



**NEAR EAST UNIVERSITY  
INSTITUTE OF GRADUATE STUDIES  
DEPARTMENT OF ARCHITECTURE**

**THE EFFECT OF URBAN GREEN SPACE:  
CASE OF ZAKHO CITY IN IRAQ**

**M.Sc. THESIS**

**JEHAT HUSSEIN ABDULQADER**

**Nicosia  
February, 2022**

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**Supervisor:**

**Assoc. Prof. Dr. Buket ASILSOY**


**Nicosia**

**February, 2022**

## Approval

We certify that we have read the thesis submitted by Jehat Hussein Abdulqader titled “**The Effect of Urban Green Space: Case of Zakho City in Iraq**” and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Educational Sciences.

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## **Declaration**

I hereby declare that all information, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

05 /02 /2022

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**Jehat Hussein Abdulqader**

## Özet

### **Kentsel Yeşil Alanların Etkisi: Irak'taki Zaho Kenti Örneği**

**Jehat Hussein Abdulqader**

**Yüksek Lisans Tezi, Mimarlık Bölümü**

**Danışman: Doç. Dr. Buket Asilsoy**

**Şubat, 2022, (61) Sayfa**

Mevcut çalışma, kentsel yeşil alanların insanların zihinsel ve fiziksel esenliği üzerindeki etkisini araştırmıştır. Kentsel yeşil alanlar, kent planlamanın önemli bir parçasıdır. Bu çalışma, kentsel yeşil alanların fiziksel, sosyal ve psikolojik sağlık ve iyilik hali ve algısı üzerindeki etkisini araştırdığı için önemlidir. Çalışma, araştırma sorularına cevap vermek için nicel araştırma tasarımını benimsemiştir. Yeşil alan ve sakinlerin sağlığı (fiziksel ve zihinsel) arasındaki ilişki analiz edilmiştir. Veriler anket kullanılarak toplandı ve SPSS yazılımının 22 sürümü kullanılarak analiz edildi. Çalışmanın sonuçları, Zaho kentinde yeşil alanlara 1 km yarıçapında erişimi olan insanların fiziksel ve zihinsel sağlıklarının daha iyi olduğunu gösteriyor. Sonuçlar, insanların %47,31'inin kendilerini ilk kullanmaya başladıkları zamana göre daha sağlıklı olarak algıladıklarını, 1km yarıçapın ötesinde yaşayanların ise %35,69'a kıyasla 1 km içinde yaşadıklarını gösteriyor. Ayrıca çok değişkenli regresyon analizinin sonuçları, regresyon modelinin % 99 anlamlılık gösterdiğini ortaya koymuştur. Gelecekteki çalışmalar, kentlerdeki fiziksel mekanların bireyler üzerindeki etkisinin araştırılmasına odaklanabilir.

**Anahtar Kelimeler:** kentsel yeşil alanlar, zihinsel ve fiziksel sağlık, Zaho kenti, anket

## Abstract

### **The Effect of Urban Green Spaces: Case of Zakho City in Iraq**

**Jehat Hussein Abdulqader**

**Master Thesis, Department of Architecture**

**Supervisor: Assoc. Prof. Dr. Buket Asilsoy**

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The current study investigated the impact of urban green spaces on the mental and physical well-being of people. The urban green space is an important part of urban planning. This study is significant as it explores the effect of urban green space on physical, social and psychological health and wellbeing as well as the perception of people. The study adopted quantitative research design to answer the research questions. The relationship between green space and health (physical and mental) of the residents was analysed. The data was collected using a questionnaire and the data was analysed using SPSS software version 22. The results of the study show that, people living within the radius of 1 km access to green spaces were better in physical and mental health in Zakho city. The results show that 47.31% of people perceive themselves to be in better health than when they first started using the space living within 1 km as compared to 35.69% living beyond 1 km of radius. The results of multivariate regression analysis outlined that the regression model is significant showing 99% significance. The future studies can focus on investigating the physical space impact on individuals within the context of cities.

**Key Words:** urban green spaces, mental and physical health, Zakho city, questionnaire

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## **CHAPTER I**

### **Introduction**

#### **1.1 Background of the Study**

Urbanization is referred to as the change in size, heterogeneity, and density of cities. However, Urbanity is considered as the impact of living in urban zones at a particular time frame. Urbanization also affects the health of the population and their living standards (Vlahov & Galea, 2002). The recent industrialization has pose a threat on these green spaces where growing industrial activities have left the environment polluted and endangered human and wildlife across the globe. Urbanization has become a worldwide threat for the whole humanity as the natural land is decreasing and thus ecological balance is destroyed. Due to increased urbanization, people face different social and health issues due to confined spaces. The greener resources are also lowered due to urbanization. It may also contribute to the environmental injustice in terms of greener space distribution. There is a relationship between the exposure to the greener space and wellbeing of the people (Ulrich, 1984).

The key factors which affect the health of people in cities can be in physical environment theme, social environment theme and the access to the social services and health facilities (Galea & Vlahov, 2005). Urban green space in land use planning refers to green and/open space areas that may range from green roofs up to urban parks etc. Majority of the population has started migrating to cities. The frequent migration of people towards cities is most common in developing countries. The growth and migration rate of people vary from region to region.

**Figure 1.1**

*An urban green space in Denmark (WHO, 2017).*



Green space has become necessary for urban areas in order to protect and safeguard the health of the citizens. Green space can help by filtering the air and removing pollution from it. It also helps in actuating the noise and providing cooler temperatures. Green space helps in penetrate the storm water and restock ground water (Cummins & Jackson, 2001). Trees can also help in absorbing the pollutants and providing cleaner air to breathe. Health issues can be lowered by the greener spaces (Escobedo, Kroeger, & Wagner, 2011). Heat-Related issues can be solved by urban forests and trees. They can help in reducing the temperatures which will ultimately help in mitigating the risk of heat-related health issues for city inhabitants. Urban green spaces, such as parks, playgrounds, and residential greenery, can benefit mental and physical health by promoting relaxation and stress relief, increasing social cohesion, encouraging physical exercise, and minimizing air pollution exposure (Maas, Verheij, Groenewegen, De Vries, & Spreeuwenberg, 2006). They can also reduce pollution and control the microclimate of the city by making it more attractive and green. Green spaces are also important to sustain biodiversity in the city. Forests, lawn, as well as other natural grass provide wildlife habitat, prevent soil erosion, absorbing greenhouse gases, and reduce surface temperatures, lowering air conditioning demand and power expenses (Haq, 2011).

## 1.2 Statement of Problem

Zakho city is located in Iraq which is a mile away from the Iraqi-Turkish border. Zakho is the main districts of Duhok Governorate. It has around 190,000 inhabitants located in the city. It was initially recognised as a small island on Khabur River but later the city expanded. The main reason is its location and availability of job opportunities. Due to this attraction, urbanization has increased in Zakho city. (Raswol & Khorsheed, 2017).

### Figure 1.2

Google earth view of Zakho city (<https://earth.google.com/web/search/>)



Zakho city in Iraq with a population of nearly 400,000 has also problems as a result of the rapid urbanization process. Within the last few years the population of Zakho increased considerably. Thus, the city is greatly in need of sustainable urban development including the adequate amount of open green spaces. In addition, with regards to the possible urban development studies, it seems that green space is an important element to maintain physical, social, and psychological wellbeing of people of Zakho.

## 1.3 Study Objectives

The study's goal is to see if there's a link between how much green space people have in their homes and how healthy they think they are. For various age and socioeconomic groups, this relationship is investigated.

1. What is the existing scientific data about the impact of urban green space on psychological, physical, and social health on people in general?
2. What is the impact of urban green space on psychological, physical, and social health of people in Zakho city?
3. Is there any correlation between urban green space and perceived general health?

#### **1.4 Significance of the Study**

One of the important element in urban planning and design is urban green spaces. Therefore, designing more green spaces plays an important role in health and well-being of public as well as the environment. This study is significant as it explores the effect of urban green space on physical, social and psychological health and wellbeing as well as the perception of people residing in Zakho with different socio-economic backgrounds about urban green space (Lee, & Maheswaran, 2011).

## CHAPTER II

### Environmental Sustainability and Urban Green Spaces

#### 2.1 Environment sustainability

Urbanization has become a very common issue in different cities. People have tended to move towards cities for the purpose of jobs, employment, business or other issues. Due to the vast migration rate, buildings and other infrastructure are made rapidly. The issue of pollution and health-related concerns are also common. It has raised the need for proper urban planning and green spaces. This research will compare the environmental suitability of Milan and Antalya. The green space of both cities will be examined. Different articles and sources will be reviewed and the comparison of both cities in terms of sustainable urban green energy will be presented. The obligation to conserve natural resources and maintain global ecosystems in order to support health and wellbeing today and in the future is known as environmental sustainability. The health of the environment is inextricably tied to human well-being. According to the World Health Organization, 24 percent of fatalities worldwide can be attributed to preventable environmental conditions. People require clean air to breathe, pure water to drink, and environments free of hazardous substances and risks to live in. The obligation to conserve natural resources and maintain global ecosystems in order to support health and wellbeing today and in the future is known as environmental sustainability. Because many decisions that affect the environment have a long-term impact, one of the most important aspects of environment. In reality, the United States Environmental Protection Agency defines it as "filling today's requirements without jeopardizing future generations' ability to fulfil their own."



Natural supportability benchmarks change broadly depending on neighbourhood financial, social, and natural circumstances. Government directions are regularly sanctioned. The Natural Assurance Office within the Joined together States, for case, controls everything from discuss contamination to refrigerants to unsafe squander transfer. The Natural Assurance Office (EPA) builds up measures for discuss, water, soil, creature environments, and carbon outflows, and implements them through financial fines and legitimate activity. More thorough benchmarks may be built up by state/provincial and nearby governments. Cities such as Madrid and Paris, for illustration, are starting to force confinements on diesel vehicles and older, less fuel-efficient automobiles. Within the Joined together States, the Natural Security Office (EPA) is in obligation of making and implementing rules relating to natural maintainability and assurance. These controls address discuss quality, water quality, soil quality, plant life, creatures and natural life living spaces, perilous squander, and nursery gas outflows. Infractions of natural laws are classified as white-collar wrongdoings, and wrongdoers are arraigned

## **2.2 Environmental Sustainability and Green Space**

The findings of the study revealed that the dimension of green spaces and the amount of tree cover are important factors which support the avian ecological diversity in urban settings. The study also revealed that green spaces have demonstrated a greater capacity to promote human health and well-being as compared to the covered areas. The study also confirmed that green infrastructures include different parks, clean air and water, natural resources, greenways, and wetlands. Green infrastructure is actually the interconnected setups of open spaces and natural areas. It improves the quality of life of people. The study conducted by Padoa-Schioppa, Ficetola, Digiovinazzo, Bottoni, and Colangelo (2009) examined the fringe parks, green spaces and urban forestry in Milano. The study was based on the quantitative research method. The aim of the study was to study and outline the benefits of visiting the parks and green spaces in Milan in summer. The findings of the study revealed that the dimension of green spaces and the amount of tree cover are important factors which support the avian ecological diversity in urban settings.

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that green infrastructures include different parks, clean air and water, natural resources, greenways, and wetlands. Green infrastructure is actually the interconnected setups of open spaces and natural areas. It improves the quality of life of people.

The study conducted by Chiesura (2004) examined the role of urban parks for the sustainable city. The study was conducted through both primary and secondary data. Questionnaires were distributed in Amsterdam. The findings of the study confirmed that nature has a positive role in the development of positive feelings in human. The study also outlined that the presence of natural areas in urban setup contributes to the quality of life in numerous ways. Nature and the parks help in providing significant social and psychological benefits to human societies of urban areas. The study also highlighted the demand for such urban areas for the people to get benefit from. The study also reflected that the effect of nature is variable for every person. It also depends upon the age factors and their perception of the living environment. The urban planners should consider these points while planning to meet the expectation of urban people (Chiesura, 2004).

By providing noise reduction, and pollution filtration, green areas in cities help to mitigate and adapt to climate change, reduce the risks of natural disasters, and assist biodiversity conservation (Kabisch et al., 2015). Multiple parts of the environment, including green spaces, are impacted by urban expansion in and around European cities. On the one hand, large population densities cause environmental difficulties, overpopulation, and overuse in many cities. High densities, on the other hand, result in better access to public green areas, more efficient public transportation, and lower resource demand.

Brambilla, Gallo, and Zambon (2013) used a quantitative research method to examine the positive aspects of parks and green areas in Milan. The study was conducted through survey results which were conducted through five different parks of Milan. The results of the survey results depicted that people are more comfortable with natural sounds than technological sounds. It also showed that people visited parks to seek tranquillity and peace. The presence of such parks in Milan helps people to relief from their stress and normal routine (Brambilla, Gallo, & Zambon, 2013). The study by Mattijssen, et al., (2016) highlights the role of citizens in managing the green spaces. The study also highlighted that the role of management and authorities is also crucial. The study

suggested that authorities should consider the security of green spaces and make policies to ensure it. The study also indicated that the role of citizens in adopting the changes is critical. They should have an adaptive capacity (Mattijssen, et al., 2016).

The study by Sanesi, Padoa-Schioppa, Lorusso, Bottoni, and Laforteza (2009) examined the relationship between the diversity of avian ecology species and green space characteristics. The research was based on the two case studies which were conducted in Italy. The quantification method was used in this research. The findings of the study indicated that bird species are important creatures which indicate the ecological functionality and environmental quality. The findings revealed that Milan is enriched in bird species which displays the environmental quality of Milan. The study also indicated that a high percentage of green forest and a large extension of green space is accountable for the ecological functionality in Milan. (Sanesi, Padoa-Schioppa, Lorusso, Bottoni, & Laforteza, 2009). Another study by Fumagalli, et al., (2017) highlighted the health-related advantages from the green areas of Milan. The authors conducted research using 60 Nursing Homes of Milan to examine the size, quality and conditions of the green spaces. The study indicated that a good amount of green spaces are available for old age people. They can access them in order to get relief from stress and anxiety (Fumagalli, et al., 2017).

A similar study was conducted by Fumagalli and Toccolini (2012) to examine the Relevance among greenways and biological organize in Italy. The discoveries of the consider uncovered that greenways are valuable to associate individuals with scene assets. They moreover serve as a recreational region which is utilized by people. The consider moreover affirmed that both environmental systems and greenways are straight structures which cross the arrive space. Both of them ordinarily contain vegetation (Fumagalli & Toccolini, Relationship Between Greenways and Biological Organize: A Case Consider in Italy, 2012). The consider conducted by Salata (2017) examined the arrive utilize alter investigation within the urban locale of Milan. The subjective inquire about strategy was utilized and comparative consider was conducted. The comes about of the think about shown that Milan keeps an compelling adjust between urban regions and occupants. The arrive of the provincial ranges is additionally taken by unused frameworks. The ponder too demonstrated that the level of an urban locale in Milan fits the scale for green

framework arranging It is possible by advertising a vital foundation for natural advancement and significance for nearby communities (Salata, 2017).

Roads are the main part of the urban areas and green infrastructure. These roadsides tree has many advantages in removing the air pollutants (Kiran & Kinnary. S., 2011). The study conducted by Mutlu, Selim, and Ün (2017) examined the plant biodiversity of five major urban roadside trees in Antalya, Turkey. The research was conducted using the face to face interviews with landscape designers and municipal arborists. The findings of the study revealed that there were three species which do not fit the expected ratio. The municipals also lacked the inventory lists which stops decision maker to make biodiversity-related decisions for a sustainable environment. The study also indicated that more planting is required and inventory of planting should be maintained by the related authorities (Mutlu, Selim, & Ün, 2017).

Ortaçeşme (2005) conducted a study to examine the arranging, enactment and execution issues of green spaces within the case of Antalya city. The study indicated that there is great pressure on Antalya city to meet the challenges of urbanization and green space. Fast immigration towards the city has caused many issues related to open and closed green space. The green space in Antalya was found to be 4.4 m<sup>2</sup> which is very low. The study also outlined that the green spaces are increasing but they are not sufficient. There is a need for proper planning and strategies which can cope up with the challenges of green space (Ortacesme, 2005).

Jennings, Larson, and Yun, (2016) examined sustainability through the green space. The study was aimed to outline the benefits of the green space and its use in supporting cultural ecosystem services, equity, and social determinants of health. The findings of the study outlined that green space provides many benefits to the ecosystem which are necessary for our psychological, physical, and social health.

Wolch, Byrne, and Newell (2014) highlighted the challenges of making cities just green enough for public health and environmental justice. The critical analysis method was used in the study to highlight the advantages of greener space in the cities. The study highlighted that urban green space provides critical ecosystem services to the people. The green space includes parks, green roofs, forests, streams, and other community gardens.

It promotes the physical activity, general public health and the psychological well-being of the residents of urban areas. The study also highlighted that urban planners need to develop strategies that promote a greener environment and provides environmental justice to all people (Wolch, Byrne, & Newell, 2014).

Urban green spaces is an inclusive strategy For long-term natural supportability by making strides people's quality of life and discuss quality, raising property esteem due to their enhancement and stylish qualities, and bringing down cooling vitality costs. Urban green spaces can moreover give biological system administrations, such as diversion and unwinding, which are especially useful to city individuals and tourists.

It has been progressively recognized as a cost-effective basis for expanding green space and tree planting in mild climate cities, as Heidt and Neef (2008) demonstrated that utilizing vegetation can offer assistance to play down the vitality costs of cooling buildings. Plants offer assistance to circulate the discuss, give shade, and evapotranspire. This includes a cooling impact and helps within the decrease of discuss temperatures. A 1.2 km by 1.0 km stop can cause an discuss temperature contrast between the stop and the encompassing city that can be identified from a separate of up to 4 km. Concurring to a inquire about conducted in Chicago, expanding tree cover by 10% might cut by and large vitality utilized for warming and cooling by roughly 5% to 10% greatest (Sorensen, Smit, Barzetti and Williams, 1997).

According to Bolund and Sven (1999), urban green spaces give cities with environmental administrations extending from biodiversity conservation to climate administration. Contrasts in sun oriented input, precipitation design, and temperature are common in metropolitan ranges as compared to country settings. Due to the built environment, sun based radiation, discuss temperature, wind speed, and relative stickiness vacillate drastically. The urban heat island effect, according to Heidt and Neef (2008), is created by huge regions of heating-absorbs surface combined with tall vitality utilize in cities. The urban warm island impact can raise city temperatures by up to 5 degrees Celsius. As a result, suitable woodland manor, greenery around urban dweller's homes, and government administration of water bodies can all offer assistance to reduce the circumstance.

### 2.3 Definition and Classification of Urban Green Spaces

Every open tract of ground that is underdeveloped (i.e., without buildings or other built structures) and accessible to the open is considered open space. The nearness of greenery (arrive that's mostly or totally secured with grass, trees, bushes, or other vegetation). Parks, community gardens, and cemeteries are cases of green space. Any open tract of ground that's undeveloped (i.e., without buildings or other built structures) and accessible to the open is considered open space. The nearness of greenery (arrive that's incompletely or totally secured with grass, trees, bushes, or other vegetation). Parks, community gardens, and cemeteries are cases of green space such as schoolyards, play areas, siting spaces for the common open, squares publics and empty properties. Inhabitants have get to to recreational places, and open space contributes to the engaging quality and natural quality of neighbourhoods.

**Figure 2.1**

*Forsyth Park in Savannah, Georgia. [https://www.wikiwand.com/en/Urban\\_green\\_space](https://www.wikiwand.com/en/Urban_green_space)*



However, with such a diverse range of recreational opportunities comes an equally diverse set of environmental concerns. The way parks are administered is similar to how other land uses are handled. Dunnet, Swanwick, and Woolley (2002) stated the definition

of Civilian green space in their investigate report for the Office of Transport, Nearby Government and the Districts within the UK as:

*"Land that consists predominantly of unsealed, permeable, 'soft ' surfaces such as soil, grass, shrubs and trees (the emphasis is on 'predominant ' character because of course, green spaces may include buildings and hard-surfaced areas); it is the umbrella term for all such areas whether or not they are publicly accessible or publicly managed. It includes all areas of parks, play areas and other green spaces specifically intended for recreational use, as well as other green spaces with other origins."*  
(Dunnet, Swanwick, & Woolley, 2002:8)

Coles and Grqayson (2004) further added that accessibility and function are also fundamental to the definition of urban green space as:

*"Urban green spaces are understood as public green spaces located in urban areas, mainly covered by vegetation (as opposed to other open spaces) which are directly used for active or passive recreation, or indirectly used by virtue of their positive influence on the urban environment, accessible to citizens, serving the diverse needs of citizens and thus enhancing the quality of life in cities or urban regions."*

Baycan-Levent et al., (2002) included ownership and property rights to the definition of urban space as:

*"By urban green spaces, we understand public and private open spaces in urban areas, primarily covered by vegetation, which is directly (e.g. active or passive recreation) or indirectly (e.g. positive influence on the urban environment) available for the users."*

Vlahov and Galea (2002) argued that majority of the population has started migrating to cities. The frequent migration of people towards cities is most common in developing countries. The growth and migration rate of people varies from region to region. Several factors affect the migration and transfer of people to cities. To monitor these changes, urbanization and urbanity can be monitored

and studied further. Urbanization is referred to as the change in size, heterogeneity, and density of cities. However, Urbanity is considered as the impact of living in urban zones at a particular time frame. Urbanization also affects the health of the population and their living standards. The key factors which affect the health of people in cities can be in physical environment theme, social environment theme and access to the social services and health facilities (Galea & Vlahov, 2005).

**Figure 2.2**

*View of a city. <https://gsdrc.org/topic-guides/urban-governance/key-policy-challenges/urban-migration/>*



Escobedo, Kroeger, and Wagner (2011) argued that green space has become necessary for urban areas to protect and safeguard the health of the citizens. Green space can help by filtering the air and removing pollution from it. It also helps in actuating the noise and providing cooler temperatures. Green space helps in penetrate the storm water and restock groundwater. Trees can also help in absorbing the pollutants and providing cleaner air to breathe. Health issues can be lowered by the greener spaces. Heat-Related issues can be solved by urban forests and trees. They can help in reducing the temperatures which will ultimately help in mitigating the hazard of heat-related wellbeing issues for city tenants (Cummins & Jackson, 2001). Panduro and Veie (2013) classified



urban green spaces as parks, lakes, nature, churchyards, sports areas, common ranges, greenways, agrarian lands or areas.

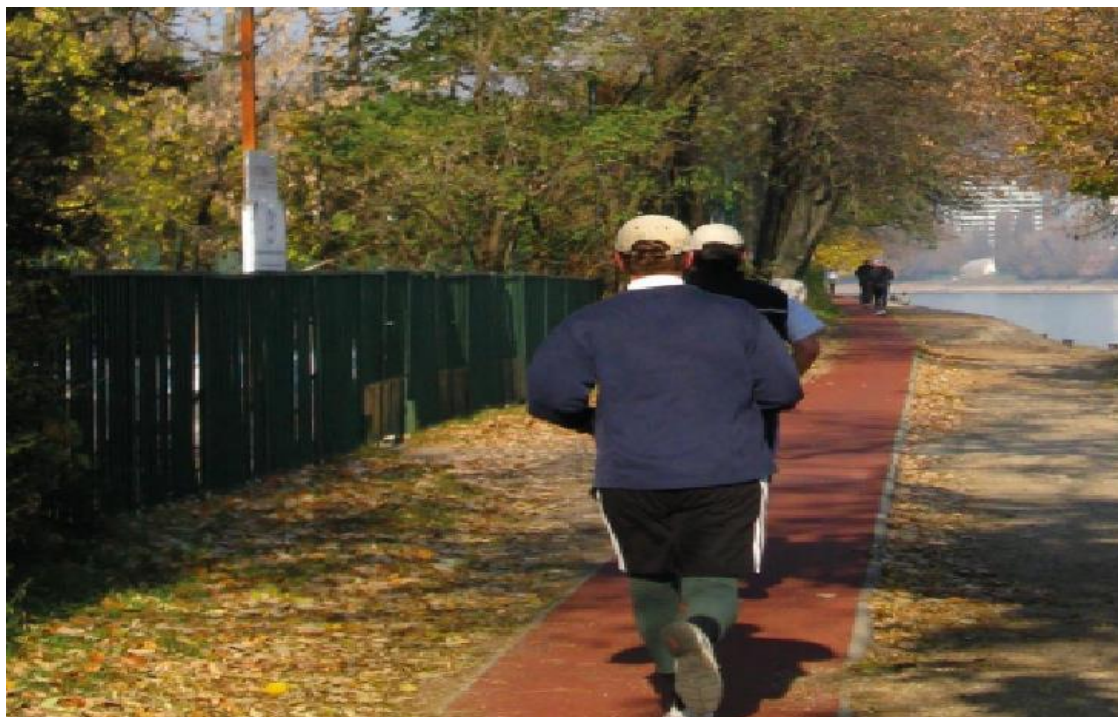
A stop could be a green space with a tall level of upkeep, and a variety of entertaining and leisure opportunities. Tracks allow the public to wander across the green space and enjoy various attractions example are small ponds, bushes, meadows, plants, and physical exercises. The nearness of water bodies such as lakes recognizes a few urban green space. Since the get to and support prerequisites vary from those of a stop or common zone, a lake is classed as a separate type of place when it is the most prominent part of a green space. This implies that the services provided are also different. Large sections of green space, generally with wide fields of grass, tree cover, and lakes, can be found on the outskirts of the city. Small gravel roads and natural walks are common in these places, allowing people to travel across the terrain. The area is not as well maintained as an urban park. The natural region is frequently surrounded by fields and meadows. Green space is commonly available to schools and institutions, allowing for sports activities and playgrounds for students. These places are frequently shaped like a square and are encompassed by trees. Sports offices related with sports clubs as often as possible share characteristics, such as estimate. These regions are in some cases gated, securing security. In communities of houses or flat buildings, property proprietor organizations or proprietors ordinarily keep up shared "common green space." The larger part of open spaces are small patches of green space associated by pathways. Common ranges are separated into two sorts of space depending on whether they were associated with flat complexes or houses. Well-kept gardens and small play areas more often than not overwhelm such zones. The scenes are as it were semi-public in terms of availability because the users are largely locals. Agricultural zones are vast and uniform in size. Many meadows are walled, and there are rarely any walkways or roads extending into the fields. Some places in Denmark are off-limits to the public. Near infrastructure such as highways, major roads, and railroads, green space can be found. The main goal of such areas, which are often densely forested, is to reduce the negative effects of adjacent infrastructure on noise and air pollution. Similarly, green space is frequently found in industrial regions. The spaces are often comprised of a well-kept lawn, maybe flanked by trees, and do not encourage recreational activities. Due to the unappealing nature of the adjacent land use, we grouped these places together.

## 2.4 Urban Green Spaces and Perceived Wellbeing

Louv (2005) affirmed that green space is fundamental for wellbeing. The need of green space can cause numerous wellbeing issues among individuals. He fights that children who need get to to urban green space endure from different behavioural issues (Louv, 2005). Kahn and Kellert (2002) also confirmed the importance of nature for the healthy development of children. The interaction of human with nature and animals is considered significant for wellbeing and healthy child development. The interaction with nature using green space can improve the health of children and provide them with a better place to grow and develop their abilities. It helps in providing them with a healthy and pleasant environment which can also affect their mood.

### Figure 2.3

*View of an urban green space. World Health Organization (WHO, 2017).*



Wolch, Byrne, and Newell (2014) highlighted the challenges of making cities just green enough for public health and environmental justice. The critical analysis method was used in the study to highlight the advantages of greener space in the cities. The study highlighted that urban green space provides critical ecosystem services to the people. The green space includes parks, green roofs, forests, streams, and other community gardens.

It promotes the physical activity, general public health and the psychological well-being of the residents of urban areas. The study also highlighted that urban planners need to develop strategies that promote a greener environment and provides environmental justice to all people (Wolch, Byrne, & Newell, 2014).

### ***Urban green spaces and psychological health***

Green area has been largely seen as a health-promoting include of private situations, and it has been associated to mental wellbeing points of interest such as mental weakness recuperation and push lessening, eminently through environmental brain research inquire about. Green space, concurring to Van sanctum Berg, Maas, Verheij, and Groenewegen (2010), makes a difference moderate the negative wellbeing impacts of unpleasant life occasions. Individual-level information on wellbeing and socio-demographic components were collected from 4529 Dutch respondents to the Moment Dutch National Overview of Common Hone (DNSGP-2), which was performed in 2000–2002. The discoveries illustrate a interface between upsetting life occasions and the number of wellbeing complaints and generally wellbeing discernment. Respondents who lived inside a 3-kilometer span of a huge sum of green space were less affected by a unpleasant life occasion than those who lived within a 3-kilometer radius of a small amount of green space. The same tendency was detected in terms of reported mental health, albeit on a smaller scale. Green space's moderating effects were only seen within 3 km of inhabitants' residences, not within 1 km, likely since the 3-km sign is more influenced by the nearness of more noteworthy segments of green space, which are planning to preserve more profound sorts of rebuilding. These discoveries bolster the thought that green space can act as a buffer against hindering wellbeing impacts.

### ***Releasing mental stress***

Cohen-Cline, Turkheimer, and Glen (2015) also highlighted the impact of green space on physical activity and mental health. The identical sets were utilized to investigate the link between mental health and access to green space. The study discovered that people who had more access to green space have a lower risk of depression. The study also indicated that green space is essential to lower mental health risks (Cohen-Cline, Turkheimer, & Glen, 2015).

Individuals can lower stress by being exposed to local nature, according to Jiang, Chang, and Sullivan (2014); however, the form of the dose-response curve is unknown. After taking the Trier Social Stress Test (TSST), participants were randomly allocated to see one of 10 6-minute 3-D movies of local streets. In the videos, the tree cover density ranged from 1.7 percent to 62.0 percent. Salivary cortisol and skin conductance levels are used to measure stress reactivity. There is a substantial gap between men and women in the results. We observed no link between varying tree cover densities and stress recovery in women. The dose-response curve for men was an inverted-U shape, with stress recovery increasing as tree cover density climbed from 1.7 percent to 24 percent. There was no difference in stress recovery between tree densities of 24 and 34 percent. Tree densities greater than 34% were linked to shorter recovery periods.

### ***Minimizing aggression***

The effect of green space has an enormous effect on the mental and emotional welfare of citizens. The study by Wolsko and Lindberg (2013) examined the mental health implications of urban green spaces. The relationships between psychological well-being and the personal experience of people were examined using the survey results. The findings of the study revealed that people who are outdoor enthusiasts have a higher level of psychological well-being. They tend to have better mindfulness, positive emotions, subjective vitality and less negative emotions than those who do not connect with nature. The study reveals that stress can be lowered even by less physical activity in the green space. The study highlighted the positive role of green space in enhancing the physical and psychological well-being of urban people (Wolsko & Lindberg, 2013).

Beyer et al., (2014) examined the association among mental health and neighbouring green space. The cross-sectional study used the survey results to monitor the relationship. The findings of the study indicated the progressive connection between nearby green space and mental well-being. The people getting exposed to green space have lower levels of anxiety, mental stress, and depression. The study also outlined that greening can help in the improvement of urban health. The study indicated that higher levels of tree canopy can contribute to more positive mental health. The study also indicated the need for future research on the demographic characteristics which contribute

to both access to green space and mental health advantages of green spaces. Scholars argue that natural atmospheres have the potential to provide relief from mental fatigue. It has the soothing capability which provides relief to the people (Beyer, et al., 2014).

### ***Promoting relaxation***

The previous studies have indicated that green spaces are associated with the mental health of the citizens living in that area (Dadvand, et al., 2016). There are many studies which confirmed the relationship between mental health and green spaces. This section will demonstrate the existing findings of different researchers. It will represent what factors affect the green space associated with mental health. It will also suggest how mental health can be improved by green space. It will also discuss how green spaces have become the necessity of the urban people who are affected by pollution, population disadvantages and another urbanization effect.

### ***Recreation and wellbeing***

Short-term excursions to urban natural areas had mental (seen restrictiveness, subjective imperativeness, temperament, inventiveness) and physiological (salivary cortisol concentration) impacts, concurring to Tyrväinen, Ojala, Korpela, Lanki, Tsunetsugu, and Kagawa (2014) inquire about. Seventy-seven members gone to three diverse sorts of urban situations in Helsinki, Finland's capital: a built-up city center (as a controlled environment), an urban stop, and urban woods. The discoveries recommend that an expansive urban stop and an broadly overseen urban forest had about indistinguishable advantageous impacts, but the forest rearward had the next add up to seen restrictiveness. In comparison to the built-up environment, indeed short-term visits to nature districts have positive benefits on seen push easing, agreeing to the inquire about. During the trial, salivary cortisol levels declined in all three metropolitan contexts in a comparable way. The effects of nature exposure on diverse groups of people, as well as the relationship between psychological and physiological measures.

## 2.5 Urban Green Spaces and Physical Health

Raswol (2018) highlighted the effect of advancing open air spaces plan highlights to extend client fulfilment in a private region in Duhok City. The qualitative method of research was used using the case study. A questionnaire was used to measure and examine the satisfaction level of the people from the outdoors. The findings of the study provided rules for lodging engineers, urban architects, and related legislative teach. It can be used to make and enhance the quality of effective outdoor space which is required for an effective urban living environment. The findings of the study indicated that people are fascinated by the design quality of the physical feature of the outdoor space. It includes landscape furniture, artificial waters, landscape designs, greenery, and proper pedestrians. It also encourages people to use outdoor space for various social activities. These outdoor spaces should be available for all communities belonging from different socioeconomic groups (Raswol, 2018).

### *Promoting physical activities*

Toftager et al. (2011) investigated the link between distance to green space and physical action among the Danish populace. In expansion, the interface between corpulence and remove to green space was explored. Respondents who lived more than 1 km from green space were less likely to use it to exercise and stay in shape than those who lived less than 300 meters away (OR: 0.71; 95 percent CI: 0.600.83). There is also a link between moderate vigorous physical activity and proximity to green space during leisure time. People who lived more than a kilometre away from a green area had an increased chance of getting sick. Self-reported physical activity and obesity are linked to self-reported distance to green space. Visiting green space to exercise and stay in shape is a common cause, and vicinity to green space is connected to moderate/vigorous physical movement during leisure time.

Branas et al. (2011) used a distinction approach to look at the effect of an empty parcel greening program in Philadelphia, Pennsylvania, on wellbeing & security markers over the course of a decade. The study looked at the before and after effects of the greening and compared the findings to non-greening plenty of open space. The findings of the study suggested that people considered free lots to be better for exercising and other

activities. It helped them reduced their stress and anxiety. The green lots can help in promoting healthy activities of the citizens (Branas, et al., 2011). Berman et al., (2012) also examined the effect of nature on the improvement in an individual's depression rate. The study also explored the effect of walking in nature for individuals with major depressive disorder (MDD). The participants of the study included 20 different individuals. The quantitative research method was used to examine the effects. The results indicated that walking in nature has a positive effect on patients suffering from mental health disorders (Berman, et al., 2012). It can also highlight the significance of having open green spaces for people living in urban areas. The availability of such areas can help them get benefit easily.

### ***Improving the quality of life***

Barton and Pretty (2010) highlighted the positive impact of green exercise on physical health. In this research, a meta-analysis methodology was used to analyse 10 different UK studies which consisted of 1252 participants. The participants were from different age groups and genders. The findings of the study outline that both mood and self-esteem of the participants was improved by green environment. The presence of water has a greater effect on the mood of the people. The study also indicated that both men and women were affected by green exercise in terms of self-esteem whereas; the mood of men was improved more than women after green exercise. The results were also distinctive in different age groups. The mood of young and old people was not considerably affected by the exercise. However, the self-esteem of young people was changed considerably after the green exercise. The findings of the study confirmed that the environment is responsible for providing an important health service to the citizens (Barton & Pretty, 2010).

**Figure 2.4**

*View of a park as urban green space. Source: World Health Organization (WHO, 2017).*



Groenewegen, Berg, Vries, and Verheij (2006) conducted a study to monitor the effects of green space on health, well-being, and social safety of the people. The quantitative research method was used in this study. Different open-ended interviews were conducted to examine the effects of green space. Questionnaires were also used in this study and it was studied using different settings to get a wider understanding of the impact. The study was conducted using multilevel analysis and GIS techniques for the analysis of data. The study was also designed to get awareness about the methods and procedures which can help to develop strategies of public health and safety using spatial and green space. The findings of the study highlighted that urban space is under pressure. It has caused people to live in less green residential environments. The people of low income have less exposure to the green spaces within the cities. It has also caused



environmental injustice regarding the distribution of green space. The findings of the study indicated that planners should be well aware of the significance of green space and they consider the safety and wellbeing of people while developments (Groenewegen, Berg, Vries, & Verheij, 2006).

## **2.6 Urban Green Spaces and Social Cohesion**

### ***Promoting neighbourliness***

The study conducted by Raswol (2018) highlighted the effect of advancing open air spaces plan highlights to extend client fulfilment in a private range in Duhok City. The subjective strategy of inquire about was utilized utilizing the case think about. A survey was utilized to degree and look at the fulfilment level of the individuals from the outside. The discoveries of the consider given rules for lodging designers, urban creators, and related administrative teach. It can be used to make and enhance the quality of effective outdoor space which is required for an effective urban living environment. The findings of the study indicated that people are fascinated by the design quality of the physical feature of the outdoor space. It includes landscape furniture, artificial waters, landscape designs, greenery, and proper pedestrians. It also encourages people to use outdoor space for various social activities. These outdoor spaces should be available for all communities belonging from different socioeconomic groups (Raswol, 2018).

### ***Advancement of outdoor activities***

Celebration spaces - gathering regions for celebrations and celebrations; imaginative spaces - rousing places that rouse inventiveness in an open air setting. In spite of the fact that the outside gives more seasoned grown-ups with a few conceivable outcomes to move forward their quality of life (QOL), few investigate have looked at how powerful this environment is in hone. Sugiyama and Thompson (2007) assess later writing in gerontology, open wellbeing, natural brain research, scene engineering, and urban plan to look at the concept of natural bolster. It is contended that the supportiveness of neighbourhood environment that make open air exercises (e.g., strolling) open and agreeable for more seasoned people is conducive to a better quality of life.

### ***Spiritual values***

Landscapes are seen as adding spiritual value to everyday life. It is believed that green spaces traditionally are seen as peaceful and relaxing. They are full of life and help in reducing stress and anxiety. Motloch (2001) stated that:

*"Landscape is seen as a symbol of the values, ideals, aspirations, hopes, and dreams of a culture. People encode and decode landscape meanings about the culture, its underlying philosophies, and its self-perception. The landscape is the physical expression of the culture, and its hopes and dreams". (Motloch, 2001:16)*

Motloch (2001) suggested that green spaces have traditionally been symbolic places of meditation and pondering. Green spaces help in contemplating the different dimensions of creation and to observe the greatness of nature and its creator. Green spaces are associated with paradise as described in holy books as splendid rivers, amazing vegetation, shading trees, and saccharine fruits. It is suggested that:

*"Vertical elements are inspiring, horizontal elements are stabilizing, massive elements lend an air of permanence, and filigree elements evoke a sense of nostalgia. Angular forms suggest energy and motion, and circular forms convey passivity and restfulness. Certain sounds and smells also have symbolic meanings, as do natural materials, including water, earth, and plants and architectural elements". (2001:120-121)*

Wilkinson (1998) stated that in ancient Egypt, gardens were given great significance and the landscaping was focused on religious ideas. Many plants were grown with symbolic significance. Similarly, the civilization of great Japanese Zen gardens also symbolized tall trees as long life and wisdom. Water was symbolized as a neutralizer of negative energy carried by depressed, fatigued, and tired people. Despite metaphysical and religious dimensions to green spaces, there are different levels and the kind of significance across cultures. In the UK, values come from the 19<sup>th</sup> Romantic art movement as a source of inspiration rather than just social and economic benefits (Gallet, 2005).

## CHAPTER 3

### Methodology

The data was collected from 100 respondents. The data was collected in September, 2020 through google forms because of COVID-19 lockdown. The researcher analysed the collected data through SPSS. The data was collected from people living within 1 km radius and 3 km from the existing green space. The researcher collected the data for perceived mental and physical health. The data was then analysed and compared.

#### 3.1 Research Context

Zakho city is an underdeveloped city in Iraq. The architecture of Zakho city is old and traditional as well as simple as shown in figure below.

**Figure 3.1**

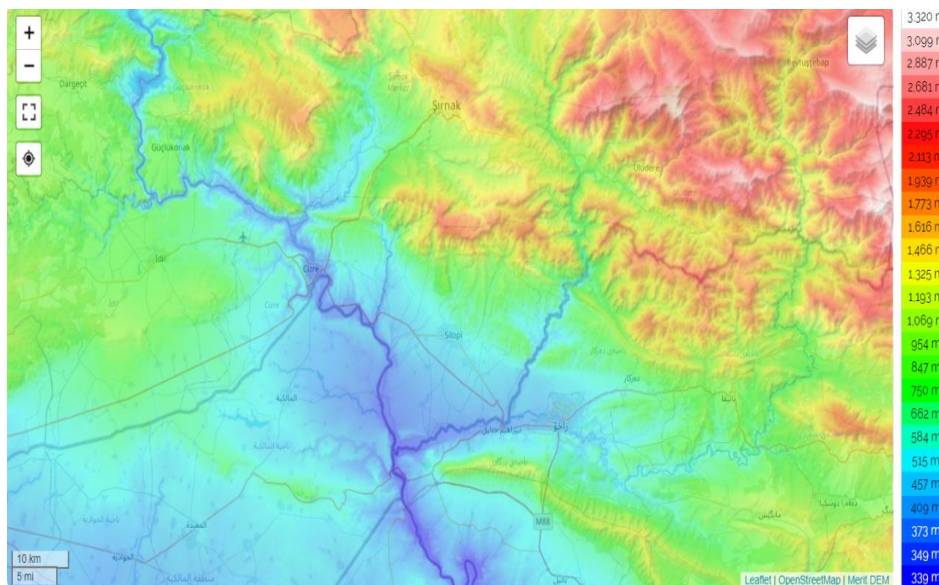
*Zakho architecture*



The climate of Zakho city is hot Mediterranean that means hot and dry. Zakho topography is as shown in figure below.

**Figure 3.2**

*Topography map of Zakho city (<https://en-nz.topographic-map.com/maps/9kvc/Zakho/>)*



Zakho, Zakho Central Subdistrict, Zakho District, Dohuk Governorate, Iraqi Kurdistan, 42002, Iraq (37.14338 42.68229)

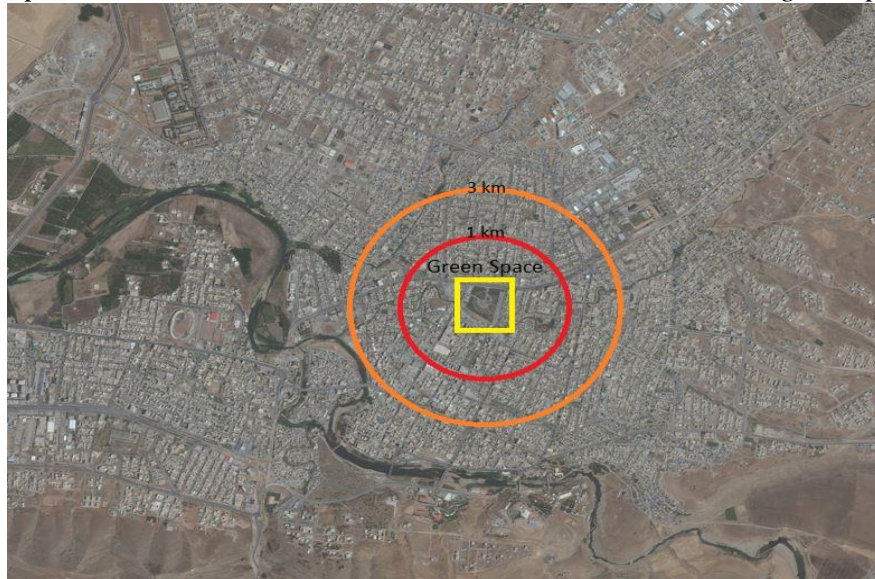
Zakho city in Iraq with a population of nearly 400,000 has problems as a result of the rapid urbanization process. Within the last few years the population of Zakho increased considerably. Thus, the city is greatly in need of urban development. In addition, with regards to the possible urban development studies, it seems that green space is an important element to maintain physical, social, and psychological wellbeing of people of Zakho.

**Figure 3.3***Zakho map (source: google)***3.2 Sample**

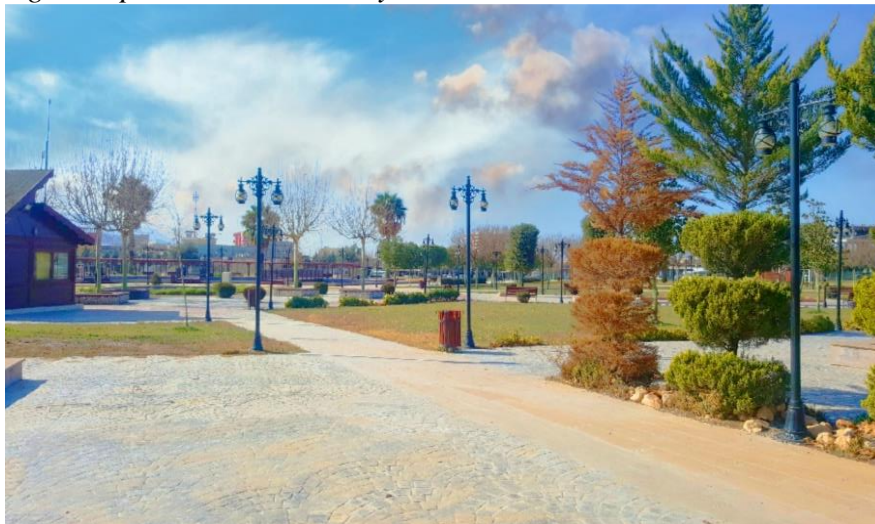
The sample of the study was individuals living near to the green space. The chosen green space for the study is displayed in Figure 3.4 and 3.5. Green spaces in the study are open piece of land that there are no buildings or other structures on the land and they are accessible to the public for walking, exercising, recreational activities and other social activities (Dadvand, Nieuwenhuijsen, Esnaola, Forn, Basagaña, Alvarez-Pedrerol, & Jerrett, 2015).

**Figure 3.4**

*The green space area around with 1 km and 3 km radius. Source: Google maps*

**Figure 3.5**

*The chosen green space within the study area*



The sample of the study was selected through simple random sampling technique. A simple random sample is a sub - group where each subgroup component seems to have the same possibility of being selected. A basic random sample is intended to represent a group in an unbiased manner (Sharma, 2017). The simple random probability sampling is used when everyone in the population has an equal opportunity/ chance of being part of the study (Meng, 2013). The researcher used the SRS technique because everyone living near the green space had an equal chance to be part of the study (Kadilar & Cingi, 2006).

### **3.3 Research Design**

The researcher in this study collected the data through questionnaire (see Appendix A). The questionnaire was used as the main tool for collecting the opinions of the participants to answer the research questions. The questionnaire consists of three parts. The first part of the questionnaire consisted of four items about demographic information of the participants like age, gender, occupation, and education level. The second part of the questionnaire involved the items about perceived physical health of the participants that live near the green space. The third and last part of the questionnaire consisted of the items about perceived mental health of the participants. Each section of perceived mental and physical health have three items. The questionnaire was adopted from Petroski (2012).

Data collection is the process of collecting and gathering information regarding the variable of interest. It is a systematic way of answering the research questions or hypothesis to evaluate the outcomes (Johnson & Turner, 2003). The researcher followed a quantitative research design. The research quantitative research design was suitable for the research problem explored in this study. The study is descriptive as the researcher described the association between the green space and the perceived physical and mental health of the individuals (Ashley & Boyd, 2006). The quantitative studies require large sample size as that was necessary for this study. The quantitative research design concentrates on the quantity of responses because it does not focus on emotional insight that is focus of qualitative studies (Mackenzie & Knipe, 2006).

The researcher followed the ethical principles throughout the research. The data was collected from the participants after their written consent. The researcher described the aim of the study prior to data collection. The researcher did not collect any personal data from the participants. The anonymity and privacy of the participants was preserved. The data was kept in the electronically locked PDF and was disposed as the researcher completed this study.



## CHAPTER IV

### Findings

#### 4.1 Findings of Part 1

##### *Demographic characteristics of respondents*

The participants of the study were asked for the age, gender, level of education, and their occupation. 38% of the participants of the study were youth, 31% were adults and 31% were elderly. 60% of participants were males and 40% were females. 24% of participants had higher education level, 55% had secondary, and 21% had primary level of education. 32% of participants were students by occupation, 17% were housewives, 29% were employed and 22% were retired. The characteristics of the participants are presented in Table 1.

**Table 4.1**

##### *Characteristics of participants*

Characteristics	Percentage
<i>Age</i>	
15-25	38%
26-35	31%
36 and above	31%
<i>Gender</i>	
Male	60%
Female	40%
<i>Level of Education</i>	
Higher education	24%
Secondary education	55%
Primary education	21%
<i>Occupation</i>	
Student	32%
Housewife	17%
Employer	29%
Retired	22%

## 4.2 Findings of Part 2

### *Perceived Physical Health Effects of this Green Space*

Chronic stress, poor physical activity, and exposure to manmade environmental risks are all linked to modern city life. By providing psychological relaxation and stress relief, stimulating social cohesion, supporting physical activity, and reducing exposure to air pollutants, noise, and excessive heat, urban green spaces, such as parks, playgrounds, and residential greenery, can promote mental and physical health and reduce morbidity and mortality in urban residents.

The questionnaire asked the participants what is being active in terms of 1-5 hours per week. 49% of participants considered them as active. Following 16% said neutral and 8% said highly active. Only 9% said as inactive. This means that green spaces has a positive impact on the physical activity of the people. See Table 4.2.

**Table 4.2**

*Findings of the item how active do you consider yourself?'*

	Frequency	Percentage
Inactive	16	9%
Lazy	28	15%
Neutral	30	16%
Active	88	49%
Highly active	15	8%

The results of the study show that 76.83% respondents answered as they perceive themselves to be in better health than when you first started using the space. Only 23.16% replied as no they do not perceive themselves as to be in the better health since they first started using green space. Hence, green spaces help in bringing people into better health. See Table 4.3

**Table 4.3**

*Findings of the item 'Do you perceive yourself to be in better health than when you first started using the space?'*

	Frequency	Percentage
Yes	136	76.83%
No	41	23.16%

Are there changes to your health? If so, what?

(Better breathing, Healthier feel, More motivation, Higher energy levels; Poorer breathing, Increased allergies)

**Table 4.4:**

*Findings of are there changes to your health?*

	Frequency	Percentage
Better breathing	37	20.90%
Healthier feel	29	16.38%
More motivation	19	10.73%
Higher energy levels	56	31.63%
Poorer breathing	12	6.77%
Increased allergies	34	19.20%

The results of the study show that 20.90% people feel better breathing after living into a green space, 16.38% people felt healthier, 10.73% people feel more motivation and 31.63% people feel higher energy levels. However, 19.20% people experiences increased allergies that may be by birth.

### **4.3 Findings of part 3**

#### ***Perceived Mental Health Effects of this Green Space***

Green spaces provide restorative experiences and promote better mental health by increasing mindfulness, reducing rumination, and increasing stress resilience, according to the findings. The direct effect of exposure with green spaces on fostering positive mental health outcomes is known as psychological repair.

**Table 4.5**

*Findings of 'are you more satisfied with yourself since you started using this green space?'*

	Frequency	Percentage
Less	9	5%
Moderate	38	22%
Neutral	27	15%
Satisfied	79	45%
More satisfied	24	13%

The results of the study show that 45% of people are more satisfied with using a green space. 22% are moderately satisfied and 13% are more satisfied with using a green space.

**Table 4.6**

*Findings of 'have you noticed an enhancement in the level of wellbeing? Wellbeing is defined as the state of happiness'*

	Frequency	Percentage
Lower	6	3%
Moderate	13	8%
Neutral	32	18%
Enhanced	83	47%
More enhanced	43	24%

The results if the study show that 47% of people have notices an enhanced in the level of wellbeing. 24% have experienced more enhanced wellbeing and only 3% of people have lower wellbeing with the green space.

**Table 4.7***Findings of 'Do you feel decreased amounts of stress?'*

	Frequency	Percentage
No decrease	28	15%
Moderate	13	7%
Neutral	18	10%
Decrease	62	35%
More decrease	56	31%

The results of the study show that, 35% and 31% have experienced decreased stress level with the green space. Only 15% of people have not experienced decrease in the stress level with the urban green space.

#### 4.4 Relationship between green space and health

**Table 4.8***Regression analysis for perceived physical health and distance (1 km)*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.007	1	.0789	.024	.877 <sup>b</sup>
	Residual	29.525	98	.301		
	Total	29.532	99			
a. Dependent Variable: physical health						
b. Predictors: (Constant), distance 1km						

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.655	.168		15.823	.000
	Distance 1Km	.017	.111	.000***	.156	.877
a. Dependent Variable: perceived physical health						

Model	R	R Square
1	.016 <sup>a</sup>	.000

Coefficients<sup>a</sup>

**Table 4.9**

*Regression analysis for perceived mental health and distance (1 km)*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.006	1	.0678	.034	.767 <sup>b</sup>
	Residual	28.535	97	.402		
	Total	28.542	89			
a. Dependent Variable: mental health						
b. Predictors: (Constant), distance 1km						

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.65	.162		16.714	.000
	Distance 1Km	.024	.121	.000***	.166	.787
a. Dependent Variable: perceived mental health						

Model	R	R Square
1	.012 <sup>a</sup>	.000

Coefficients<sup>a</sup>

Multilevel logistic regression analysis was conducted to assess the relation between green spaces and mental health. The socio-demographic variables were controlled. The main model of this study included the socio-economic and demographic characteristics of the participants. The results of the study outlined that perceived mental health was better among individuals living in a greener surroundings Table 3 represents the findings of the relation between perceived mental health and green space. Thus, the findings of the study suggest that there is a significant relationship between green space and perceived mental health. The results show that 52.31% of people perceive themselves to be in better mental health than when they first started using the space living within 1km as compared to 39.28% living beyond 1km of radius. The results of multivariate regression analysis outlined that the regression model is significant p-value = .000\*\*\* showing 99% significance

## CHAPTER V

### Discussions

This chapter presents the discussion of these findings in comparison to the studies in the literature. This section demonstrated the existing findings of different researchers. It will represent what factors affect the green space associated with mental health. It also suggested how mental health can be improved by green space. It also discussed how green spaces have become the necessity of the urban people who are affected by pollution, population disadvantages and other urbanization effects. The results of this study are consistent with Dadvand, et al. (2016) that have indicated that green spaces are associated with the mental health of the citizens living in that area. There are many studies which confirmed the relationship between mental health and green spaces.

The results of the present study are consistent with Raswol (2018) highlighted the impact of promoting outdoor spaces design features to increase user satisfaction in a residential area in Duhok City. The findings of the study indicated that people are fascinated by the design quality of the physical feature of the outdoor space. It includes landscape furniture, artificial waters, landscape designs, greenery and proper pedestrians. It also encourages people to use outdoor space for various social activities. These outdoor spaces should be available for all communities belonging from different socioeconomic groups (Raswol, 2018). Similarly, the study conducted by Wolch, Byrne and Newell (2014) argued that the green space promotes the physical activity, general public health and the psychological well-being of the residents of urban areas. The study also highlighted that urban planners need to develop strategies which promote a greener environment and provides environmental justice to all people.

Furthermore, the current results supported the findings of Barton and Pretty (2010) highlighted the positive impact of green exercise on physical health. The findings of the study outline that both mood and self-esteem of the participants was improved by green environment. The presence of water has a greater effect on the mood of the people. The findings of the study confirmed that the environment is responsible for providing an important health service to the citizens.

The findings of the current research are supported by Beyer et al., (2014) that examined the relationship between mental health and neighbouring green space. The findings of the study indicated the positive relationship between nearby green space and mental health. The people getting exposed to green space have lower levels of anxiety, mental stress and depression. The study also outlined that greening can help in the improvement of urban health. The study indicated that higher levels of tree canopy can contribute to more positive mental health. The study also indicated the need for future research on the demographic characteristics which contribute to both access to green space and mental health advantages of green spaces. Scholars argue that natural atmospheres have the potential to provide relief from mental fatigue. It has the soothing capability which provides relief to the people (Beyer, et al., 2014).

The current findings also support the results of Louv (2005) that argued that green space is essential for health. In comparison, the findings of the current study also suggest that the lack of green space can cause many health issues among people. He contends that children who Kahn and Kellert (2002) also confirmed the importance of nature for the healthy development of children. The interaction of human with nature and animals is considered significant for wellbeing and healthy child development (Kahn & Kellert, 2002). The interaction with nature using green space can improve the health of children and provide them with a better place to grow and develop their abilities. It helps in providing them with a healthy and pleasant environment which can also affect their mood.

The findings of the study also support the explorations made by Groenewegen, Berg, Vries and Verheij (2006) that examined and monitored the effects of green space on health, well-being, and social safety of the people. The findings of the study highlighted that urban space is under pressure. It has caused people to live in less green residential environments. The people of low income have less exposure to the green spaces within the cities. It has also caused environmental injustice regarding the distribution of green space. The findings of the study indicated that planners should be well aware of the significance of green space and they consider the safety and wellbeing of people while developments.



Consequently, the current study may also suggest based on Jennings, Larson and Yun, (2016) that presented that the green spaces help in sustainability. The findings of the study outlined that green space provides many benefits to the ecosystem which are necessary for our psychological, physical, and social health (Jennings, Larson, & Yun, 2016). Cohen-Cline, Turkheimer and Glen (2015) also highlighted the impact of green space on physical activity and mental health. The twin pairs were used to examine the association between access to green space and mental health. The findings of the study revealed that those who have greater access to green space have less chance of depression. The study also indicated that green space is essential to lower mental health risks (Cohen-Cline, Turkheimer, & Glen, 2015).

Furthermore, the current study also implied that the green spaces have a huge remarkable impact on the psychological wellbeing of citizens. Wolsko and Lindberg (2013) also examined the psychological health implications of the shift toward a more ecologically rooted identity. The findings of the study revealed that people who are outdoor enthusiasts have a higher level of psychological well-being. They tend to have better mindfulness, positive emotions, subjective vitality and less negative emotions than those who do not connect with nature. The study reveals that stress can be lowered even by less physical activity in the green space. The study highlighted the positive role of green space in enhancing the physical and psychological well-being of urban people (Wolsko & Lindberg, 2013).

Similarly, the findings of the study are also supported by Berman et al., (2012) added nature has a dominant role in the improvement of individual's depression rate. The study also explored the effect of walking in nature for individuals with major depressive disorder (MDD). The findings of the study suggested that people considered free lots to be better for exercising and other activities. It helped them reduced their stress and anxiety. The green lots can help in promoting healthy activities of the citizens. The participants of the study included 20 different individuals. The results indicated that walking in nature has a positive effect on patients suffering from mental health disorders (Berman, et al., 2012). It can also highlight the significance of having open green spaces for people living in urban areas. The availability of such areas can help them get benefit easily.

## CHAPTER VI

### Conclusion and Recommendations

#### 6.1 Conclusion

The change in the size, heterogeneity, and density of cities is referred to as urbanization. However, urbanity is defined as the influence of living in urban areas over a specific time period. The population's health and living standards are also affected by urbanization. Urbanization has become a worldwide threat for the whole humanity as the natural land is decreasing and thus ecological balance is destroyed. Recent industrialization has posed a threat to these green places, with increasing industrial operations polluting the environment and endangering human and wildlife around the world. As natural land is depleted and consequently ecological equilibrium is disrupted, urbanization has become a global threat to humanity. People are confronted with a variety of social and economic issues as a result of rising urbanization. The key factors which affect the health of people in cities can be in physical environment theme, social environment theme and the access to the social services and health facilities. Urban green space in land use planning refers to green and/open space areas that may range from green roofs up to urban parks etc. Majority of the population has started migrating to cities. The frequent migration of people towards cities is most common in developing countries. The growth and migration rate of people vary from region to region.

Zakho city is located in Iraq it lies only a few kilometres from the Turkish border. Zakho is the main districts of Duhok Governorate. It has around 190,000 inhabitants located in the city. It was built on a small island on the Khabur River, but the city grew over time. It has attracted a large number of labourers and workers from various parts of Iraq along with Syria and Turkey. The main reason is its location and availability of job opportunities. Due to this attraction, urbanization has increased in Zakho city. Hence, the study's goal was to investigate the correlation between the quantity of green space surrounding people's living and working areas and their perceived overall wellness. This relationship is examined for various ages and socioeconomic groups. The study provided answers to the following questions:

1. What is the existing scientific data about the impact of the green spaces on psychological, physical, and social health on people in general in an urban area?
2. What is the impact of the green spaces on psychological, physical, and social health of people in Zakho city?
3. Is there any correlation between the general wellbeing and the green space of the living environment?

The research shows that there is a positive and major correlation between urban green spaces and perceived physical and mental health of the people. Multilevel logistic regression analysis was performed to measure the relation between green spaces and physical health. The socio-demographic variables were controlled. The main model of this study included the socio-economic and demographic characteristics of the participants. The findings of the study outlined that the overall physical health was better among individuals living in a greener surroundings Table 2 represents the findings of the perceived physical health and green space relationship. Thus, the findings of the study suggest that there is a significant relationship between green space and perceived physical health. The results show that 47.31% of people perceive themselves to be in better health than when they first started using the space living within 1km as compared to 35.69% living beyond 1km of radius. The results of multivariate regression analysis outlined that the regression model is significant  $p\text{-value} = .000^{***}$  showing 99% significance. The results of the present study are aligned with the existing literature and the findings of the existing studies.

## **6.2 Recommendations**

Based on the findings and discussions, following recommendations can be made for future studies:

1. This study focused on the analysing the impact of green spaces on mental and physical wellbeing. The future research can analyse how green spaces impact the psychological and physical condition of sick people who are getting medical treatments.
2. The future studies can also compare the two urban green spaces to analyse the importance of green spaces on mental and overall physical wellbeing.
3. The future result can also extend on the current study and investigate how the absence of green space can have a negative impact on mental and physical health.
4. Green spaces in urban areas have a significant role when it comes to health of urban people thus, the future studies can get into qualitative data through focused groups and interviews to understand how green space is important for them.
5. Future research can also focus on how green areas promote development and learning among children outside their classrooms.

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## **Appendices**

### **Appendix A**

#### **Questionnaire**

##### **The Effect of Urban Green Space: Case of Zakho city in Iraq**

Dear participant,

The aim of this questionnaire is to collect data about your views towards the effect of urban green space: case of Zakho city in Iraq. In any part of the questionnaire, you are entitled to abandon to participate in this research. If you decide to withdraw from the questionnaire your views and response will not be included anymore.

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## Section I

Please indicate:

## 1. Gender

Male  Female

## 2. Age:

20-30  31-40  41-50  50 and above

## 3. Level of education

Higher education  secondary education  primary

## 4. Occupation

Student  housewife  employee  retired

## Section II

## Perceived Physical Health Effects of this Green Space

Active defined as exercising 1 – 5 hours a week how active do you consider yourself?

1 (inactive) 2 3 4 5 (highly active)

Do you perceive yourself to be in better health than when you first started using the space?

Yes No

Are there changes to your health? If so, what?

(Better breathing, Healthier feel, More motivation, Higher energy levels; Poorer breathing, Increased allergies)

### Section III

#### Perceived Mental Health Effects of this Green Space

Are you more satisfied with yourself since you started using this green space?

1 (less) 2 3 4 5(more)

Have you noticed an enhancement in the level of wellbeing? Wellbeing is defined as the state of happiness.

1 (lower) 2 3 4 5(higher)

Do you feel decreased amounts of stress?

1 (no decrease) 2 3 4 5(high decrease)

**Appendix B**  
**Ethical Approval Document**

02.04.2020

Dear Jehat Hussein Abdulqader

Your application titled “The effect of urban green space: case of Zakho city in Iraq” with the application number YDÜ/FB/2020/85 has been evaluated by the Scientific Research Ethics Committee and granted approval. You can start your research on the condition that you will abide by the information provided in your application form.

Assoc. Prof. Dr. Direnç Kanol

Rapporteur of the Scientific Research Ethics Committee



Note: If you need to provide an official letter to an institution with the signature of the Head of NEU Scientific Research Ethics Committee, please apply to the secretariat of the ethics committee by showing this document.

## Appendix C

### Turnitin Similarity Report

#### Jehat Hussein Abdulqader Thesis

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<input type="checkbox"/>	Jehat Hussein	Chapter 4	12% <span style="color: green;">■</span>	--	--	<a href="#">📄</a>	1763063646	15-Feb-2022

**Appendix D**  
**CURRICULUM VITAE (CV)**

**1. PERSONAL INFORMATION**

NAME, SURNAME:	Jehat Hussein Abdulqader
DATE of BIRTH and PLACE:	28/09/1990 - Duhok
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**2. EDUCATION**

YEAR	UNIVERSITY	BACHELOR
2018	Near East University-Nicosia	Architecture