noticeable that the population Density increases in the city center and its environs then starts decreasing as

we move away from the center. In the city center, the population reaches 9.4 per square meter, while it decreases to 0.006 on the outskirts of the city. On the other hand, areas specified for urban expansion are almost uninhabited, while on the ground people began to move towards it.

4.2.3 Planning Development of Ramallah

Ramallah faces urban sprawl, high land prices, and a lack of efficient transport. And that is not limited to specific parts of the city, but rather affect the city as a whole. However, some areas have experienced more intense development pressure than others.

For example, the eastern and southern parts of Ramallah have witnessed significant urbanization in recent years, with new housing developments, commercial centers, and infrastructure projects being built in these areas. The construction of the new Palestinian government compound in Al-Masyoun neighborhood has also led to increased development and land values in this part of the city.

The traffic congestion is due to the increase in registered vehicles that reached up to 91,901 by 2020 and poor urban planning. Ramallah is a city that experiences significant traffic congestion, especially during peak hours. One area that is known for its high levels of traffic congestion is the city center, particularly around the Manara Square and Al-Irsal Street. This area is a commercial hub with many shops, businesses, and government institutions, which attracts a large number of vehicles throughout the day.

The Jordanian master-plan during the 1960s (see map 4) focused on residential and commercial use, accommodating immigrants and refugees. After the Oslo Accords, planning responsibilities were transferred to Palestinian institutions, with regional and local levels of planning. A 2019 master-plan (see map 5) for Ramallah was established under the Ministry of Planning and International Cooperation and the Ministry of Local Government.

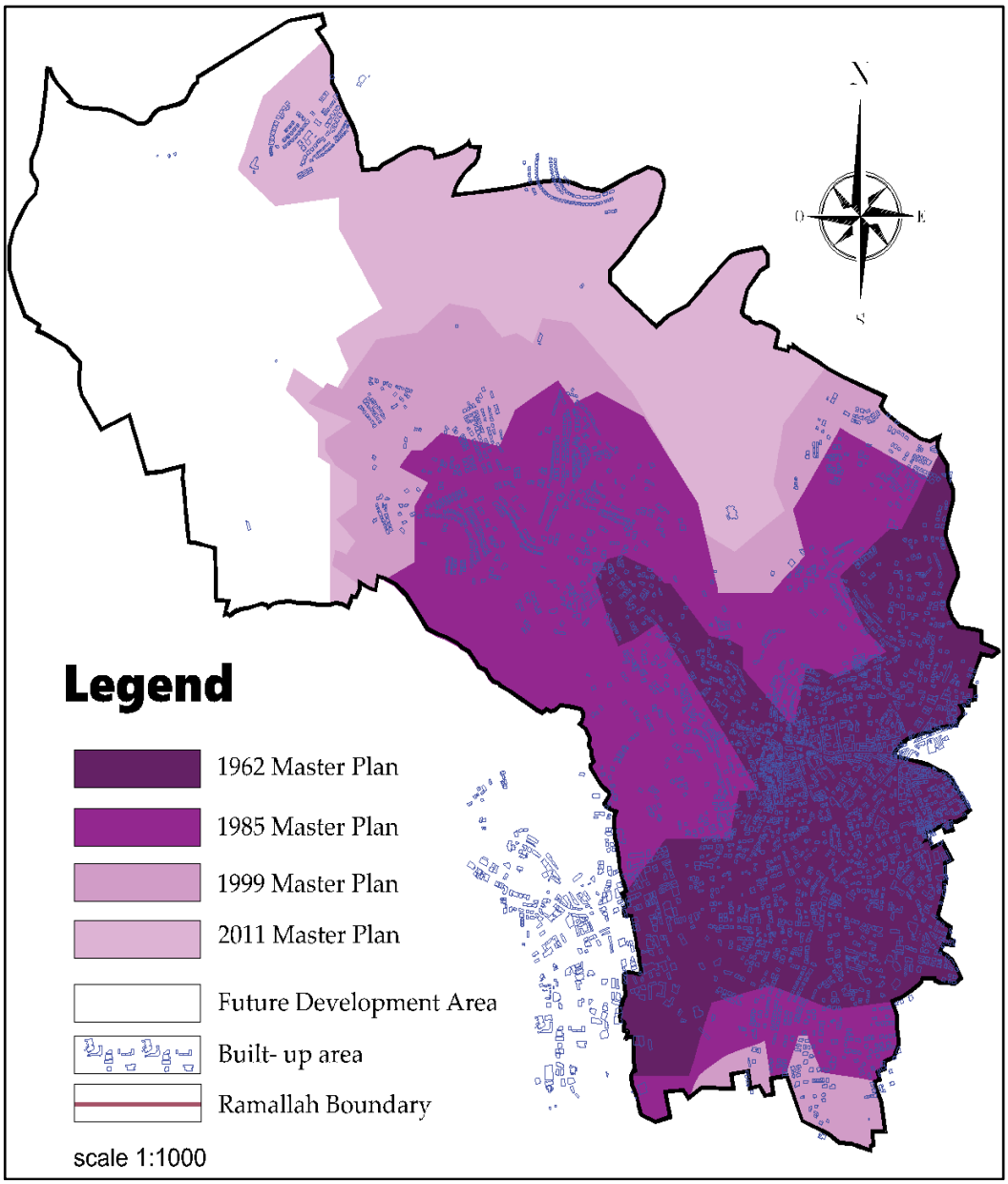
From 1992 to 2004 Ramallah Municipality issued building permits for different uses (commercial and housing) reaching 1,500 donums. The number of households jumped from 6,981 in 1997 to 13,636 in 2010. In 1997, the city planning department prepared a new masterplan to cope with the increasing need for new developments. The plan targeted the city center and the areas surrounding the municipal boundary that were not included

within the old masterplan.

Planning for Ramallah developed to include more than 200 classifications. Looking at the map (3), we can clearly see the rapid urban development in Ramallah, as the area of the current Masterplan is approximately 18,688 dunams, including the expansion areas. the first Masterplan to determine the land uses in 1962 was approximately 4,000 dunums only, therefore Ramallah has witnessed a remarkable development in 50 years, with an estimated area of 12,000 dunums filling.

Map 2

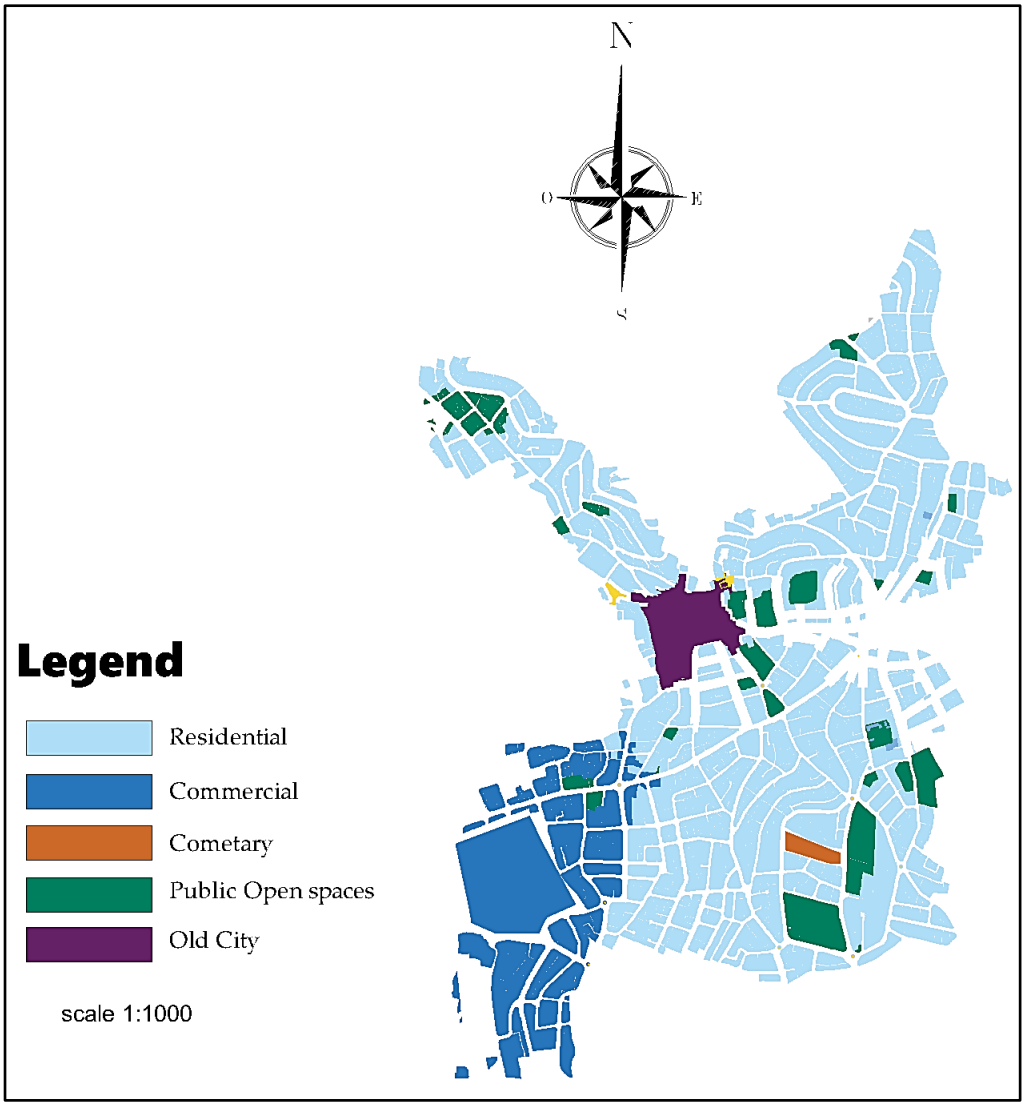
Ramallah Masterplans Development



Source: Author 2022

Map 3

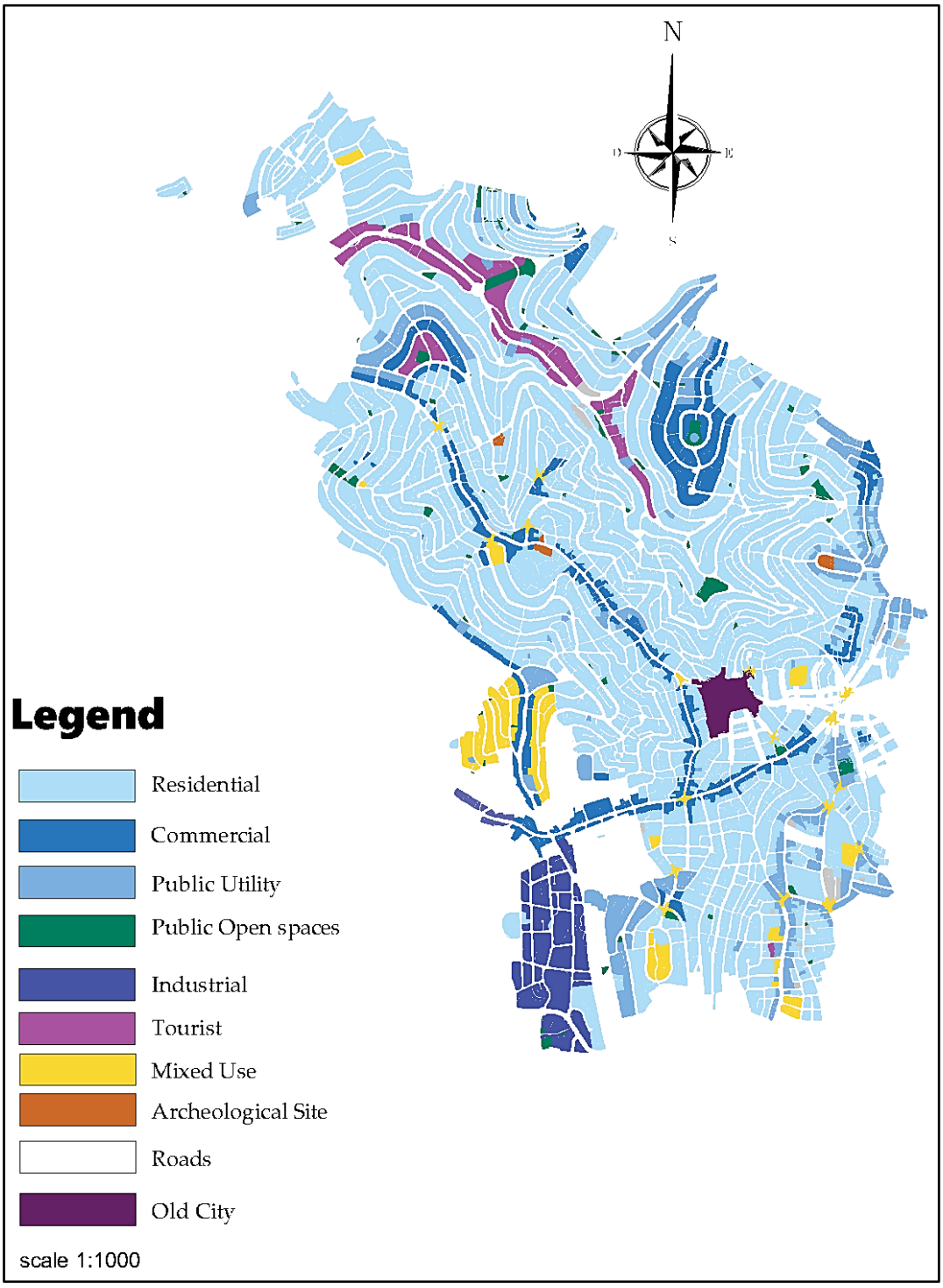
Ramallah masterplan of 1962



Source: Author 2022

Map 4

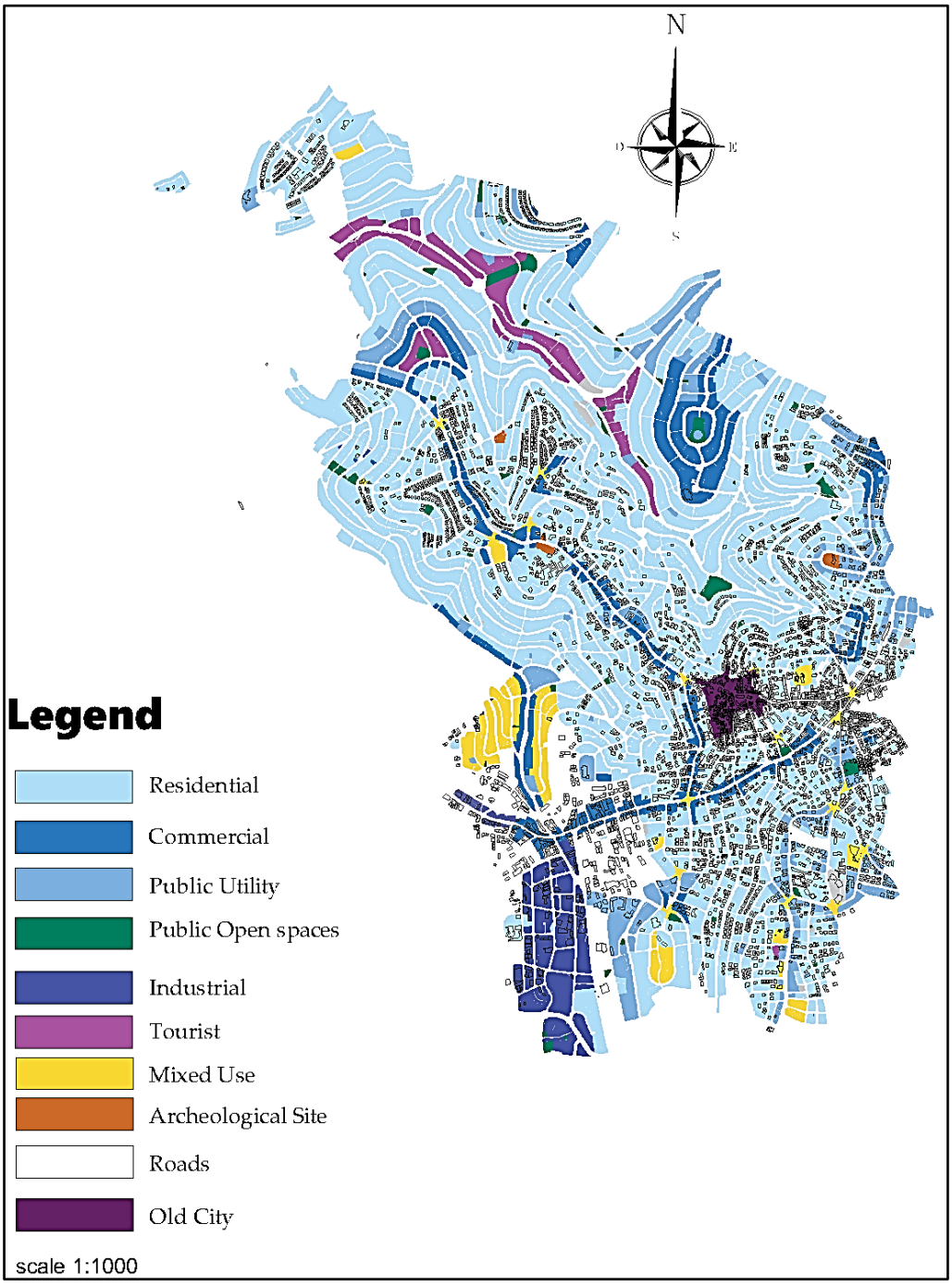
Ramallah city Land Use 2019



Source: Author 2022

Map 5

Ramallah city Land Use with Buildings 2019



Source: Author 2022

Here are some key milestones in the urban development of Ramallah:

- In the 1950s and 1960s, Ramallah was a small town with a population of around 10,000. The first Masterplan was developed in 1962, covering an area of approximately 4,000 dunams.

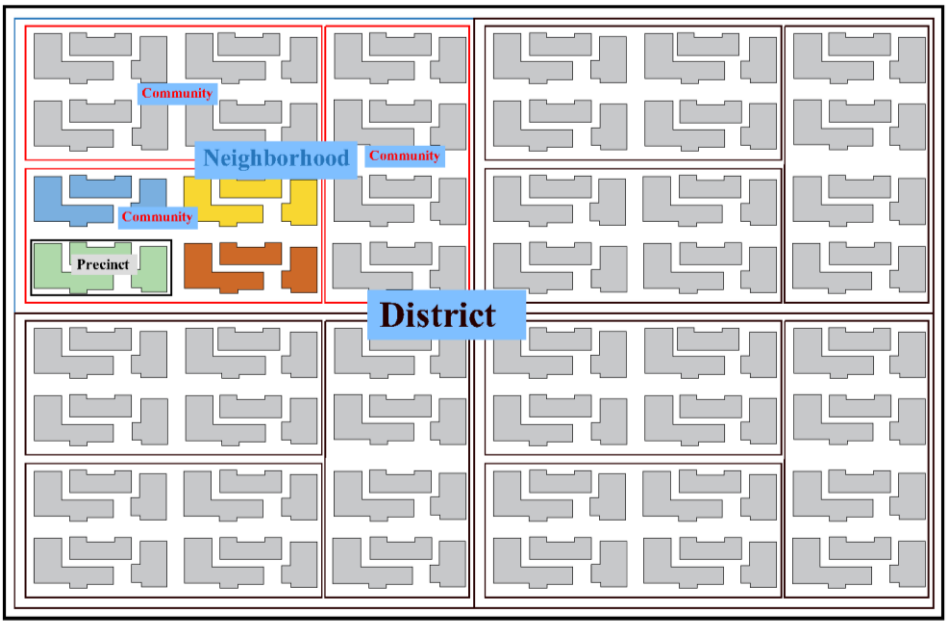
- In the 1970s and 1980s, Ramallah began to experience a period of rapid growth, driven by increasing urbanization and migration from other parts of the West Bank. The city's population grew to around 25,000 by the mid-1980s, and the urban area expanded significantly.
- In the 1990s, following the signing of the Oslo Accords, Ramallah became the administrative capital of the Palestinian Authority. This led to a new wave of urban development, as the city's infrastructure and public services were upgraded to meet the needs of the growing population.
- In the 2000s, Ramallah continued to experience rapid growth, with new housing developments, commercial centers, and infrastructure projects being built throughout the city. The construction of the new Palestinian government compound in Al-Masyoun neighborhood was one of the major development projects during this period. After 2011, minor amendments occurred in 2012, followed by a plan in 2016 and 2017,2019 while maintaining the original expansions borders in 2011 with an area of 14.506 km2, while the area of Ramallah increases to currently be 18.688 km2 according to 2019 masterplan.
- In recent years, Ramallah has faced challenges related to urban sprawl, high land prices, and a lack of efficient transport. The city's current Masterplan, which includes more than 200 classifications, reflects a comprehensive approach to managing urban growth and promoting sustainable development.

Map C.1 in Appendix C shows Ramallah built-up area as the city of Ramallah stands between both Beitunia and Al-Bireh, which limits its expansion in these directions and leaves it with limited directions. as the space available for expansion reaches only 5,000 dunams, and after the exposure of the pandemic, new needs emerged during the planning process, which makes this 5,000 dunams barely adequate.

4.2.4 Proposed planning standards in Ramallah

Figure 9

Hierarchy of Planning Units



Source: The residential community of Palestine according to the Standards and Guidelines Handbook (MOLG, 2021)

Figure 9, sourced from The Residential Community of Palestine according to the Standards and Guidelines Handbook (MOLG, 2021), illustrates the hierarchy of planning units. It provides a visual representation of the different levels of planning units within Palestinian communities.

The residential community of Palestine according to the Standards and Guidelines Handbook (MOLG, 2021) for urban planning in Palestine consists of the following residential and planning units, and service centers in these units are arranged according to Its population size

Table A.7 presents the hierarchy of planning units for Palestinian communities based on population and housing units. It provides a comprehensive overview of the different planning units and their corresponding characteristics. Please refer to Appendix A for Table A.7.

Based on the table, Ramallah is considered to be Large City in the Palestinian context

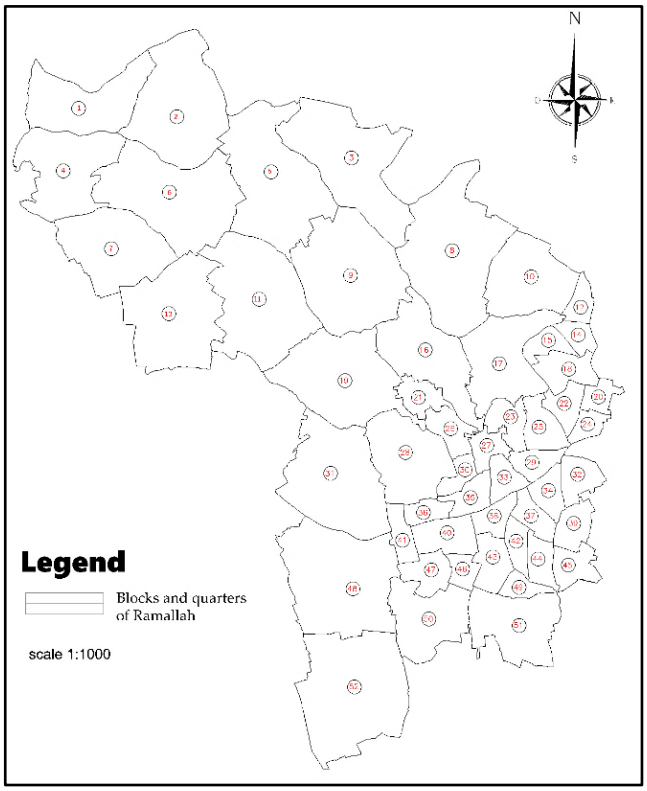
with a total population of 69,180 for the year 2020 since it has been divided into 52 neighborhoods(quarters) of different sizes, and Based on the Palestinian urban planning handbook, Ramallah governate considered to have a medium density sequence, because their population density does not exceed 2092 people per square kilometer (MOLG, 2021).but sooner than later Ramallah will be considered to be Mega City.

Ramallah neighborhoods extend to include future expansion areas as shown in map (9) and table A.8 in appendix A shows the divisions of Ramallah's neighborhoods with their areas.

4.2.5 Ramallah Quarters (Neighborhoods)

Map 7

Ramallah Quarters



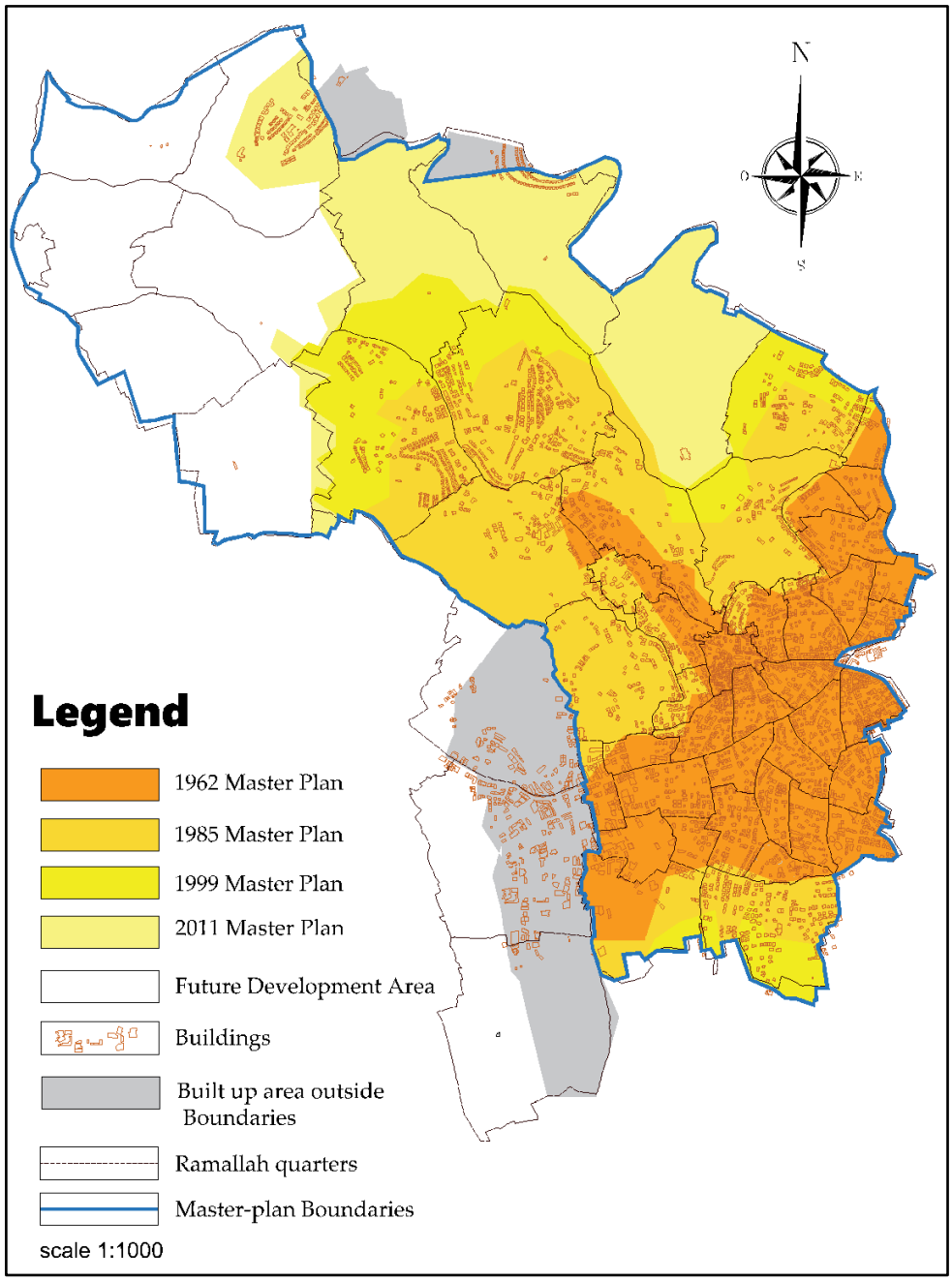
Source: Author 2022

The largest neighborhood in the city of Ramallah, with an approximate area of 1.084 km2 and one housing unit, falls within the boundaries of the master plan approved in 2011, while the smallest neighborhood in Ramallah includes 30 housing units with an area not exceeding 0. 08 km2 and falls within the boundaries of the master plan approved in 1962 as shown in map (8). From what we can notice, the city was divided into neighborhoods

with areas that depend entirely on the number of existing and planned housing units, as the neighborhoods far from the center were divided into areas that accommodate larger housing units for future urban planning, while the existing areas with high population density are divided into very small neighborhoods. So that it is not considered in any future wide-dimensional planning operations.

Map 8

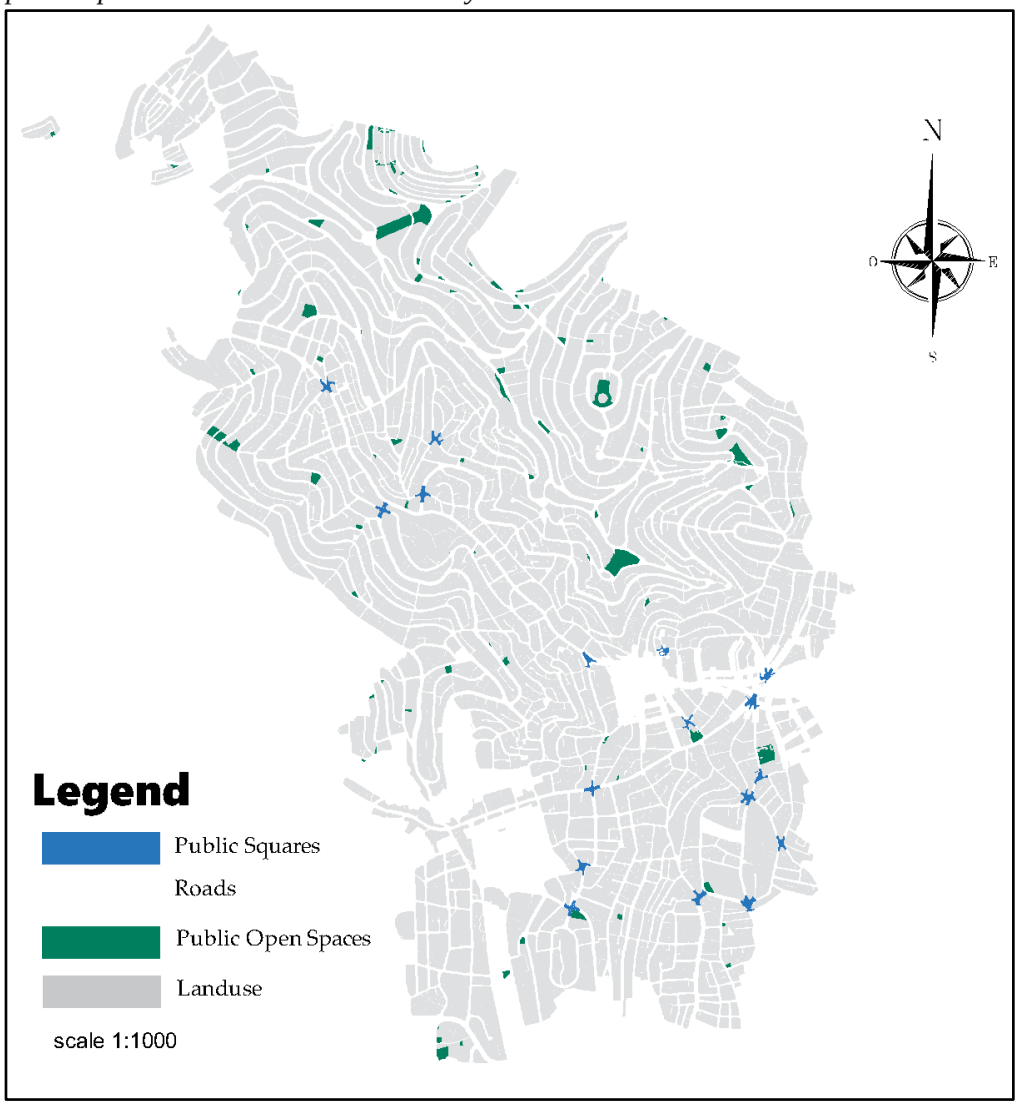
Ramallah Built up Area in Relation to Neighborhoods and Masterplan Development



Source: Author 2022

Map 9

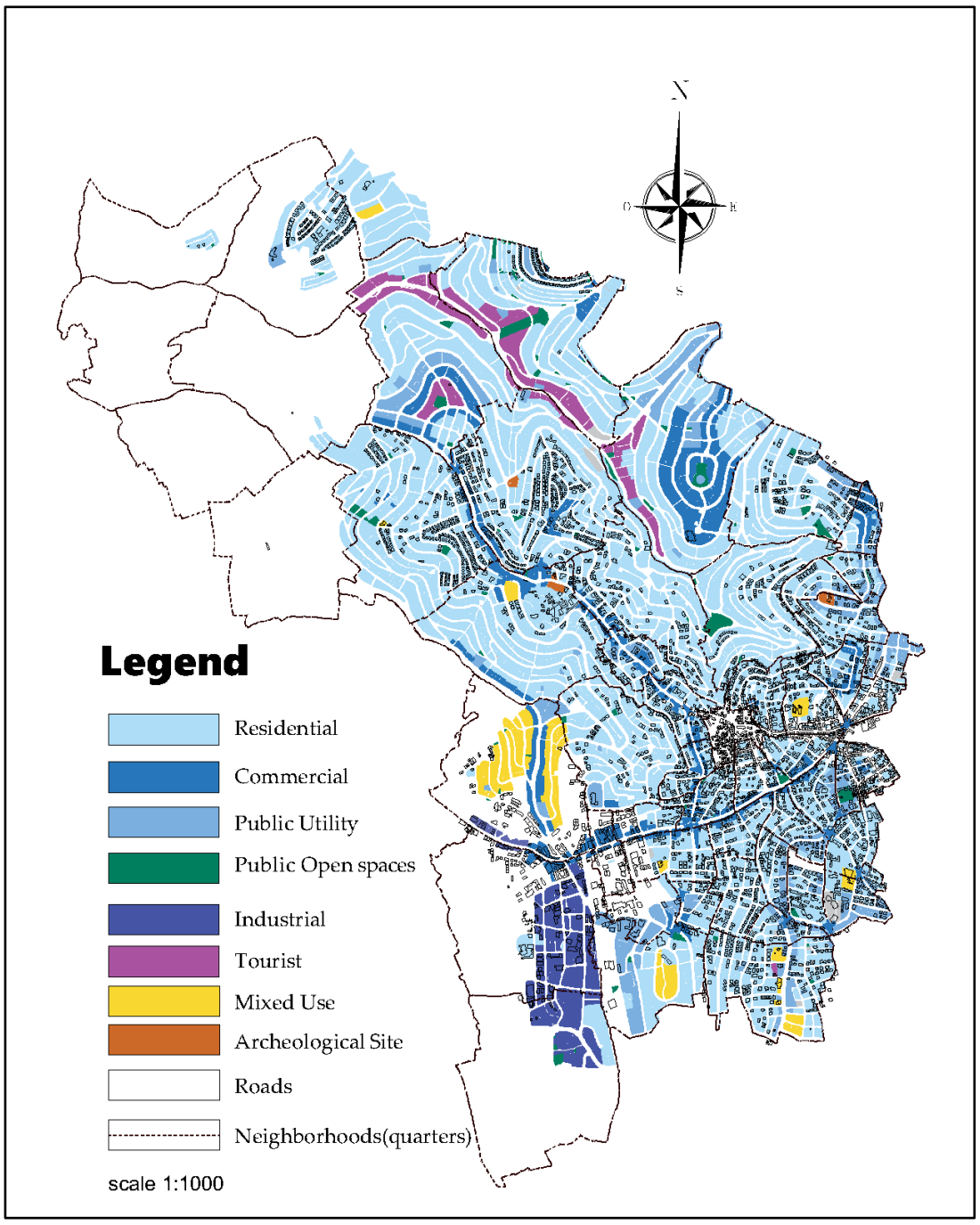
open public spaces Network in Ramallah City.



Source: Author 2022

Map 6

Ramallah's Quarters in Relation to Land Use.



Source: Author 2022

Neighborhood's land use Furthermore, there are 21 maps (mapC.2-mapC.22) available in Appendix C that indicate the neighborhood's land use, including the percentage of Open Public Spaces (OPS) and built-up areas, for all neighborhoods of Ramallah. These maps provide a detailed understanding of the neighborhood-level land use patterns within the city.

4.3 Summary

The built-up area of Ramallah equals 14.506 Km2 divided to Residential (79%), Commercial (6.6%), Public Utility (6%), Industrial (2.6%), Tourist (2.3%), Mixed Use (1.9%), Archeological (0.13%) and OPS of (1.28%). The current master plan of Ramallah’s borders is 18.688 km2. Furthermore, Ramallah has a limited open public space area of only 185,843.70 m2, which is around 1.28% of the built-up area and 0.99% of the total area. These public spaces primarily consist of parks, gardens, and a few random public areas, covering only 21 out of the city's 52 neighborhoods.

Chapter Five
Assessment of Public open space in Ramallah city
Parks, Gardens, Squares

5.1 Open Public Spaces in Ramallah

Open public spaces in this study refer to "outdoor areas in the city that are accessible to the general public, such as parks, public squares, playgrounds, and other recreational areas. These spaces are typically owned, maintained, and operated by the local government or community organizations, and are designed to promote community engagement, physical activity, and social interaction". OPS in Ramallah are distributed at a rate around 1 % of the total area of Ramallah. This percentage is represented by 18 parks and 17 linear squares only and 115 fragmented parcels (left-overs) with a total area Percentage of 1.28% of total built-up.

Map C.23, sourced from the author in 2022, illustrates the relation between parks and squares in Ramallah and their corresponding quarters. It provides a spatial representation of the distribution of these recreational areas within the city. Please refer to Appendix C for Map C.23. For 50 years, many gardens were opened and established, especially the neighborhood gardens, and this all came with Ramallah new quarters as shown in the map (C.23).

Map C.24, sourced from the author in 2022, showcases the positioning of parks and squares in relation to the built-up area in Ramallah. It offers insights into the integration of green spaces within the urban fabric. Please refer to Appendix C for Map C.24. Ramallah municipality's classification of open spaces differs from the international classification due to the limited space and the difference in scale. The previous map shows the distribution of parks and gardens as they are classified and distributed in the Master plan up to 2019.

Map C.26 in appendix C shows that the number of open spaces and parks is barely sufficient with the current and future population density. For example, the number of people per square meter living near Ramallah Municipal Park ranges between (7.89 -8.46) P/m^2 and this park is only 4000 m^2.

5.2 Ardens and Parks Assessment

In this study, I relied on the Standards and Guidelines Handbook for urban planning in Palestine (MOLG, 2021) to classify and evaluate Public Open Space: parks, gardens, and later squares were assessed in relation to accessibility and space, on the other hand there were no regulations for the remained OPS, where the hand book declares that Recreational areas are located in the city or residential community in the form of a hierarchical formation in terms of size, level of service, and the degree of specialization for each of them separately. These graded levels relate to the service-equivalent population. The service does not exist except when it is demanded, represented in the number of residents and the hierarchy of planning units. Figure (B.3) in Appendix A shows the hierarchy of recreational areas at the city or community level.

Table A.9 outlines the criteria used to determine the needs for all garden classifications. It provides a comprehensive overview of the factors considered when classifying gardens. Please refer to Appendix A for Table A.9

Returning to the Palestinian planning guide, the percentage of the urban population in Palestine amounted to 77% (MOLG, 2021), with a population growth rate of 2.4% for all regions and 3.2% in urban areas, and since Ramallah is considered part of an urban area, the population density for the year 2020 reached 2902 people per square km (MOLG, 2021).

Table A.10 categorizes the gardens in Ramallah based on the classifications provided in the Palestinian handbook for urban planning. It offers insights into the different types of gardens found in the city. Please refer to Appendix A for Table A.10.

Map C.25, sourced from the author in 2022, displays the classifications of parks and gardens in Ramallah City. It provides a visual representation of the different categories of parks and gardens present in the city. Please refer to Appendix C for Map C.25.Based on the Standards and Guidelines Handbook for urban planning in Palestine (MOLG, 2021), each residential area (depending on virtual spaces) needs 1.3 % of Precinct gardens, 3.8% of Community Gardens, 3% of Neighborhood gardens, and 3.5% of the residential area gardens , on the other hand , the city of Ramallah 52 Neighborhoods proportions was calculated as following : 1.5 % of Precinct gardens and 1.1% of

Community Gardens, 3.4% of Neighborhood gardens , regardless of their distribution.

5.2.1 Gardens and Parks: Quarter (Neighborhoods) Level Assessment

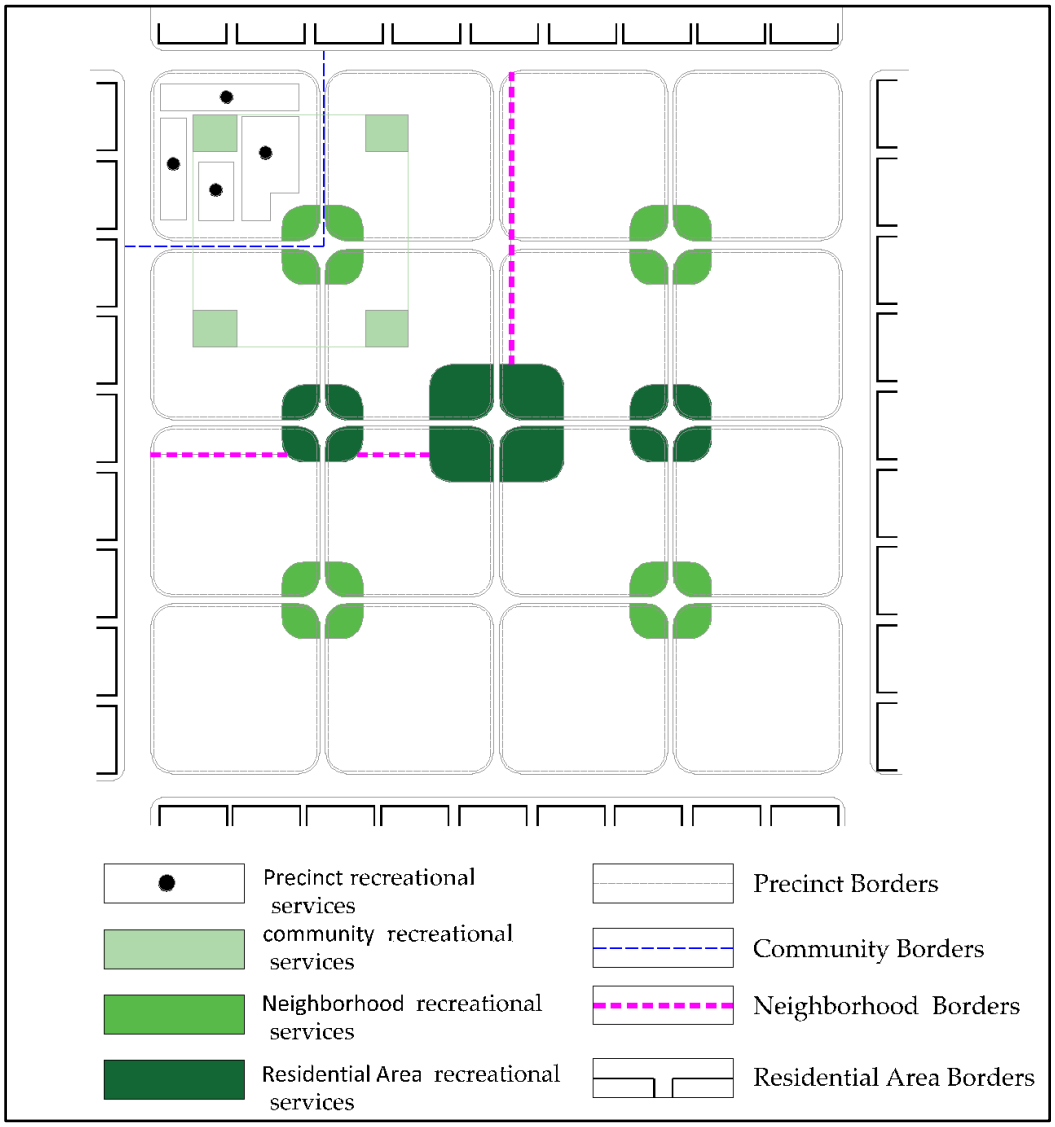
As mentioned in the previous section of this chapter, the city of Ramallah was divided into 52 quarters, and of these quarters there are only 14 that include a garden or an open space for picnicking, we can obviously notice that Ramallah city which equals approximately (18.688 km2) have only one park that is considered district park with an area equals 14500 m2 (Ramallah new park) in quarter No.3 , so, according to the Standards and Guidelines Handbook for urban planning in Palestine (MOLG, 2021) most of open public areas in Ramallah either community or Precinct parks.

Table A.11 categorizes the public gardens and parks in Ramallah City based on classifications at the quarters level. It offers insights into the distribution and types of public gardens and parks across different quarters. Please refer to Appendix A for Table A.11.

Map C.26, sourced from the author in 2022, showcases the population density distribution across the quarters of Ramallah City in 2018. It provides a visual representation of the varying population densities within the city. Please refer to Appendix C for Map C.26. Based on the Hierarchy of recreational areas in this previous section, and depending on the distribution hierarchy of parks at the quarter or neighborhood level only, each neighborhood containing green space only will be analyzed as shown in the following hierarchy:

Figure 10

Hierarchy of Recreational Areas



Source: MOLG, Standards and Guidelines Handbook for urban planning in Palestine 2021

Figure 10, sourced from the Standards and Guidelines Handbook for urban planning in Palestine 2021, presents the hierarchy of recreational areas specifically at the neighborhood level. It visually represents the different levels of recreational areas within neighborhoods. The city of Ramallah is considered a vital city and an important part of Ramallah and Al-bireh urban area, as the actual population cannot be accurately determined, because the number of people entering and leaving is not fixed, but given that the population is constant, we will analyze the neighborhoods that contain either gardens or public spaces only, as the number of neighborhoods that cover this reaches only 14 out of 52 neighborhoods. In this section, parks and gardens current situation is analyzed in the stated neighborhoods, while the other neighborhoods with no recreational

areas will have place in the final recommendations, and this is by returning to the hierarchy of services for the neighborhood according to what was stated in the Palestinian Planning Guide (MOLG, 2021), as only the neighborhood boundaries will be taken in this section.

Map C.27, sourced from the author in 2022, identifies the quarters in Ramallah City that contain parks and gardens. It offers insights into the spatial distribution of these green spaces across the city. Please refer to Appendix C for Map C.27.

In this section, detailed maps and tables are provided to assess both coverage and accessibility for each of the 14 neighborhoods. These resources offer valuable insights into the spatial distribution and level of accessibility within each neighborhood. The following maps and tables, available in Appendixes C (map28-map39) and A (Table A.12-Table A.25)

5.2.2 Gardens and Parks: City Level Assessment

Map C.40, sourced from the author in 2022, displays the accessibility of parks and gardens in Ramallah. It provides a visual representation of the level of accessibility throughout the city. Please refer to Appendix C for Map C.40.

Map C.41, sourced from the author in 2022, illustrates the scope of service provided by parks and gardens in Ramallah. It offers insights into the amenities and facilities available within these green spaces. Please refer to Appendix C for Map C.41. moreover, Tables A.26, A.27, A.28, and A.29 provide valuable information on the per capita share of green areas in Ramallah City, highlighting different categories of green spaces. These tables offer insights into the allocation of space for parks, gardens, and recreational areas at various levels within the city. Please refer to Appendix Afor Tables A.26-A.29.

5.3 Ramallah Open Public Spaces During Covid-19

5.3.1 Safety Measurements During Covid-19 in Ramallah City

Ramallah, like many other cities around the world, has had to adapt to the COVID-19 pandemic and implement measures to limit the spread of the virus. In terms of public open spaces, the Palestinian Authority has taken various steps to maintain safety while also allowing residents to enjoy outdoor activities. Here are some of the measures that have been implemented:

1. **Closure of some public spaces:** all parks except the (Daraj Al-Terih Community space) were closed to prevent the spread of the virus.
2. **Social distancing measures**: As public spaces began to reopen, measures such as social distancing were implemented to limit the number of people in a given area. Signs and markers were placed to remind people to keep a safe distance from others.
3. **Mandatory mask-wearing:** The Palestinian Authority also made it mandatory to wear masks in public spaces, including outdoor areas.
4. **Increased cleaning and sanitization:** The municipality of Ramallah increased the cleaning and sanitization of public spaces to help reduce the spread of the virus.
5. **Promotion of outdoor activities:** To encourage people to spend time outdoors, the Palestinian Authority organized various outdoor activities such as bike tours and hiking trails. These activities were designed to allow people to enjoy the outdoors while still adhering to social distancing measures. And a new Sport track (800 m) was opened during 2021 after the epidemic.

   Map C.42, sourced from the author in 2022, highlights the location of the new sport track in Ramallah City. It provides a visual representation of this newly developed sporting facility. Please refer to Appendix C for Map C.42.
6. **Public education campaigns:** The Palestinian Authority also launched public education campaigns to raise awareness about the importance of following COVID-19 safety measures in public spaces.

   Overall, the Palestinian Authority has taken a range of measures to ensure the safety of residents while also allowing them to enjoy open public spaces during the COVID-19 pandemic.

5.3.2 Survey Data for OPS During and After Covid-19

As mentioned before A survey was administered to a randomly selected sample of 384 individuals in the city of Ramallah, regardless of whether they were residents of the city, from the same city, or from outside the city. The survey aimed to assess the status of open public spaces during, and after the pandemic.

The questionnaire first examined demographic variables, revealing that the number of **females (208)** was greater than the number of **males (176).** Additionally, the majority of the sample (205) fell within the age range of (18-30).

Regarding COVID-19 infection rates, the survey found that a total of **216** individuals from various age groups had contracted the virus, representing **56%** of the population and of the total number of infected individuals**, 36%** were residents of Ramallah, with the remaining percentage distributed among individuals living in nearby areas or visiting the city as showing in table 1. were table 2 shows Distribution of Coronavirus Disease (COVID-19) for sample of 384, by Governorate & Age Group.

Table 1

demographic variables for the sample (384 P)

Gender / Age Groupe	Females		Males		Total		Cumulative %	Sex ratio (Male / Female) *100
	No.	%	No.	%	No.	%		
Younger than 18	22	5.7%	27	7%	49	12.7%	12.76%	122.7%
18-30	120	31.25%	85	22.1%	205	53.38%	66.08%	70.8%
31-40	44	11.45%	34	8.8%	78	20.31%	86.39%	77.27%
41-50	15	3.9%	20	5.2	35	9.11%	95.5%	133.3%
51-60	7	1.8%	10	2.6	17	4.5%	100%	142.8%
Older than 60	0	0	0	0	0	0%	100%	0
Total	208		176		384			

Table 2

Distribution of Coronavirus Disease (COVID-19) for Sample of 384, by Governorate & Age Group

Did you get corona virus during the pandemic?			Age					Total
			less than 18	18-30	31-40	41-50	51-60	
No	Address	Ramallah City	11	45	18	3	2	79
		Ramallah & Al-Berih Governate	8	25	15	5	3	56
		Outside Ramallah & Al-Berih	1	23	7	2	0	33
	Total		20	93	40	10	5	168
Yes	Address	Ramallah City	12	36	15	11	4	78
		Ramallah & Al-Berih Governate	11	45	17	8	3	84
		Outside Ramallah & Al-Berih	6	31	6	6	5	54
	Total		29	112	38	25	12	216

Figure (B.4), sourced from the author in 2022, presents the correlation between people with coronavirus and their age and address. It offers insights into the distribution of COVID-19 cases based on demographic factors. Please refer to Appendix B for Figure (B.4).

According to the results, only 55 indivsual out of the 216 individuals who had contracted COVID-19 had visited open public spacesand followed safety protocols while doing so. The majority of infected individuals did not visit these spaces or leave their homes as shown in the graph.

Figure (B.5), sourced from the author in 2022, illustrates the relationship between people with coronavirus and their visitation frequencies to open public spaces (OPS). It provides insights into the potential impact of OPS visitation on the spread of the virus. Please refer to Appendix B for Figure (B.5). There could be a variety of reasons why most people did not visit open public spaces or participate in outdoor activities during the COVID-19 pandemic in Ramallah city including fear of the virus, government restrictions, lack of information, and personal or family health concerns, and it might be because these OPS are not properly equipped and prepared for such circumstances.

5.4 Gardens and Parks Comprehensive Assessment

Figure (B.6), sourced from the author in 2022, showcases the satisfaction degree of individuals regarding open public spaces (OPS). It offers an assessment of the overall satisfaction levels among users. Please refer to Appendix B for Figure (B.6). In order to assess the level of satisfaction that people have with gardens and open spaces, a general survey was conducted, and later on personal visits were made to each park surveying random People in each and every one of them, during each visit, a general referendum was conducted to assess the level of satisfaction. Moreover, many indicators were assessed during these visits in order to get a comprehensive and detailed picture.

The next four tables provide a comprehensive assessment of different factors related to the accessibility, safety, quality, and utilization of various outdoor public spaces (OPS) in Ramallah, Palestine.

Table 3 focuses on the accessibility factor and evaluates each OPS based on its physical accessibility, transportation, signage and wayfinding, and disability access availability. The OPS are graded on a scale ranging from insufficient to excellent, and several criteria are used to determine their rating. These criteria include the location of the OPS, the availability of public transportation lines, the number of parking lots, the coverage of the OPS, the street connections, the number of entrances, and the availability of disability access.

Table 4 assesses the safety factor and considers the public health guidelines, crowd management, hygiene facilities, and emergency planning of each OPS. It also evaluates the OPS based on its physical distance marks, hygiene protocols, number of visitors per day, washing stations and sanitizers, and whether the OPS is closed or opened during epidemics. The OPS are graded on a scale ranging from no safety measures to very crowded, and the level of safety measures implemented in each OPS is indicated.

Table 5 evaluates the quality of the OPS factor, considering the amenities, landscape, cleanliness, and programming of each OPS. It also assesses the OPS based on its topography, vegetation, trash receptacles, maintenance schedule, and litter. The OPS are graded on a scale ranging from no amenities to heavy litter, and the level of quality of each OPS is indicated.

Table 6 summarizes the level of engagement of local communities with various public open spaces in Ramallah. The factors assessed include participation in planning and design processes, community-led initiatives, feedback mechanisms, level of participation, type of use, frequency of use, and volunteering works. The assessment found that most of the parks have a low level of engagement from the local community.

Table 3

Accessibility Factor Comprehensive assessment

Factor	Location		Physical accessibility		Transportation	[4] Privat Parking	Signage and
OPS	[1] coverage	[2]Street connections	[3] No. Entrances	Disability access availability	(Public transportation Line availability)	(Parking Lots)	wayfinding
Ramallah new park	insufficient	Excellent	Poor	Available	Not available	Insufficient	Available
Redana Forest	Sufficient	Excellent	Good	Available	Not available	Sufficient	Available
Al-Birwa Park	Sufficient	Good	Good	Available	Not available	Insufficient	Available
Ramallah Municipality Park	Sufficient	Excellent	Excellent	Available	Available	Does Not exist	Available
Al-Omam Park	insufficient	Excellent	Poor	Available	Available	Does Not exist	Available
Yousif Qaddora Park	Sufficient	Poor	Poor	Available	Available	Does Not exist	Available
Al-Aela Park	insufficient	Excellent	Good	Available	Not available	Does Not exist	Not available
Al-Qasr Park	insufficient	Excellent	Poor	Available	Not available	Does Not exist	Not available
Bayyarat Al-jadwal Park	insufficient	Good	Poor	Available	Not available	Does Not exist	Not available
Bayyart Al-Masyoon Park	insufficient	Poor	Poor	Not available	Not available	Does Not exist	Available
Bayyaret Al-Terih Park	Sufficient	Excellent	Poor	Not available	Not available	Does Not exist	Not available
Daraj Al-Terih Park	insufficient	Excellent	Good	Available	Available	Does Not exist	Available
San Fernando Park	insufficient	Poor	Good	Available	Not available	Does Not exist	Not available
Een-monjed-albayarrah Park	insufficient	Poor	Good	Available	Not available	Does Not exist	Not available
Kamil Al-Ajlouni Park	Sufficient	Good	Poor	Not available	Not available	Does Not exist	Not available
Al-Zaytoona Park	Sufficient	Good	Good	Available	Not available	Does Not exist	Not available
Al-Kholoud Park	Sufficient	Poor	Good	Available	Not available	Does Not exist	Not available
Al-Amal Park	Sufficient	Poor	Poor	Available	Not available	Does Not exist	Not available

Insufficient: Poor accessibility, with significant barriers or challenges in terms of physical access, transportation options, parking, signage, and disability access. **Poor:** Limited accessibility, with some barriers or challenges in terms of physical access, transportation options, parking, signage, and disability access. **Sufficient**: Adequate accessibility, with some room for improvement in terms of physical access, transportation options, parking, signage, and disability access. **Good**: Above-average accessibility, with relatively few barriers or challenges in terms of physical access, transportation options, parking, signage, and disability access**. Excellent**: Outstanding accessibility, with few to no barriers or challenges in terms of physical access, transportation options, parking, signage, and disability access. (1) coverage: Accessibility factor is poor with limited coverage. (2) Street connections: Accessibility factor is good with sufficient street connections. (3) No. Entrances: Accessibility factor is insufficient with limited entrances. (4) Private Parking: Accessibility factor is available with private parking lots.

Figure (B.7), sourced from the author in 2022, focuses on the accessibility factor of open public spaces (OPS). It highlights the level of accessibility and ease of use for individuals. Please refer to Appendix B for Figure (B.7). Table 3 and the relationships map present an assessment of the accessibility factor for various parks in the Ramallah area. The assessment is based on several factors, including physical accessibility, transportation, parking, signage, and disability access. Each park is assigned a rating of insufficient, poor, sufficient, good, or excellent, based on the level of accessibility it provides. The table also provides information on the availability of public transportation lines, private parking, signage, and disability access.

The results of the assessment indicate that most of the parks in the Ramallah area have either poor or insufficient accessibility. Only a few parks have good or excellent accessibility. Physical accessibility and transportation are the most common barriers to accessibility, with many parks being rated as insufficient or poor in these areas. Parking and signage are also identified as significant barriers to accessibility, with many parks lacking private parking and having insufficient or no signage. Disability access is generally available, but some parks are rated as insufficient in this area.

Overall, the assessment suggests that there is a need for improvement in the accessibility of parks in the Ramallah area. In particular, there is a need to improve physical accessibility and transportation options, provide more private parking, and enhance signage. The assessment also highlights the importance of ensuring that parks are accessible to people with disabilities.

In conclusion, the comprehensive assessment of accessibility factor presented in the table suggests that accessibility of parks in the Ramallah area needs significant improvement in various areas to make them accessible to everyone. This information can be used by the relevant authorities to prioritize their efforts in making the parks more accessible to people.

Table 4

Safety Factor Comprehensive assessment

Factors / OPS	(1) Public health guidelines		(2) Crowd management	(3) Hygiene facilities	(4) Emergency planning
	Physical Distance marks	Hygiene protocols	Number of visitors /Day	Washing stations and sanitizers	Closed/Opened during epidemics
Ramallah new park	Fully implemented and enforced	Partially implemented	Good	Limited and/or not easily accessible	Closed
Redana Forest	Fully implemented and enforced	Partially implemented	Poor	Limited and/or not easily accessible	Closed
Al-Birwa Park	Fully implemented and enforced	Fully implemented and enforced	Excellent	Not Available	Closed
Ramallah Municipality Park	Not implemented	Fully implemented and enforced	Good	Sufficient and easily accessible	Closed
Al-Omam Park	Not implemented	Partially implemented	Good	Sufficient and easily accessible	Closed
Yousif Qaddora Park	Not implemented	Partially implemented	Poor	Sufficient and easily accessible	Closed
Al-Aela Park	Not implemented	Not implemented	Excellent	Sufficient and easily accessible	Closed
Al-Qasr Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Bayyarat Al-jadwal Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Bayyart Al-Masyoon Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Bayyaret Al-Terih Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Daraj Al-Terih Park	Not implemented	Not implemented	Good	Not Available	Closed
San Fernando Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Een-monjed-albayarrah Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Kamil Al-Ajlouni Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Al-Zaytoona Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Al-Kholoud Park	Not implemented	Not implemented	Excellent	Not Available	Closed
Al-Amal Park	Not implemented	Not implemented	Excellent	Not Available	Closed

(1) Public health guidelines: Fully implemented and enforced: Public health guidelines are being followed strictly and enforced; Not implemented: Public health guidelines are not being followed. (2) Crowd management, fully implemented and enforced: Crowd management protocols are being followed strictly and enforced, partially implemented: Crowd management protocols are partially implemented, Not implemented: Crowd management protocols are not being followed. (3) Hygiene facilities, Excellent: Hygiene facilities are of the highest standard and easily accessible.

Good: Hygiene facilities are good, but may be limited in availability or accessibility, Poor: Hygiene facilities are insufficient or not easily accessible, Not Available: Hygiene facilities are not available. (4) Emergency planning: Excellent: Emergency planning is of the highest standard, with all necessary protocols in place, Good: Emergency planning is good, but may have some gaps or limitations., Not Available: Emergency planning protocols are not available or not being followed., Closed: The facility is closed during epidemics.

Figure (B.8), sourced from the author in 2022, examines the safety factor of open public spaces (OPS). It addresses the measures and conditions in place to ensure the safety of users. Please refer to Appendix B for Figure (B.8). safety factor comprehensive assessment evaluated several factors in Table 4 with the relationships map including public health guidelines, crowd management, hygiene facilities, and emergency planning for various parks in Ramallah. The table shows that none of the parks have fully implemented and enforced all four factors. The Ramallah new park and Redana Forest have fully implemented and enforced public health guidelines, but only partially implemented crowd management protocols. Both parks have limited and/or not easily accessible hygiene facilities and are closed during epidemics.

On the other hand, Al-Birwa Park has fully implemented and enforced public health guidelines and crowd management protocols, and has excellent hygiene facilities, although washing stations and sanitizers are not available. The park is also closed during epidemics.

Ramallah Municipality Park has not implemented public health guidelines, but has fully implemented and enforced crowd management protocols and good hygiene facilities that are easily accessible. The park is closed during epidemics.

The remaining parks, including Al-Omam Park, Yousif Qaddora Park, Al-Aela Park, Al-Qasr Park, Bayyarat Al-jadwal Park, Bayyart Al-Masyoon Park, Bayyaret Al-Terih Park, Daraj Al-Terih Park, San Fernando Park, Een-monjed-albayarrah Park, Kamil Al-Ajlouni Park, Al-Zaytoona Park, Al-Kholoud Park, and Al-Amal Park, have not implemented public health guidelines or crowd management protocols. However, these parks have excellent hygiene facilities that are not easily accessible, and they are all closed during epidemics.

Table 5

Quality of OPS Factor Comprehensive Assessmen

Factors OPS	Amenities				Landscape		Cleanliness			Programming Events and concerts
	Playgrounds	[(1)]Seatings area	Toilets	Cafeterias	Topography	Vegetation	Trash receptacles	Maintenance schedule	Litter	
Ramallah new park	Available	Available	Available	Available	High slope	Heavy	Sufficient	Daily	Clean	Available
Redana Forest	Available	Available	Available	Available	High slope	Heavy	Sufficient	Daily	Clean	Available
Al-Birwa Park	Not Available	Not Available	Not Available	Available	High slope	Moderate	insufficient	Daily	Clean	Available
Ramallah Municipality Park	Not Available	Available	Available	Available	No slope	Moderate	insufficient	Daily	Clean	Available
Al-Omam Park	Available	Available	Available	Available	No slope	Moderate	Sufficient	Daily	Clean	Available
Yousif Qaddora Park	Available	Available	Available	Yes	No slope	Moderate	Sufficient	Daily	Clean	Available
Al-Aela Park	Available	Available	Available	Not Available	No slope	Moderate	Sufficient	Daily	Clean	Not Available
Al-Qasr Park	Available	Available	Not Available	Not Available	No slope	Moderate	Sufficient	Daily	Clean	Not Available
Bayyarat Al-jadwal Park	Available	Available	Not Available	Not Available	No slope	Moderate	Sufficient	Daily	Clean	Not Available
Bayyart Al-Masyoon Park	Available	Not Available	Not Available	Not Available	No slope	Moderate	Sufficient	Daily	Clean	Not Available
Bayyaret Al-Terih Park	Available	Available	Not Available	Not Available	No slope	Moderate	insufficient	Daily	Clean	Not Available
Daraj Al-Terih Park	Not Available	Available	Not Available	Not Available	High slope	Light	insufficient	Not scheduled	Not clean	Available
San Fernando Park	Available	Available	Not Available	Not Available	No slope	Moderate	Sufficient	Daily	Clean	Not Available
Een-monjed-albayarrah Park	Available	Not Available	Not Available	Not Available	No slope	Moderate	Sufficient	Not scheduled	Not clean	Not Available
Kamil Al-Ajlouni Park	Available	Available	Not Available	Not Available	No slope	No vegetation	Sufficient	Daily	Clean	Not Available
Al-Zaytoona Park	Available	Available	Not Available	Not Available	No slope	Light	Sufficient	Not scheduled	Not clean	Not Available
Al-Kholoud Park	Available	Available	Not Available	Not Available	Moderate slope	Moderate	insufficient	Not scheduled	Not clean	Not Available
Al-Amal Park	Available	Available	Not Available	Not Available	No slope	Moderate	Sufficient	Daily	Clean	Not Available

Amenities: Available (1), Not Available (0) Landscape: slope between (0% and 15%): 0-15%: Ideal slope for park amenities and activities,16-25%: Moderately steep slope that may limit some park amenities and activities,26-35%: Steep slope that significantly limits park amenities and activities,36% and above: Very steep slope that makes park amenities and activities impractical or impossible, vegetation, Non-existent: There are no visible plants or trees in the park. Poor: There are some plants or trees, but they are sparse, unhealthy, or not well-maintained. Fair: The park has a moderate number of healthy plants or trees, but they are not evenly distributed. Good: The park has a good number of healthy plants or trees, and they are evenly distributed throughout the park. Excellent: The park has a wide variety of healthy plants or trees, including native species, and they are well-maintained and enhance the overall aesthetics of the park. **Cleanliness:** Available: Daily (3), Insufficient (2), Not scheduled (1) Not Available: Not applicable (0) Programming: Available: (1), Not Available (0).

Figure (B.9), sourced from the author in 2022, explores the quality factor of open public spaces (OPS). It assesses the overall quality and design elements that contribute to a positive user experience. Please refer to Appendix B for Figure (B.9). Based on the comprehensive assessment of the Quality of OPS factors showed in both table 5 and the relationships map, the parks in Ramallah vary in their overall quality. The Ramallah new park and Redana Forest are the highest-rated parks, with all four factors (Amenities, Landscape, Cleanliness, and Programming) being available and well-maintained. On the other hand, the Al-Qasr Park, Bayyarat Al-jadwal Park, Bayyart Al-Masyoon Park, Bayyaret Al-Terih Park, and Een-monjed-albayarrah Park have a lower rating due to the absence of important amenities, lack of maintenance, or insufficient programming.

In terms of amenities, all parks except for the Al-Birwa Park and Ramallah Municipality Park have seating areas, and most parks have trash receptacles. However, playgrounds and cafeterias are not available in many of the parks, limiting their attractiveness for families and children. It is recommended to install playgrounds and cafeterias in more parks to improve their amenities.

The landscape factor was rated based on slope and vegetation. Most parks have a no slope or a low slope, which is ideal for park amenities and activities. However, several parks have high or moderate slopes, which may limit some park amenities and activities. Only a few parks, such as Kamil Al-Ajlouni Park and Daraj Al-Terih Park, have no vegetation or light vegetation, indicating that more attention is needed to improve the plant life in these parks.

The cleanliness factor was rated based on the frequency of cleaning, and most parks are cleaned daily, which is a good sign. However, some parks have insufficient cleaning schedules, which can result in litter and unclean facilities. It is important to maintain a daily cleaning schedule for all parks to ensure a pleasant and hygienic environment.

The programming factor was rated based on the availability of events and concerts in the parks. Only a few parks, such as the Ramallah new park and Yousif Qaddora Park, have events and concerts, indicating that more programming is needed to attract visitors and enhance the park experience

Table 6

The level of engagement of local communities Factor Comprehensive assessment

Factors	Participation in planning and design processes	Use of public open spaces		Community-led initiatives	Feedback mechanisms
OPS	Level of participation	Type of use	Frequency of use	Volunteering works	
Ramallah new park	Low	Picnic and playgrounds	Heavy	No	Exist
Redana Forest	Low	Picnic and playgrounds	Heavy	No	Exist
Al-Birwa Park	Low	Walking	Light	No	Does not Exist
Ramallah Municipality Park	Low	Outdoor seatings	Heavy	No	Exist
Al-Omam Park	Low	Picnic and playgrounds	Moderate	No	Exist
Yousif Qaddora Park	Low	Picnic and playgrounds	Heavy	No	Exist
Al-Aela Park	Low	seatings and playgrounds	Very light	No	Does not Exist
Al-Qasr Park	Low	playgrounds	Very light	No	Does not Exist
Bayyarat Al-jadwal Park	Low	playgrounds	Very light	No	Does not Exist
Bayyart Al-Masyoon Park	Low	playgrounds	Very light	No	Does not Exist
Bayyaret Al-Terih Park	Low	playgrounds	Very light	No	Does not Exist
Daraj Al-Terih Park	Low	Gatherings	Light	No	Does not Exist
San Fernando Park	Low	playgrounds	Very light	No	Does not Exist
Een-monjed-albayarrah Park	Low	playgrounds	Very light	No	Does not Exist
Kamil Al-Ajlouni Park	Low	playgrounds	Very light	No	Does not Exist
Al-Zaytoona Park	Low	playgrounds	Very light	No	Does not Exist
Al-Kholoud Park	Low	playgrounds	Very light	No	Does not Exist
Al-Amal Park	Low	playgrounds	Very light	No	Does not Exist

low/light: Little to no engagement observed in any of the factors assessed. light: Limited engagement observed in some of the factors assessed., Moderate: Moderate engagement observed in some of the factors assessed.
High/heavy: High engagement observed in most of the factors assessed. Very high: Very high engagement observed in all of the factors assessed.
Exist: complaining box, Volunteering works indicates cleaning and participating in OPS rehabilitation or renovation.

Figure (B.10), sourced from the author in 2022, depicts the level of engagement of local communities in open public spaces (OPS). It offers insights into the degree of community involvement and participation. Please refer to Appendix B for Figure (B.10). Table 6 with the relationships map provides a comprehensive assessment of the level of engagement of local communities in various public open spaces (OPS) in Ramallah. The assessment is based on four factors, including participation in planning and design processes, use of public open spaces, community-led initiatives, and feedback mechanisms.

The results of the assessment show that little to no engagement was observed in any of the factors assessed in all the OPS evaluated. The level of engagement was low or very light in most of the OPS, with limited or moderate engagement observed in some of the factors assessed in some OPS. There were no OPS where a high or very high level of engagement was observed in most or all of the factors assessed.

Furthermore, the assessment also indicates that none of the OPS had any mechanism for feedback or complaint boxes. Additionally, there were no volunteering works observed for OPS rehabilitation or renovation.

Overall, the assessment highlights the lack of community engagement and involvement in the OPS in Ramallah. The findings suggest that there is a need for increased efforts to encourage community participation and feedback mechanisms to enhance the use and maintenance of the OPS.

5.5 Public squares

Most of the squares in the city of Ramallah are considered crossroads with population centers, and most of the roundabouts in the city of Ramallah are classified as mini roundabouts, whose diameter ranges between 15-25 meters only. It was also considered, during the lockdown in Covid-19 period, as large areas for people to breath and walk. Low-speed modern roundabouts define public spaces as places of shared use: safe, comfortable, and interesting to pedestrians. Unlike polluting, hectic, and ugly signalized intersections, the Possibilities for clean, calm, and attractive round intersections are endless. (KEN SIDES, 2018)

Figure (B.11), sourced from the author in 2022, highlights the best square in Ramallah City. It showcases a notable square that stands out for its design, amenities, or cultural significance. Please refer to Appendix B for Figure (B.11).

Maps C.43 and C.44, sourced from the author in 2022, provide valuable information on Ramallah's public squares. These maps offer a comprehensive view of the city's square network and their proximity within a 25-meter range. They highlight the location, distribution, and density of public squares, providing insights into the availability and accessibility of these communal spaces. Please refer to Appendix C for Maps C.43 and C.44.

5.5.1 Public squares Assessment

public squares can be an important pandemic-resilient resource for communities. and for Ramallah case, we will assess the 17 mentioned squares and because all the squares in Ramallah are considered small, the area of the squares was calculated based on a circle with a radius of 25 meters. Therefore, the area of the 17 squares in the city of Ramallah does not exceed 26,694 square meters, or 0.20% of the total Built-Up area.

Table 7

Coverage and Accessibility of Public Open Squares in Ramallah City

Open public spaces[1]	Area (m square) [1]	Percentage of Ramallah's structural area [1]	Percentage of Ramallah's built-up area [1]	Accessibility [1]	
				Distances from nearest homes (Meters)	Walking time from nearest building (minutes) speed 1.3 m/s
Nelson Mandela Square	1672	0.01%	0.01%	71.6	1
Al-Manarah square	1673	0.009%	0.013%	23	0.30
Yasir Arafat square	1836	0.010%	0.014%	24	0.30
Kareem Khalaf Square	1697	0.009%	0.013%	29	0.40
King Abdallah Square	1648	0.009%	0.013%	44	1
Asra Al-Horryeh Square	1547	0.008%	0.012%	25	0.30
Ahmad Yasin Square	1429	0.008%	0.011%	19	0.25
Haidar Abed-Alshafeiy Square	1464	0.008%	0.011%	22	0.30
Mahmoud Darwish Square	1963	0.011%	0.015%	33	0.40
Azeez shaheen Square	1393	0.007%	0.011%	19	0.25
Al-shabab Square	1700	0.009%	0.013%	19	0.25
Falasteen Square	1781	0.010%	0.014%	25	0.30
Rashid Alhadadeen Square	1175	0.006%	0.009%	15	0.20
Al-Qadera Square	721	0.004%	0.005%	4	0.05
Basheer Al-barghouthi Square	1627	0.009%	0.012%	22	0.30
George Habash Square	1634	0.009%	0.012%	18	0.25
Abu-Ali Mustafa Square	1734	0.009%	0.013%	27	0.35
Totals		0.14%	0.20%		

5.6 Resiliency Factors assessment

Ramallah is considered to be Larg City in the Palestinian context with a total population of 69,180 for the year 2020 since it has been divided into 52 neighborhoods(quarters) of different sizes, and Based on the Palestinian urban planning handbook, Ramallah and Al-Bireh considered to have a medium density sequence, because their population density does not exceed 2092 people per square kilometer (MOLG, 2021).but sooner than later Ramallah will be considered to be Mega City.

After reviewing the previous evaluations of the Ramallah parks, it is apparent that they are currently insufficient. Moreover, with the exception of the Tira Stairs Garden, all of these public parks have been closed during the Corona period. Additionally, they are inaccessible for a significant portion of the year, typically for five months due to maintenance, and when they are operational, their hours of operation are limited. Therefore, it is imperative that the parks in the city of Ramallah be restructured, and their hours of operation scheduled to ensure that people have a venue to enjoy the outdoors and have a picnic, even on sunny winter days. This will alleviate the overcrowding and pressure on open squares such as Al-Manara Square, Nelson Mandela, and other public areas.

Maps C.45 to C.58 provide detailed information on the LFS (Loose Fit Space) and DMaM (Disaster management and mitigation) fulfillment for the parks and gardens in Ramallah. Please refer to Appendix C for Maps C.45 to C.58. Maps show the result of assessment process taking into consideration the rating scale used to assess and describe the parks, where (1 is for Extremely unfulfilled,2=Unfulfilled,3=Nutrel,4=Fulfilled,5=Extremally fulfilled) for both factors, LFS (Loose Fit Space) factor Extracted from (accessibility and Quality of OPS) and DMaM Factor (Disaster management and mitigation) Extracted from (LFS, Safety, and the level of community engagement).

Chapter Six
Conclusion and Recommendations

6.1 Conclusion

OPS in Ramallah are distributed at a rate around 1.28 % of the total area of Ramallah. This percentage is represented by 18 parks and 17 linear squares only and 115 fragmented parcels. with a total area Percentage of 0.98% of total built-up.

Upon assessing 19 parks, it was discovered that one of them does not physically exist (Ein-Muzrab Park), although the city of Ramallah's electronic maps and structural plans still classify it as a park. It was also observed that the 18 park closes between (November-March) for maintenance every year not just after the pandemic. Moreover, 72% of the parks are unsuitable for Disaster management or mitigation, with 45% of them failing to meet the requirements of being Losse Fit Spaces for all aspects of, including disaster relief.

In conclusion, the comprehensive assessments presented in Tables 3, 4, 5, and 6 provide valuable insights into the accessibility, safety, quality, and community engagement of public open spaces in the Ramallah area. The assessments highlight that there is a need for significant improvements in various areas to make the parks more accessible to everyone. Physical accessibility, transportation options, and signage are identified as the most common barriers to accessibility, while the implementation of public health guidelines and crowd management protocols is inadequate. Furthermore, the assessments revealed that more amenities, maintenance, and programming are needed to enhance the quality of parks and attract visitors. Finally, the assessments suggest that there is little to no engagement of local communities in the planning, design, and feedback mechanisms of public open spaces. The information provided by these assessments can be used by the relevant authorities to prioritize their efforts in making the parks more accessible, safe, and engaging for the local community. Overall, the assessments call for a comprehensive approach that considers all factors to ensure that public open spaces in the Ramallah area meet the needs and expectations of all residents.

it is clear that Ramallah is in need of more public parks, and the existing parks require improvement. It is essential to restructure the parks and schedule their hours of operation to provide people with access to outdoor areas throughout the year. By improving the

parks, Ramallah can provide its residents with safe, accessible, and enjoyable outdoor spaces.

6.2 Improvements and Recommendations

As a crisis, Covid-19 has been a universal experience with local dimensions depending on where you are. Access to open space, places for recreation and fitness and children's play, have all become new priorities for many. It follows a sustained yet subdued discussion on how to improve the well-being of the citizens and residents
For the case of Ramallah, we can clearly see that the municipality did not utilize OPS to serve people during the epidemic, this study offers some recommendations for future planning and design of OPS in terms of resilience.

1. **Increase the number of OPS**: Ramallah's Open public spaces (OPS) currently occupy around 1.28% of the city's total area, which translates to around 2 square meters per capita for the year 2022. If this percentage remains unchanged by 2035,as shown in table 7 the per capita share of OPS is estimated to decrease to 1.7 square meters per person. This is significantly lower than the World Health Organization's recommended minimum of 15 square meters per person of public parks and gardens, indicating that the current OPS percentage only covers **13% of the city's total population**. Therefore, there is a need to increase the number of OPS in the city to ensure that every resident has access to a nearby public space.

Table 8
OPS scenarios for future development

Item	Current situation 2022	Future scenario 2035	Targeted scenario 2035
Open public spaces area	157,195.3 m2	157,195.3 m2	1,379,205 m2
Population	72118	91,947	91,947
Per capita share	2 m2/P	1.7 m2/P	15 m2/P
Population coverage	13.3%	11.3%	100%
Needed Area	0.9 km2	1.2 km2	0 km2

There are multiple ways in which the required 1.2 square kilometers of open public spaces can be incorporated into the preparation of the Master plan for future development.

- **Design for New OPS's:** and this is mainly the municipality responsibility to enhance the built-up areas with new Open public spaces that can uplift the city and make it pandemic resilient showed in models in map C.59 in Appendix C.

Beyond formally designated open spaces like parks and playgrounds, it's valuable **to plan for and maximize informal open spaces** such as spaces between buildings, and terraces. As we start to consider how to design resilient cities, we should look to these private and semi-private spaces such as balconies, and courtyards to provide additional options for outdoor activity.

ap 70, sourced from the author in 2022, showcases the design plans for new open public space (OPS) interventions in Precinct (Neighborhood 10). It offers visual representations of the proposed design elements and interventions aimed at enhancing the OPS in this specific precinct. Please refer to Appendix C for Map C.60. Community wellbeing in future depends on our taking a joined-up approach to the use of space. A well thought-through Open Space Strategy at a city or master plan level can be an important tool in identifying and providing an appropriate mix of open spaces to meet a community's needs, catering for a variety in size, public access, and function to fulfill the "Loose Fit" space and design for everyday use.

Map C.61, sourced from the author in 2022, illustrates the integration of private outdoor spaces into building designs, specifically focusing on a sample from Neighborhood 110. It showcases how private outdoor areas are incorporated into the architectural designs of buildings within this neighborhood. Please refer to Appendix C for Map C.61. For Ramallah city, it is common to see mid/high rise buildings without balconies or windows that open fully. However, private and semi-private outdoor spaces such as balconies, courtyards, and podiums are highly valued as they offer a respite from the confines of internal spaces and provide opportunities for socializing with neighbors, reinforcing a sense of community.

Based on Palestinian handbook for urban planning these are the needed areas for each neighborhood:

Table 9

Needed Percentages of Gardens and Parks in Ramallah City in reference to the Palestinian handbook of urban planning-City Level

	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0.012%	0.1%	0.1%	0.1%
Targeted percentage	1.3%	3.8%	3%	3.5%
Needed Percentage	1.288%	3.7%	2.9%	3.4%

Table 10

Needed Percentages of Gardens and Parks in Ramallah City in reference to the Palestinian handbook of urban planning-Neighborhood Level (sample-Neighborhood 10)

Area of Neighborhood=533 Dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed Area	586 m2	0 m2	7,144 m2	
Targeted Area	7,997 m2	5,865 m2	18,127 m2	
Needed Area	7,411 m2	5,865 m2	10,983 m2	

Undeveloped plots within the city could be transformed into parks, improving the quality of life for local residents and making the community more attractive to owners and tenants. This investment would benefit both residents and developers, making Ramallah city a more appealing place to live and work as shown in Map C.62, sourced from the author in 2022, showcases the use of left-over spaces and proposes new parks and gardens. It offers insights into the creative utilization of unused or underutilized areas and presents plans for the development of new parks and gardens. Please refer to Appendix C for Map C.62.

2. **Improve maintenance:** The fact that 18 parks close for maintenance between **November-March** every year can be seen as a major inconvenience for residents who rely on these spaces for their recreational needs. Thus, the maintenance schedule could be applied by a kind of Rotation system /monthly (two parks per month could be scheduled) to ensure that these spaces remain open throughout the year and especially during epidemics. As for winter time the parks can be opened under supervision and with necessary equipment's and shades, especially in the sunny days as people defiantly need an outlet.
3. **Ensure accuracy of park information:** It is crucial to ensure the accuracy of information regarding the existence and classification of parks in the city. Inaccurate

information can lead to confusion and waste of resources. Therefore, it is recommended to update the city's electronic maps and structural plans to reflect the actual status of parks in the city.

Map C.63, sourced from the author in 2022, highlights the improvements made to new parks in Ramallah. It showcases the enhancements, renovations, or additions that have been implemented to enhance the quality and functionality of these parks. Please refer to Appendix C for Map C.63.

Map C.64, sourced from the author in 2022, showcases the specific improvements made to Redana Park. It highlights the enhancements, renovations, or additions that have been implemented to enhance the quality and functionality of this park. Please refer to Appendix BC for Map C.64.

6.3 Summary

In summary, the study found that Open public spaces (OPS) in Ramallah occupy around 1.28 **%** of the city's total area, which is inadequate for the city's population. Out of the 18 parks and 17 linear squares, one park does not physically exist, and **72%** of the parks do not fulfill disaster management or mitigation factors. The study offers several recommendations, including increasing the number of OPS, designing for new OPS, improving maintenance, ensuring accuracy of park information, retrofitting parks for disaster management, and investing in new technology. These recommendations aim to enhance the city's built-up areas, make it pandemic resilient, and improve the quality of life for local residents.

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Appendices

Appendix A

Tables

Table A.1

Accessibility Factors and indicators

Factor No.	*Factor*	*Factors indicators*	*Assessment Method*
1	Location	Coverage /Street connections	Maps and Collected Data
2	Physical accessibility	No. of Entrances /Disability Access	Observation and survey
3	Transportation	Public Transportation	Observation and survey
4	Parking	Parking Lots	Observation
5	Signage and wayfinding	Signs and advertisements	Observation

Table A.2

Quality of open spaces Factors and indicators

Factor No.	Factor	Factors indicators	Assessment Method
1	Amenities	Playgrounds/seating area/Toilets/Cafeterias	Observation and survey
2	Landscape	Topography/Vegetation	Maps
3	Cleanliness	Trash receptacles/ Maintenance schedule/ Litter	Observation and survey
4	Programming	Events and concerts	Observation
5	User satisfaction	User satisfaction	Observation and survey
6	Design	The overall design of the OPS	Maps analysis

Table A.3

Safety Factors and Indicators

Factor No.	Factor	Factors indicators	Assessment Method
1	Public health guidelines	Physical distance marks / Hygiene Protocols	Observation and survey
2	Crowd management	Numbers of Visitors/Daily	Observation and survey
3	Hygiene facilities	Washing stations and sanitizers	Observation
4	Emergency planning	Closing during epidemic	Observation and survey

Table A.4

The level of engagement of local communities Factors and indicators

Factor No.	Factor	Factors indicators	Unit of factor
1	Participation in planning and design processes	Level of participation	Observation and collected data
2	Use of public open spaces	Type and frequency of use	Observation and survey
3	Community-led initiatives	Volunteering works	Observation
4	Feedback mechanisms	Complaints box…etc.	Observation

TableA.5

Analysis of the demographic changes of Ramallah city and the surrounded areas from 2017 to 2026

Study area	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2017-2020	2017-2026
Ramallah	76341	78459	80636	82874	85174	87473	89835.	92261	94752	97310	↑7.5%	↑11.2%
Betonia	41823	42984	44176	45402	46662	47922	49216	50545	51909	53311	↑7.5%	↑11.2%
Al-Berih	94946	97580	100288	103071	105931	108791	111728	114745	117843	121025	↑7.5%	↑11.2%

Explanations:

↑ population growth.

↓ population Decline.

Table A.6

Ramallah density changes based on master-plan and Built-up area from 2017 to 2033

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Population	76341.	78460	80637	82874	85174	87474	89835	92261	94752	97310	99938	102636	105407	108253	111176	114178	117261
Master-plan density	4085	4198	4315	4435	4558	4681	4807	4937	5070	5207	5348	5492	5640	5793	5949	6110	6275
Built-up area density [1]	5409	5559	5713	5872	6030	6193	6360	6532	6708	6889	7075	7266	7463	7664	7871	8084	8302

[1] the density in the table is calculated considering that it is the same in any part of Ramallah with an annual rate of 2.7% for the population (MOLG, 2021).

Table A.7

the Hierarchy of planning units for Palestinian communities according to population and housing units

Planning unit	Consisting of	Population	Housing Units
Precinct	Housing Units	10-750	2-150
Community	3-5 Precinct	1,500-3,000	300-600
Neighborhood	3-5 communities	4,500-9,999	900-1,800
Intermediate City	3-7 Neighborhoods	10,000-39,999	2,000-8,000
**District	3-5 Neighborhoods	12,000-20,000	2,400-4,000
Larg City	Districts (2 districts minimum)	40,000-100,000	8,000-20,000
Mega City	Districts (4 districts minimum)	>100,000	>20,000
** Districts are used only in cases of large and Mega cities (population more than 40 thousand people)			

Table A.8

Ramallah quarter's Areas

Quarter name	Quarter Number	Area (m2)	Quarter name	Quarter	Area (m2)
Al-Khanouq	1	576.452	Old City	27	107.087
Al-Askaryeh	2	890.078	Batn Al-Hawa	28	536.391
Al-Juhair	3	911.828	Al-Moghtrbeen	29	112.751
Al-Mwajeer	4	628.462	Batn Al-Hawa	30	83.900
Kherbet Al-Bad	5	994.614	Ein Tarfedia	31	865.825
Al-Dour	6	957.124	Qaddora	32	143.178
Dahr Al-Oqdeh	7	644.769	Mar Jurais	33	111.582
Al-Krena'ah	*8	1083.286	Al-Nuzha	34	120.208
Khallet Adas	9	965.489	Al-Qastal	35	124.428
Radana	10	533.139	Dar Jaghab	36	89.919
Sho'ab Al-Samaqa	11	957.772	Al-Husain	37	114.392
Dar Jurais	12	89.700	Al-Nasir	38	110.479
Al-Oqdeh	13	827.444	Bour Sa'eed	39	135.914
Al-Hasasneh	14	84.678	Jamal Abed An-Naser	40	196.462
Al-Jabal	15	99.137	Al-Sina'eh	41	109.954
Al-Jadwal	16	600.030	Dar Awwad	42	96.394
Ein Al-Karzam	17	566.242	Ein Monjed	43	162.089
Al-Carmel	18	175.598	Al-Masyoun	44	116.927
Al-Terih	19	842.114	An-Nahdah	45	144.388
Al-Msayef	20	85.663	Ash-Shaqrah	46	82.196
Al-Terih	21	128.981	Al-Muraijmeh	47	151.995
Al-Ameera Aliah	22	120.893	Al-Batn Al-Sharqi	48	1005.562
Al-Qadeera	23	143.948	Dar Yousef	**49	80.192
Al-Fanadiq	24	77.507	Khallet T'aimeh	50	446.343
Ghassan	25	163.300	Al-Masyoun	51	497.000
Ibrahim	26	141.034	Wadi Ad-Dair	52	1057.963
* Largest quarter, **smallest quarter					

Table A.9

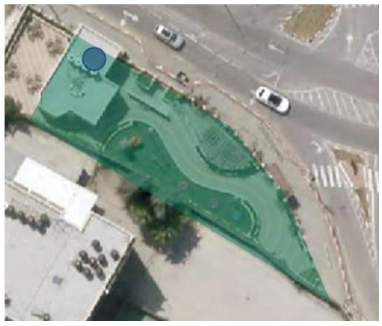
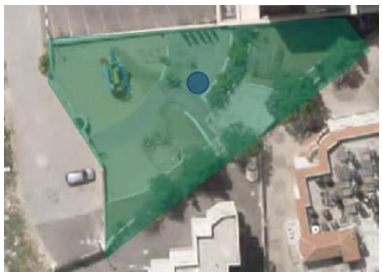
Criteria for determining needs for all garden classifications

Group	Definition	Served population	Scope of service (m)	The per capita share of the total area (m^2)	Area of the garden (m^2)
Precinct gardens	It is called the semi-public green area and it is located between the residential building and the public green areas, and it acts as a transitional area between the interior of the building, public green areas and roads.	5-750	100-200	0.3-0.8	<600
Community Gardens	It is at the level of the center of the Community, and its area is calculated based on the number and density of the population in the Community.	1500-3000	200-350	0.8-1.66	600-4980
Neighborhood gardens	This type of garden represents a large part of the green space in cities. This type of garden includes both quiet recreation such as picnics, sitting, etc., and recreation accompanied by movement and sports for children and adults.	4500-9000	400-800	0.5-1.00	4980 - 9000
District gardens	These gardens come second after parks, as they serve several residential neighborhoods of the city, and visitors move to them from different locations. And its area is extended and not small	12000-20000	2500-5000	0.7-1.2	9000-24000
City gardens	This park serves the residents of the city or the population group and the residents of the neighboring areas.	>20,000	5000-10000	1-2	24,000-40,000

Table A.10

Ramallah Gardens classifications based on the Palestinian handbook for urban planning

Park or garden	Park Map	Area (m2)	Categorization	Neighborhood Name
Ramallah new park		14,500	District garden	Al-Juheer
Yousif Qadora Park		8,171	Neighborhood gardens	Qaddora
Redan Forest		7150	Neighborhood gardens	Redana
Al-Birwa Park		3400	Community Gardens	Khallet T'emeh
Ramallah Municipality Park		4000	Community Gardens	Mar Jerias

Al-Omam Park		2200	Community Gardens	Dar Awwad
Al-Aela Park		640	Community Gardens	Al-Qastal
Al-Qasr Park		680	Community Gardens	Sho'ab al-sommaqa
Bayada Al-jadwal Park		780	Community Gardens	Ein Al-Karzam
Bayyart Al-Masyoon Park		630	Community Gardens	Al-masyoon

Bayyaret Al-Terih Park		870	Community Gardens	Al-Terih
Daraj Al-Terih Park		675	Community Gardens	Al-Terih
San Fernando Park		1330	Community Gardens	Batn Al-hawa
Een-monjed-albayarrah Park		930	Community Gardens	Al-Masyoon
Kamil Al-Ajlouni Park		300	Precinct gardens	Al-Qastal

Al-Zaytoona Park		460	Precinct gardens	Khallet Al-Adas
Al-Kholoud Park		600	Precinct gardens	Radana
Al-Amal Park		400	Precinct gardens	Al-Jadwal

Table A.11

public gardens and parks classifications on the quarters level

Quarter	Precinct gardens	Community gardens	Neighborhood Parks	Districts gardens	Gardens total Area (dunums)	Quarter Area (dunums)	Public space area /Quarter area percentage
3	-	-	-	1	14.50	912	1.58%
9	1	-	-	-	0.456	965.50	0.047%
10	1	-	1	-	7.776	533.14	1.46%
11	-	1	-	-	0.682	957.77	0.07%
16	1	-	-	-	0.403	600.0	0.07%
17	-	1	-	-	0.780	566.242	0.14%
19	-	2	-	-	1.55	842.11	0.18%
28	-	1	-	-	1.33	536.40	0.25%
32	-	1	-	-	8.17	143.18	5.71%
33	-	1	-	-	3.69	111.58	3.31%
35	2	1	-	-	1.07	124.43	0.86%
44	-	1	-	-	2.156	116.93	1.84%
50	-	1	-	-	3.42	446.34	0.77%
51	-	2	-	-	1.558	497.00	0.31%
Total	5	12	1	1	47.62	7017.122	17.54%

Table A.12

Quarter No.3 coverage and accessibility

Quarter parks area percentages Quarter area =912 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	0%	0%	1.58%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (0.007 density)	4,035 people in neighborhood only.			
scope of service (2500-5000 m)	***Neighborhood scope =155 buildings			
Per capita share of the total area (0.7-1.2) Garden area = 14,500 m2	3.6 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 6 m2/p ** Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.13

Quarter No.9 coverage and accessibility

Quarter parks area percentages Quarter area =965.50dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0.047%	0%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (9.45 density)	9,124 people			
scope of service (100-200 m)	***Nearest home 5 m ,50 buildings			
Per capita share of the total area (0.3-0.8) Garden area = 460 m2	0.05 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 0.16 m2/p * Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.14

Quarter No.10 coverage and accessibility

Quarter parks area percentages Quarter area =533.14 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0.11%	0%	1.34%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (5.6 density)	2,986 people			
scope of service (100-200 m) P*(400-800) N*	***Nearest home 16 m ,40 buildings			
Per capita share of the total area (0.3-0.8) *P (0.5-1) *N	2.4 m2/p for N* and 0.17m2/P for P*			

Garden area = 7150 m2 N*,600 m2 P* *P is for Precinct Gardens *N is for Neighborhood Garden	*If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 4.6 m2/p for N* and0.38 for P* * Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.

Table A.15

Quarter No.11 coverage and accessibility

Quarter parks area percentages Quarter area =957.7dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	0.07%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (2.86 density)	2740 people			
scope of service (200-350 m)	***Nearest home 25 m ,50 buildings			
Per capita share of the total area (0.8-1.6) Garden area = 680 m2	0.25 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 0.25 m2/p * Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.16

Quarter No.16 coverage and accessibility

Quarter parks area percentages Quarter area =600 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0.07%	0 %	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (7.5 density)	4500 people			
scope of service (100-200 m)	***Nearest home 34 m ,15 buildings			
Per capita share of the total area (0.3-0.8) Garden area = 400 m2	0.09 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 0.23 m2/p * Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.17

Quarter No.17 coverage and accessibility

Quarter parks area percentages Quarter area =566 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	0.14%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (5.6 density)	3,170 people			
scope of service (200-350 m)	***Nearest home 20 m ,40 buildings			
Per capita share of the total area (0.8-1.6)	0.25 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 0.48 m2/p			
Garden area = 780 m2	* Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.18

Quarter No.19 coverage and accessibility

Quarter parks area percentages Quarter area =842 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	0.18%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (2.86 density)	2,408 people			
scope of service (200-350 m) C*	***Nearest home 20 m ,60 buildings			
Per capita share of the total area (0.8-1.6) *C	0.64 m2/p for both C*			
Garden area = 675 m2 C*,870 m2 C*	*If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 0.63 m2/p for both C*			
*C is for Community Gardens	* Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.19

Quarter No.28 coverage and accessibility

Quarter parks area percentages Quarter area =536 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	0.25%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (7.5 density)	4,020 people			
scope of service (200-350 m)	***Nearest home 28 m ,65 buildings			
Per capita share of the total area (0.8-1.6)	0.33 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 0.86 m2/p			
Garden area = 1330 m2	* Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.20

Quarter No.32 coverage and accessibility

Quarter parks area percentages Quarter area =143 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	0%	5.7%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (8 density)	1,144 people			
scope of service (200-350 m)	***Nearest home 5 m ,211 buildings			
Per capita share of the total area (0.5-1)	7 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 19.7 m2/p			
Garden area = 8171 m2	* Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.21

Quarter No.33 coverage and accessibility

Quarter parks area percentages Quarter area =112 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	3.3%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (8 density)	896 people			
scope of service (200-350 m)	***Nearest home 40 m ,95 buildings			
Per capita share of the total area (0.8-1.6)	4 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 11 m2/p			
Garden area = 4000 m2	* Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.22

Quarter No.35 coverage and accessibility

Quarter parks area percentages Quarter area =124 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0.44%	0.5%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (8 density)	992 people			
scope of service (100-200 m) P*(200-350) C*	***Nearest home 15-30 m ,120 buildings			
Per capita share of the total area (0.3-0.8) *P (0.8-1.6) *C	0.6 m2/p for C* and 0.54 m2/P for P*			
Garden area = 640 m2 C*, 300m2 P*	*If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 1.6 m2/p for C* and 0.66 for P*			
*P is for Precinct Gardens *C is for Community Garden	* Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.23

Quarter No.44 coverage and accessibility

Quarter parks area percentages Quarter area =117 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	1.8%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (8 density)	936 people			
scope of service (200-350 m)	***Nearest home 40 m ,52 buildings			
Per capita share of the total area (0.8-1.6) Garden area = 2200 m2	2.3 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 6.3 m2/p * Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.24

Quarter No.50 coverage and accessibility

Quarter parks area percentages Quarter area =446 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	0.76%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (0.5 density)	223 people			
scope of service (200-350 m)	***Nearest home 40 m ,18 buildings			
Per capita share of the total area (0.8-1.6) Garden area = 3400m2	15 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 2.65 m2/p * Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.25

Quarter No.51 coverage and accessibility

Quarter parks area percentages Quarter area =497 dunums	Precinct gardens	Community Gardens	Neighborhood Parks	(residential) Districts gardens
Existed percentage	0%	0.31%	0%	0%
Needed percentage (MOLG, 2021)	1.5 %	1.1%	3.4%	3.6%
Served population (8 density)	3,976 people			
scope of service (200-350 m)	***Nearest home 13-17 m ,156 buildings			
Per capita share of the total area (0.8-1.6) Garden area = 630 m2 ,930 m2	0.4 m2/p *If density is taken 2902 p/km2 for all areas equally, Per capita share of the total area will be = 1.08 m2/p * Ramallah and al-Bireh density (MOLG, 2021) ***2019 buildings survey.			

Table A.26

District parks Per capita share of the total area at the level of Ramallah City

Open public spaces	Area (meter square)	Percentage area of Ramallah	Location		Coverage			
			Distances from nearest homes (Meters)	Walking time from nearest building (minutes)*(Average speed =1.3 m/s)	Coverage (area within 5000m) Dunums	Dinsety In the Area P/m2	No. people served	***Per capita share of the total area
Ramallah new park	14500	0.099%	125	1.6	17,900	**2.9	51,910	0.28 m2/P
Total	14,500 meter square	0.099%						

*International Standards of Measurement, gait speed should be expressed in m/s. Collectively, the range for normal WS for adults is between 1.2 and 1.4 m/s. (Mohamed & appling, 2020),*** density calculated based on area =(2902) P/km2 (MOLG, 2021) ,*** Per capita share of the total area for District gardens (0.7-1.2) (MOLG, 2021),

Table A.27

Neighborhoods gardens Per capita share of the total area at the level of Ramallah City

Open public spaces	Area (meter square)	Percentage area of Ramallah	Location		Coverage			
			Distances from nearest homes (Meters)	Walking time from nearest building (minutes)*Average speed =1.3m/s	Coverage (area within 800m) Dunums	Dinsety In the Area P/m2	No. people served	**Per capita share of the total area
Yousif Qaddora Park	8171	0.056%	14	0.19	1,424	8	11,392	0.71m2/P
Radana Forest	**7**,150	0.049%	41	0.5	1,424	5.6	7945	0.9m2/p
Total	15,321 meter square	0.10%						

*International Standards of Measurement, gait speed should be expressed in m/s. Collectively, the range for normal WS for adults is between 1.2 and 1.4 m/s. (Mohamed & appling, 2020), *** density calculated in (MOLG, 2021), ,** Per capita share of the total area for Neighborhoods gardens (0.5-1) (MOLG, 2021), Ramallah's Built -Up area equals 14.5 km2

Table A.28

Community gardens Per capita share of the total area at the level of Ramallah City

Name	Area (meter square)	Percentage area of Ramallah	Location		Coverage			
			Distances from nearest homes (Meters)	Walking time from nearest building (minutes)*Average speed =1.3m/s	Coverage (area within 350 m) Dunums	Density In the Area P/m2	No. people served	**Per capita share of the total area
Ramallah Municipality Park	4000	0.027%	23	0.3	385	8	3,080	1.2 m2/p
Al-Omam Park	2200	0.015%	20	0.25	385	8	3,080	0.7 m2/p
Al-Birwa Park	3400	0.025%	20	0.25	385	0.5	193	17.7 m2/p
Al-Aela Park	640	0.004%	17	0.21	385	8	3,080	0.20 m2/p
Al-Qasr Park	680	0.004%	45	1	385	2.86	1,101	0.6 m2/p
Bayyarat Al-jadwal Park	780	0.005%	54	1.15	385	5.6	2,156	0.36 m2/p
Bayyart Al-Masyoon Park	630	0.004%	40	0.5	385	8	3,080	0.2 m2/p
Bayyaret Al-Terih Park	870	0.006%	17	0.21	385	2.86	1,101	0.79 m2/p
Daraj Al-Terih Park	675	0.004%	17	0.21	385	2.86	1,101	0.6 m2/p
Een monjed-albayarrah Park	930	0.006%	10	0.12	385	8	3,080	0.3 m2/p
San Fernando Park	1330 16,135	0.009% 0.11%	15	0.19	385	7.5	2,888	0.46 m2/p

*International Standards of Measurement, gait speed should be expressed in m/s. Collectively, the range for normal WS for adults is between 1.2 and 1.4 m/s. (Mohamed & appling, 2020), ** Per capita share of the total area for Community gardens (0.8-1.6) (MOLG, 2021),Ramallah's Built -Up area equals 14.5 km2

Table A.29

Precinct gardens Per capita share of the total area at the level of Ramallah City

Name	Area (meter square)	Percentage area of Ramallah	Accessibility		Coverage			
			Distances from nearest homes (Meters)	Walking time from nearest building (S)	Coverage (area within 200 m) Dunums	Dinsety In the Area P/m2	No. people served	**Per capita share of the total area
Al-Amal Park	400	0.0029%	82	1.05	125.6	7.5	942	0.42 m2/p
Kamil Al-Ajlouni Park	300	0.0026%	25	0.32	125.6	8	1005	0.29 m2/p
Al-Zaytoona Park	460	0.0026%	12	0.15	125.6	9.45	1187	0.38 m2/p
Al-Kholoud Park	600	0.0032%	7	0.09	125.6	5.6	703	0.85 m2/p
Total	1760 meter square	0.01%						

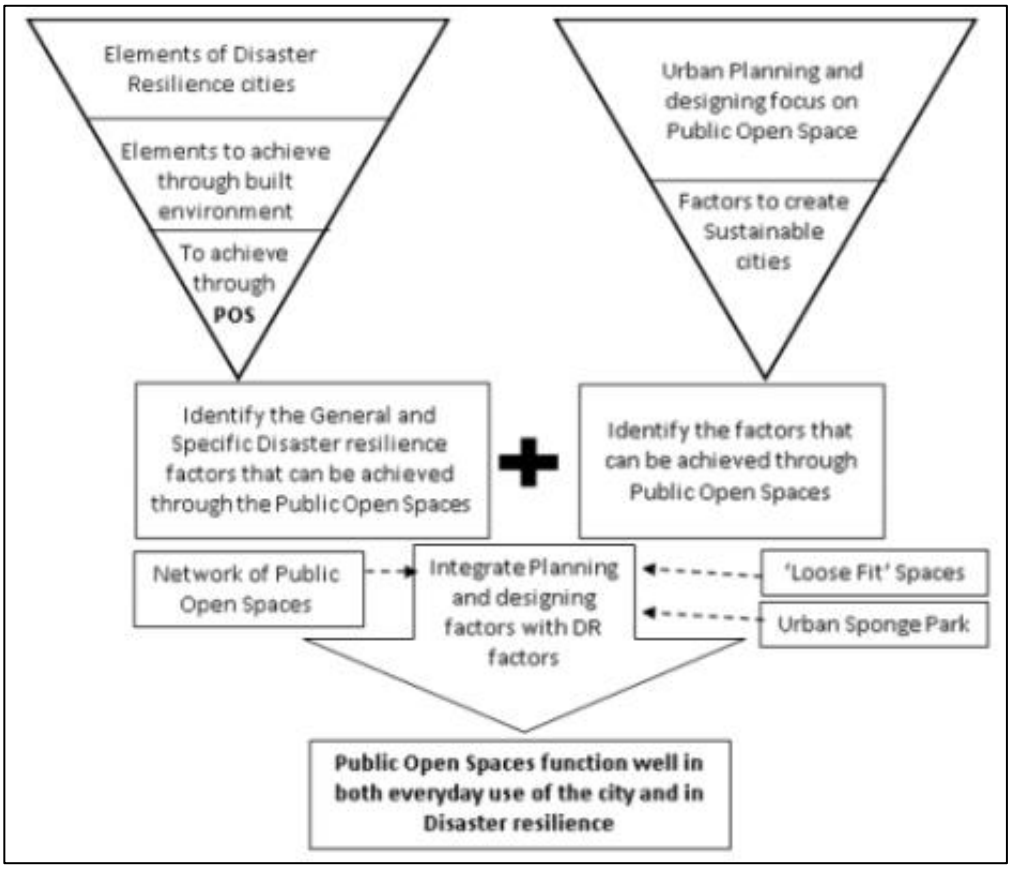
*International Standards of Measurement, gait speed should be expressed in m/s. Collectively, the range for normal WS for adults is between 1.2 and 1.4 m/s. (Mohamed & appling, 2020), *** density calculated in (MOLG, 2021), ** Per capita share of the total area for Community gardens (0.3-0.8) (MOLG, 2021), Ramallah's Built - Up area equals 14.5 km2

Appendix B

Figures

Figure B.1

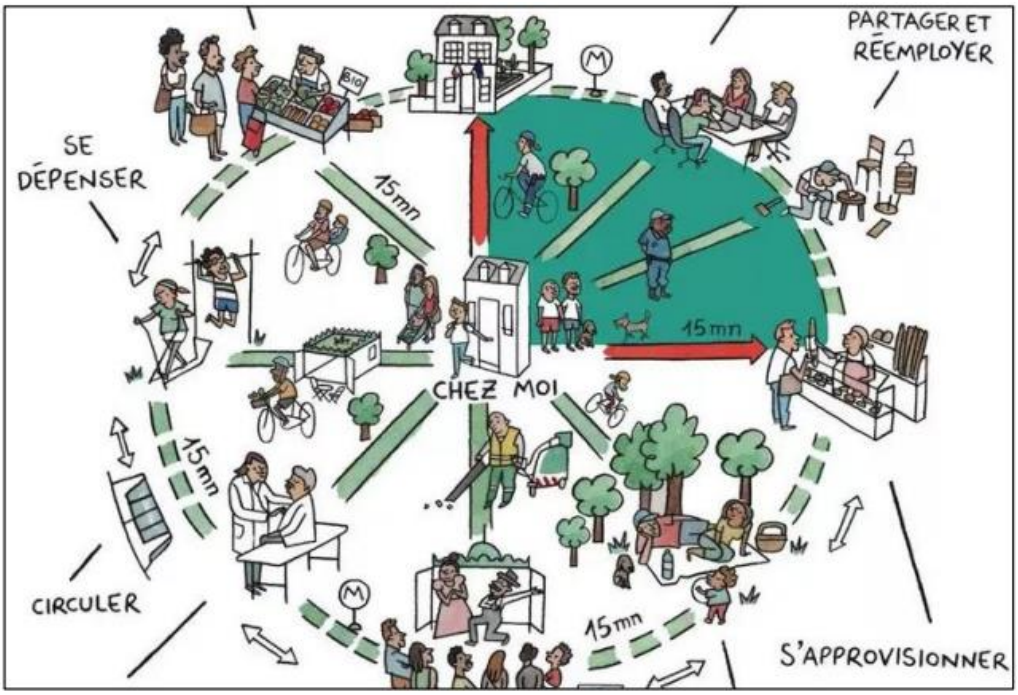
Framework to plan and design public open spaces for sustainable disaster resilience cities



Source: (Jayakody, Amaratunga, & Haigh, 2016)

Figure B.2

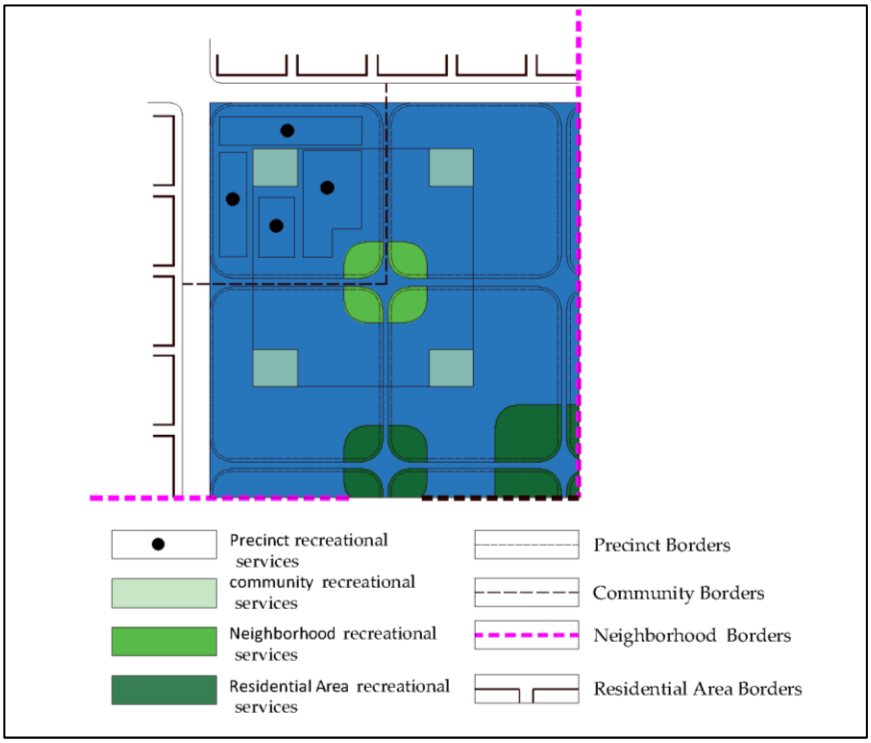
15 minutes city concept



Source: (Berchtold, 2018)

Figure B.3

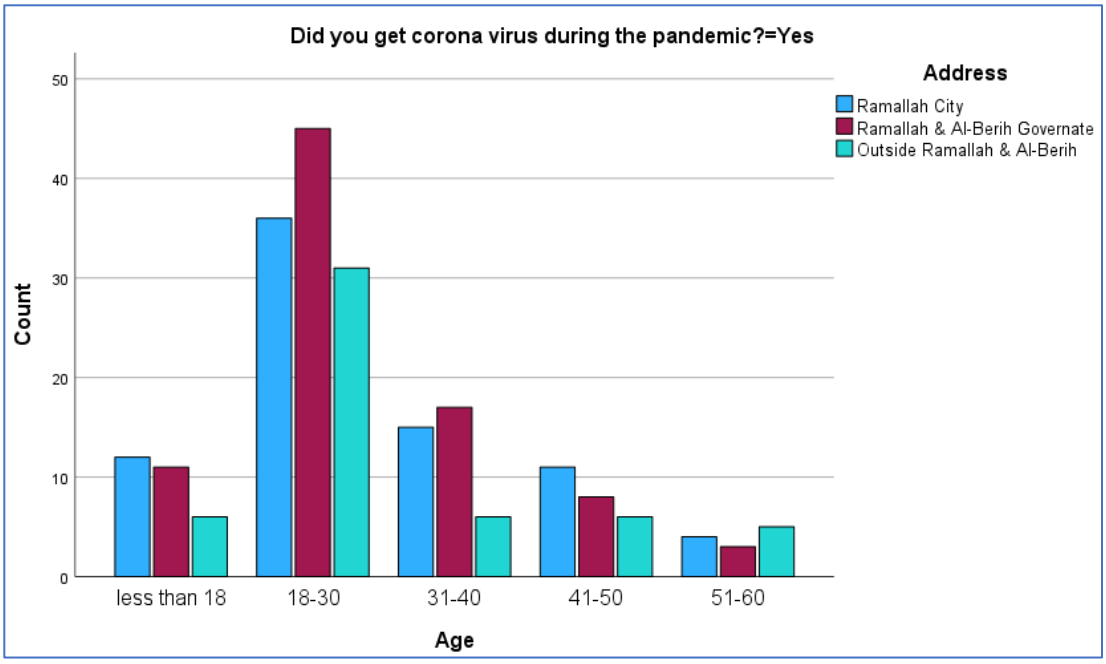
Hierarchy of recreational areas at the neighborhoods level only



Source: Standards and Guidelines Handbook for urban planning in Palestine 2021

Figure B.4

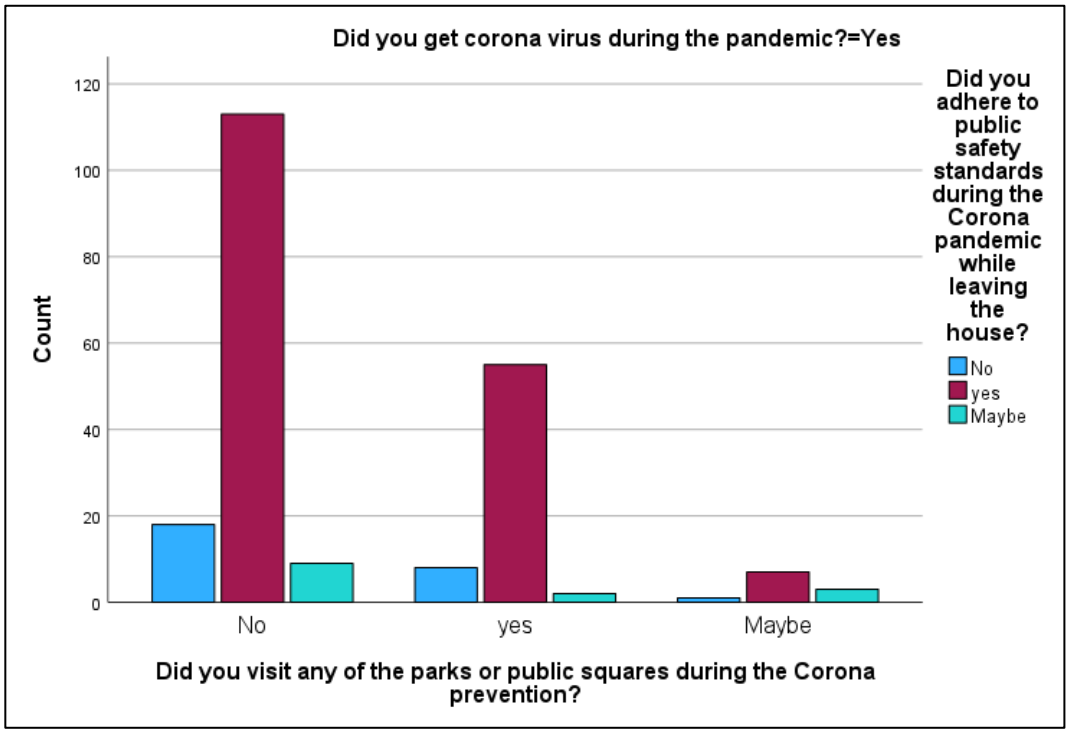
People with corona virus vs age and address



Source: Author 2022

Figure B.5

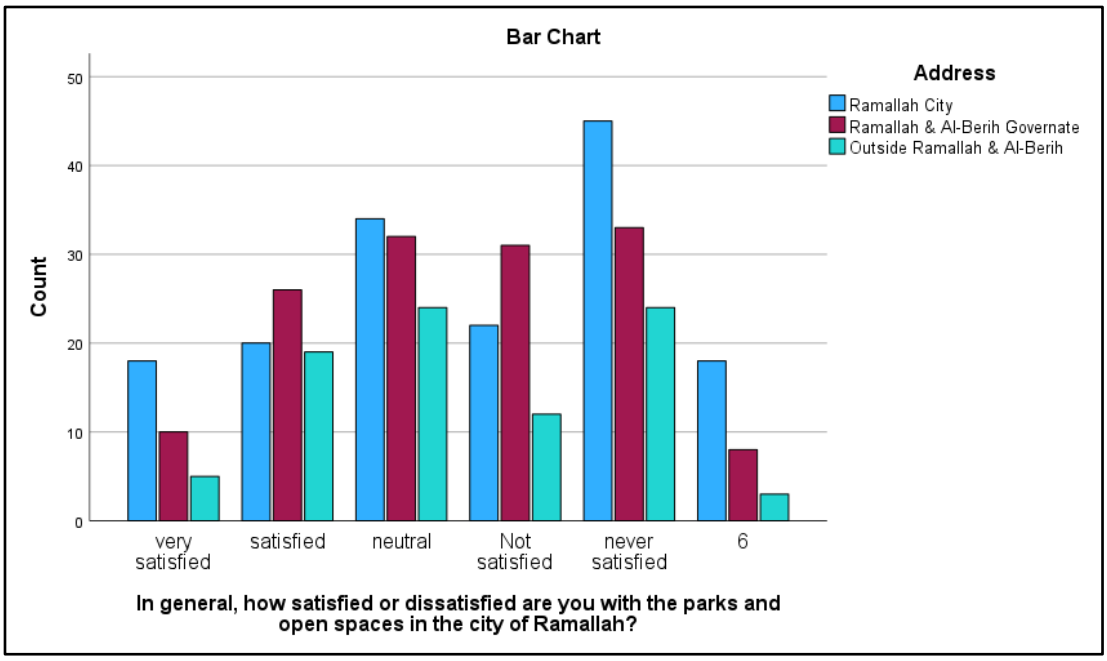
People with corona virus vs OPS visitation frequencies



Source: Author 2022

Figure B.6

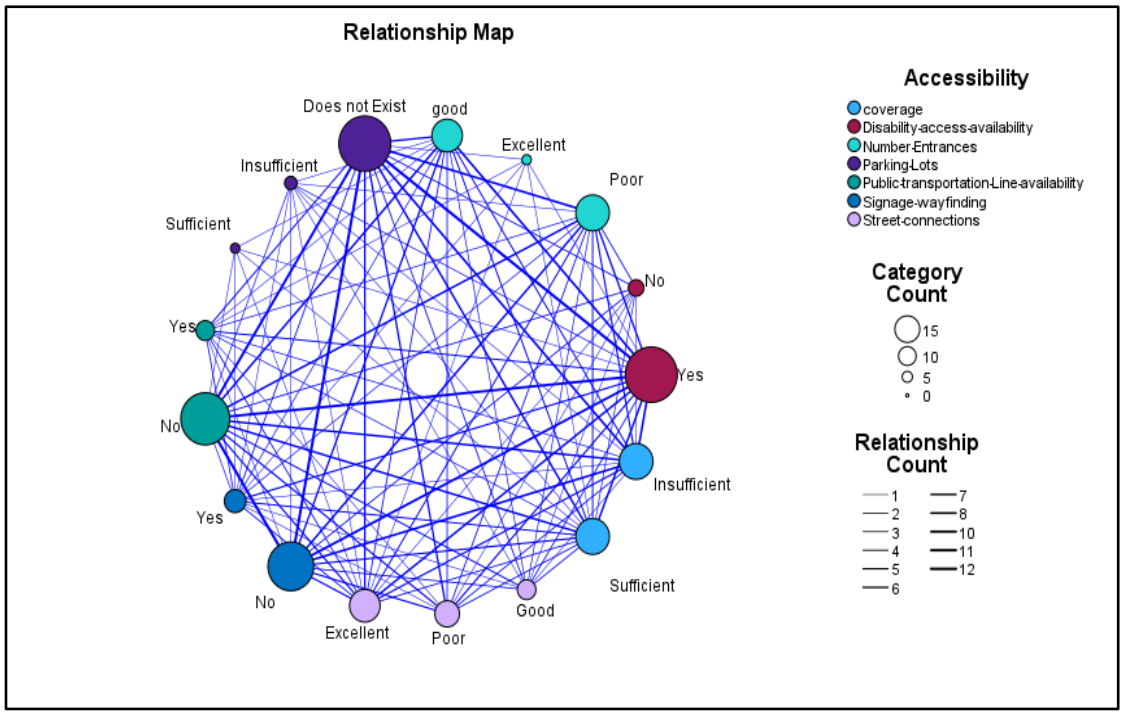
satisfaction degree of OPS



Source: Author 2022

Figure B.7

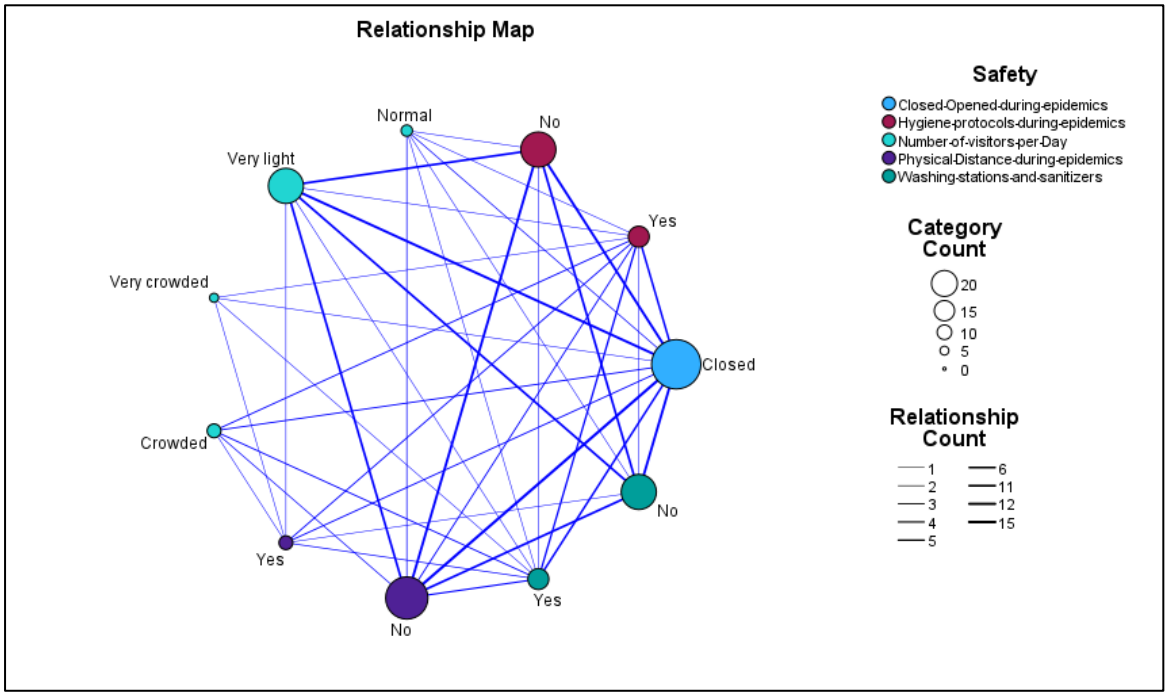
Accessibility Factor of OPS



Source: Author 2022

Figure B.8

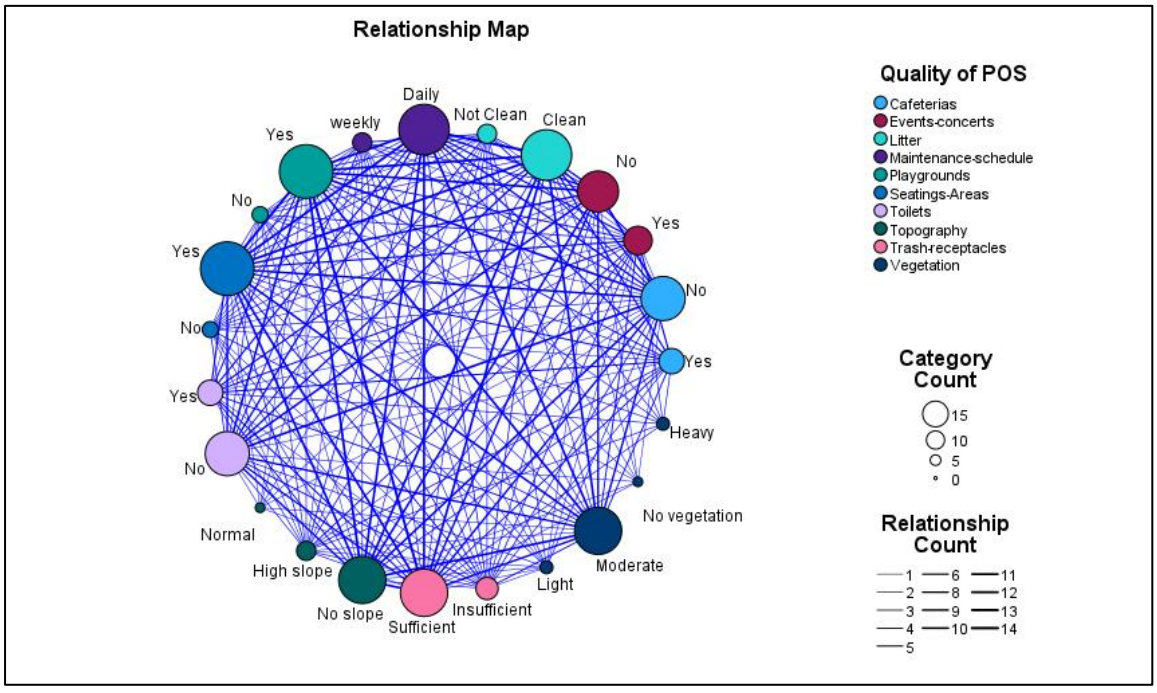
Safety Factor of OPS



Source: Author 2022

Figure B.9

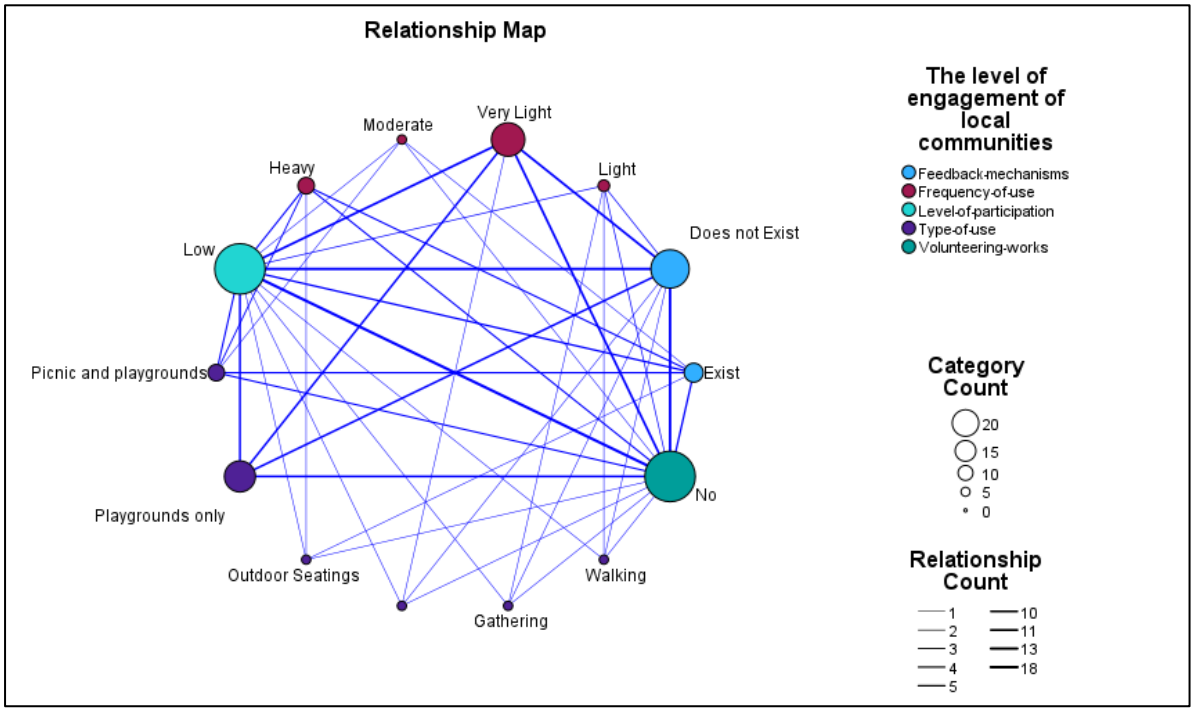
Quality of OPS Factor



Source: Author 2022

Figure B.10

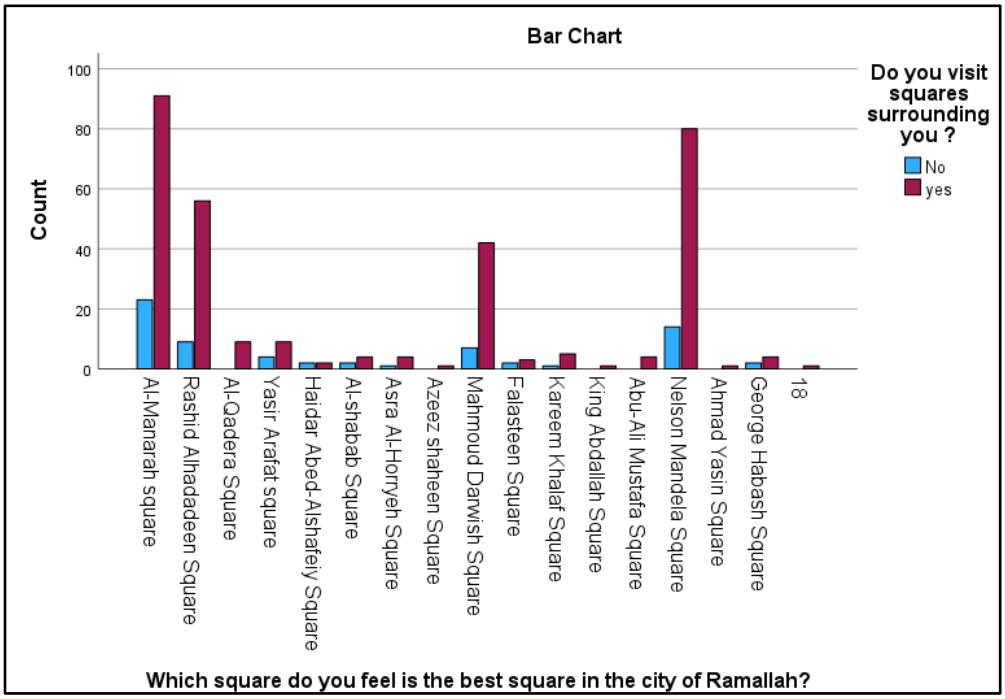
Level Of engagement of LC of OPS



Source: Author 2022

Figure B.11

Best Square in Ramallah City



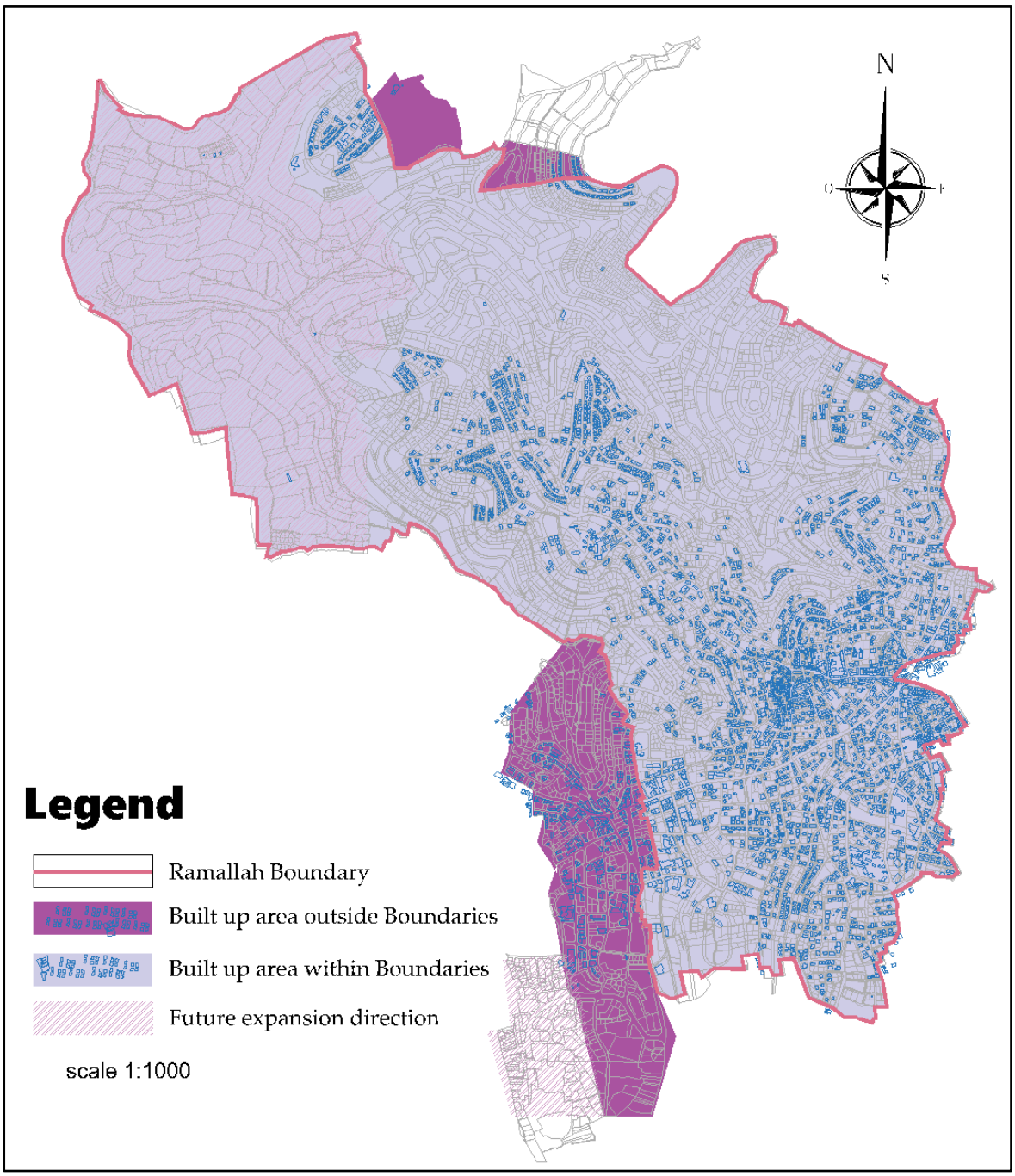
Source: Author 2022

Appendix C

Maps

Map C.1

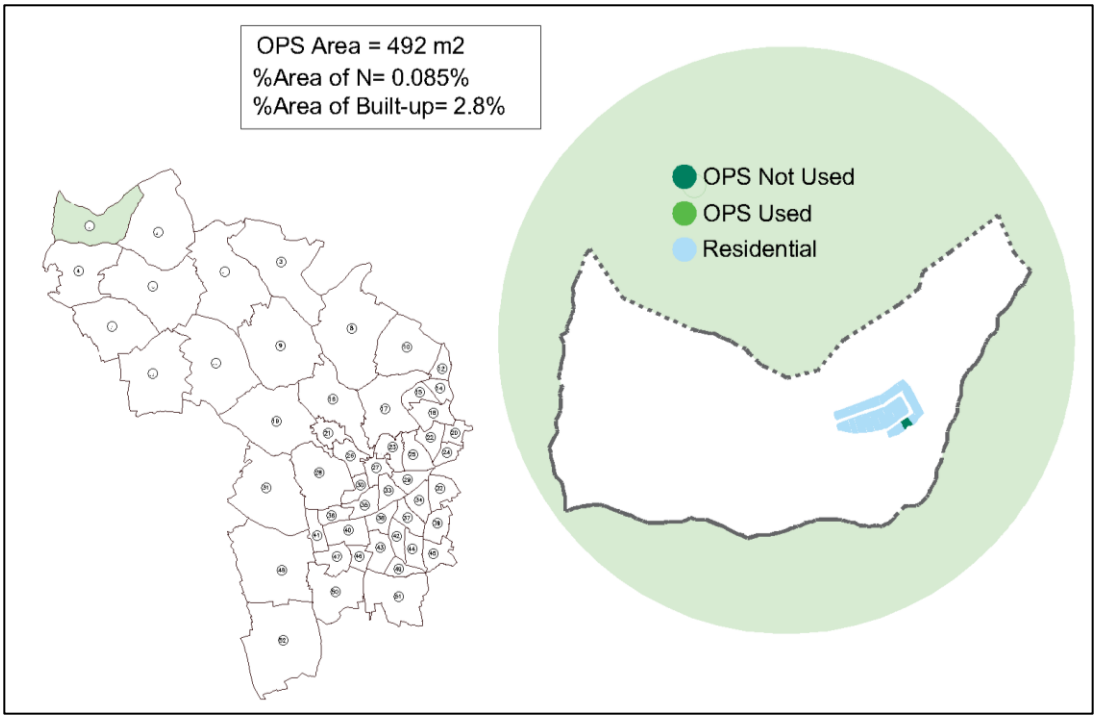
Ramallah Built-up area



Source: Author 2022

Map C.2

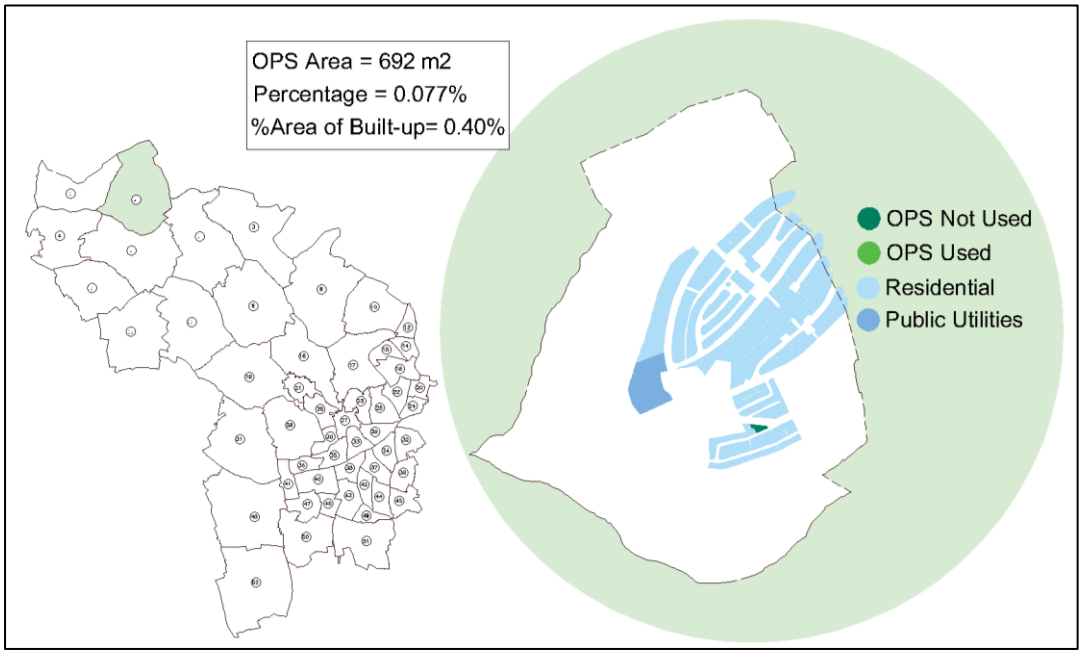
Neighborhood (1) OPS Percentage



Source: Author 2022

Map C.3

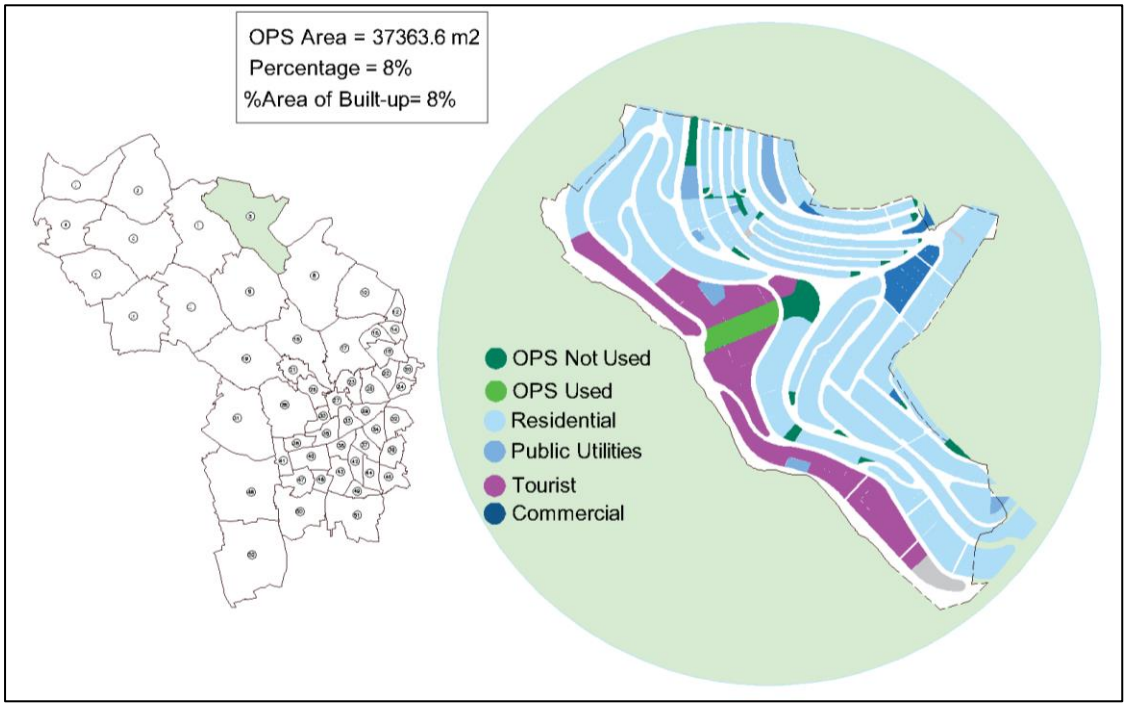
Neighborhood (2) OPS Percentage



Source: Author 2022

Map C.4

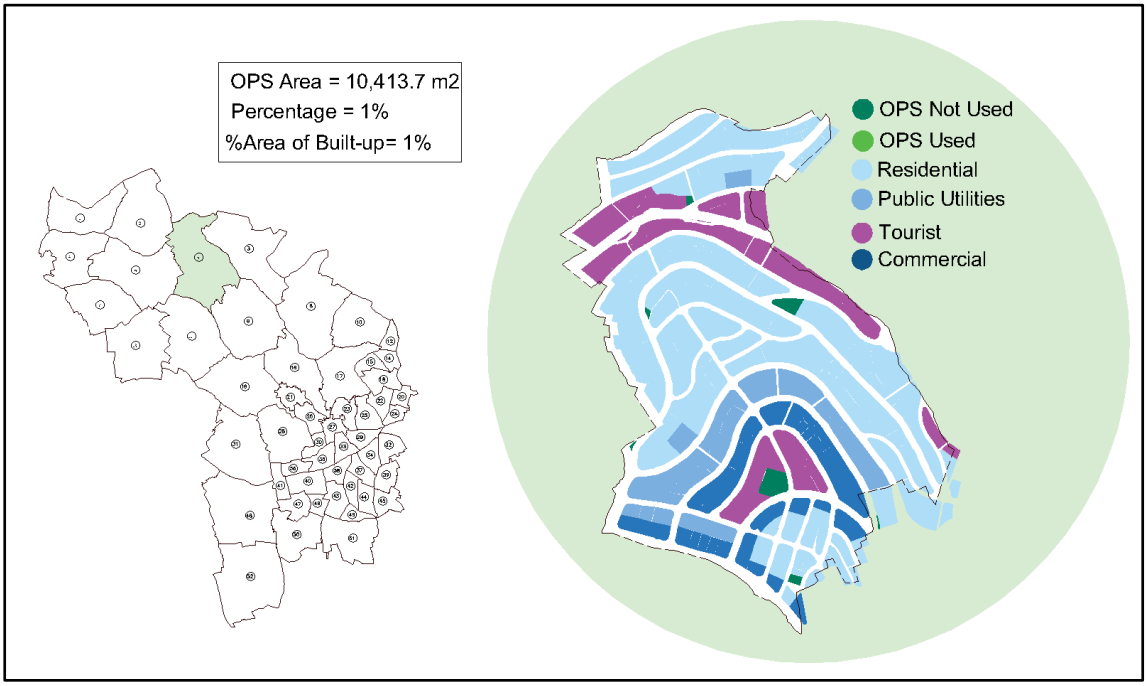
Neighborhood (3) OPS Percentage.



Source: Author 2022

Map C.5

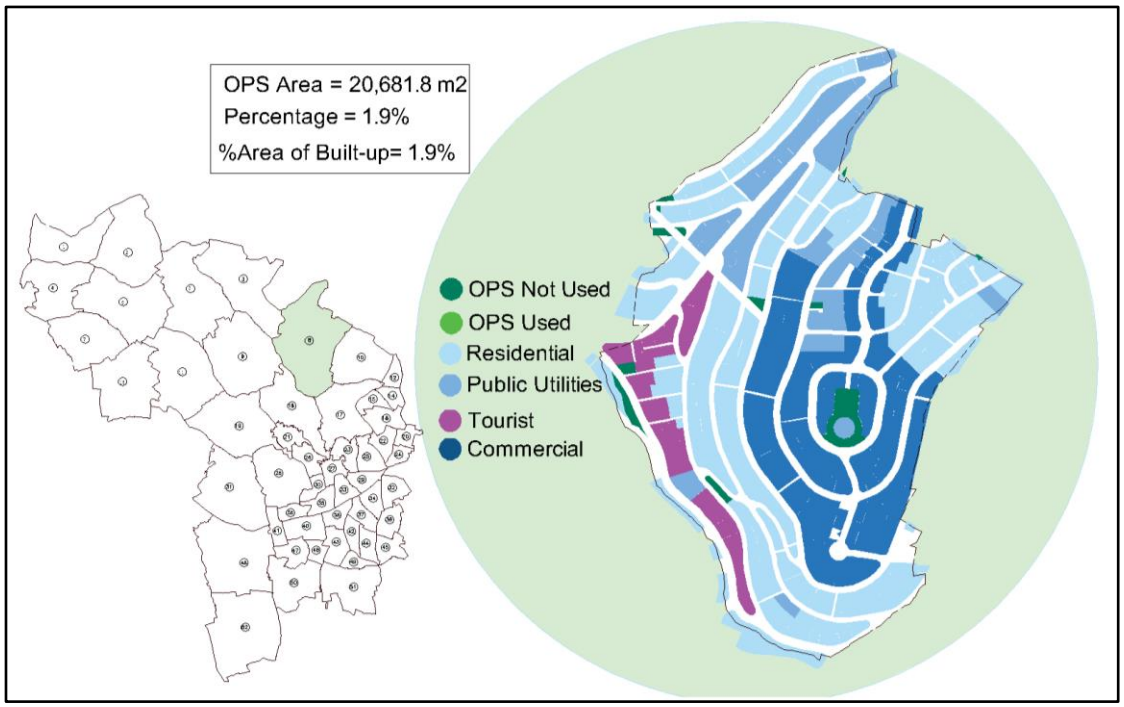
Neighborhood (5) OPS Percentage



Source: Author 2022

Map C.6

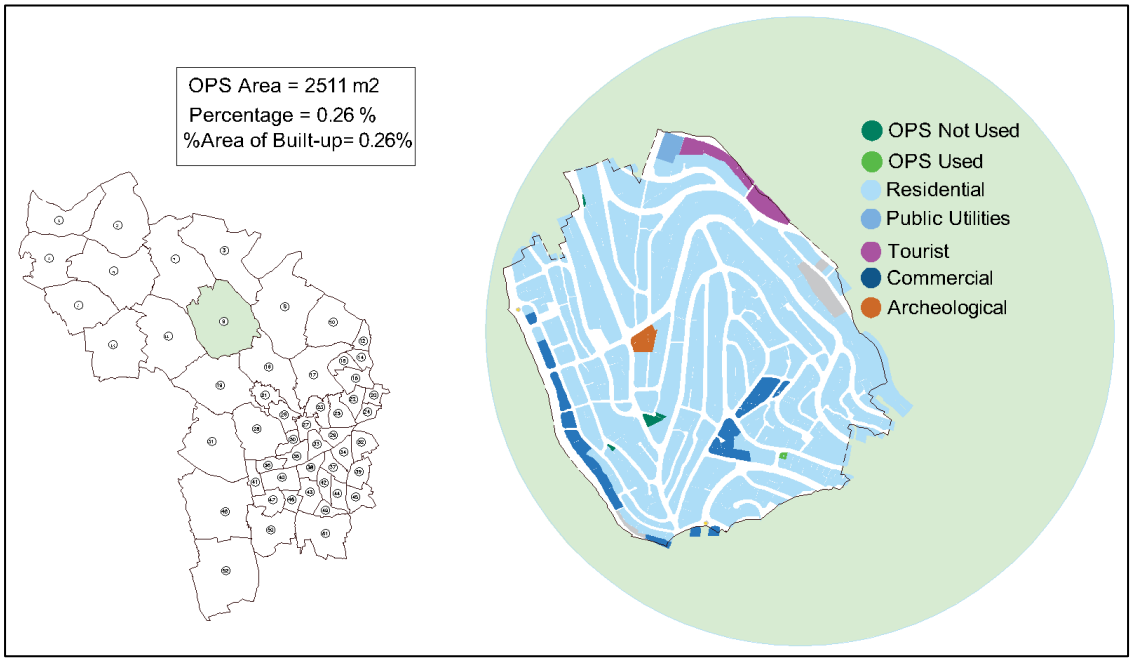
Neighborhood (8) OPS Percentage.



Source: Author 2022

Map C.7

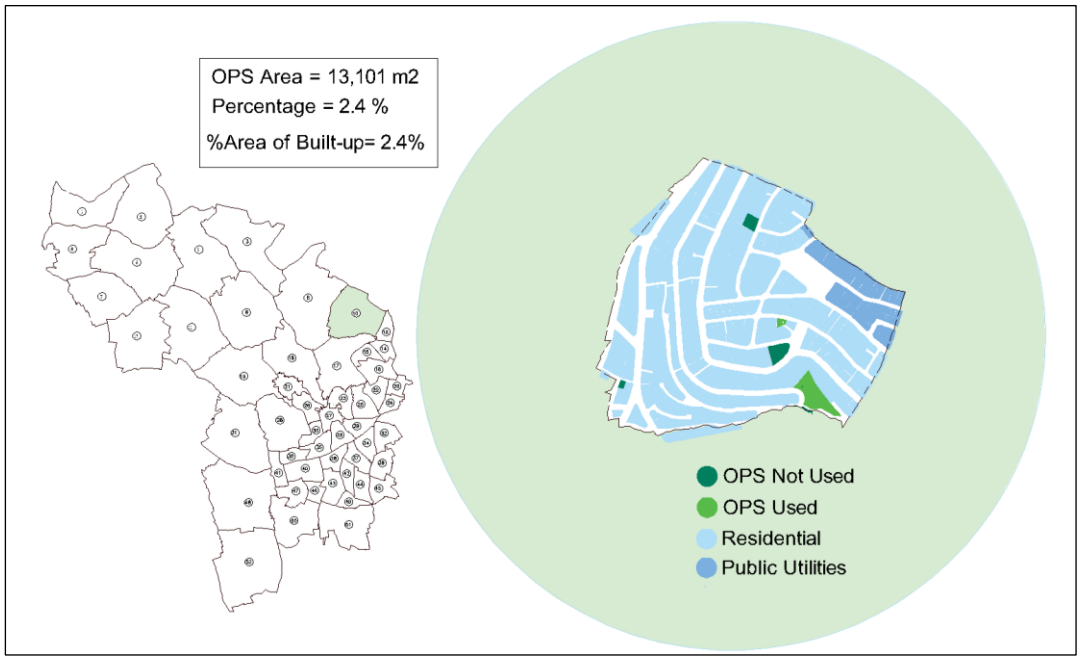
Neighborhood (9) OPS Percentage.



Source: Author 2022

Map C.8

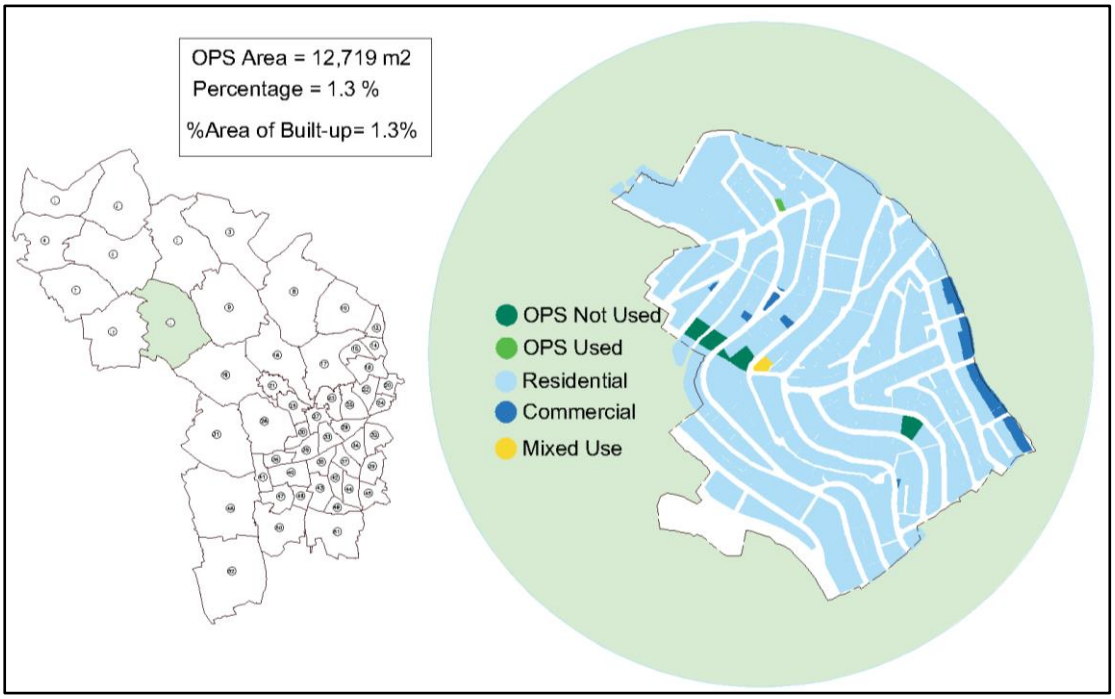
Neighborhood (10) OPS Percentage.



Source: Author 2022

Map C.9

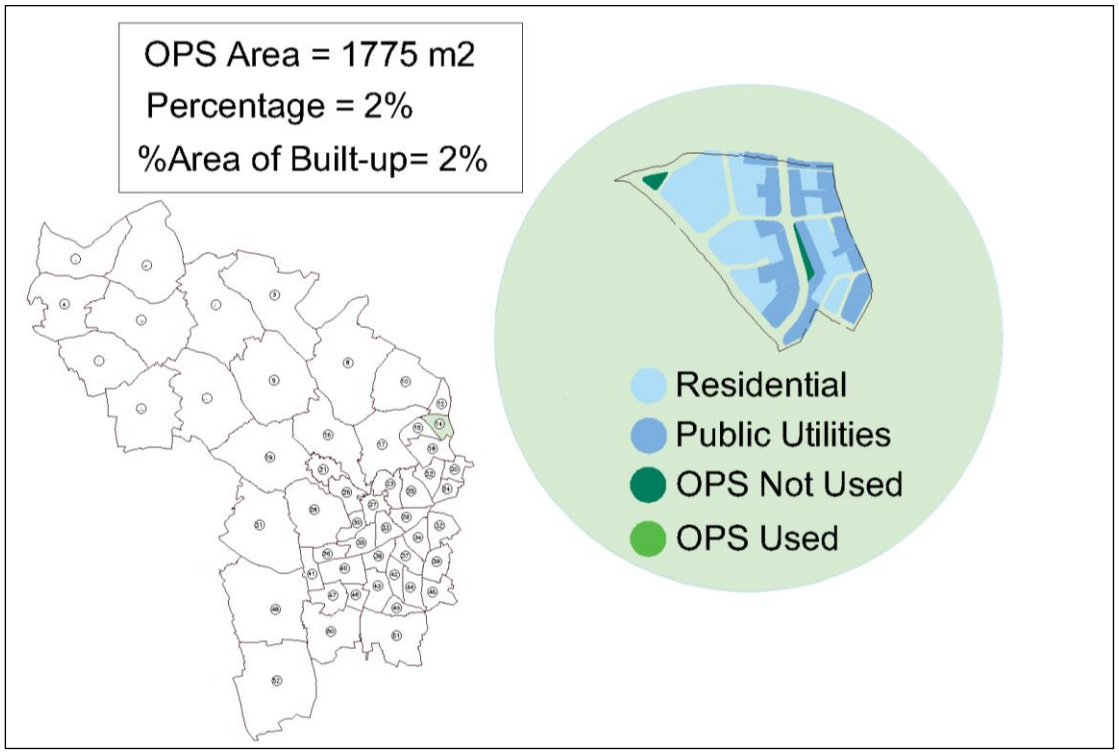
Neighborhood (11) OPS Percentage.



Source: Author 2022

Map C.10

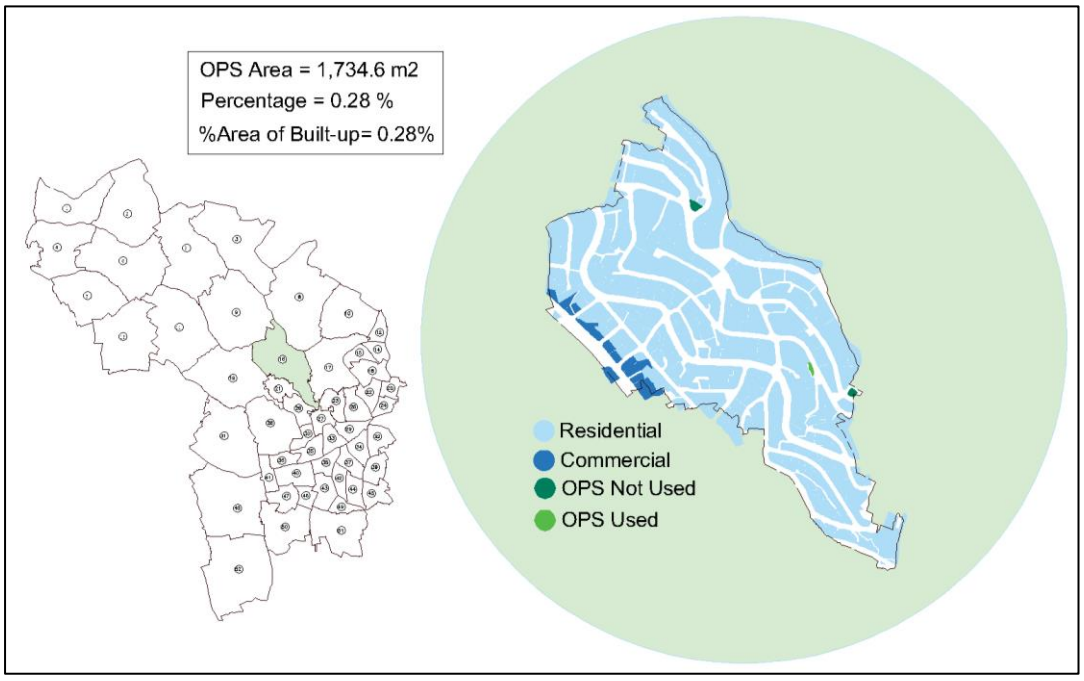
Neighborhood (14) OPS Percentage



Source: Author 2022

Map C.11

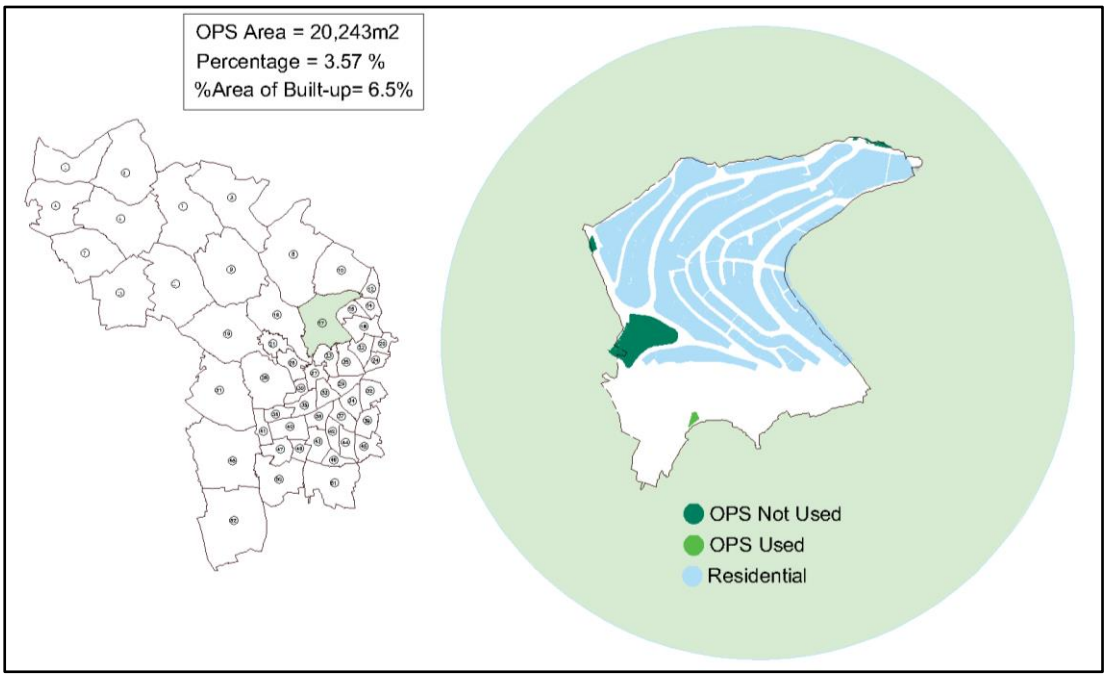
Neighborhood (16) OPS Percentage



Source: Author 2022

Map C.12

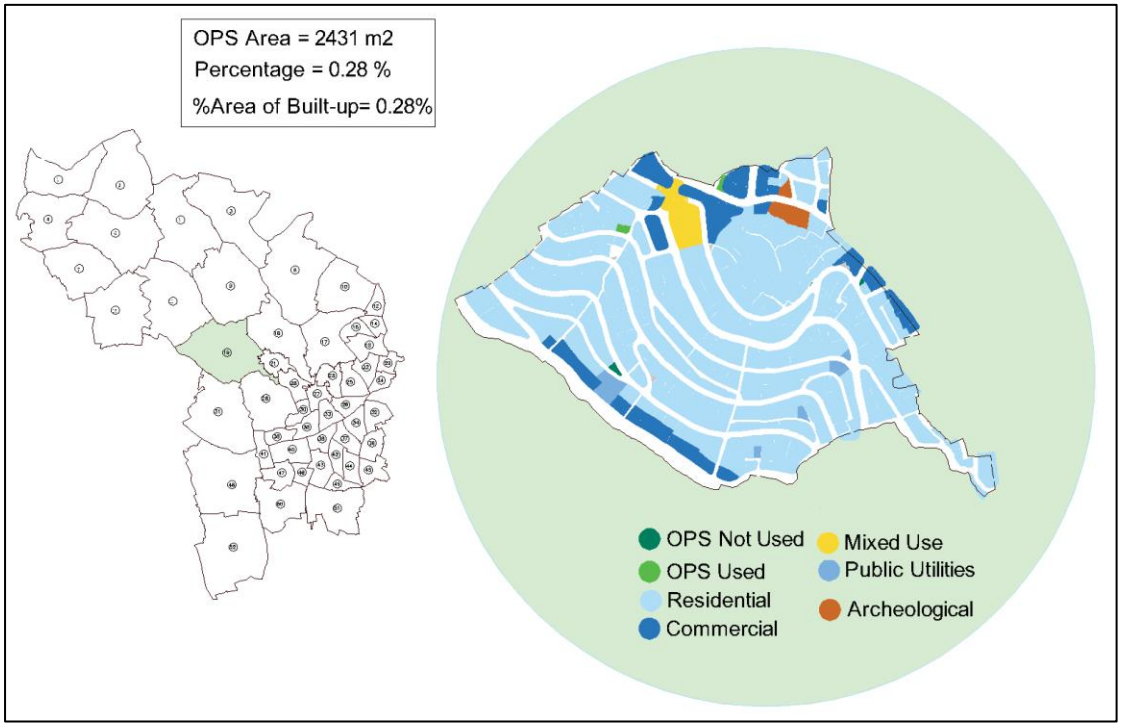
Neighborhood (17) OPS Percentage



Source: Author 2022

Map C.13

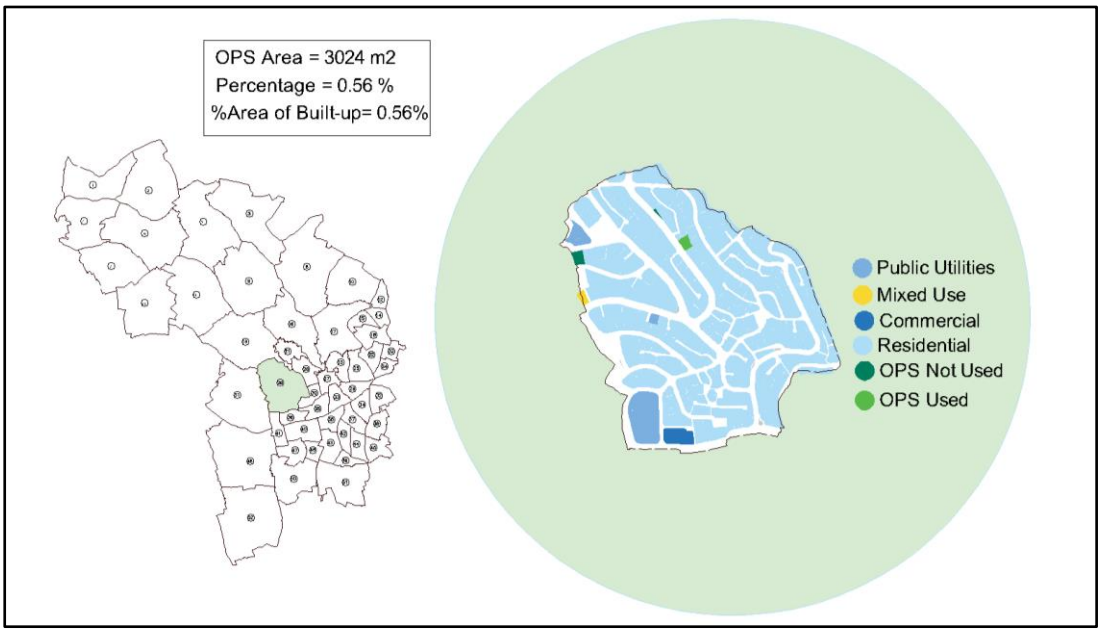
Neighborhood (19) OPS Percentage



Source: Author 2022

Map C.14

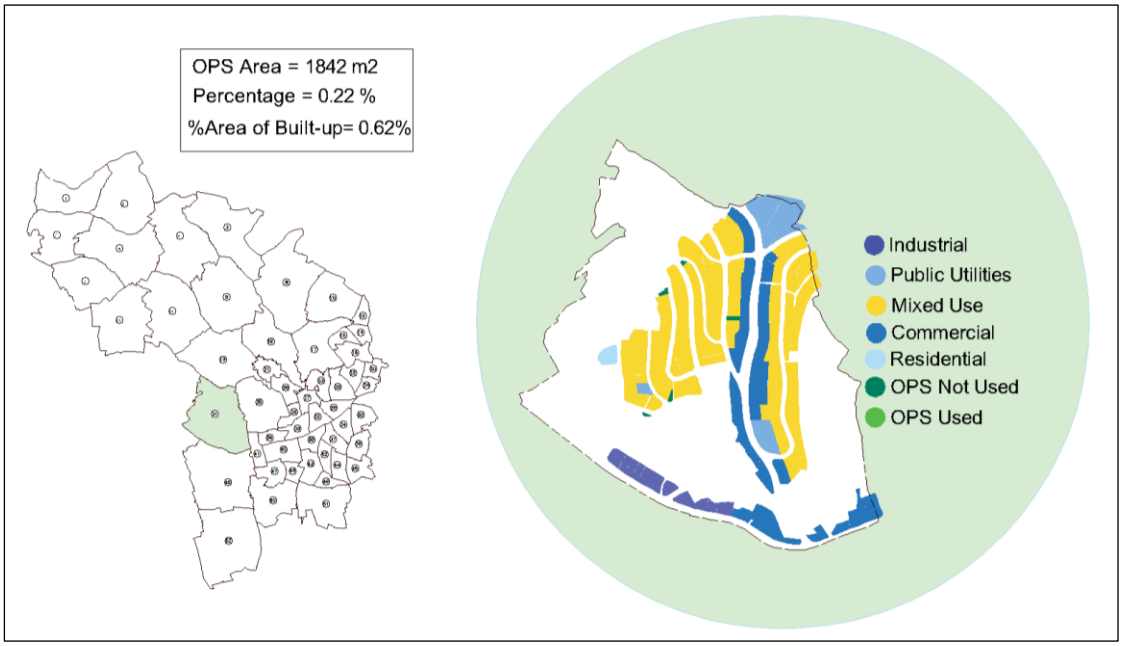
Neighborhood (28) OPS Percentage



Source: Author 2022

Map C.15

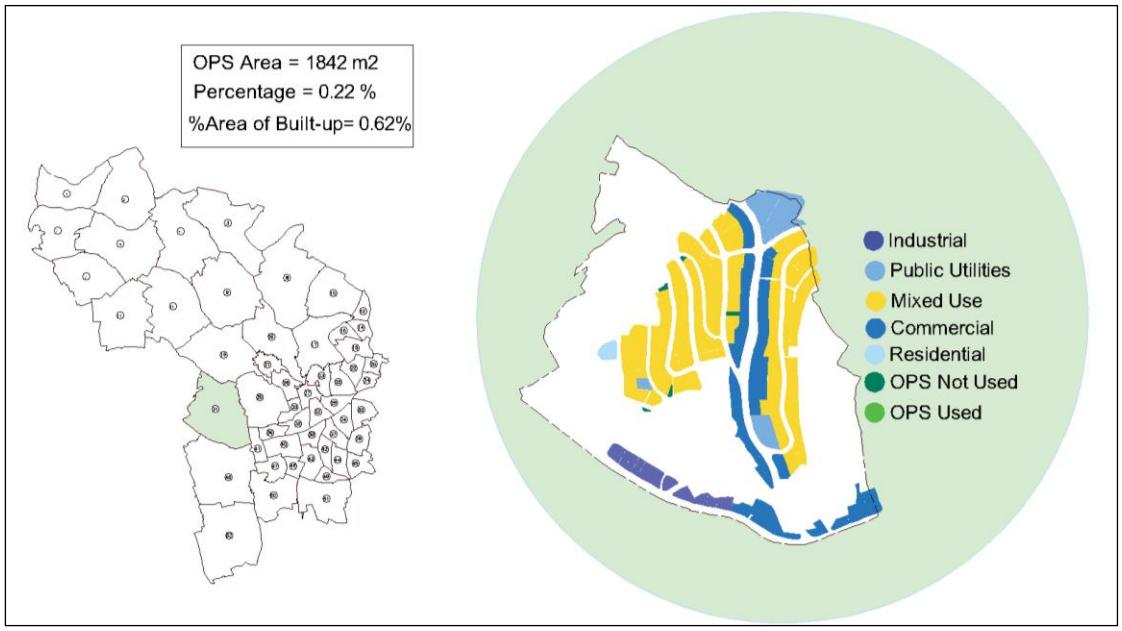
Neighborhood (31) OPS Percentage



Source: Author 2022

Map C.16

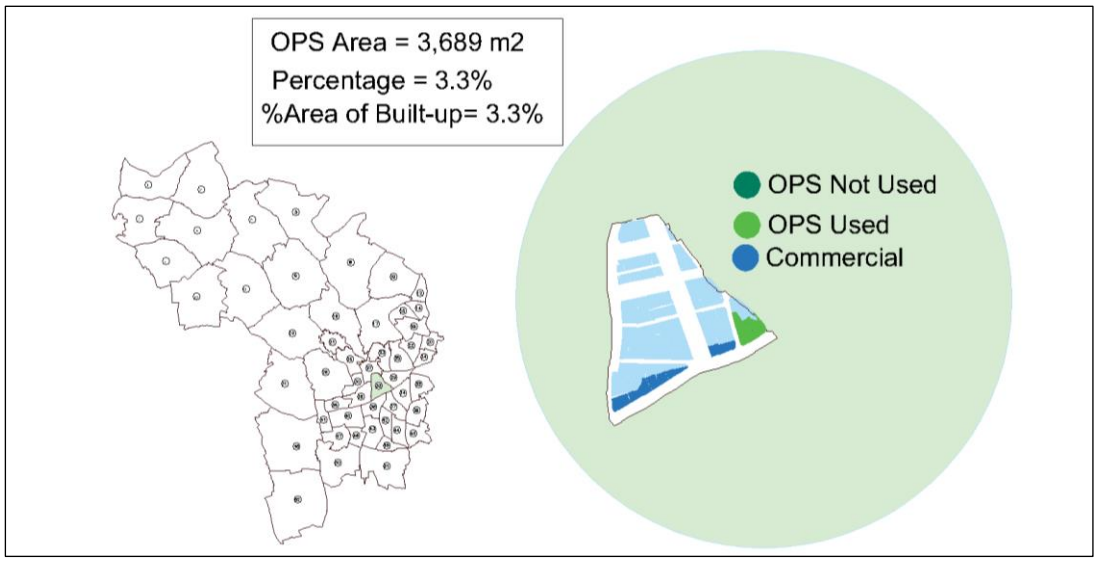
Neighborhood (32) OPS Percentage



Source: Author 2022

Map C.17

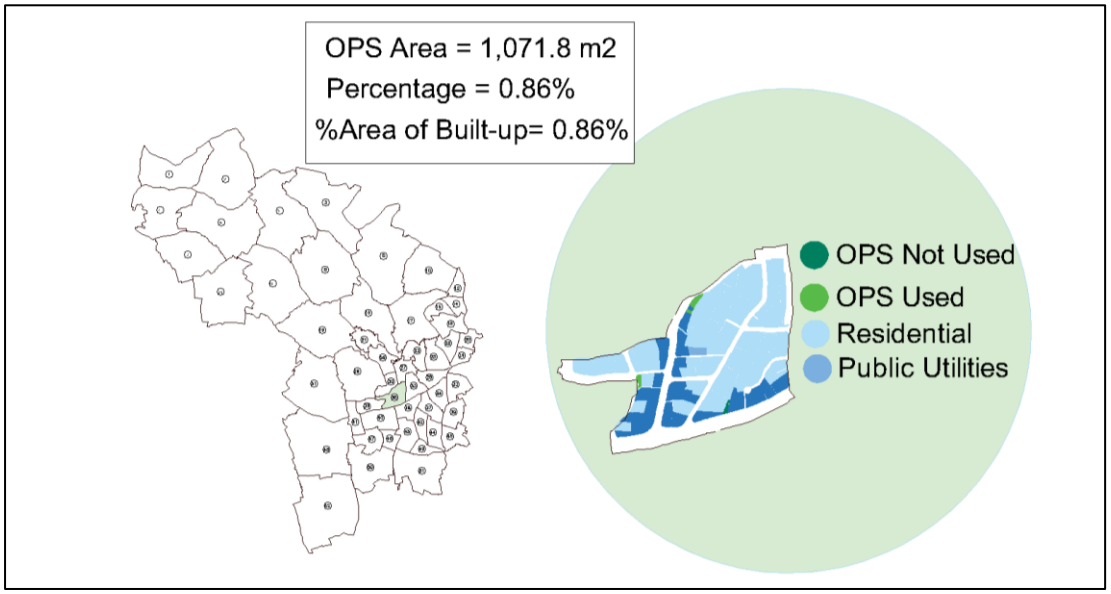
Neighborhood (33) OPS Percentage



Source: Author 2022

Map C.18

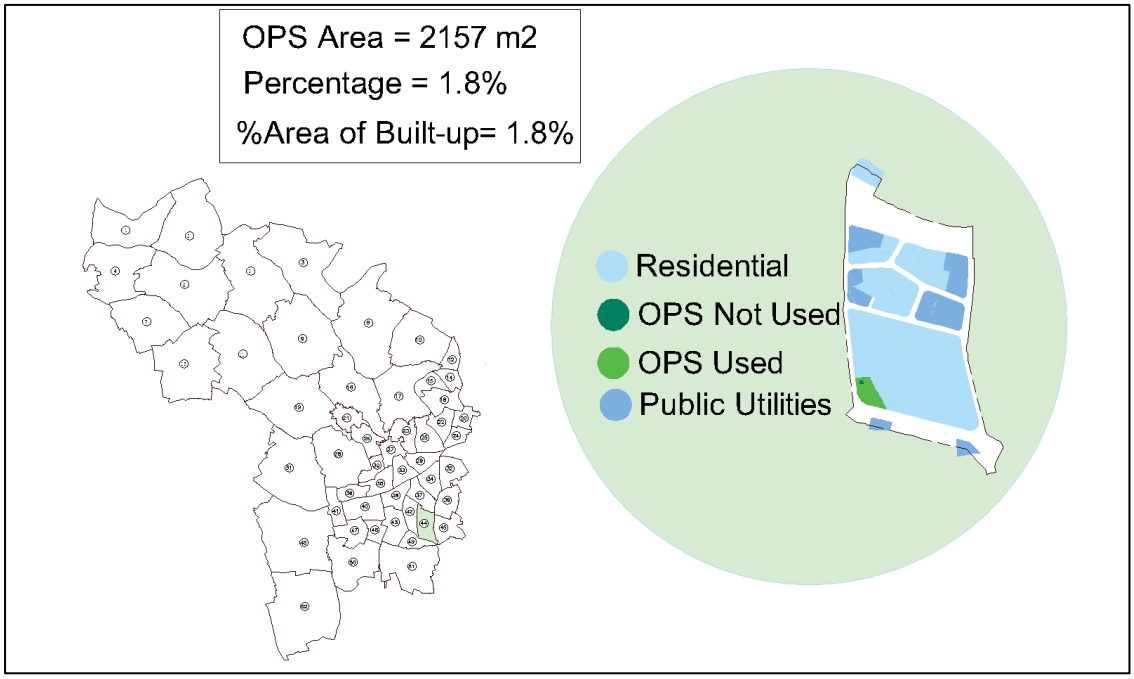
Neighborhood (35) OPS Percentage



Source: Author 2022

Map C.19

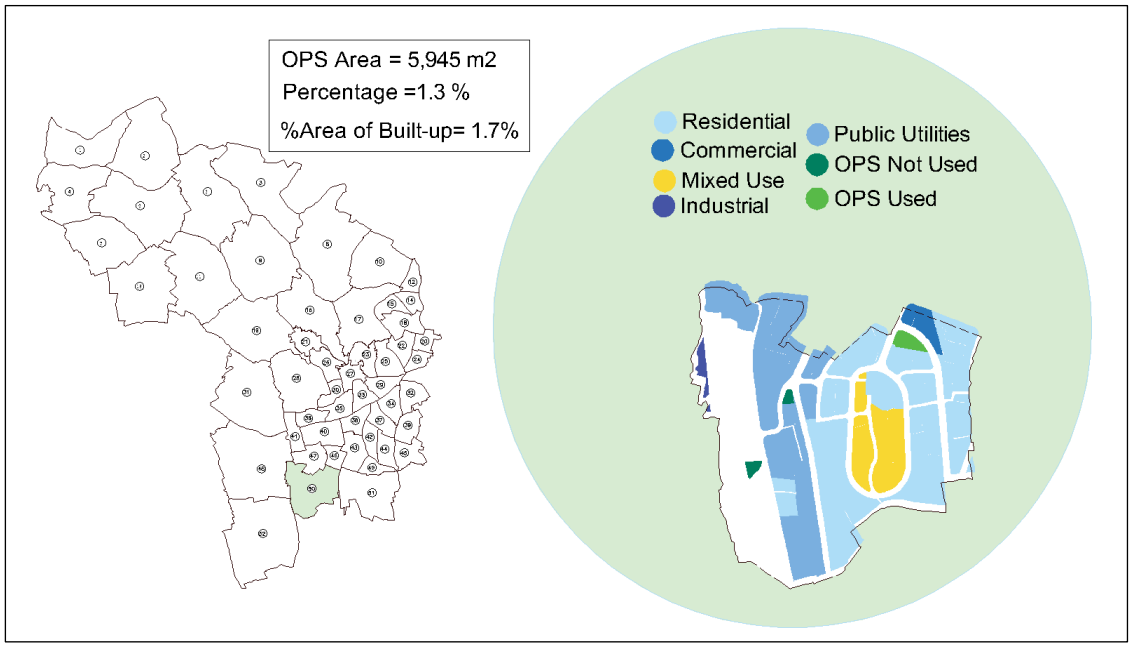
Neighborhood (44) OPS Percentage



Source: Author 2022

Map C.20

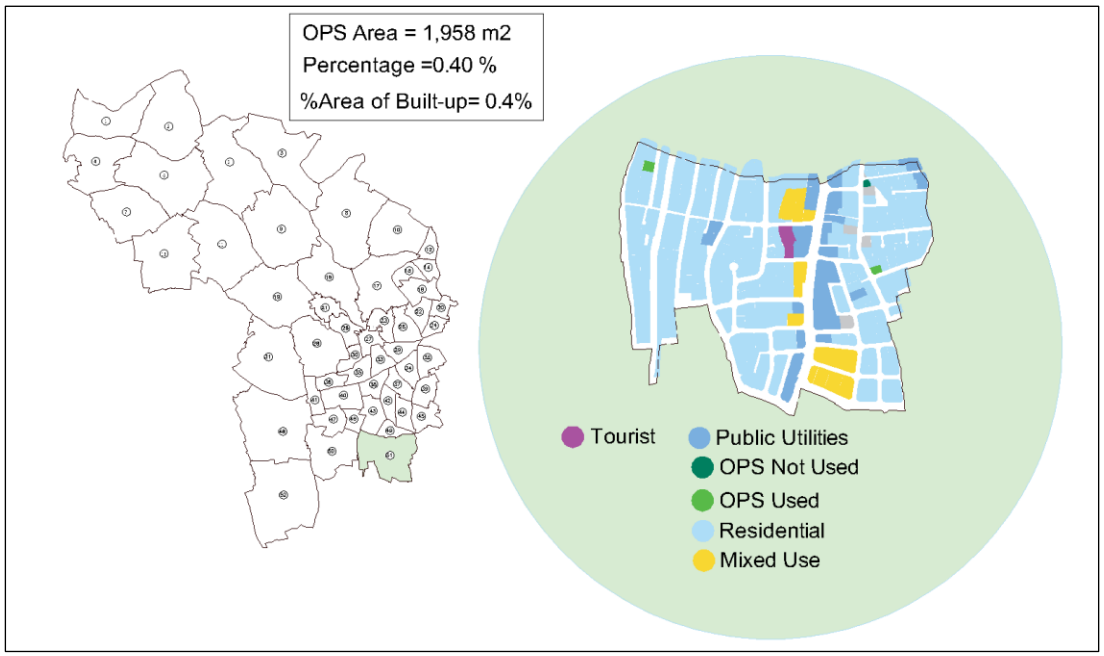
Neighborhood (50) OPS Percentage



Source: Author 2022

Map C.21

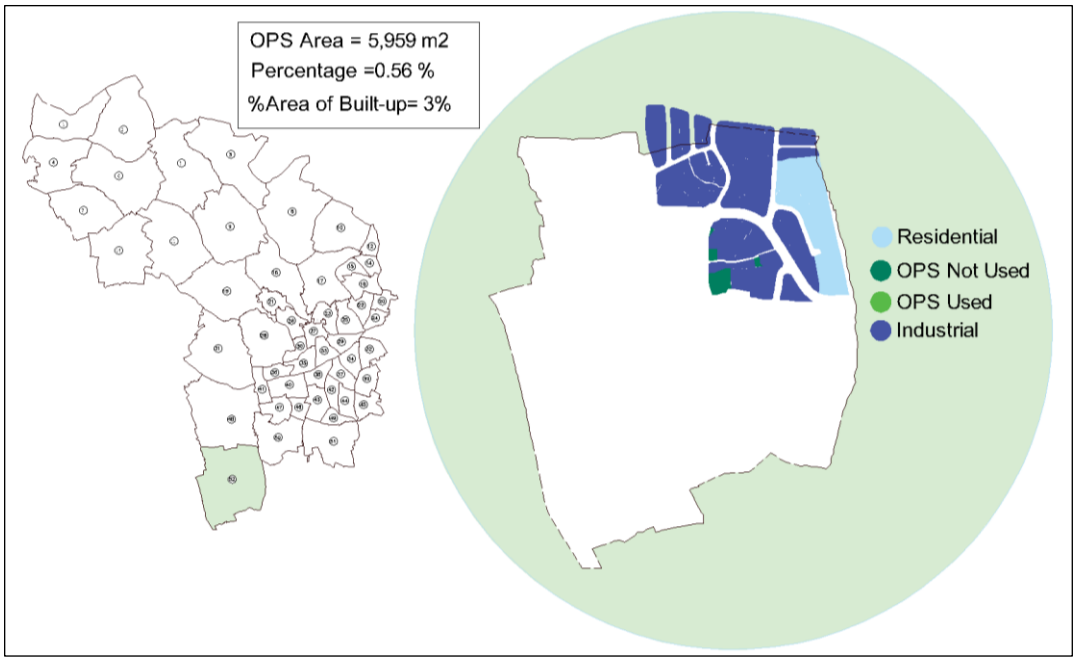
Neighborhood (51) OPS Percentage



Source: Author 2022

Map C.22

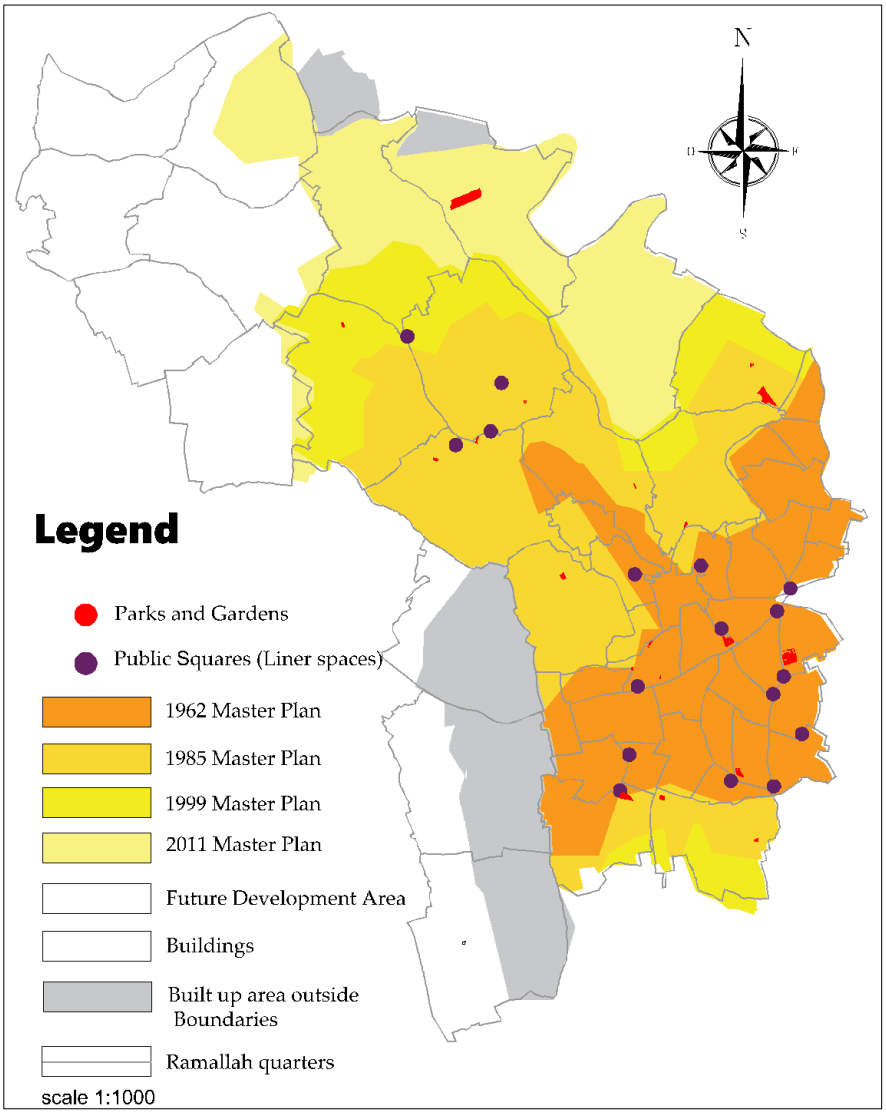
Neighborhood (52) OPS Percentage.



Source: Author 2022

Map C.23

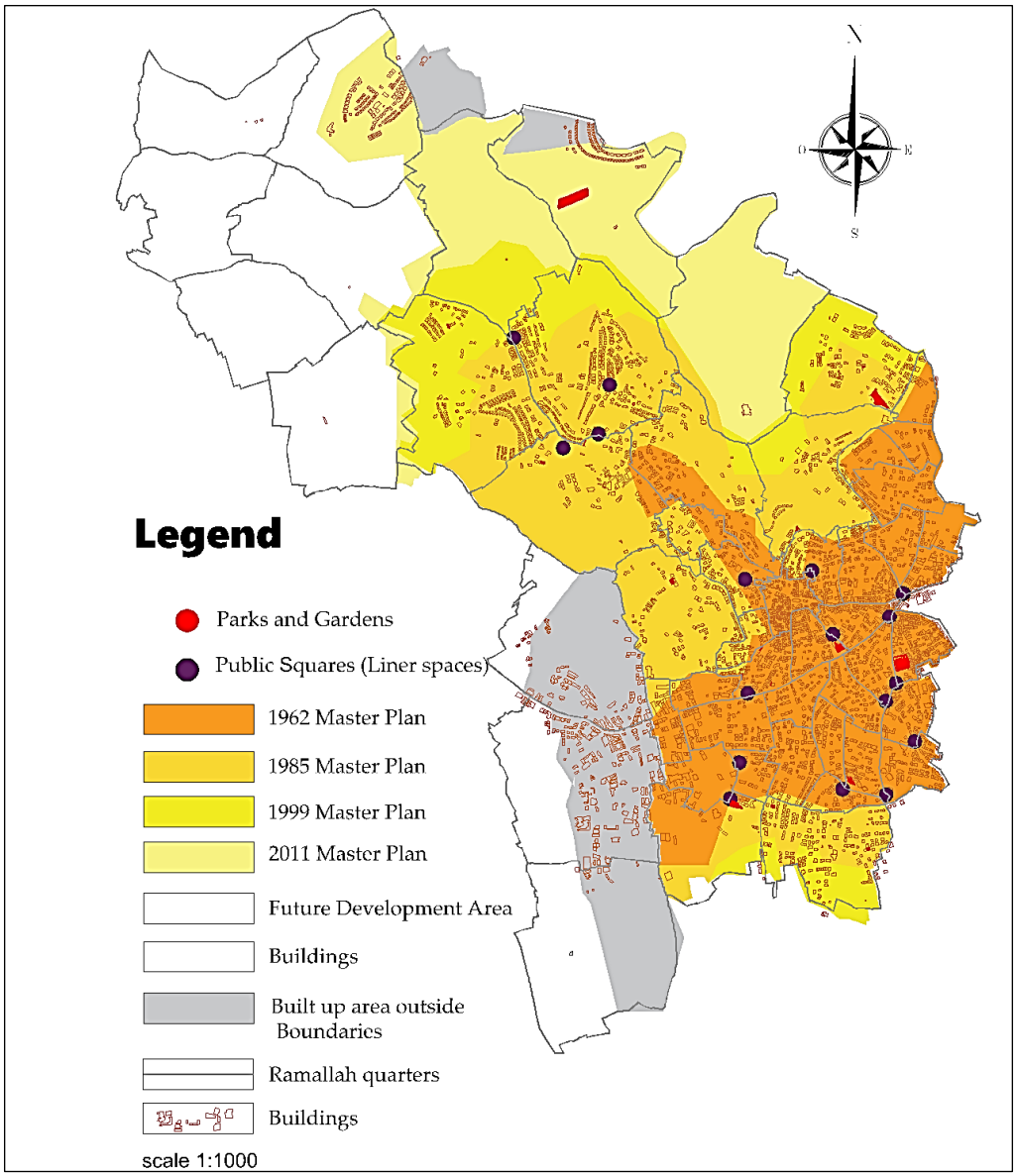
Ramallah Parks and Squares relation to quarters



Source: Author 2022

Map C.24

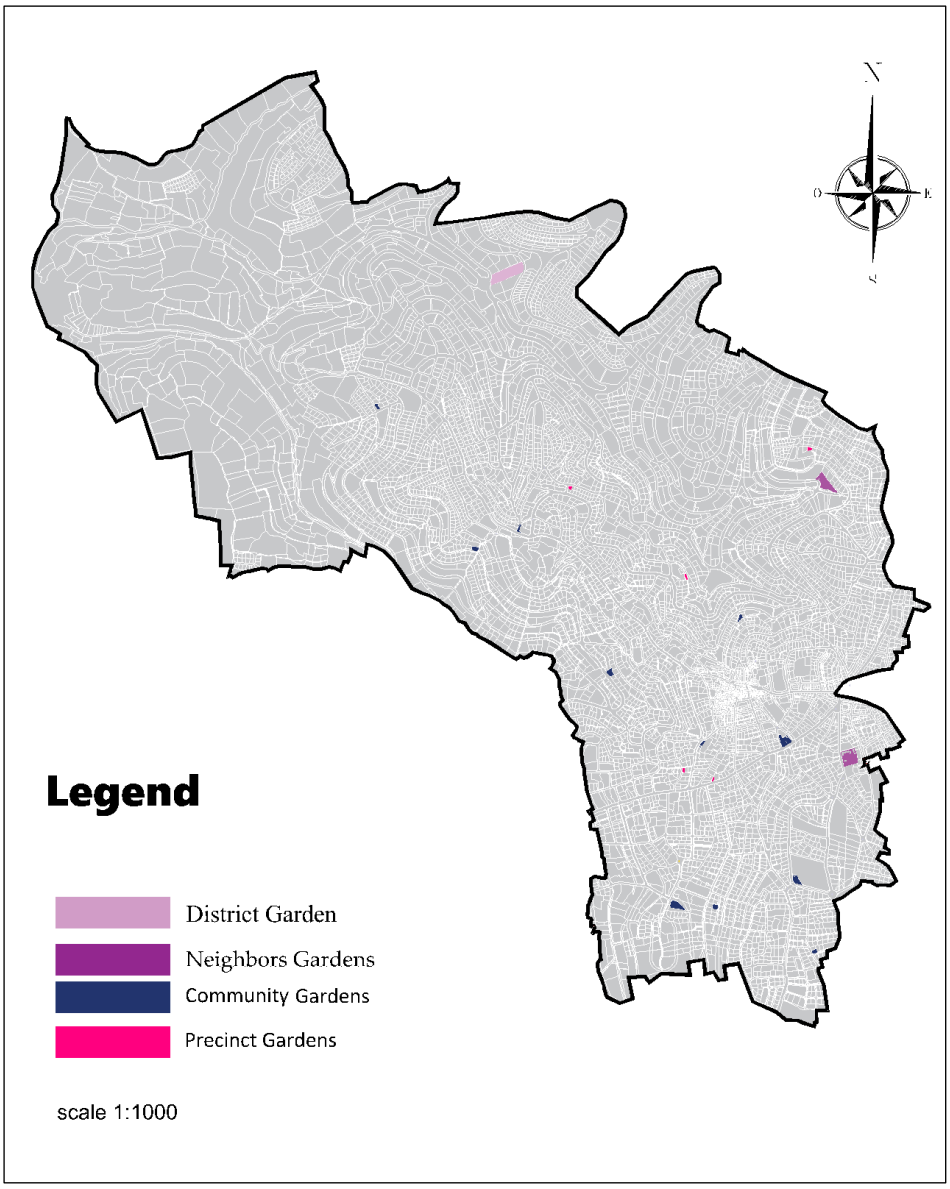
Parks and Squares in relation to built-up area



Source: Author 2022

Map C.25

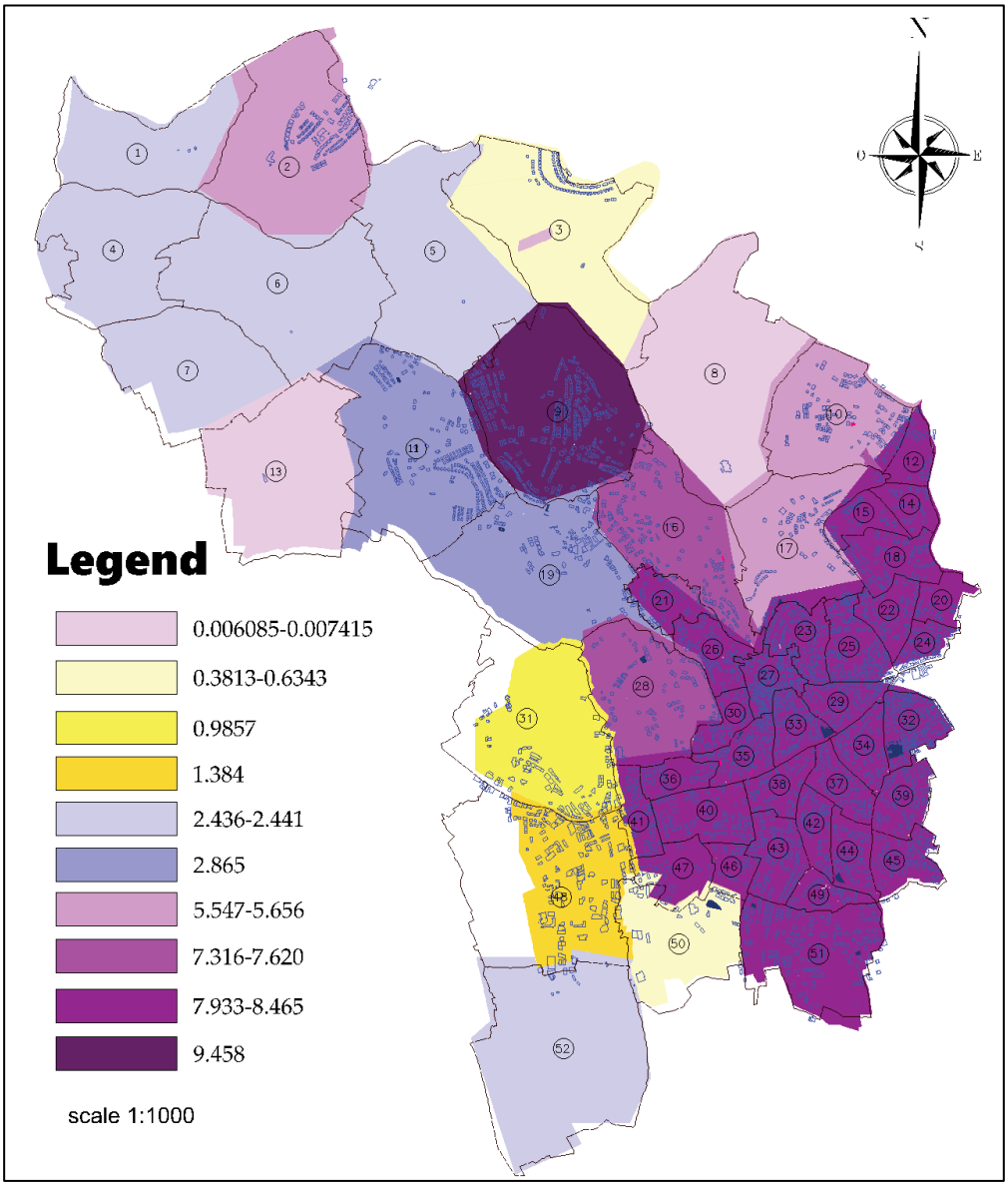
Parks and Gardens classifications in Ramallah City



Source: Author 2022

Map C.26

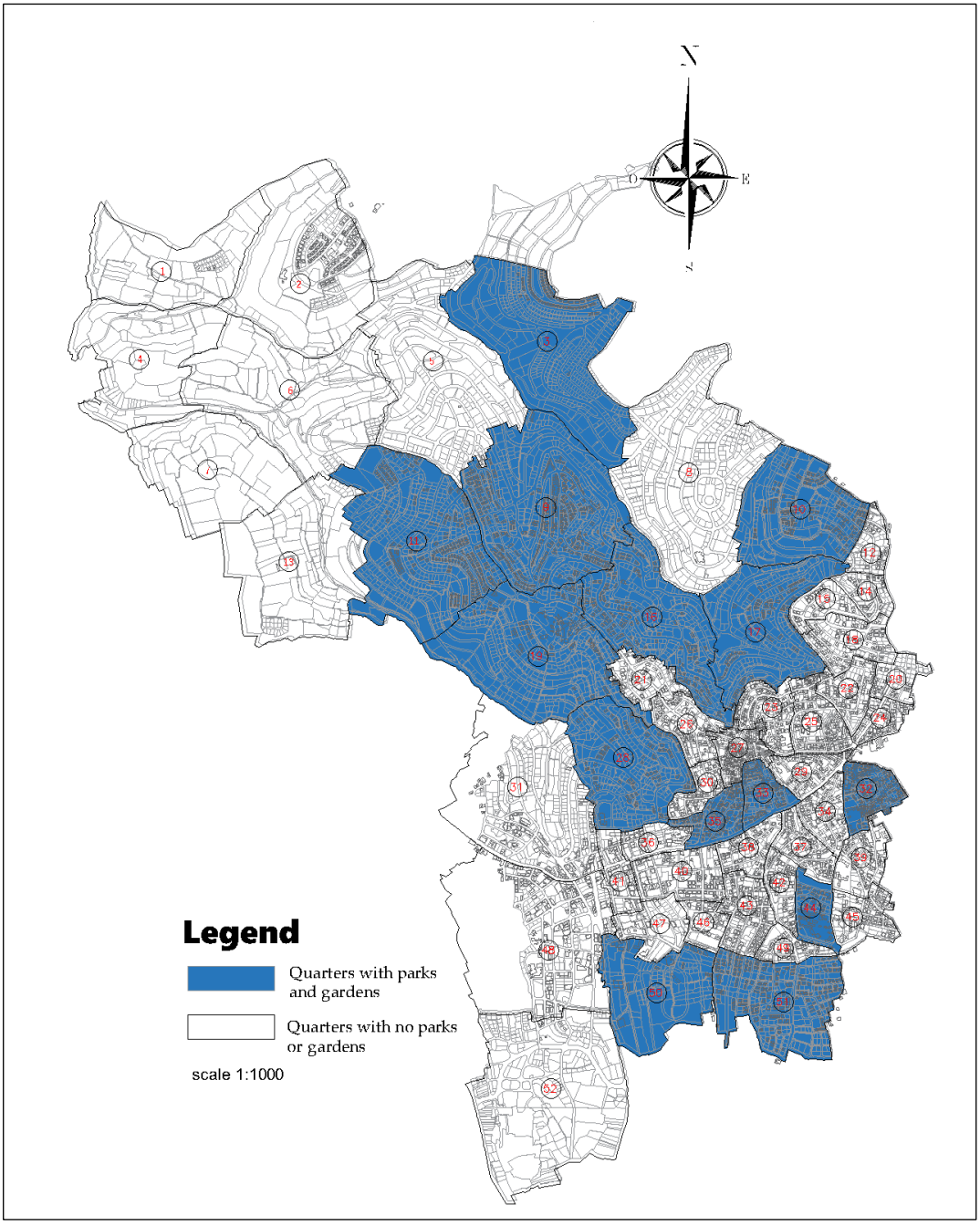
Ramallah quarters with population density distribution (2018)



Source: Author 2022

Map C.27

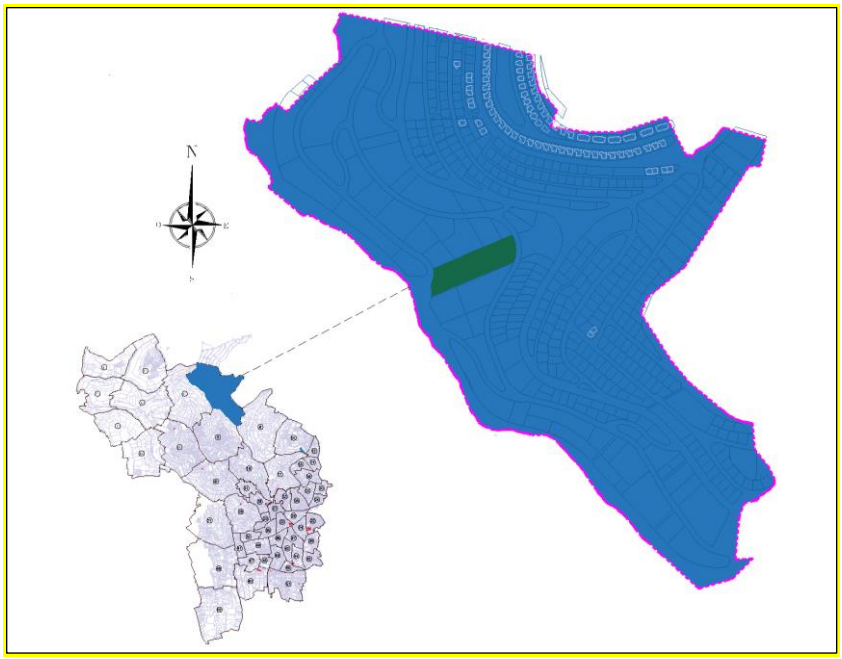
Ramallah's Quarters that contain parks and gardens



Source: Author 2022

Map C.28

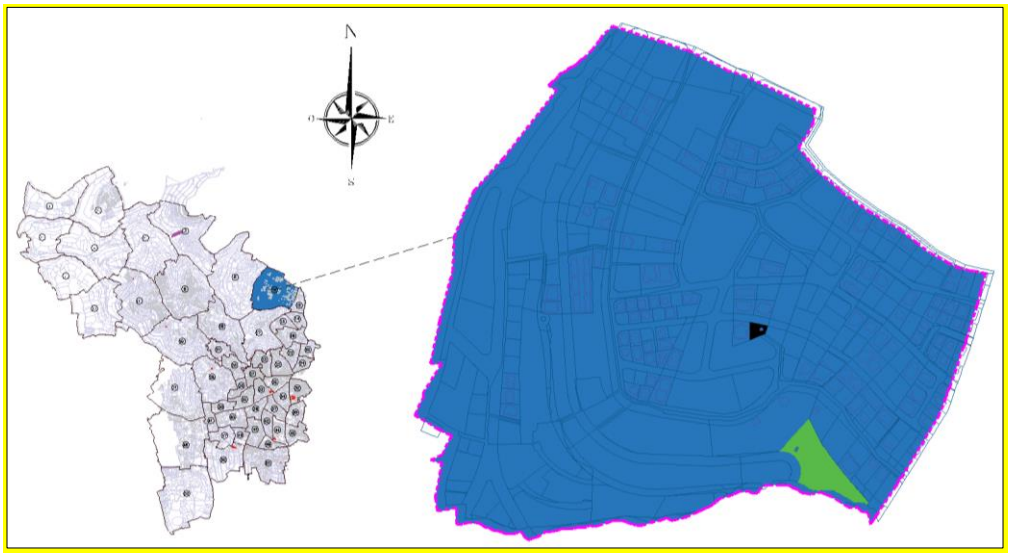
quarter No.3 (Al-Juheer) coverage and accessibility



Source: Author 2022

Map C.29

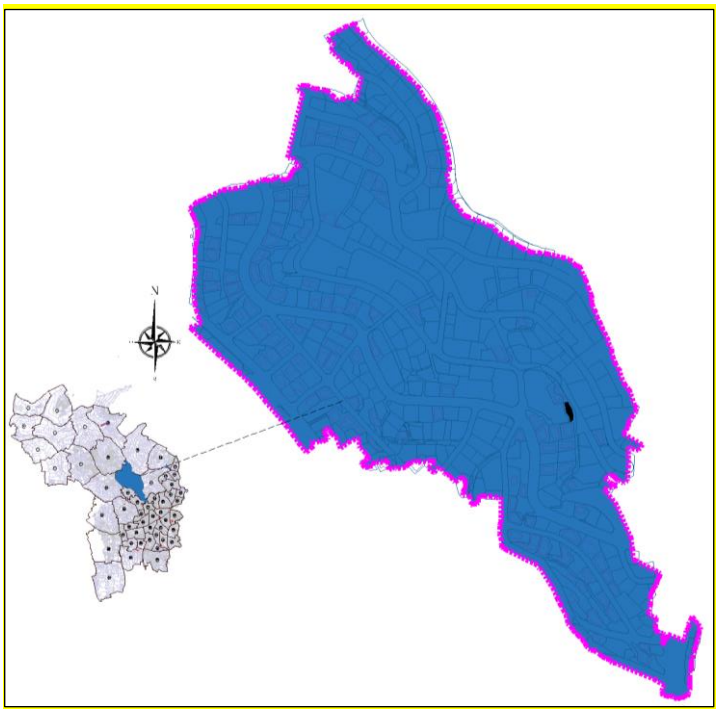
quarter No.10(Radana) coverage and accessibility



Source: Author 2022

Map C.30

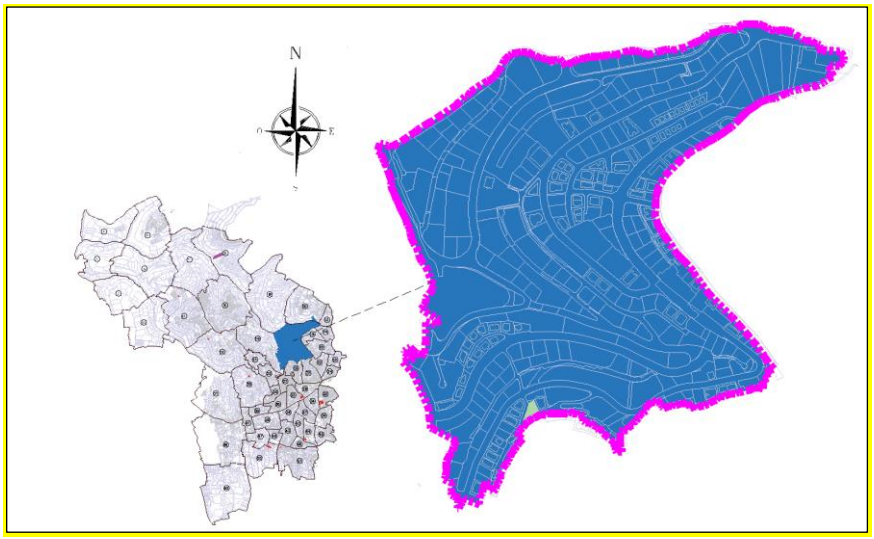
quarter No.16(Al-Jadwal) coverage and accessibility



Source: Author 2022

Map C.31

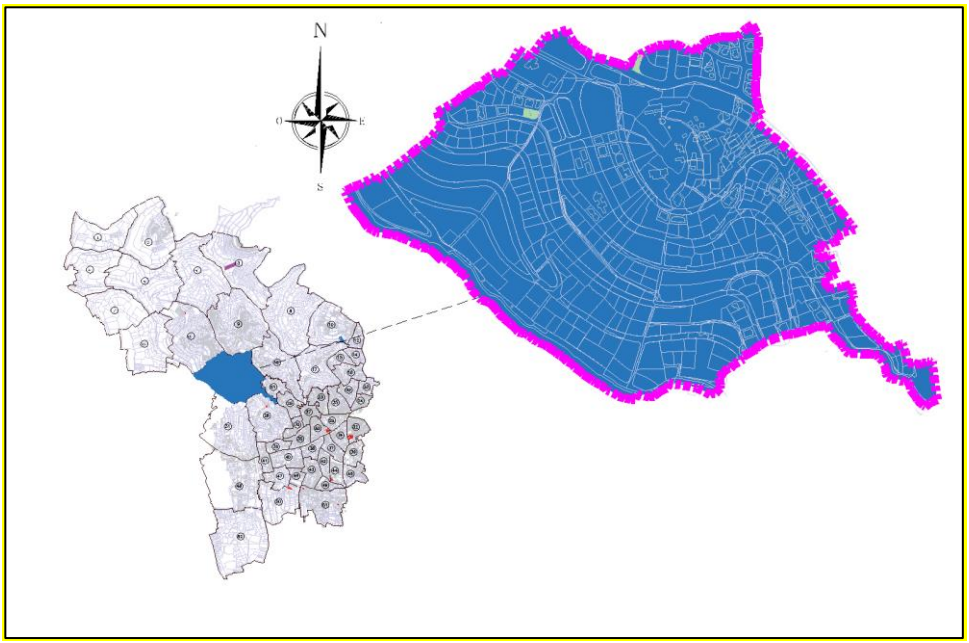
quarter No.17(Ein-Alkarzam) coverage and accessibility



Source: Author 2022

Map C.32

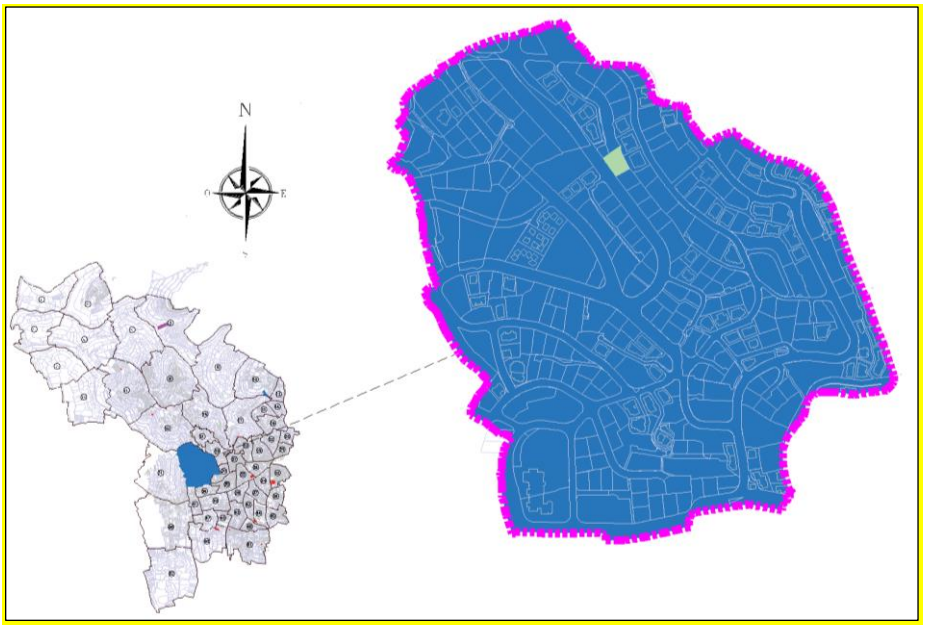
quarter No.19 (Al-Terih) Coverage and Accessibility



Source: Author 2022

Map C.33

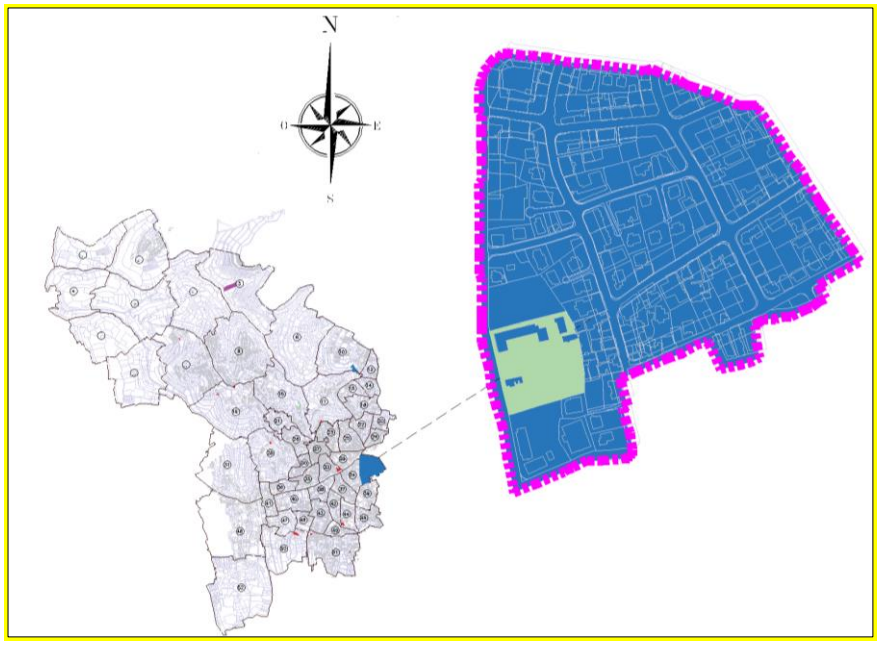
quarter No.28(Batn Al-hawa) coverage and accessibility



Source: Author 2022

Map C.34

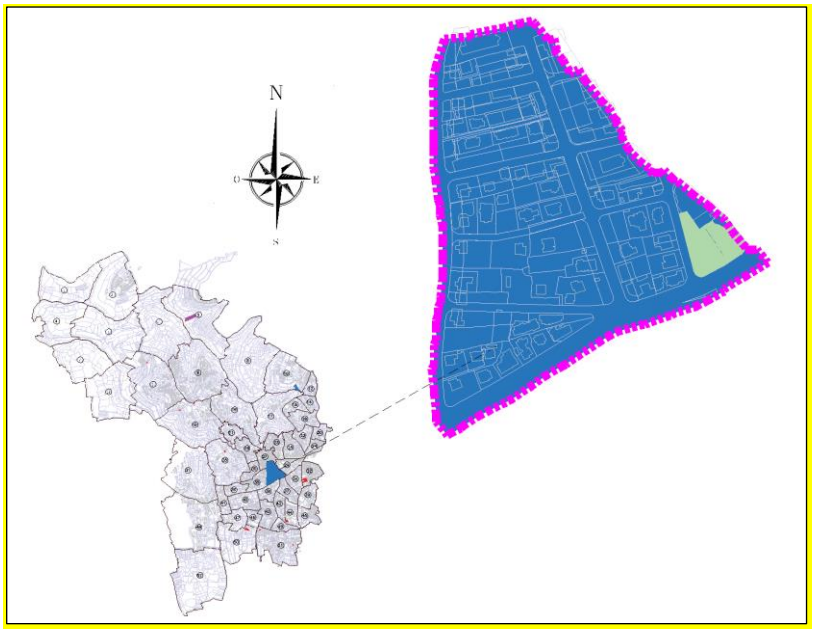
quarter No.32(Qaddora) coverage and accessibility



Source: Author 2022

Map C.35

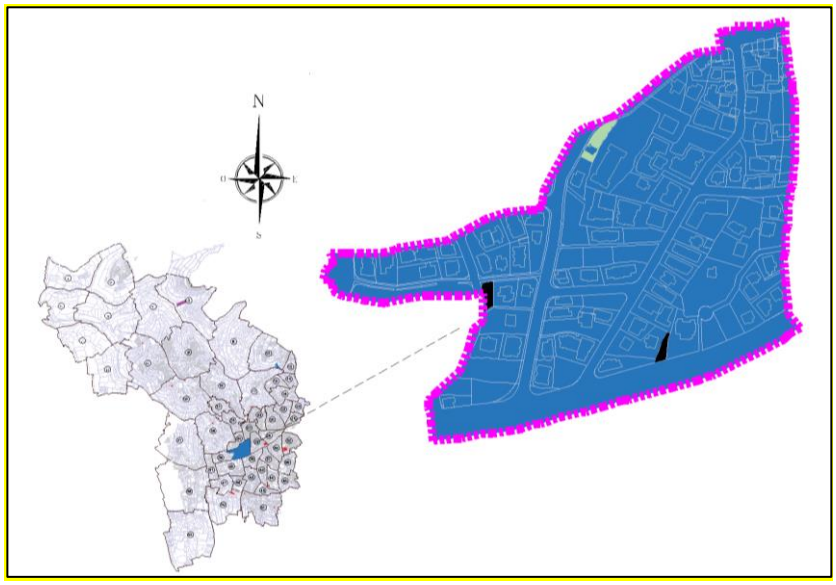
quarter No.33 (Mar Jerais)coverage and accessibility



Source: Author 2022

Map C.36

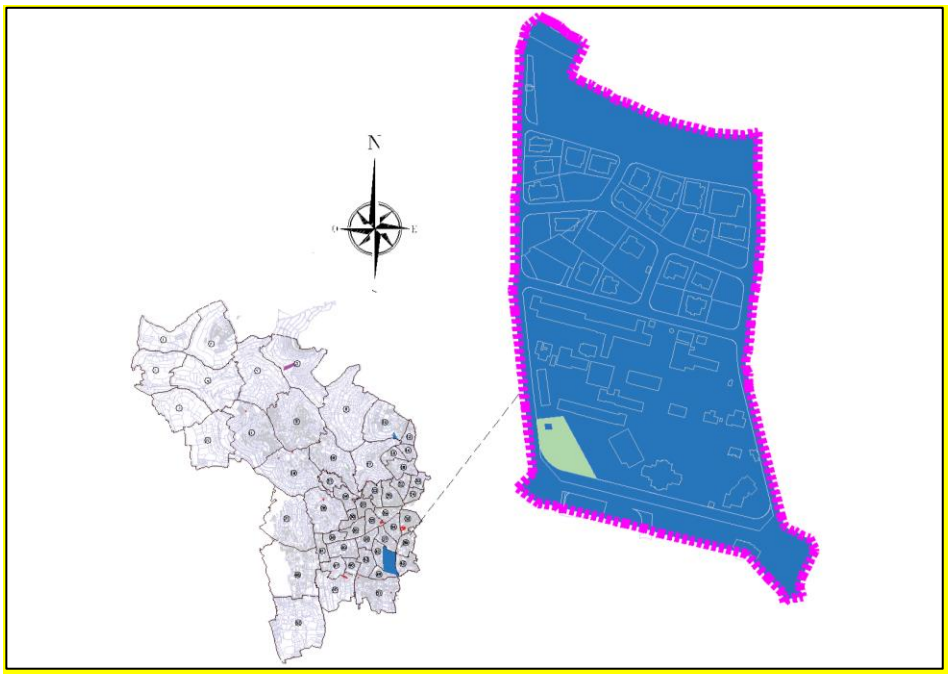
quarter No.35 (Al-qastal)coverage and accessibility



Source: Author 2022

Map C.37

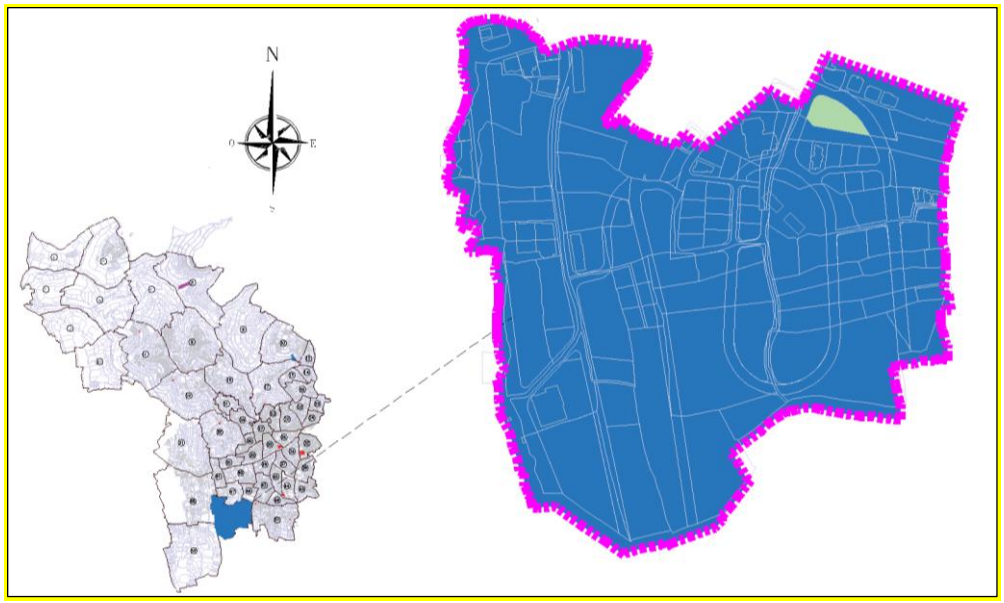
quarter No.44 (Dar Awwad)coverage and accessibility



Source: Author 2022

Map C.38

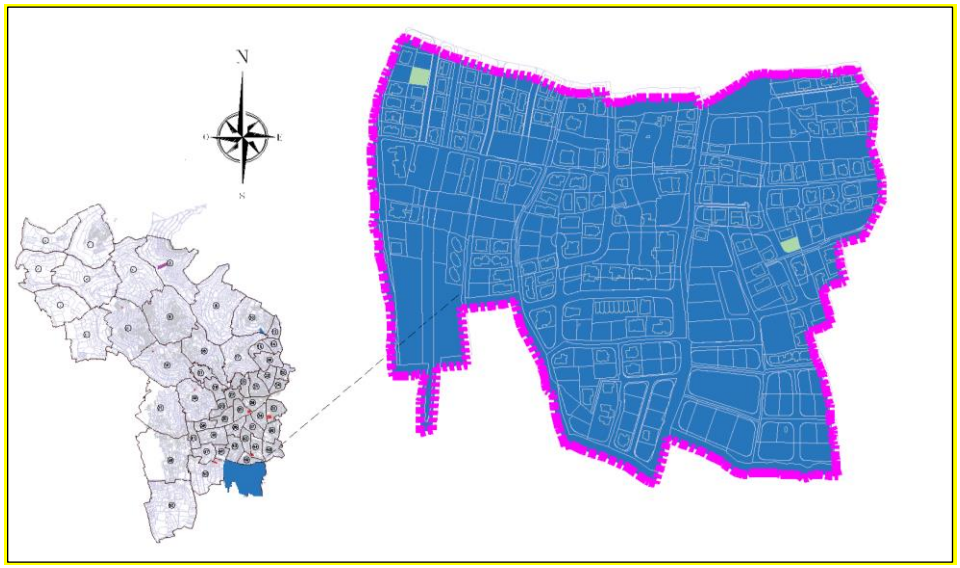
quarter No.50 (khallet T'emeh) coverage and accessibility



Source: Author 2022

Map C.39

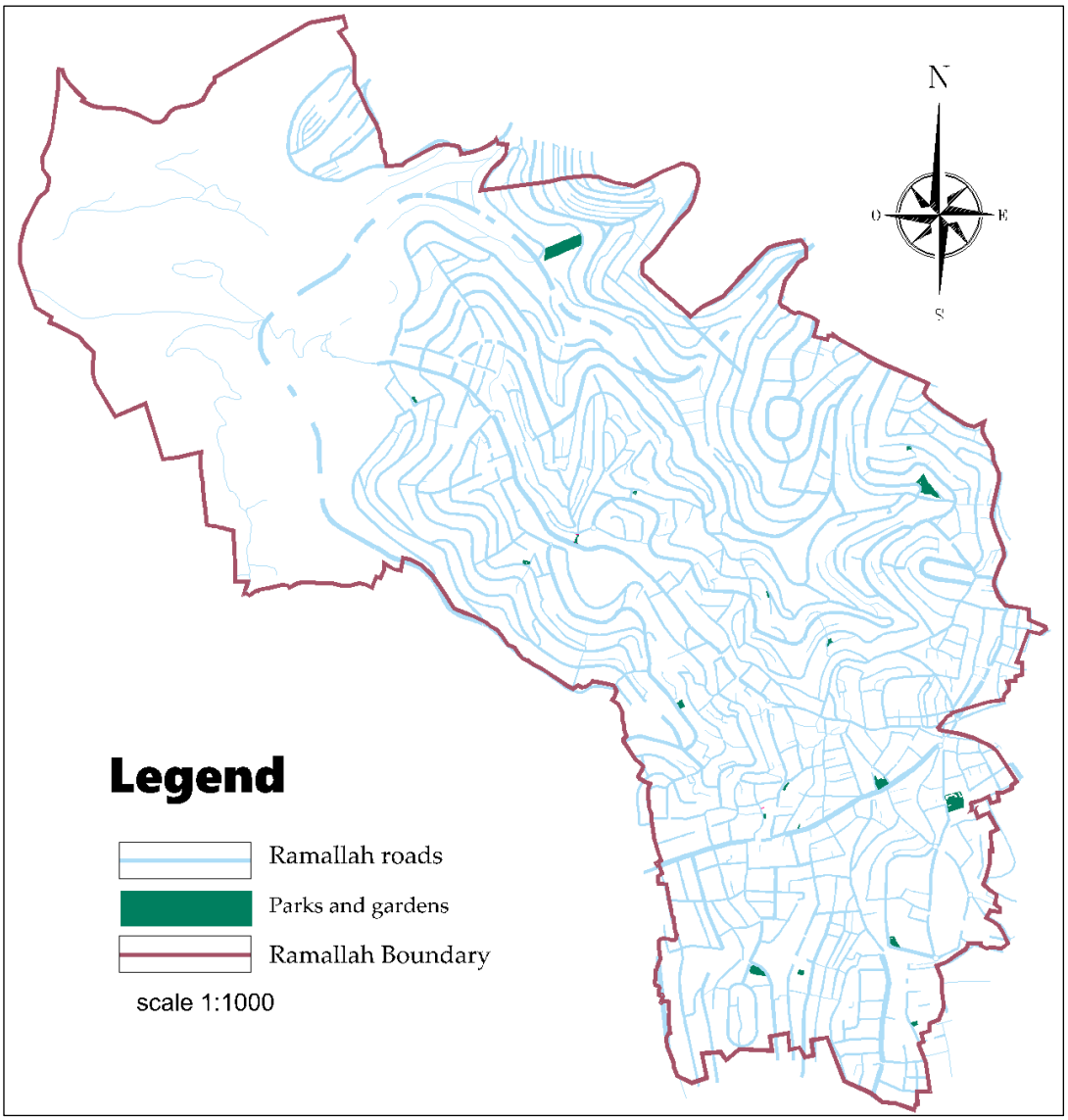
quarter No.51 (Al-Masyoon) coverage and accessibility



Source: Author 2022

Map C.40

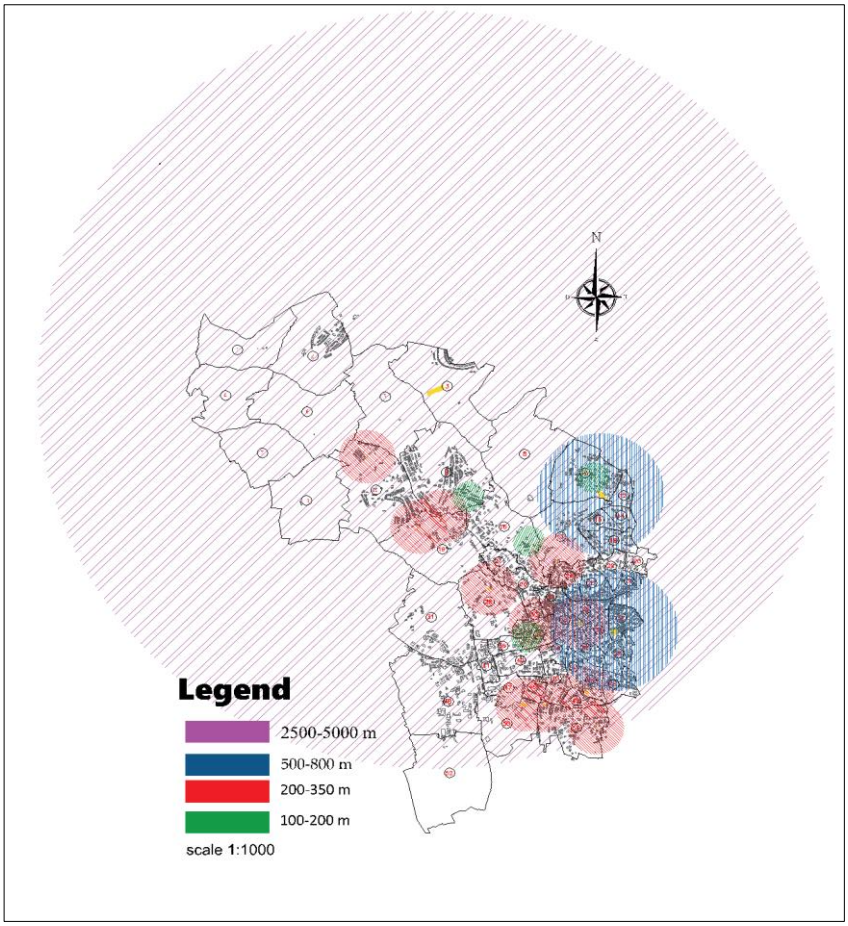
Ramallah parks and gardens accessibility



Source: Author 2022

Map C.41

Ramallah parks and gardens scope of service



Source: Author 2022

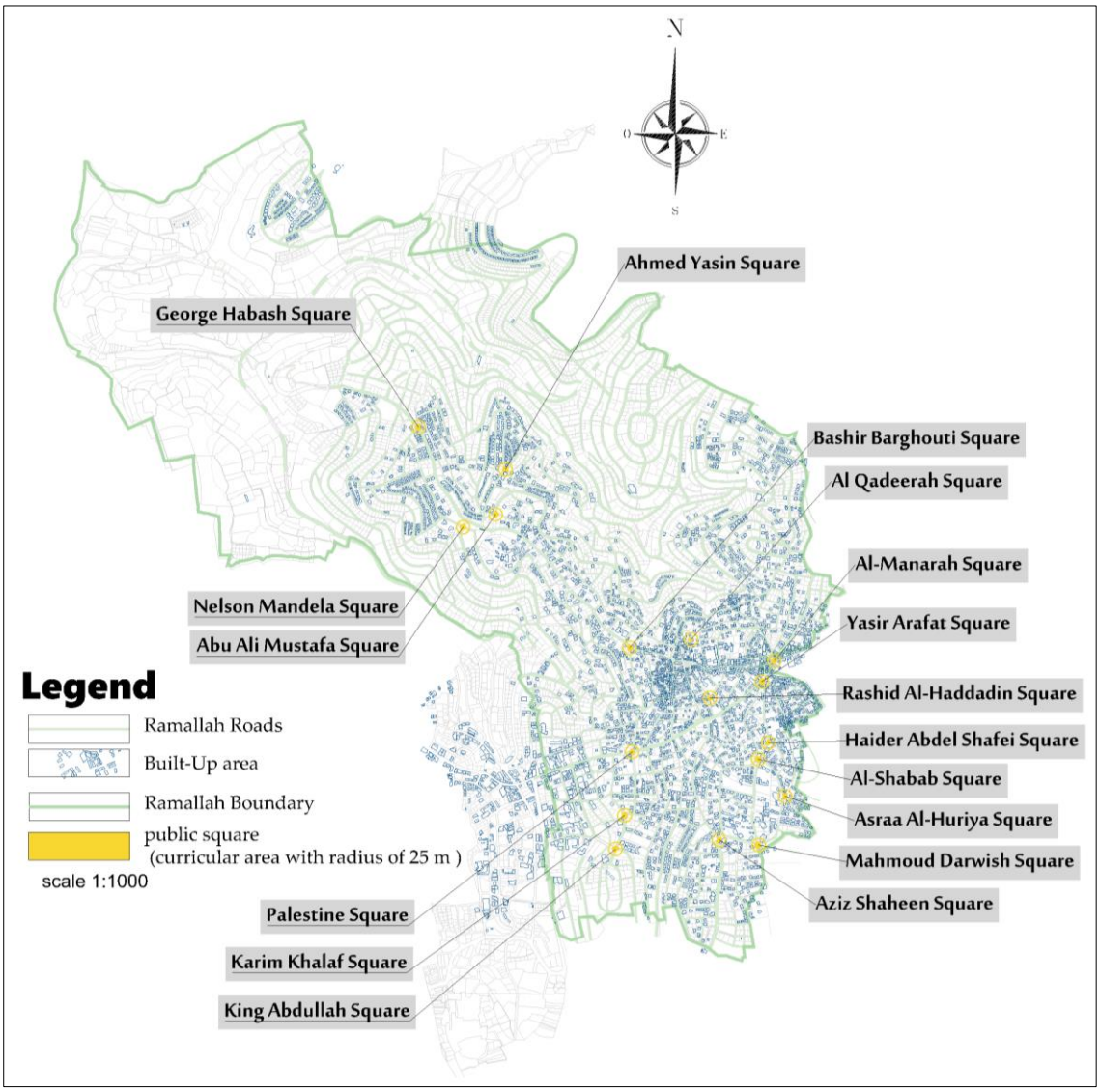
Map C.42

Ramallah New Sport Track 2021

Source: Author 2022

Map C.43

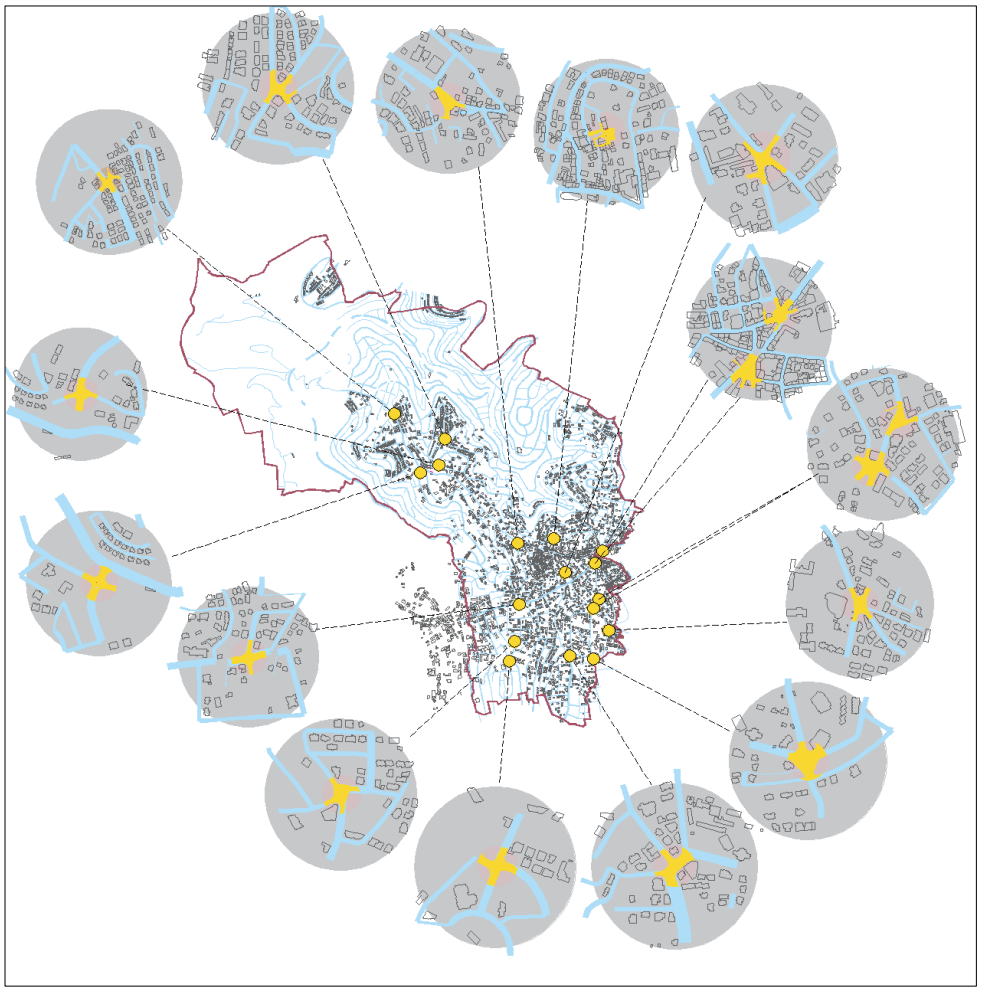
Ramallah Public Squares



Source: Author 2022

Map C.44

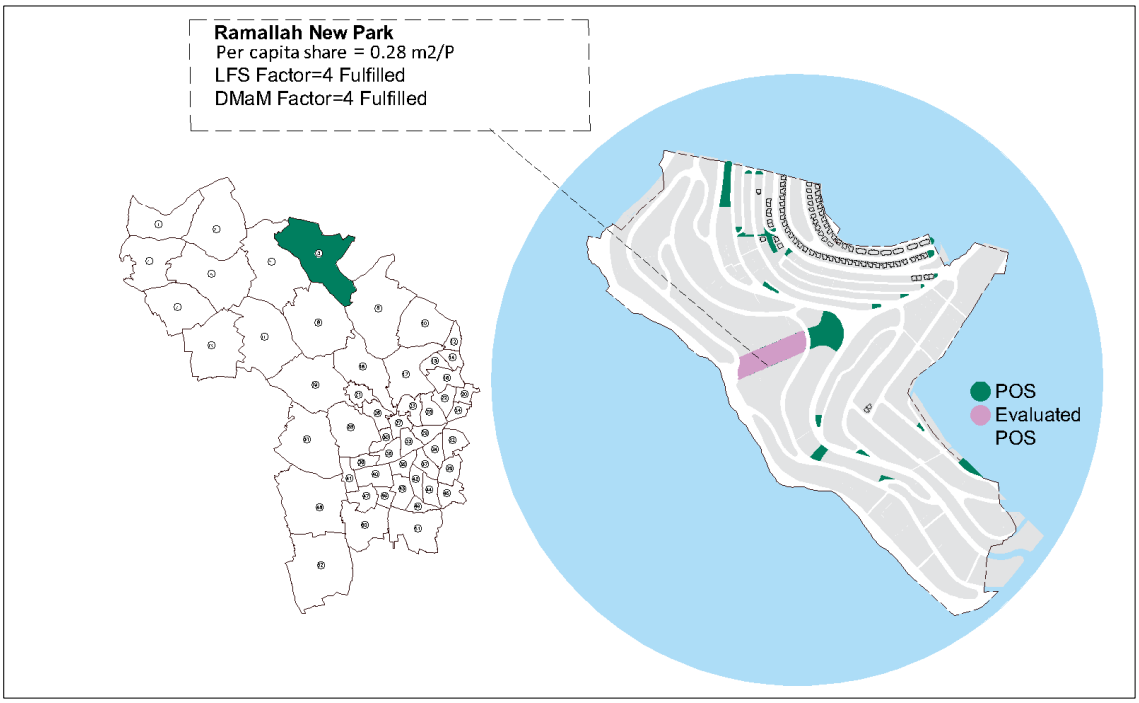
Ramallah Public Squares -25 m range



Source: Author 2022

Map C.45

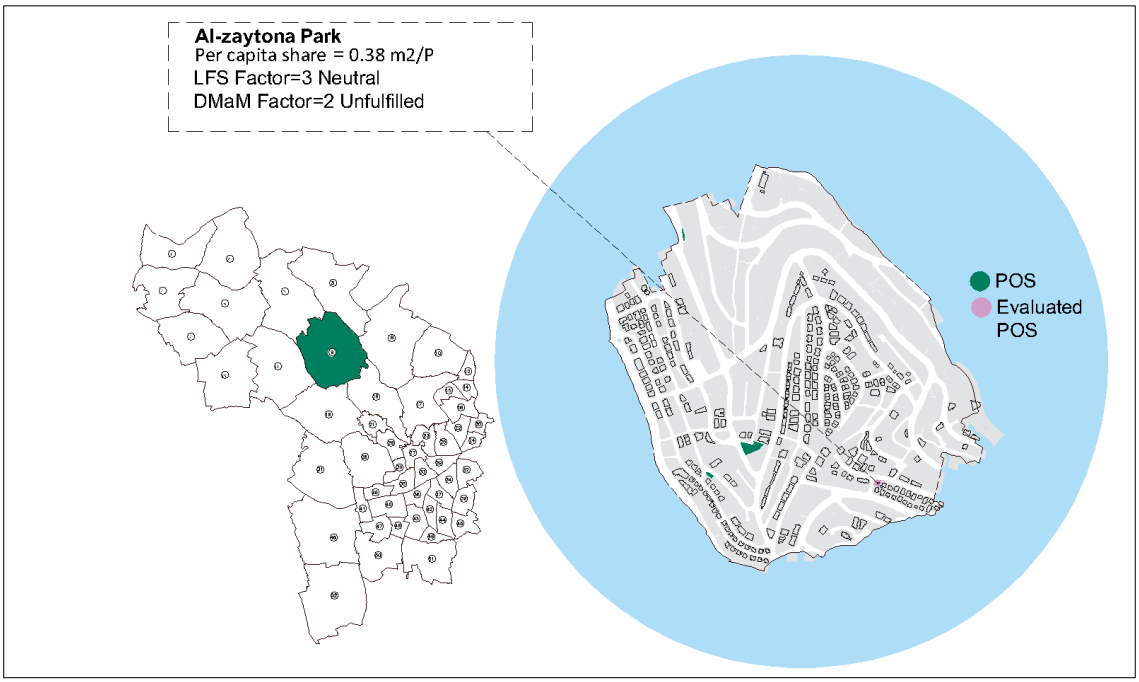
Ramallah New Park LFS and DMaM fulfillment



Source:Author 2022

Map C.46

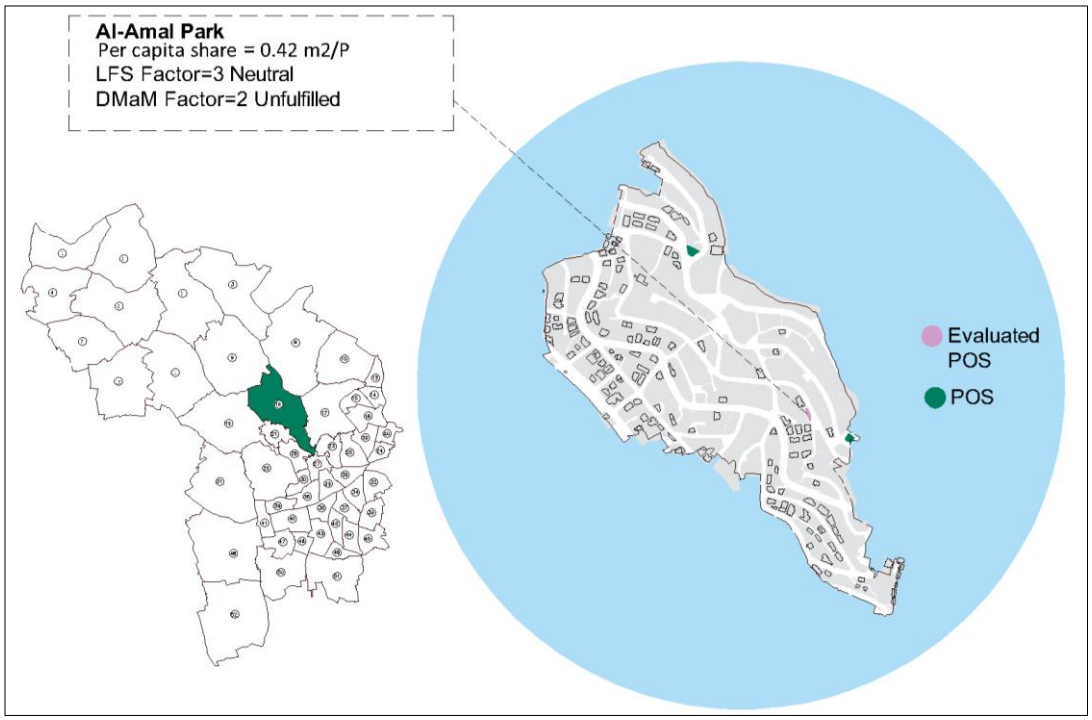
Al-Zaytoona Park LFS and DMaM fulfillment



Source:Author 2022

Map C.47

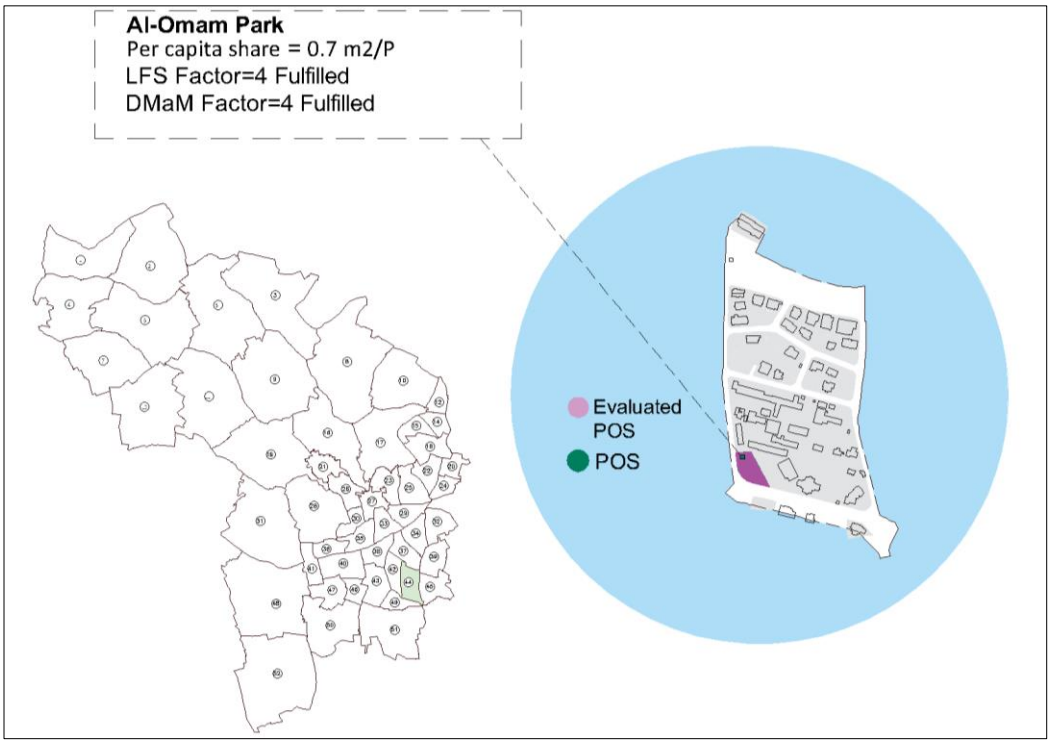
Al-Amal park LFS and DMaM fulfillment



Source:Author 2022

Map C.48

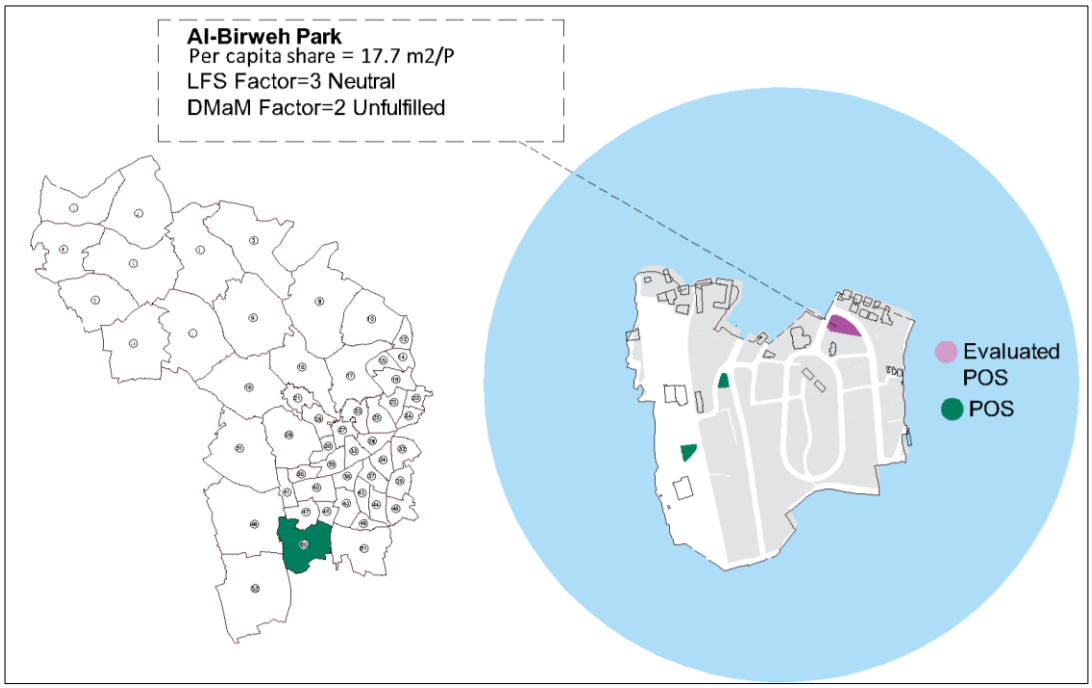
Al-Omam park LFS and DMaM fulfillment



Source:Author 2022

Map C.49

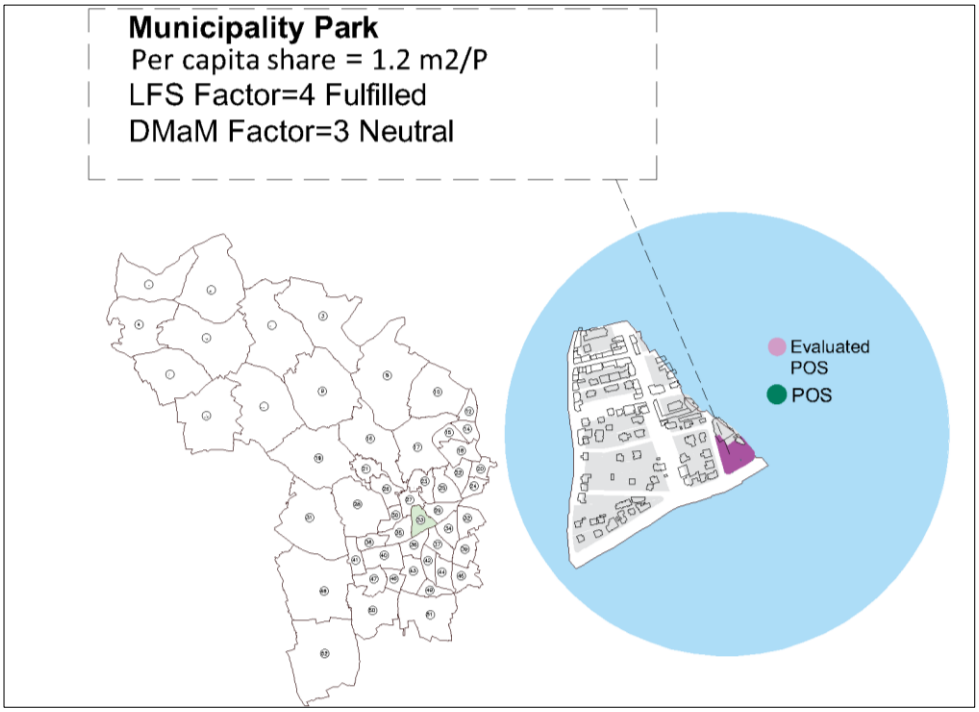
Al-Birweh park LFS and DMaM fulfillment



Source:Author 2022

Map C.50

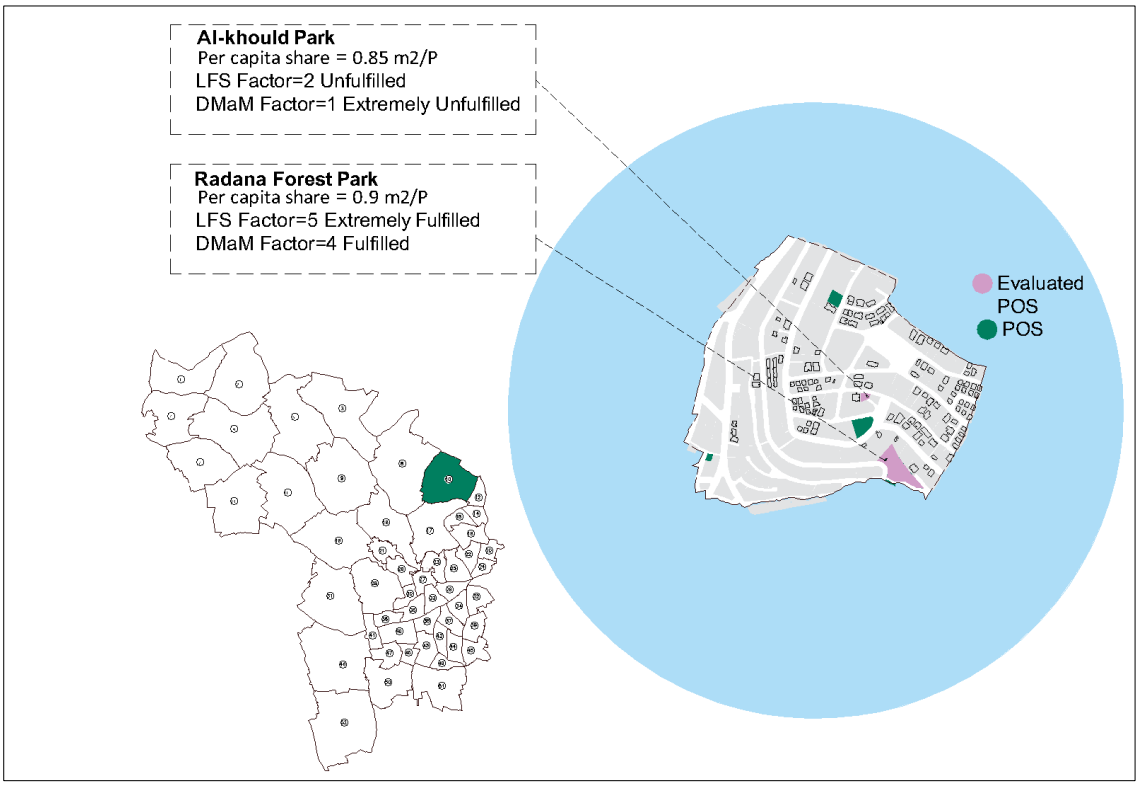
Munacipality park LFS and DMaM fulfillment



Source:Author 2022

Map C.51

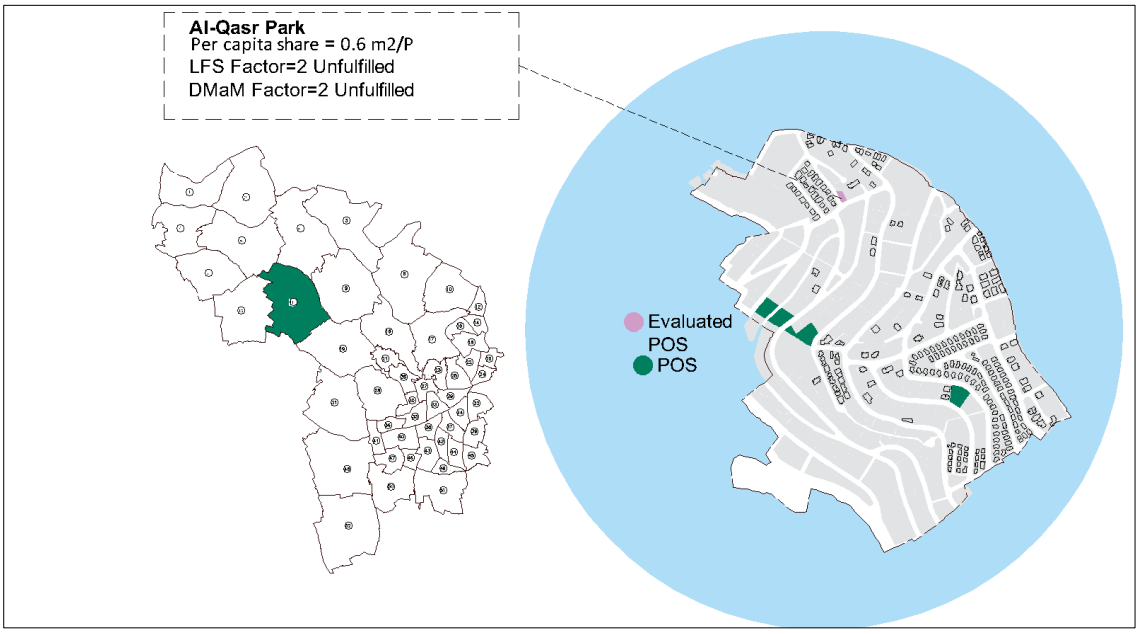
Redana Forest and Al-Kholoud park LFS and DMaM fulfillment



Source:Author 2022

Map C.52

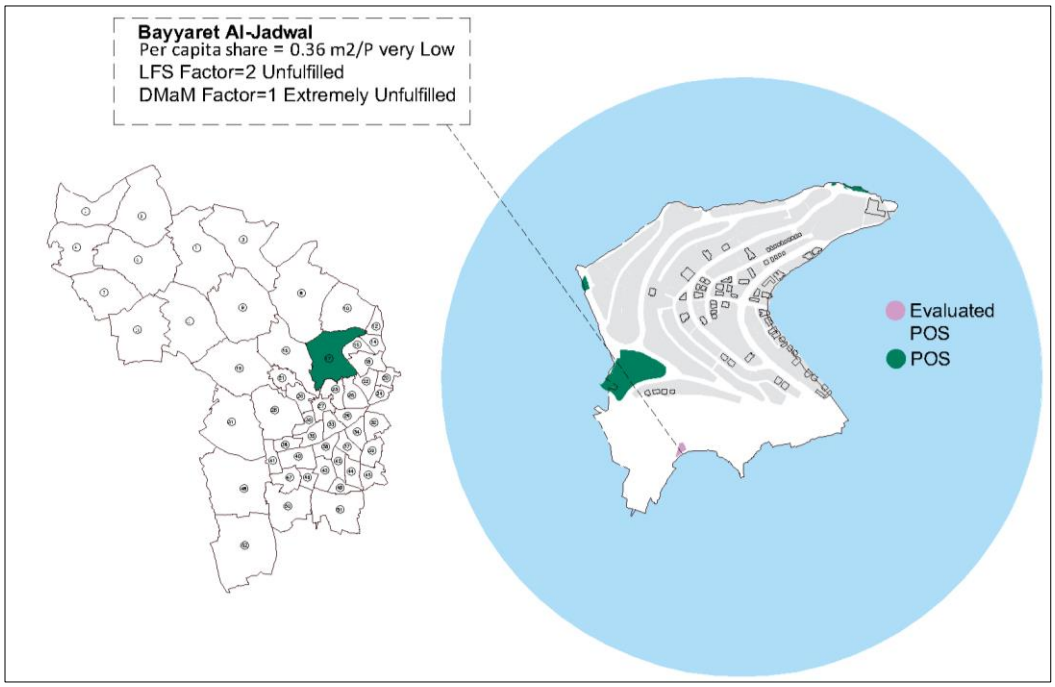
Al-Qasr park LFS and DMaM fulfillment



Source:Author 2022

Map C.53

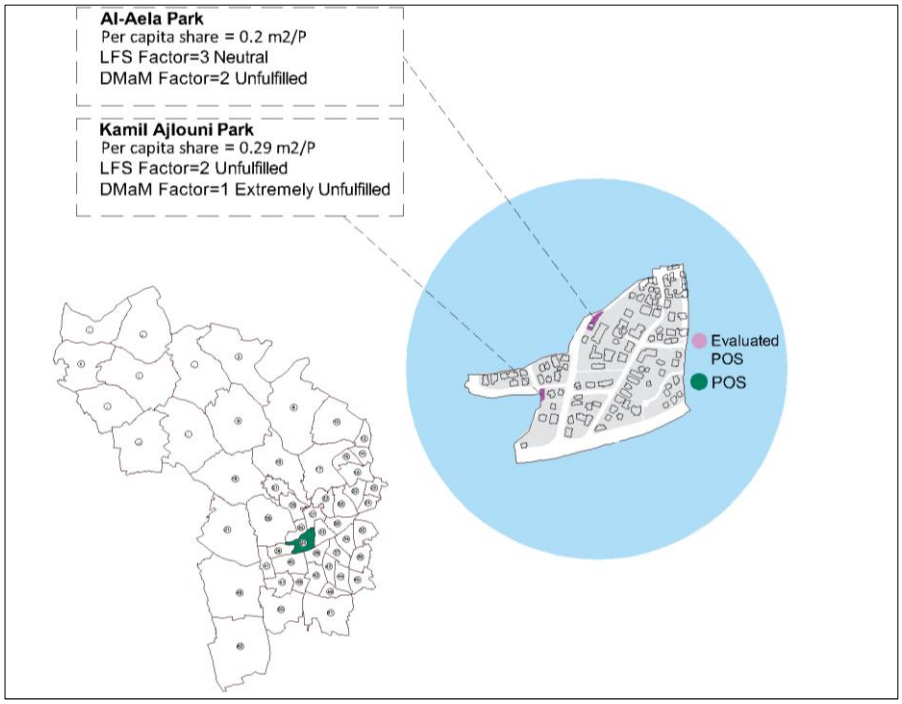
Bayyaret Al-Jadwal LFS and DMaM fulfillment



Source:Author 2022

Map C.54

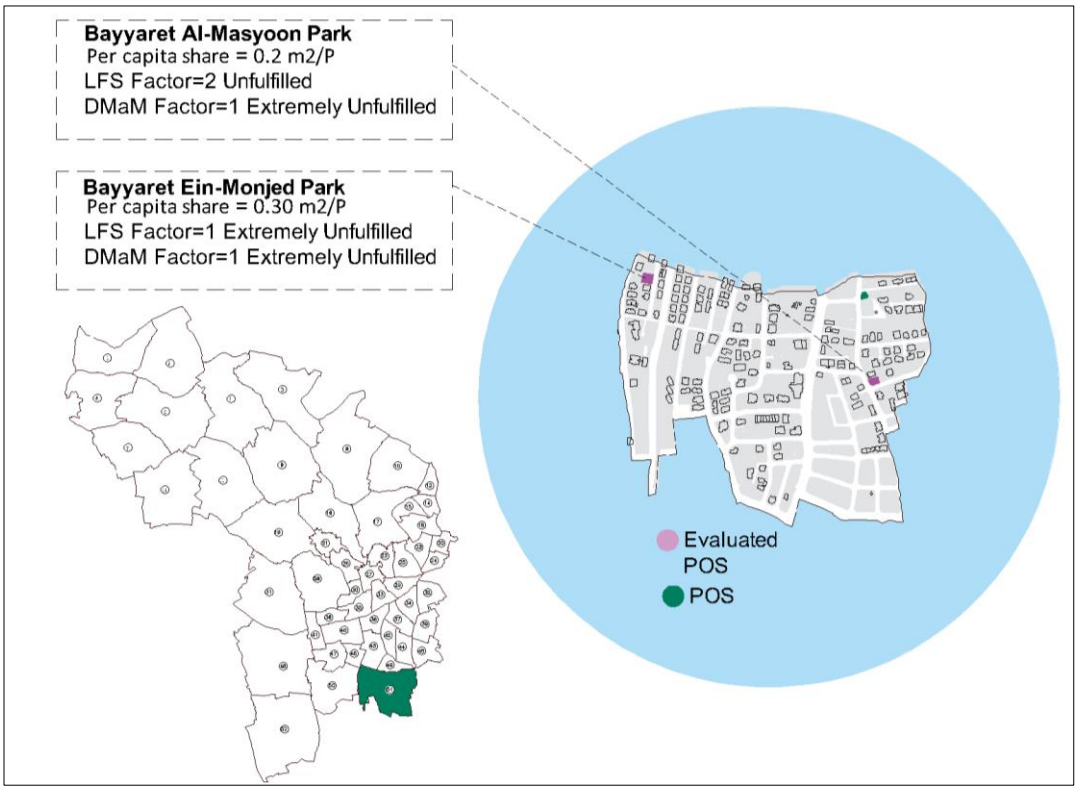
Al-Aela and Kamil Ajlouni Park LFS and DMaM fulfillment



Source:Author 2022

Map C.55

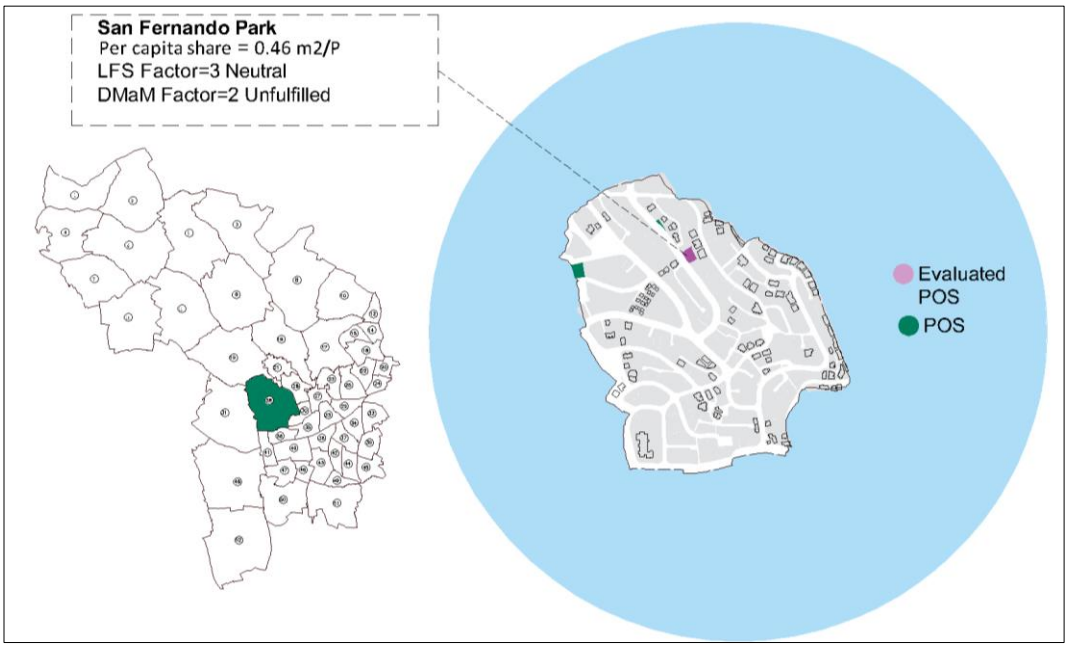
Bayyaret Al-masyoun &Ein Monjed Park LFS and DMaM fulfillment



Source:Author 2022

Map C.56

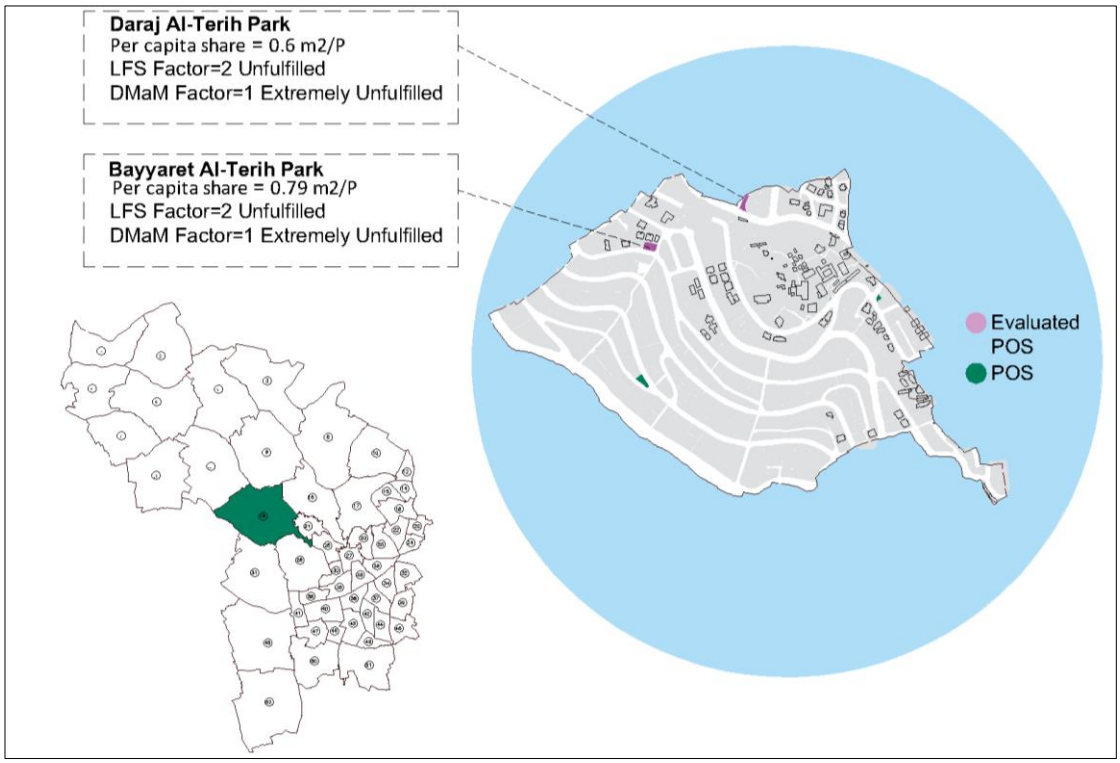
San fernando Park LFS and DMaM fulfillment



Source:Author 2022

Map C.57

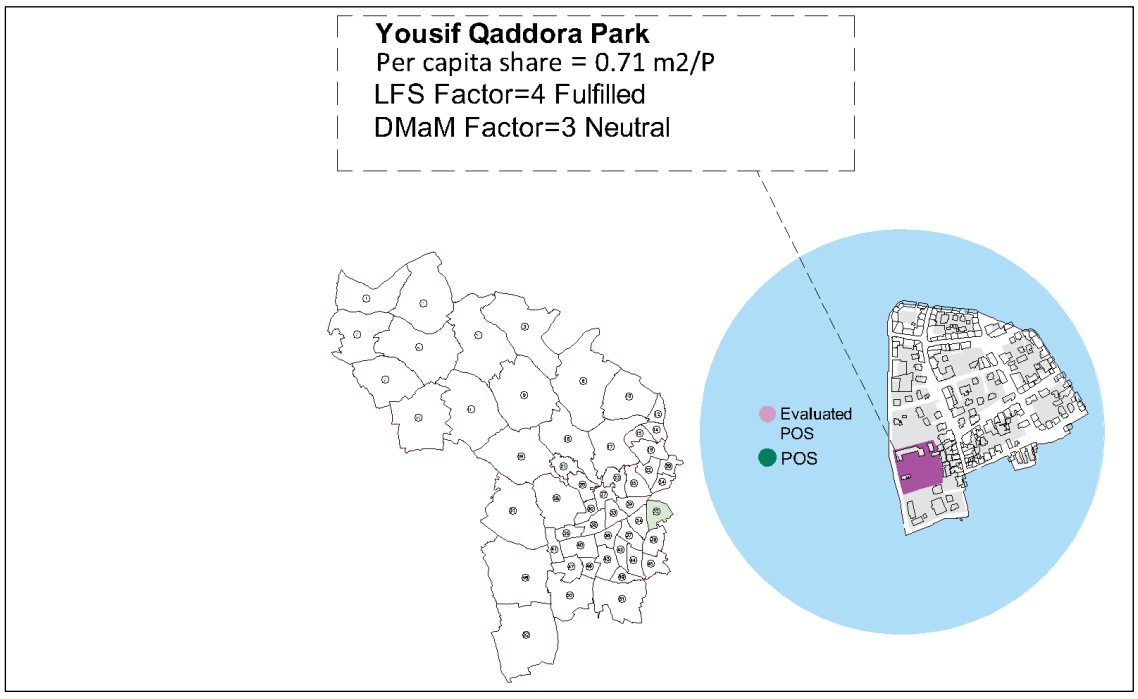
Daraj Al-terih&Bayyaret Al-terih Park LFS and DMaM fulfillment



Source:Author 2022

Map C.58

Yousef Qaddora Park LFS and DMaM fulfillment



Source:Author 2022

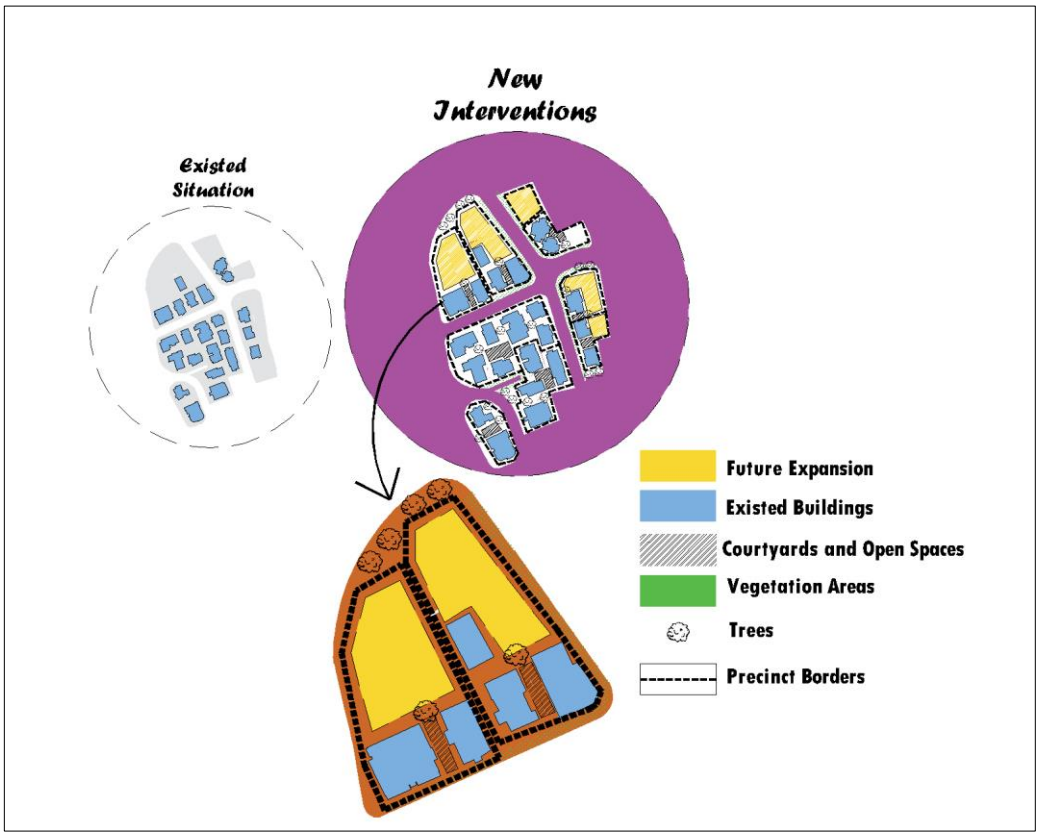
Map C.59

Shapes of proOPSed new OPS

Source:Author 2022

Map C.60

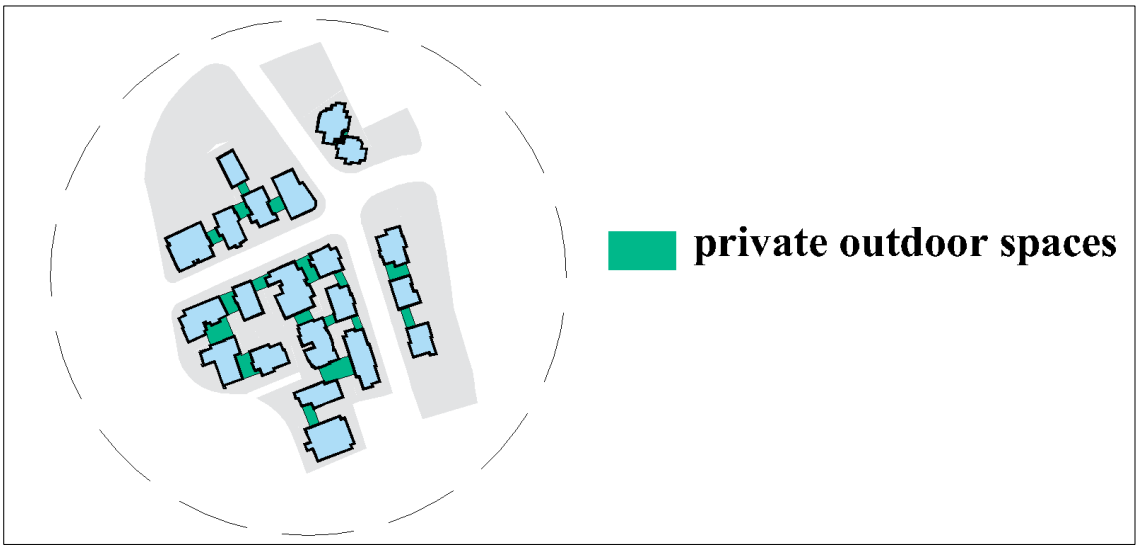
Design for New OPS's Interventions of Precinct in (Neghborhood 10)



Source:Author 2022

Map C.61

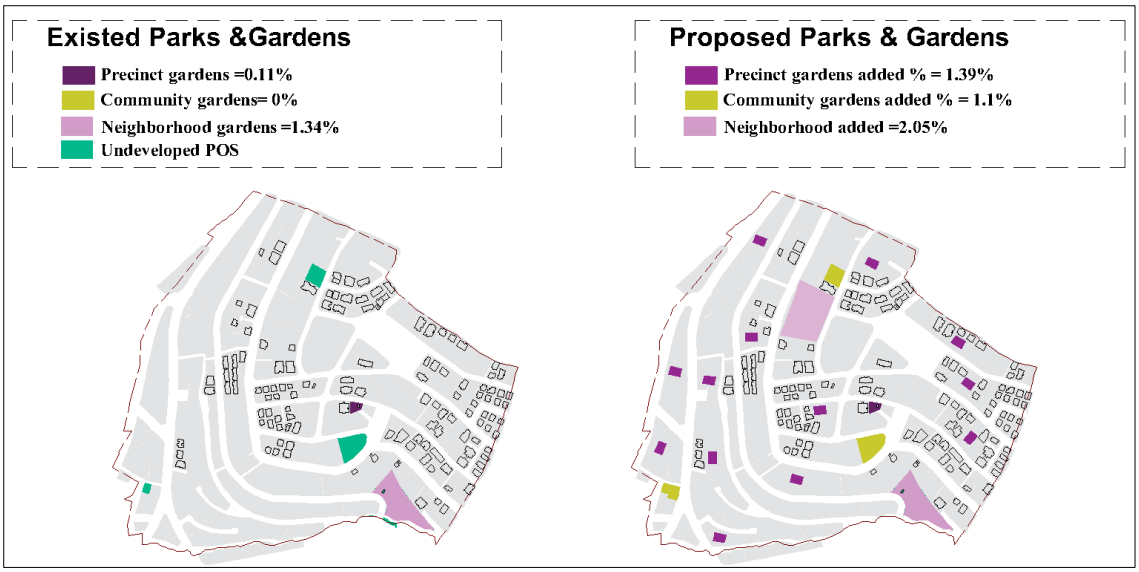
Integration of private outdoor spaces into building designs (Neghborhood 110 sample)



Source:Author 2022

Map C.62

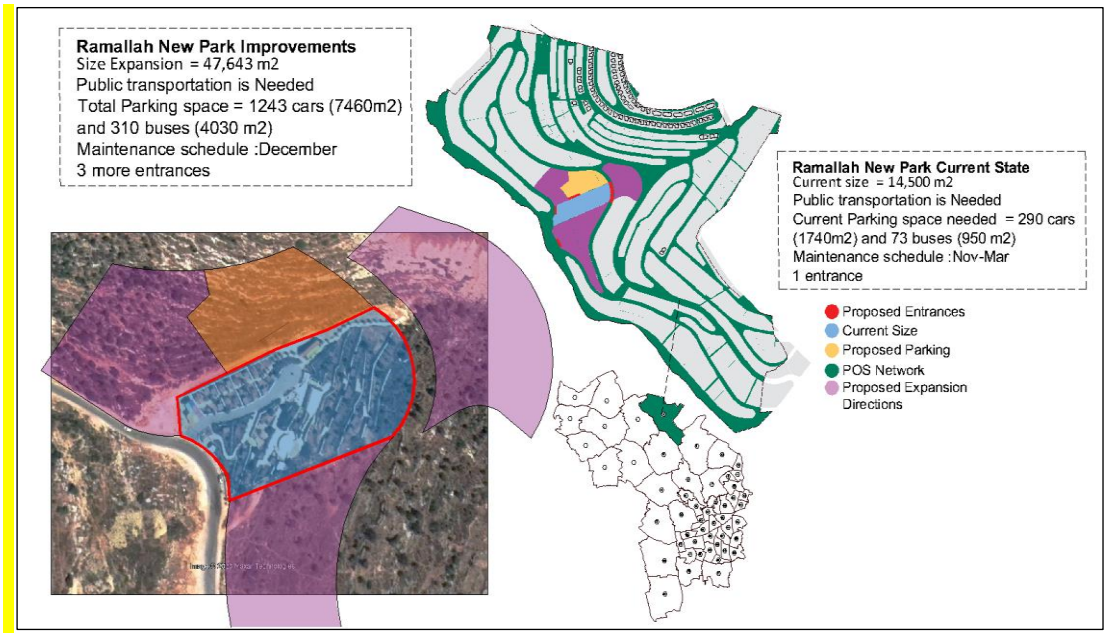
left-over spaces use & proOPSed new Parks and gardens



Source:Author 2022

Map C.63

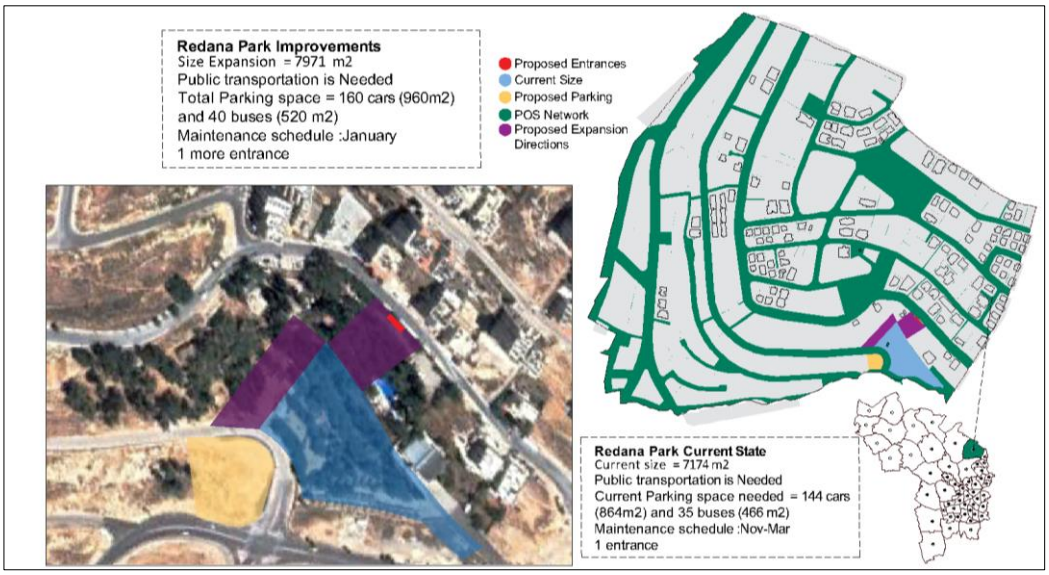
Ramallah new Park Improvments



Source:Author 2022

Map C.64

Redana Park Improvments



Source:Author 2022

Appendix D

Survey questions

A form for evaluating the state of parks and public open spaces in the city of Ramallah after the COVID-19 pandemic, compared to their state before the pandemic.

Evaluation of parks and public open spaces during the COVID-19 pandemic in the city of Ramallah:
This survey consists of five sections. Please answer all questions in all sections, and simple notes have been attached regarding filling out the survey in each section. Please read them before answering the questions.

Demographic variables:
This section contains six questions, all of which should be answered.
Gender*
Male
Female
Age*
Under 18 years old
18-30 years old
31-40 years old
41-50 years old
51-60 years old
Over 60 years old
Education level*
Uneducated
In school
High school diploma
Bachelor's degree / currently studying
Diploma / still studying
Graduate degrees / still studying
Other
Place of residence*
City of Ramallah
Ramallah and Al-Bireh Governorate
Outside Ramallah and Al-Bireh Governorate
If you live in the city of Ramallah, in which neighborhood do you live?
Have you contracted the coronavirus during the pandemic? *
Yes
No
If the answer is yes, how many times have you contracted the coronavirus?
Once
Twice
More
Year of infection with the virus
2020
2021
2022

Survey regarding parks and public open spaces in Ramallah, generally, and before the COVID-19 pandemic:
This section consists of 20 questions to clarify the evaluation of parks and open spaces in general.

Please answer all questions.

Generally, how satisfied or dissatisfied are you with the parks and public open spaces in the city of Ramallah?*

Satisfied
Somewhat satisfied
Neutral
Somewhat dissatisfied
Dissatisfied
I don't know

What are your comments related to?*

All parks in general
A specific park
If the previous answer was a specific park, please mention the name of the park.

How often did you visit the park or open space before the pandemic?*

Most days
Weekly
Monthly
Sometimes
Rarely
Never

How did you get to your park or open space before the pandemic?*

On foot
Bicycle/Scooter
Car/Motorcycle
Other

How long did your typical trip take before the pandemic? *

0-5 minutes
5-10 minutes
10-20 minutes
More than 20 minutes

How far is the nearest park or open space from your residence? *

Less than 400 meters
400 meters
More than 400 meters

Was the park or open space clean and well-maintained before the pandemic? *

Yes
No
I don't know

Was the public park or open space safe before the pandemic? *

Yes
No
I don't know

Why did you visit the park or open spaces before the pandemic? (Please specify up to five main reasons for visiting parks or open spaces regularly). *

For peace and quiet
To breathe some fresh air
To ride a bike
To visit the play area
To enjoy the flowers/trees
For walking
To walk the dog
To enjoy the surrounding views

To watch sports or games
To watch birds and wildlife
Picnic for children and family
Eating/drinking
To meet friends
Other

How easy was it to access and navigate around the park or open spaces before the pandemic? *

Very easy
Easy
Difficult
Very difficult
No opinion

Were you satisfied with the available facilities in the park before the pandemic? *

Yes
No
I don't know

Do you have any other comments or suggestions regarding your garden or open space?

Which park do you feel is the best park in Ramallah?

Ramallah Municipality Park
Al-Ummah Park
Al-Bireh Park
Rdannah Forest Park
Yousef Qadura Park
Al-A'ela Park
Al-Amal Park
Al-Biarwa Park
Al-Qasr Park
Biarat Al-Jadwal Park
Biarat Al-Masayon Park
Biarat Al-Terih Park
Darrage Al- Terih Park
San Fernando Park
Kamel Al-Ajlouni Park
Al-Zaytouna Park
Al-Khaloud Park
Ain Mazrabe Park
New Ramallah Park

Which park do you feel is the closest park to you in Ramallah?

Ramallah Municipality Park
Al-Ummah Park
Al-Bireh Park
Rdannah Forest Park
Yousef Qadura Park
Al-A'ela Park
Al-Amal Park
Al-Biarwa Park
Al-Qasr Park
Biarat Al-Jadwal Park
Biarat Al-Masayon Park
Biarat Al-Terih Park
Darrage Al- Terih Park
San Fernando Park

Kamel Al-Ajlouni Park
Al-Zaytouna Park
Al-Khaloud Park
Ain Mazrabe Park
New Ramallah Park
Which parks do you feel are easily accessible and safe for you to reach?
Ramallah Municipality Park
Al-Ummah Park
Al-Bireh Park
Rdannah Forest Park
Yousef Qadura Park
Al-A'ela Park
Al-Amal Park
Al-Biarwa Park
Al-Qasr Park
Biarat Al-Jadwal Park
Biarat Al-Masayon Park
Biarat Al-Terih Park
Darrage Al- Terih Park
San Fernando Park
Kamel Al-Ajlouni Park
Al-Zaytouna Park
Al-Khaloud Park
Ain Mazrabe Park
New Ramallah Park
Do you visit the squares and surroundings around you?
Yes
No
What is the square that you feel is the best square in Ramallah city?*

Manara Square
Rashid Al-Haddadin Square
Al-Qadeera Square
Bashir Al-Barghouti Square
Yasser Arafat Square
Haider Abdul Shafi Square
Al-shabab Square
Asra Al-Horryeh Square
Aziz Shahin Square
Mahmoud Darwish Square
Palestine Square
Karim Khalaf Square
King Abdullah Square
Abu Ali Mustafa Square
Nelson Mandela Square
Ahmed Yassin Square
George Habash Square
What is the square that you feel is the closest to you in Ramallah city?*

Manara Square
Rashid Al-Haddadin Square
Al-Qadeera Square

Bashir Al-Barghouti Square
Yasser Arafat Square
Haider Abdul Shafi Square
Al-shabab Square
Asra Al-Horryeh Square
Aziz Shahin Square
Mahmoud Darwish Square
Palestine Square
Karim Khalaf Square
King Abdullah Square
Abu Ali Mustafa Square
Nelson Mandela Square
Ahmed Yassin Square
George Habash Square

What is the square that you feel is very crowded in Ramallah city?*

Manara Square
Rashid Al-Haddadin Square
Al-Qadeera Square
Bashir Al-Barghouti Square
Yasser Arafat Square
Haider Abdul Shafi Square
Al-shabab Square
Asra Al-Horryeh Square
Aziz Shahin Square
Mahmoud Darwish Square
Palestine Square
Karim Khalaf Square
King Abdullah Square
Abu Ali Mustafa Square
Nelson Mandela Square
Ahmed Yassin Square
George Habash Square
The following section is about evaluating the use of parks and open squares during the coronavirus pandemic. This section contains 7 questions, please answer all of them.

Were public parks and squares closed during the coronavirus pandemic? *

Yes
No
Maybe
Was movement prohibited during that time? *

Yes
No
Maybe
Did you comply with movement restrictions and stay at home during the coronavirus pandemic? *

Yes
No

Maybe

Did you adhere to general safety standards during the coronavirus pandemic when going outside? *

Yes
No
Maybe

Did you visit any parks or public spaces during the coronavirus lockdown?
Yes
No
Maybe

If your answer is yes, did the park or space adhere to public safety standards during the pandemic?
Yes
No
Maybe

Do you think that the open public spaces and parks in Ramallah are resilient and equipped against disasters and pandemics?
Yes
No
Partially

Assessment of the use of open public spaces and parks after the coronavirus pandemic
This section contains 17 questions. Please answer all questions.

Do you think the parks were equipped to receive people after the coronavirus pandemic?
Yes
No
Maybe

Do you go to parks or public spaces after the coronavirus pandemic?
Yes
No
Maybe

Which park do you frequent the most after the coronavirus pandemic?
Municipal Park of Ramallah
Ramallah Municipality Park
Al-Ummah Park
Al-Bireh Park
Rdannah Forest Park
Yousef Qadura Park
Al-A'ela Park
Al-Amal Park
Al-Biarwa Park
Al-Qasr Park
Biarat Al-Jadwal Park
Biarat Al-Masayon Park
Biarat Al-Terih Park
Darrage Al- Terih Park
San Fernando Park
Kamel Al-Ajlouni Park
Al-Zaytouna Park
Al-Khaloud Park
Ain Mazrabe Park

New Ramallah Park
Which square do you visit the most after the coronavirus pandemic?

Manara Square
Rashid Al-Haddadin Square
Al-Qadeera Square
Bashir Al-Barghouti Square
Yasser Arafat Square
Haider Abdul Shafi Square
Al-shabab Square
Asra Al-Horryeh Square
Aziz Shahin Square
Mahmoud Darwish Square
Palestine Square
Karim Khalaf Square
King Abdullah Square
Abu Ali Mustafa Square
Nelson Mandela Square
Ahmed Yassin Square
George Habash Square
How many times have you visited the nearest park or open space to you after the pandemic?
Most days
Weekly
Monthly
Sometimes
Rarely
Never At the moment, how do you usually get to the park or open spaces that you frequently visit?*
By walking
By bike/scooter
By car/motorcycle
Other
How long does it take you to get to the nearest park or open space after the pandemic?*
0-5 minutes
5-10 minutes
10-20 minutes
20 minutes or more
How many times did you visit a park or open space in the past week?*
0 times
1 time
2 times
3-4 times
About once a day
Multiple times a day
After your last visit to a park or open space, how did it affect your mood?*
Improved significantly
Improved somewhat
No difference
Have you noticed any differences in parks and public spaces after the coronavirus pandemic?*
Yes
No
Maybe

If there is a difference, please briefly describe it here

Has the municipality made any improvements to parks and public spaces after the coronavirus pandemic?*
Yes
No
Maybe
Did your visits to parks and public spaces increase after the coronavirus pandemic?*
Yes
No
Maybe
Do you think there are few parks and open spaces in the Ramallah area?*
Yes
No
Maybe
Do you think the parks and public spaces in the Ramallah area are not spacious enough? *
Yes
No
Maybe
Do you feel safe while in a park or public space after the coronavirus pandemic? *
Yes
No
Maybe
If you have a priority for improving parks and public spaces, what could it be? *
Improving the design and size of the park
Improving Park facilities
Improving Park accessibility
Improving the maintenance and durability of the park
In your opinion, what makes a park or public space better?*
Its large size
Its proximity to your residence
The availability of games, benches, and facilities
Its good design
Its strategic location
The readiness and resilience of the place for all conditions
Safety and security in it

جـامعـــة النجاح الوطنية

كليـــة الدراســـات العليـــا

تخطيط وتصميم المساحات العامة المفتوحة في المدن المقاومة للأوبئة: مدينة رام الله كحالة دراسية

إعداد

لمى دحبور

إشراف

د. علي عبد الحميد

قدمت هذه الرسالة استكمالا لمتطلبات الحصول على درجة الماجستير في هندسة التخطيط الحضري والاقليمي، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس- فلسطين.

2023

تخطيط وتصميم المساحات العامة المفتوحة في المدن المقاومة للأوبئة: مدينة رام الله كحالة دراسية

إعداد

لما عبد الحكيم شاكر دحبور

إشراف

د.علي عبد الحميد

الملخص

يعتبر التخطيط والتصميم للمساحات العامة المفتوحة في مدينة رام الله أمرًا حاسمًا لمواءمة استراتيجيات المدن المنيعة. تهدف هذه الدراسة إلى تقييم الوضع الحالي للمساحات العامة المفتوحة في مدينة رام الله خلال جائحة كوفيد-19 وتحديد التحديات الحالية. تم تطوير منهجية وإطار شامل يتضمن مراجعة الدراسات السابقة وجمع البيانات وتطوير المؤشرات الرئيسية و تطوير الإطار الخاص بمدينة رام الله اضاقة الى تقديم التوصيات. تبين النتائج أن المساحات العامة المفتوحة في رام الله موزعة بمعدل حوالي 1.28٪ من إجمالي مساحة رام الله المبنية، والتي تمثلها 18 حديقة و17 ميدان و115 قطعة مجزأة بنسبة إجمالية للمنطقة المبنية تبلغ 0.98٪. وبعد تقييم 19 حديقة، تبين أن إحداها لا توجد بشكل فعلي،أما بالنسبة لتحقيقها للمنعة والصمود فإن 72٪ من الحدائق ليست مناسبة لإدارة أو التخفيف من الكوارث كما فشلت 45٪ منها في تلبية متطلبات أن تكون مساحات يمكن استخدامها بشكل يومي و لجميع الجوانب، بما في ذلك الإغاثة من الكوارث.

تسلط التقييمات الضوء على الحاجة إلى تحسينات كبيرة في مختلف المجالات لجعل الحدائق أكثر إمكانية الوصول وآمنة وجاذبة للمجتمع المحلي. من الضروري إعادة هيكلة الحدائق والمساحات العامة المفتوحة وجدولة ساعات عملها لتوفير وصول الناس إلى المناطق الخارجية.

الكلمات المفتاحية: المساحات العامة المفتوحة (OPS)، مدينة رام الله، جائحة كوفيد-19، الاستدامة، ادارة الكوارث.