



Sudan University of Science and Technology
College of Graduate Studies



**Assessment and Improvement Proposals for some
Parks in Khartoum and Gezira States with
Reference to a Standard Park**

مقترحات تقييم و تحسين لبعض المتنزهات في ولايتي الخرطوم
و الجزيرة مقارنة بمتنزه قياسي

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for the degree of PhD**

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DEDICATION

To those who Love
Life, Beauty and
Greenery

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ABSTRACT

This study was carried out in Sudan University of Science and Technology to evaluate El Hurriya Park in Khartoum State and El Gezira Tourist Park in Gezira State with reference to Zabeel Park in Dubai Emirate. The study began in January 2019 and continued to January 2022. Research methodology include: Collection and inventory of information, field visits and questionnaire servuy. The field visits results found that the plant diversity in Zabeel Park is more than the plant diversity in both of El Hurriya Park and El Gezira Tourist Park. Also, Zabeel Park is more integrated in the architectural components and park facilities than El Hurriya Park and than El Gezira Tourist Parks. It is also found that the landscape style in El Hurriya and El Gezira Tourist Parks is formal style and in Zabeel Park is natural style. The questionnaire data was analysed by using (SPSS) program and when studying the social groups that vist the study parks the results confirmed that more than (60%) of respondents were males, more than (85%) of them are younger than (35) years and that almost (80%) of respondents were university educated and born in urban areas. Research findings showed that the two main goals for which more than (90%) of respondents visit El Hurriya and El Gezira Tourist Parks are enjoying the outdoors or nature and meeting relatives, friends and neighbors. It is also found that (63%) and (36%) of respondents in El Hurriya and El Gezira Tourist Parks, respectively, have frequent visits to the study parks, while (17%) and (38%) of them rarely visit the parks due to lack of time, lack of parks facilities, high cost of parks visit and far parks location. Assessing the importance of parks to the overall quality of life it is found that (89%) of the study parks respondents rated it as either very important or important. When investigating the current status of the study parks about half of El Hurriya Park respondents rate it as fair, while the other half rate it as either good or poor. On the other hand, (69%) of El Gezira Tourist Park respondents rated it as either excellent or good and (26%) rate it as fair. When evaluating visiting and exploiting of respondents to the study parks the overall assessment of the results revealed that the characteristics that respondents prefer larger central parks over smaller parks close to their houses and that they can get to the parks site easily are satisfied. Additionally, the overall assessment of the results revealed that the characteristics that respondents enjoy spending good times in the parks, and that they would like to visit the parks again, and more parks are needed in Khartoum and Gezira State are strongly satisfied. When evaluating the social effects of the study parks design on the local community results found that (98%) of respondents visit the parks in groups concluding that parks in Sudan are places for social participation generating community cohesion. Results stated that the overall assessment of the service dimentions in El Hurriya Park and in El Gezira Tourist Park is partially satisfied. Findings showed that the overall assessment of the environmental hazards resulting from the establishment of both El Hurriya Park and El Gezira Tourist Parks is partially satisfied. In El Hurriya Park the overall assessment of the environmental and the aesthetic effects of the park design on the local community is partially satisfied. Environmentaly, due to the fewer number of plants and the lack in shady trees. Aestheticly, the park is in lack of ornamental plants and flowering beds, lawn fields are not mowed, the park design is normal with no attractive or artestic elements and the hedges and fences are not pruned in wonderful shapes. On the other hand, in El Gezira Tourist Park the overall assessment of the environmental and the aesthetic effects of the park design on the local community is satisfied.

المستخلص

اجريت هذه الدراسة في جامعة السودان للعلوم و التكنولوجيا لتقييم منتزه الحرية بولاية الخرطوم و منتزه الجزيرة السياحي بولاية الجزيرة مقارنة بمنتزه زعبيل بإمارة دبي. بدأت الدراسة في يناير 2019م واستمرت إلى يناير 2022م. و قد شملت طرق البحث جمع و حصر المعلومات، زيارات ميدانية و استبانة. وجدت نتائج الزيارات الميدانية أن التنوع النباتي في منتزه زعبيل أكثر من التنوع النباتي في كل من منتزه الحرية و منتزه الجزيرة السياحي. أيضاً، منتزه زعبيل أكثر تكاملاً في المكونات الانشائية و مرافق المنتزه من منتزه الحرية و من منتزه الجزيرة السياحي. و قد وُجِدَ أيضاً أن نظام التصميم في منتزهي الحرية و الجزيرة السياحي نظام هندسي و في منتزه زعبيل نظام طبيعي. تم تحليل بيانات الاستبانة باستعمال برنامج (SPSS)، و عند دراسة المجموعات الاجتماعية التي تزور المنتزهين، أكدت النتائج أن أكثر من (60%) من المجيبين من الذكور، أكثر من (85%) منهم أصغر من (35) سنة و أن (80%) تقريباً من المجيبين تعليمهم جامعي و من مواليد المدن. اظهرت نتائج البحث أن السببين الاساسيين الذين من أجلهما أكثر من (90%) من المجيبين يزورون منتزهي الحرية و الجزيرة هما التمتع بالهواء الطلق أو الطبيعة، و لقاء الأهل، الأصدقاء و الجيران. وقد وُجِدَ أيضاً أن (63%) و (36%) من المجيبين في منتزهي الحرية و الجزيرة السياحي _على التوالي_ يقومون بزيارات متكررة للمنتزهين، بينما (17%) و (38%) منهم نادراً ما يزورون المنتزهين نسبةً لعدم وجود الوقت الكافي، النقص في مرافق المنتزهين، التكلفة العالية لزيارة المنتزهين و بعد موقع المنتزهين. تقيماً لأهمية المنتزهات لعموم نوعية الحياة، وُجِدَ أن (89%) من مجيبي المنتزهين كان تقييمهم إما هام جداً أو هام. و عند إستقراء الحالة الراهنة للمنتزهين، نصف مجيبي منتزه الحرية تقريباً قيمها بالمتوسطة بينما النصف الاخر قيمها إما جيدة أو ضعيفة. و من جهة أخرى، (69%) من مجيبي منتزه الجزيرة السياحي، كان تقييمهم إما ممتازة أو جيدة، و (26%) منهم قيمها بالمتوسطة. عند تقييم زيارات و ارتياد المجيبين لمنتزهي الدراسة، اظهر التقييم الكلي للنتائج أن الخصائص، المستجيبون يُفضِلون منتزهات كبيرة مركزية على منتزهات أصغر قريبة من منازلهم وأنهم يستطيعون الوصول إلى مواقع المنتزهين بسهولة، محققاً. إضافةً لذلك، اظهر التقييم الكلي للنتائج أن الخصائص، المستجيبون يستمتعون بقضاء أوقات جميلة بالمنتزهين، يرغبون في زيارة المنتزهين مرات أخرى، وأن هنالك حاجة للمزيد من المنتزهات في ولايتي الخرطوم و الجزيرة، محقق بشدة. عند تقييم الآثار الاجتماعية لتصميم المنتزهين على المجتمع المحلي، وجدت النتائج أن (98%) من المجيبين يزورون المنتزهين في جماعات، نستنتج من ذلك أن المنتزهات في السودان مناطق للمشاركة الاجتماعية تخلق مجتمع متماسك. ذكرت النتائج أن التقييم الكلي للابعاد الخدمية في منتزه الحرية و في منتزه الجزيرة السياحي محقق جزئياً. أظهرت النتائج أن التقييم الكلي للأضرار البيئية الناتجة عن قيام كل من منتزه الحرية و منتزه الجزيرة السياحي محقق جزئياً. في منتزه الحرية كان التقييم الكلي للتأثيرات البيئية والجمالية لتصميم المنتزه على المجتمع المحلي محقق جزئياً. بيئياً، لقلة أعداد النباتات و النقص في أشجار الظل. جمالياً، المنتزه يفتقر إلى نباتات الزينة و أحواض الزهور، ميادين النجيلة غير مقصوفة، تصميم المنتزه يفتقر إلى العناصر الفنية أو الجذابة و الأسيجة و الأسوار غير مقصوفة بأشكال جميلة. و من جهة أخرى، في منتزه الجزيرة السياحي كان التقييم الكلي للتأثيرات البيئية والجمالية لتصميم المنتزه على المجتمع المحلي محققاً.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	DEDICATION	i
	ACKNOWLEDGEMENTS	ii
	ABSTRACT	iii
	ABSTRACT IN ARABIC	iv
	TABLE OF CONTENTS	v
	LIST OF TABLES	x
	LIST OF FIGURES	xv
	LIST OF APPENDICES	xviii
1	INTRODUCTION	1
	1.1 Overview	1
	1.2 Problem Statement	2
	1.3 Research Questions	2
	1.4 Research Objectives	3
	1.5 Significance and Contribution of the Study	3
2	LITERATURE REVIEW	4
	2.1 Background of Parks	4
	2.1.1 Definition of parks	4
	2.1.2 History of parks	5
	2.1.3 General information about the study parks and the standard park	6
	2.1.3.1 El Hurriya Park	6
	2.1.3.2 El Gezira Tourist Park	8
	2.1.3.3 Zabeel Park	9
	2.2 Landscape Design of Parks	10
	2.2.1 Definition of landscape design	11

2.2.2	Elements of landscape design	11
2.2.3	Basic principles of landscape design	16
2.2.4	Plants components in the study parks	16
2.2.4.1	Trees in the study parks	16
2.2.4.2	Shrubs in the study parks	18
2.2.5	Styles of landscape design	19
2.2.5.1	Formal style	19
2.2.5.2	Natural style (informal)	20
2.2.5.3	Mixed style	20
2.2.5.4	Modern style	20
2.3	The Important Roles of Parks to the Overall Quality of Life	20
2.3.1	Role of parks in environmental quality	21
2.3.2	Effects of parks on social character	22
2.3.3	Aesthetic importance of parks	23
2.3.4	Economic value of parks	24
2.3.5	Impact of parks on physical and mental health	25
2.3.6	Psychological and recreational effects of parks	27
2.4	Previous Studies	28
3	RESEARCH METHODOLOGY	31
3.1	Collection and Inventory of Information	31
3.2	Field Visits	31
3.2.1	Plant materials in the study parks	31
3.2.2	Supporting elements in the study parks and the standard park	32
3.2.3	Designing and arrangement of the study parks and the standard park	32
3.3	Questionnaire Survey	33

3.3.1	Preparation and distribution of sample of questionnaire	33
3.3.2	Types of the study sample	33
3.3.2.1	Sample of parks	33
3.3.2.2	Sample of parks respondents	34
3.3.2.3	Determination of the user Sample size	34
3.3.3	Type of the survey questions	34
3.3.4	Survey instrument	34
3.3.4.1	Part one: Respondents demographics	35
3.3.4.2	Part two: Citizens visiting and exploiting of the study parks and their evaluation of the parks current situation	35
3.3.4.3	Part three: Assessment of the services dimentions of the parks and its impact on the local commuity	35
3.3.4.4	Part four: Assessment of the environmental, social and aethetic effects of the study parks designs on the local community	35
3.3.5	Conduction of the questionnaire	36
3.3.6	Method of analyzing the questionnaire	36
4	RESULTS	37
4.1	Collection and Inventory of Information	37
4.2	Field Visits	38

4.2.1	Plant materials present in the study parks and the standard park	38
4.2.1.1	Plant materials present in El Hurriya Park	38
4.2.1.1.1	Tree Plant present in El Hurriya Park	38
4.2.1.1.2	Shrubs Plant present in El Hurriya Park	39
4.2.1.2	Plant materials present in El Gezira Tourist Park	40
4.2.1.2.1	Tree plants present in El Gezira Tourist Park	40
4.2.1.2.2	Shrub plant present in El Gezira Tourist Park	41
4.2.1.3	Plant materials present in Zabeel Park	42
4.2.2	Supporting elements in the three parks	43
4.2.2.1	The architectural elements and the services in the three parks	43
4.2.2.2	The Recreational, cultural and sport facilities in the Three parks	46
4.2.3	Designing and arrangement of the three parks	48
4.2.3.1	Designing and arrangement of El Hurriya Park	48
4.2.3.2	Designing and arrangement of El Gezira Tourist park	48
4.2.3.3	Designing and arrangement of Zabeel park	49
4.3	The Questionnaire Results	49
4.3.1	El Hurriya Park questionnaire results	50
4.3.1.1	Part one results	50-67

4.3.1.2	Part two results	68-80
4.3.1.3	Part three results	80-82
4.3.1.4	Part four results	82-87
4.3.2	El Gezira Tourist Park Questionnaire results	87
4.3.2.1	Part one results	87-104
4.3.2.2	Part two results	105-117
4.3.2.3	Part three results	117-119
4.3.2.4	Part four results	120-124
5	DISCUSSION	125
5.1	Discussion of the Field Visits Results	125
5.2	Discussion of the Questionnaire Results	126-135
5.3	Conclusions	136
5.4	Recommendations	137-138
	REFERENCES	139-147
	Appendices	148-178

LIST OF TABLES

TABLE NO.	TITLE	PAGE
4.1	Information about the study parks and the standard park	38
4.2	Scientific names of the tree plants present in El Hurriya Park, their family names, their numbers and their usage in the park	39
4.3	Scientific names of the shrub plants present in El Hurriya Park, their family names and their usage in the park	40
4.4	Scientific names of the trees plants present in El Gezira Tourist Park, their family names, their numbers and their usage in the park	41
4.5	Scientific names of the shrub plants present in El Gezira Touris Park, their family names and their usage in the park	42
4.6	Density of plant spieces present in Zabeel Park	43
4.7	Architectural elements and the services present in the study parks and the standard park	46
4.8	Recreational, cultural and sport facilities in the study parks and the standard park	48
4.9	Evaluating the visiting and exploiting of respondents of El Hurriya Park	70
4.10	Time of day respondents visit El Hurriya Park	71
4.11	Time of day respondents of El Hurriya Park spend in the park	71
4.12	The basic goals for which El Hurriya Park respondents visit the park	72

4.13	The first main reason for which El Hurriya Park respondents visit the park	73
4.14	The second main reason for which El Hurriya Park respondents visit the park	74
4.15	When do respondents of El Hurriya Park usually visit the park?	75
4.16	Respondents who rarely visit El Hurriya Park, what are the reasons?	76
4.17	Financial expenses in El Hurriya Park	77
4.18	Do you or your family feel harassed when you visit El Hurriya Park?	77
4.19	Do respondents of El Hurriya Park go elsewhere to entertain other than this park?	78
4.20	Number of visitors to El Hurriya Park compared with the last ten years	78
4.21	How would respondents of El Hurriya Park rate the physical condition of the park?	79
4.22	The groups that are most underserved by El Hurriya park services	80
4.23	Assessment of the services dimentions of El Hurriya Park and its impact on the local community	81
4.24	The environmental impacts resulting from the designing of El Hurriya Park on the local community	83

4.25	The environmental hazards resulting from the designing of El Hurriya Park on the local community	84
4.26	Always, respondents visit the El Hurriya Park with companion or alone?	84
4.27	If respondents visit the El Hurriya Park in companion, whom they accompany with?	85
4.28	If respondents visit El Hurriya Park alone, what are the reasons?	85
4.29	Respondents who visit the park alone, do they talk with the park users?	86
4.30	Respondents who talk with the park users, do they make friendship with them?	86
4.31	The aesthetic impacts resulting from the designing of El Hurriya Park on the local community	87
4.32	Evaluating the visiting and exploiting of El Gezira Tourist Park respondents	107
4.33	Time of day respondents of El Gezira Tourist Park visit the park	108
4.34	The time of day respondents of El Gezira Tourist Park spend in the park	108
4.35	The basic goals for which El Gezira Tourist Park respondents visit the park	109
4.36	The first main reason for which El Gezira Tourist Park respondents visit the park	110
4.37	The second main reason for which El Gezira Tourist Park respondents visit the park	111

4.38	When do respondents of El Gezira Tourist Park usually visit the park?	112
4.39	Respondents who rarely visit El Gezira Tourist Park, what are the reasons?	113
4.40	Financial expenses in El Gezira Tourist Park	114
4.41	Do you or your family feel harassed when you visit El Gezira Tourist Park	114
4.42	Do respondents El Gezira Tourist Park go elsewhere to entertain other than this park?	115
4.43	What do you think about the number of visitors of ElGezira Tourist Park compared with the last ten years?	115
4.44	How would respondents rate the physical condition of El Gezira Tourist Park?	116
4.45	The groups that are mostly underserved by El Gezira Tourist Park services	117
4.46	Assessment of the service dimentions of El Gezira Tourist Park and its impact on the local community	118
4.47	The environmental impacts resulting from the designing of El Gezira Tourist Park on the local community	120
4.48	The environmental hazards resulting from the designing of El Gezira Tourist Park on the local community	121
4.49	Always, respondents visit El Gezira Tourist Park with companion or alone?	122

4.50	If respondents visit El Gezira Tourist Park in companion, whom they accompany with?	122
4.51	If respondents visit El Gezira Tourist Park alone, what are the reasons?	123
4.52	Respondents who visit El Gezira Tourist Park alone, do they talk with the park users?	123
4.53	Respondents who talk with the park users, do they make friendship with them?	123
4.54	The aesthetic returns resulting from the establishment of El Gezira Tourist Park	124

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
2.1	Common tree forms	13
2.2	Common shrub and groundcover forms	13
2.3	Coarse, medium and fine textures in foliage, branching and blades	14
2.4	Coarse texture shows in the irregular edges, spiny foliage and bold branching pattern	14
2.5	Simple leaf shape, smooth edges and average-sized stems create a medium texture	14
2.6	Small, delicate foliage and thin stems give ferns a fine texture	15
2.7	plants that stay small and compact next to a walkway	15
4.1	Gender of El Hurriya Park respondents	51
4.2	Age of El Hurriya Park respondents	52
4.3	Educational level of El Hurriya Park respondents	54
4.4	Occupation of El Hurriya Park respondents	55
4.5	Monthly income of El Hurriya Park respondents	56
4.6	Place of birth of El Hurriya Park respondents	57
4.7	Marital status of El Hurriya Park respondents	59
4.8	Number of people in the household of El Hurriya Park respondents	60
4.9	Total monthly household income of Hurriya Park respondents	61

4.10	Are El Hurriya Park respondents living in Khartoum city?	62
4.11	How far is El Hurriya Park respondents' home from the park?	64
4.12	If El Hurriya Park respondents' answer is one of the last 3 answers, is there public gardens in their areas?	65
4.13	El Hurriya Park respondents who are not living in Khartoum city, are they from Khartoum state?	66
4.14	El Hurriya Park respondents who are not living in Khartoum city, Why they are in the city?	67
4.15	How important are parks to the overall quality of life in Khartoum State?	69
4.16	Gender of El Gezira Tourist Park respondents	88
4.17	Age of El Gezira Tourist Park respondents	90
4.18	Educational level of El Gezira Touris Park respondents	91
4.19	Occupation of El Gezira Tourist Park respondents	92
4.20	Monthly income of El Gezira Tourist Park respondents	93
4.21	Place of birth of El Gezira Tourist Park respondents	95
4.22	Marital status of El Gezira Tourist Park respondents	96

4.23	Number of people in the household of El Gezira Tourist Park respondents	97
4.24	Total monthly household income of El Gezira Tourist Park respondents	98
4.25	Are El Gezira Tourist Park respondents living in Wad Medani city?	100
4.26	How far is El Gezira Tourist Park respondents' home from the park?	101
4.27	If El Gezira Tourist Park respondents' answer is one of the last 3 answers, is there public gardens in their areas?	102
4.28	El Gezira Tourist Park respondents who are not living in Wad Medani city, are they from Gezira state?	103
4.29	El Gezira Tourist Park respondents who are not living in Wad Medani city, why they are in the city?	104
4.30	How important are parks to the overall quality of life in Gezira State?	106

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
A	El Hurriya Park Questionnaire	148-156
B	El Gezira Tourist Park Questionnaire	157-165
C	Pictures	166-177
D	Publications	178

CHAPTER ONE

INTRODUCTION

1.1 Overview

The domain of landscape design is one of the recently developing sciences, which is highly connected with the life of people from the very early stages. Therefore, the landscape design of parks of cities is considered as embodiment of the fine art and extension of applied art according to the modern architectural styles (Al Shahat, 2005).

The fundamental concept of parks designing is problem solving through the use of horticultural sciences, artful composition and spatial organization to create attractive and fundamental out door rooms for different uses (Gail, 2010).

Parks perform many objectives as: finding recreational place characterized by the large green areas together with services suitable to the tradition of the area. They are considered as the vital element for linking the resident of the area to the desired social interaction Parks are places for enjoying nature and purified air, away from town noise and manufacturing dust (Abu eldahab and Mohammed, 1998).

Recreation is a fundamental human need in all ages and stages of life. It is the pursuit of physical, social, intellectual, creative and spiritual experiences that enhance individual, family and community wellbeing (Annonemus, 2017).

Sudan is badly in need of parks and gardens to protect the physical environment in the line with town extension and population increase. It is noticeable that there are limited number of parks and gardens. In addition to the lack of right planning and protection. In context, researches, references and periodics are inadequate in Sudanese libraries. Moreover, there are very few researches conducted in assessing or improving parks in Sudan. Consequently, this research studies the assessment and improvement proposals of some park in Sudan with reference to a

standard park. This research intended to provide contribution to the body of knowledge and empirical contribution.

The remaining of this chapter is divided into four sections that introduce this study by outlining the problem statement, research questions, research objectives and the significance and contribution of the research.

1.2 Problem Statement

The population explosion in Khartoum and the capitals of the different states necessitates the provision of green areas and parks to meet the popular need for such services. The already existing parks cannot represent a model for new ones. There is real need for assessment of these parks to shed light on limitations and provision of technical ideas for improvements.

Holland, (2004) study showed that a large number of parks in the United States are less than citizens' aspirations and are not subjected to environmental roles to serve local communities.

1.3 Research Questions

The overall questions of this research are developed based on the discussion on the problems. The main research questions that have been identified to provide direction for this research are:

1. Is there any assessment proposals of the current status of parks in Khartoum and Gezira States, with reference to Standard Parks?
2. Is there any evaluation procedures for the gardening components and supporting elements of the study parks, with reference to Standard Parks?
3. What is the effect of the study parks designs on the services dimentions and its impact on the local community?
4. What are the environmental, social and aesthetic effects of the study parks design on the local community?

1.4 Research Objectives

The main aims and objectives of this study are:

1. To evaluate the greening efficiency of El Hurriya Park (in Khartoum State) and El Gezira Tourist Park (in Gezira State), with reference to Zabeel Park (in Dubai Emarate).
2. To assess the architectural elements and the other facilities of the study parks design, with reference to the standard park.
3. To investigate the effect of the study parks design on the services dimentions.
4. To determine the environmental, social and aesthetic effects of the study parks design on the local community.

1.5 Significance and Contributions of the Study

This study is considered to be one of the very few studies which assesses and evaluates parks in Sudan in comparison to a standard park. The study is significant in evaluating the greening efficiency of the studied parks by identifying the most important natural or cultivated plant species scattered in the park and its density. It also had an important role in assessing the building constructions in the parks with reference to regional standards.

Furthermore, the study used the residents opinion in evaluating effect of the parks design on the services dimentions like intertainment, rest, sport ...etc and examine the effect of these services on the local community. Additionally, this study determined the environmental, social and aesthetic effects of park the landscape design on serving the local community.

Generally, Public perception surveys can enable green infrastructure managers to use their findigs and information in the urban planning framework.

CHAPTER TWO

LITERATURE REVIEW

2.1 Background of Parks

2.1.1 Definition of parks

An urban park is any public space set aside in a populated area to provide active or passive recreation (Cranz, 1982; Martin and Segrave, 1950; Dahal and Molnar, 1986).

(Annonemus, 2017) defined Parks as green areas or cultivated lands with few or no buildings within or adjoining a town, maintained for recreational and ornamental purposes. Parks may consist of grassy areas, rocks, soil and trees, also it may contain buildings and other artifacts such as monuments, fountains or playground structures. Many parks have fields for playing sports such as soccer, baseball and football, and paved areas for games such as basketball and tennis. Also they may have trails for walking, jogging, biking and other activities. Some parks are built adjacent to bodies of water or watercourses and may comprise a beach or boat dock area. Urban parks sometimes have benches for sitting, picnic tables and barbecue grills. Jasim, *et al.* (2018) stated that, urban parks are considered one of the important usage for land within the urban space of the city.

With the increasing needs of the population, the need has become urgent to the expansion in green areas, gardens and parks due to increase in transport and the industrial growth with the vertical and horizontal expansion in housing. All that beside the technological and economic progress resulted in pollution in water, air, soil and noise and was followed by a negative effect on human health and productivity affecting the national income and the standard of living of the population (Noah, 2011). Parks have also been one of the spaces that combine the activities of psychological comfort, pleasure and aesthetic in addition to the environmental, social and health benefits (Jasim, *et al.* 2018).

Arpana and Anjana (2014) addressed the importance of urban nature for citizens' wellbeing and for the sustainability of the city they inhabit, and confirmed that, the experience of nature in urban

environment is a source of positive feelings and beneficial services, which fulfil important immaterial and non-consumptive human needs.

It is estimated that, each year well over half the UK population, some 33 million people make more than 2.5 billion visits to urban green spaces alone (Dunnett, *et al.* 2002). In research carried out for CABI, 85 per cent (85%) of the people surveyed felt that the quality of public space and the built environment has a direct impact on their lives and on the way they feel (CABI, 2002).

2.1.2 History of parks

The history of parks date back to the days of Greeks, open places where allocated in Athens for audience to recreate in, where philosophers practiced horse racing and episodes of controversy. In the Nineteenth century, the industrial revolution in north Europe established gardens in crowded cities. The town committee of peace in Britain (1840), in its legislative, has endorsed the construction of parks as means of social welfare. There, people can relax and escape disease and crimes. The Hyde Park was opened in the era of James the 1st. After that the parks began to spread and in (1858) in New York, Central Park was established. There the idea of city greening was made (Al ghitani, 1985).

In Sudan, initiation of parks began during the British colonial era. Few parks were established in Khartoum, Atbara and Wad Madani where there was considerable presence of British families. After independence in 1956, Sudanese officials expanded the parks for city greening. These parks were characterized by small acreage, useage of limited types of ornamental plants, and lack of support services coupled with limitations in finance for improvements and technical support. In recent years, the government has taken an interest in establishing public parks for the residents of the city and neighborhoods, as well as spreading horticultural awareness and the importance of parks and gardens in the modern era, as they are the only outlet for city residents from the daily fatigue (Mohammed, 2009). In the last three decades, further expansions were achieved e.g. El Hurriya Park and Omdurman Park in Khartoum State beside El Gezira Tourist Park and Misk El

Khitam Park in Gezira State. However these parks suffer technical fouls and cannot rank equally with international or regional standards.

In Dubai, the city is a vivid example of designing parks and coordinating green spaces. In 1974 the Mushrif Park was the first public park established, after which the network of parks and green spaces began to expand rapidly. Now Dubai includes the largest number of parks in the UAE, with six large public parks and 13 smaller residential parks, spread over an area of 500 hectares. Officials in Dubai have prepared a long-term plan to make green spaces occupy 8% of its land, a figure commensurate with international standards (Report from Dubai Municipality, 2008).

2.1.3 General information about the study parks and the standard park

2.1.3.1 El Hurriya Park (Appendix D - picture: 1)

El Hurriya Park is located in Khartoum city, the capital of Sudan, which lies in Khartoum State. Khartoum city lies between latitudes 16° North, 15° South and longitudes 21° West, 24° East. With an area of 20,736 Km² a population of 2.682.431 (Sinsus, 2008). The city is located at an altitude of 382 meters above sea level on a flat plain surface with a slight slope towards the course of the Nile River. The climate is moderate in winter with high temperatures in summer and heavy rains in the autumn season. ([https://www.aljazeera.net/encyclopedia/cities and regions](https://www.aljazeera.net/encyclopedia/cities-and-regions)).

El Hurriya Park was named as the (Alsaha Al khadra) for a long time since it was constructed and then after December revolution, the name was changed to El Hurriya Park. The park is considered one of the most important landmarks of the capital Khartoum, it is located in the heart of Khartoum south of Khartoum International Airport. It is owned by the Presidency of the Republic of Sudan and it is under the administration of Khartoum State. El Hurriya Park was opened in 1992 to host official events and celebrations of the State and has been playing this role until the beginning of 2012 when the state leadership decided to turn it into a public park with international specifications, including sports and recreation alongside its sovereign function in order to beautify the capital Khartoum, entertain citizens and to hold events of mass character. Khartoum State in cooperation with the National Social Security Fund and Wathba Company rehabilitated the Green Yard to a place where there are many cultural, social, sports, religious and entertainment activities. The park is frequented by a large number of families and young people

ranging from 10-15 thousand on Thursday and Friday, and in Ramadan month the number reached (20-30) thousand visitors.

The park management is runned by a qualified staff, followed by a team of agricultural, insurance and ticket workers. The administrative structure is composed of a Board of Directors which is composed of a General Manager, Director of Personnel Affairs, Investment Manager, Financial Manager, Director of the Department of Media and Information, Director of Agriculture and Director of the Executive Office.

El Hurriya Park relies on the following sources for funding: Entrance tickets, games tickets, kiosks rent, advertising screens, sponsors, rent arena for government and commercial activities, health halls and Khomasiat playgrounds.

Concerning the events within El Hurriya Park, the park has become a melting pot of social interaction in which all cultural, social, religious, sports and recreational activities are concentrated. Even foreigners, diplomats and members of international organizations operating in Sudan have found it convenient to hold their celebrations and to carry out their various activities in El Hurriya Park.

El Hurriya Park has been able to contribute effectively to society through the adoption of educational and awareness programs in various fields including medical, religious and programs for foreigners, as well as programs of environmental sanitation and a program to address negative phenomena among young people and the festival Halatk for children without bond and the program of reading -for- all in addition to the National Independence Celebrations and New Year holidays. The Park hosted the Business Women's Exhibition and many exhibitions and charity markets. It has also contributed to a number of charitable activities such as relief for flood and rain victims, orphans and Ramadan orphans. These activities have multiplied many times and the park has become the largest Qibla in Sudan for activities and official and popular activities, even at the level of families (Khalid, 2017).

2.1.3.2 El Gezira Tourist Park (Appendix D - picture: 2)

El Gezira Tourist Park is located in Wad Medani city, which lies in Gezira State. Wad Medani city is the capital of the state, the largest and the most important city in Gezira state. It is located between latitudes 14°, 24° North and longitudes 33°, 31° East. With an area of 136 Km² (85 miles²) and a population density of 345,290 (Sinsus 2008). It has a hot arid climate (en.wikipedia.org/wiki/Wad-Medani). The park is located in Hai El Daraga Block (184) and No. (35). It has been constructed, designed and implemented by the technical staff of Bushriat Co.

The administrative structure consists of Board of Directors which includes: General Manager, Secretary General Manager, Financial Management, Administrative Affairs, Technical Management and Service Management, which in turn includes: Agriculture, Cleanliness and other services. All senior management working in the park are holders of higher degrees, bachelor degree as a minimum by specializations, except for the department of Agriculture where the park lacks qualified staff who can add and develop in the horticultural sector and the aesthetic aspects, flowers and other contents of the horticultural sector in the park, where the department works with intermediary staff and a group of gardeners who cannot highlight the most beautiful dimensions of agriculture in the required manner. Finance: The construction of the park has been financed entirely by the owner later, funding came from the income of the park for the replacement of the various components of the park, especially high-depreciation playgrounds, which must be renewed from time to time to keep up with the activity and the new advancements in the world of entertainment.

The main activity in the park is the playgrounds for all age groups as well as other activities which include: (1) trips to schools and kindergartens. (2) Academic and regional associations for students of different universities including: (a) Reception of new students. (b) Farewell of graduate students. (c) Celebration. (d) Cultural, social and other activities. (3) Events related to specialized societies: (a) Children's Day. (b) The Day of the Orphan. (c) Entertainment Day for children of cancer. (d) Entertainment Days for people with special needs. (4) Basic seasons: (a) Eid al - Adha. (b) Eid al-Fitr. (c) New Year holidays.

Advertising have a great role in the definition of the park and its components and programs. The annual operational plans of the park are not free of advertising programs in all audio and video media. For example the park is used to broadcast TV episodes utilizing the park's appearance and distinctive location. There is also a site for the park on Facebook to advertise and communicate with friends of the park and its pioneers in all the states of Sudan and some friends from sister countries such as Egypt and Yemen (Annonemus, 2019).

2.1.3.3 Zabeel Park (Appendix D - picture: 3)

Zabeel Park is located in Zabeel district of Dubai, United Arab Emirates. Dubai Emirate lies between latitudes 25°,26° North and longitudes 26°,51° East. It is the second largest emirate in the Federation after the Emirate of Abu Dhabi, with an area of 4,114 km² and population of 2,262,000 people (Report from Dubai Municipality 2008). Dubai Municipality. United Arab Emirates. Un-published data. P65.)

Zabeel Park is an urban public park, and it is considered one of the largest and most popular parks in Dubai. The park includes three Sections (A, B and C) connected by two pedestrian bridges and each one of these sections provides different kinds of entertainment and services.

Garden (A): Contains the followings: 1/ Dubai frame which is a tower in a form of picture frame, with a length of 125 meters, equivalent to 45 floors and a width of 96 meters. Visitors can climb to the top of the tower, to see views of Dubai, through a glass elevator on both sides of the tower. 2/ the main theater with an amphitheater that accommodates 2,400 person. 3/ surrounded by a 2.5 km long jogging track. 4/ three refreshment booths.

Garden (B): Contains the followings: 1/ the boating lake is the most important features in this park, it is specialized in rowing boats and slow-moving electric boats, includes an attractive fountain, waterfalls, an island and bridges, and it can be seen from outside the park. 2/ The smart palm: It is a landmark, in the form of a palm tree, and it works with solar energy (stores energy and restarts it during the night to give a green color similar to the real palm). It covers more than 100 meters with free Wi-Fi, used in charging phone batteries, knowing currency rates and for screens advertising. 3/ the climbing play area which is designed for youth (over 12 years old) and

it is surrounded with a fence and has an iron gate. 4/ a track with a length of 1.6 km. 5/ the cricket stadium which is surrounded by an 8 meter high wire wall. 6/ Zain restaurant is the main restaurant facing the lake. 7/ two booths to offer the visitor refreshments, and cold and fast meals.

Garden (c): Contains the followings: 1/ the open theater which is designed for hosting weddings and the legacies of people's traditions. 2/ adventure games zone which is designed for children (under 10 years old) with games through which the child learns motor skills such as climbing, skiing, swinging and crossing through channels, group play with sand and rotation movement.

Brainstorming hall: A closed, air-conditioned hall, with an area of 200 square meters, equipped with store and preparation room and characterized by a view of the green areas. In this hall brainstorming sessions for municipal administrations and government departments are held.

Exhibition hall: Closed, air-conditioned hall, with an area of 200 square meters, connected to a store of 50 square meters, surrounding the circular fountain and contains a booth.

Sculptures of sister cities: The city of Dubai has about (19) sister cities from different countries of the world, and the park contains (11) model these Sculptures.

The main roads in Zabeel Park have a width of 12 m shaded with trees. Also there are two trains that transport visitors around the park with shaded, seated train stations.

Timings and Fees: The park is open from 8:00 a.m. to 10:00 p.m. and extends late into the night on public holidays. The entrance fee to the park is 5 dirhams per person and free for children under two years and people with special needs (The garden Book, 2008).

2.2 Landscape Design of Parks

The fundamental concept of landscape design is problem solving through the use of horticultural science, artful composition and spatial organization to create attractive and functional outdoor “rooms” for different uses. The elements (visual qualities): Line, form, texture, color and visual weight, and principles (guidelines): Proportion, order, repetition and unity of design are used to create spaces, connect them and make them visually pleasing to the eye (Gail, 2010).

2.2.1 Definition of landscape design

Landscaping combines art and science elements to create a functional, aesthetically pleasing extension of indoor living to the outdoors. The initial purpose of landscape design is to blend man's house or building, into the natural surroundings (Dewayne, 1991).

2.2.2 Elements of landscape design

Gail and Erin (2010) reviewed the physical characteristics of plants elements of landscape design in the following summery: Form, texture, size and color are the physical characteristics of plants that provide variety, interest and aesthetic appeal to a landscape and they give each plant a distinct look and personality.

Form: Form is the three-dimensional shape of a plant or a plant mass, and plant forms can be divided into three groups: Trees, shrubs and groundcover.

Tree forms: are mostly dominant in the landscape because they are large in size, provide shade and block views. They include: round, columnar, oval, pyramidal, vase and weeping (Fig. 2.1).

Shrubs forms: includ Arching, irregular, cascading, upright, spiky, rounded, spreading, pyramidal, mounding and vase shaped as shown in (Fig. 2.2). The form of the shrub determines its most suitable use in landscape. Upright, vase, mounded and round forms work well as buffers and taller screens. Irregular and spreading forms work best as groundcovers. Arching, cascading, pyramidal and spiky forms work best as focal points.

Groundcover forms: include clumping, matting, sprawling, short spikes and spreading (as shown in (Fig. 2.2). Matting, spreading or sprawling plants can be used to form a solid, low cover over large areas. While groundcover plants that grow in clumps or short spikes can be used in smaller masses to cover enclosed areas or planters.

Texture: Texture refers to how coarse or fine the overall surface and individual leaves of the plant look or feel. Texture can be found in plant's foliage, bark, blades, flowers and overall branching pattern. A plant can be described as having a coarse, medium or fine texture (Fig. 2.3).

Coarse Texture: Plant characteristics that create coarse texture include: thick twigs and branches, leaves and twigs with spines or thorns, large leaves, leaves with very irregular edges and/or bold, deep veins, variegated colors and bold or irregular forms (Fig. 2.4).

Medium Texture: Medium-textured plants characterized by having foliage and branches that are neither overly large nor small and delicate (most plants fall in this category), and medium-sized leaves with simple shapes and smooth edges (Fig. 2.5). The average-sized branches are not densely spaced nor widely spaced, and the overall form is typically rounded or mounding. Medium-textured plants act as a background to unify and link the coarse- and fine-textured plants.

Fine Texture: characteristics that create fine texture include: small delicate foliage, thin strappy leaves (grasses), tall thin stems, small fragile twigs with many branches, narrow trunks, long stems (vines) and small delicate flowers (Fig. 2.6).

Size: Size refers to the overall height and width of the plant, and its relative size when compared to other spaces, plants and structures in the yard. Large plants are trees and shrubs that grow, at mature size, to (4–6) ft. or higher. Medium plants, typically shrubs, have a height of (2–4) ft. On other hand, the Small plants, typically groundcover and bedding plants, are (2) ft. tall or shorter. Plant size is closely related to form. As columnar, pyramidal and upright plants are narrow and occupy less horizontal space, while sprawling, arching and mounding plants occupy less vertical space.

Locations that require size consideration include: Underground water and electrical (avoid large trees), overhead utility lines, building height, doors and windows and architectural features, such as archways and arbors. **Spaces that require size consideration include:** Plant beds, planters and containers, particularly next to the walkway and house. (Fig. 2.7).

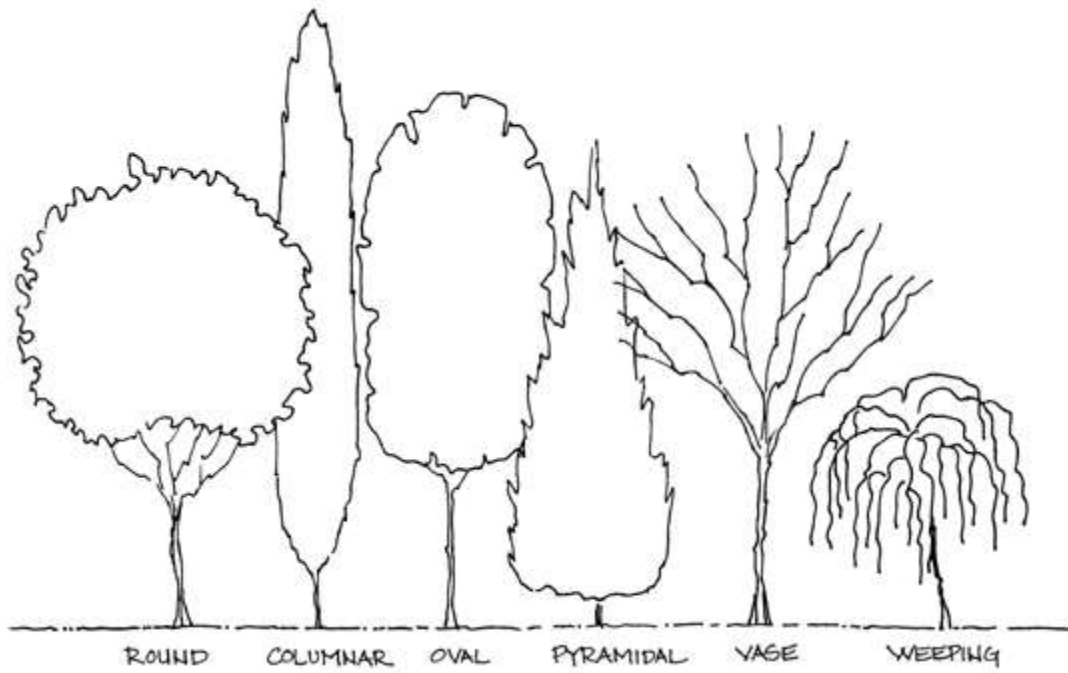


Fig. 2.1: Common tree forms (Credit: Gail Hansen)

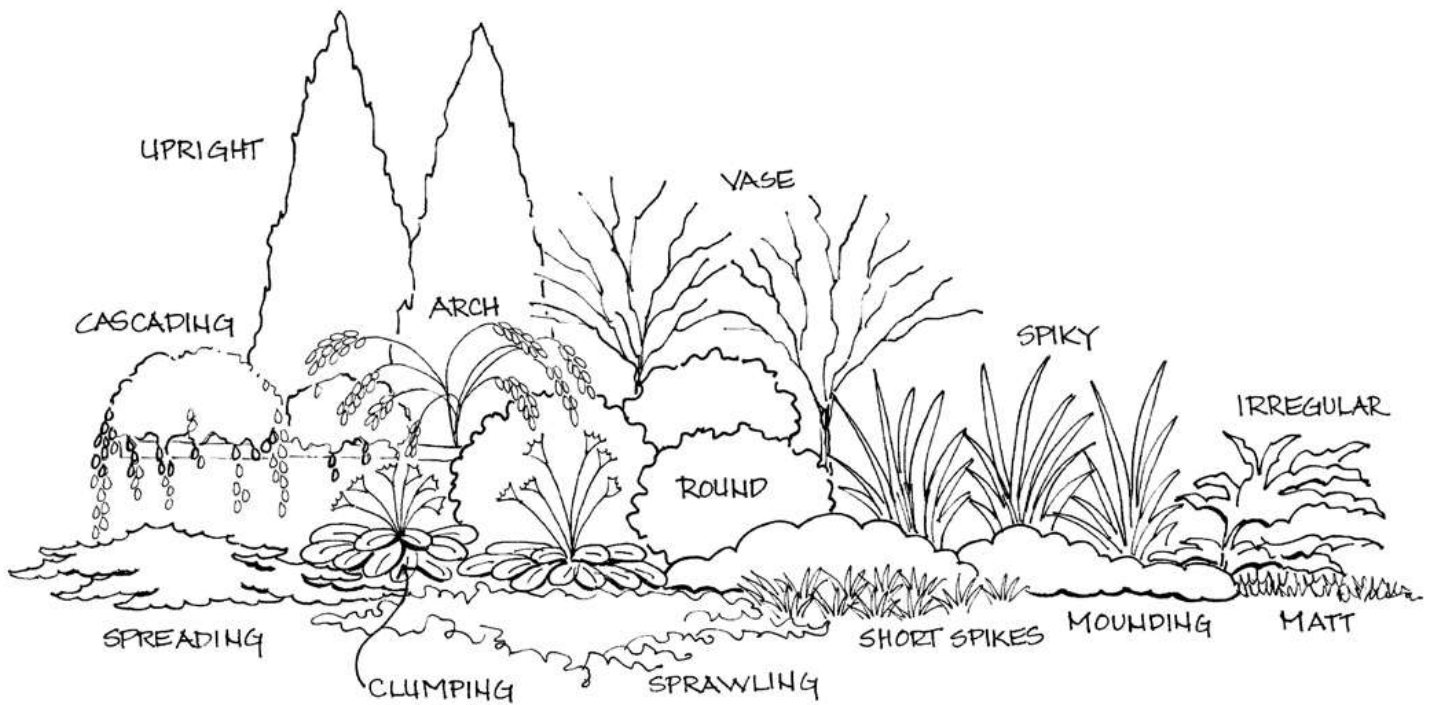


Fig. 2.2: Common Shrub and groundcover forms (Credit: Gail Hansen)

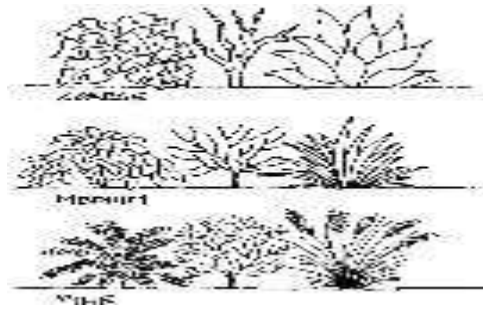


Fig. 2.3: Coarse medium and fine textures in foliage branching and blades (Credit: Gail Hansen)



Fig. 2.4: Coarse texture shows in the irregular edges spiny foliage and bold branching pattern. (Credit: Center for Landscape Conservation and Ecology)



Fig. 2.5: Simple leaf shape smooth edges and average-sized stems create a medium texture. (Credit: Center for Landscape Conservation and Ecology)



Fig. 2.6 Small delicate foliage and thin stems give ferns a fine texture. (Credit: Center for Landscape Conservation and Ecology)



Fig. 2.7: plants that stay small and compact next to a walkway.

(Credit: Center for Landscape Conservation and Ecology)

2.2.3 Basic principles of landscape design

When designing a landscape the following Principles should be considered:

Unity: It is the master principle that gives cohesiveness to the landscape design. When applied, the various use areas of the landscape will convey a sense of being pieces of the whole. It can be created by maintaining consistency in the choice of the landscape components such as plants, fixtures, pavings or colors throughout the landscape.

Balance: Balance puts the landscape design on a seesaw and requires that each side have the same visual weight. Balance may be, symmetrical, where one side of the landscape design is an exact duplicate of the other. Or it may be, asymmetrical, where one side of the landscape design does not duplicate the other side, but it has the same visual mass.

Proportion: The principle of proportion should guide the size relationships between elements of the landscape. Proportion between plants and buildings, plants and people and within plants should be considered.

Focalization of Interest: Focal point is the point to which the viewer's eye should be directed, it is a centre of attraction. It can either be created for the landscape design or enhanced where they already exist. Major landscape design should have one focal point. Some focal points are obvious, as in the public area the house entrance is the focal point. Commonly, focal points are: specimen plants, ponds or pools, statuary and sundials (Jack, 2010).

Selection of plants: Selection of garden plants requires good knowledge about the physical characteristics and the growth habit of plants.

2.2.4 Plants components in the study parks

Plants grown in El Gezira Tourist Park and El Hurriya Park can be grouped as follows:

2.2.4.1 Trees in the study parks

(1) *Albizzia lebbek*

Belong to the family Mimosaceae, it is a large deciduous tree, with feathery compound leaves. Flowering in Summer and Autumn in yellowish green inflorescence. It grows better in sandy soils and propagated by seeds and cuttings. Landscape use: in gardens and beside roads.

(2) *Azadirachta indica*

Belong to the family Meliaceae, deciduous tree moderate in size, with feathery compound leaves and propagated by seed. It grows in poor soils and tolerates cold and draught.

(3) *Conocarpus spp.*

Belong to the family Myrtaceae, ever green tree with intensive branching stems and shiny green leaves. It is a rapid growing tree with a strong root system which can go deeply in soil searching for water. Propagation by seeds and used as high fence and wind break.

(4) *Eucaliptus spp.*

Belong to the family Myrtaceae, evergreen tree. Leaves are: Lanceolate, greyish green and scented. Flowers are: White creamy in colour. Propagation by seeds.

(5) *Ficus benjamina*

Belong to the family Moraceae, it is a moderate size ever green tree, with cascading branches. Leaves are small, oval and shiny green. The plant tolerates shade and it can be planted at the centre or side of the lawns, also it can be used as pot plant and pruned hedge. Propagation by terminal cuttings.

(6) *Khaya senegalensis*

Belong to the family Meliaceae, deciduous large tree, with compound, leathery and light green leaf. Flowers white in color with orange red disc around the ovary. It grows best in fertile soils and used as shade tree. Propagation by seeds.

(7) *Peltophorum africanum*

Belong to the family Annonaceae, ever green tree with spreading branches and compound feathery leaves. Flower color is yellow and flowering in autumn. It has pod fruit and grows best in most of good drainage soils.

(8) *Phoenix dactylifera*

Belong to the family Palmaceae, erect, ever green tree. The course textured stem can reach up to 20 m length with compound feathery leaves. Fruits are edible and propagation by seeds. Used at the entrances of gardens and buildings.

(9) *Roystonea regia*

Belong to the family Palmaceae, one of the precious and most beautiful palms. The white, soft stem can reach up to 20 metres in height. The ever green, feathery leaves are long, dark green and the crown is dense and cascading. Used at the entrances of houses and gardens. Propagation by seeds.

(10) *Sabala palmetto*

Belong to the family Palmaceae, strong growth palm tree, with large, fan-shaped leaves. The leaf neck is thick, with no spines and extends inside the leaf blade which is curved down. Propagation by seeds.

(11) *Saraca asoca* or *Polyalthia longifolia*

Belong to the family Annonaceae, ever green tree grows in vertical form. Branches cascading with shiny green elongated leaves. It has beautiful flower.

2.2.4.2 Shrubs in the study parks(1) *Bougainvillea spp.*

Belong to the family Nyctaginaceae, It is a genus for many species of shrubs, climbers and creeping plants. It has green leaves, long spines and the flowers are small, of no economic importance and surrounded by attractive bracts. Propagation by stem cuttings.

(2) *Duranta plumieri*

Belong to the family Verbenaceae, ever green shrub with green oval leaves. Used in hedges and propagated by stem cuttings.

(3) *Hibiscus spp.*

Belong to the family Malvaceae, ever green shrub with red flowers. Leaves oval, green with serrate margine. Propagation by stem cuttings.

(4) *Ixora coccinea*

Belong to the family Rubiaceae, leaves are rectangular and circular or heart shaped at the base. Flowering all year round producing red flowers. Propagation by off sets, layering and stem cuttings.

(5) *Jasminum sambac*

Belong to the family Oleaceae, ever green, small sized, shrubby plant. Leaves oval in shape. Flowers white, large in size, sigle or double and scented. Flowering in summer and winter.

(6) *Plumeria Alba*

Belong to the family Apocynaceae, decidious shrub characterized by its beautiful branching. Leaves: Leathery, oval, Large and thick. Flowers: White, yellowish from the inside, scenty. Flowering in Summer and Autmn. Propagation: by stem cuttinga.

(7) *Rosa spp.*

Belong to the family Rosaceae, shrubby plant, its flowers characterized by its beautiful shape, different colours and nice scent. Cut rose flowers live longer in arrangement vase. Propagation by seeds, half mature cuttings, mature cuttings and grafting on *R. camina* (the commercial method). Flowering all year round and concentrate in winter and autumn. In winter flowers are less in number, large in size, hight in quality and rich in scent.

2.2.5 Styles of landscape design

2.2.5.1 Formal style

Characterized by straight lines and dependes upon repeatition in creating balance. It is suitable to be used in small area gardens and in flat surface regular shaped gardens (squaired, rectangular, circular). Roads and pathes are in straight and circular in regular lines, fountains located in the

central axe, trees are planted in equal inter spaces and the symmetry should be considered in distributing plant types, shape and colour. The symmetry can be: (1) Double symmetry, where the designing unit is repeated on the side of the main axis. (2) Multiple symmetry, in which the designing unit is repeated many times on the side of the main axis. (3) Circular symmetry, in which parts of the design are repeated in circular or oval way around circular or oval unit in the garden centre. It can be doubled or multiplied (Al Ghitani, 1985).

2.2.5.2 Natural style (informal style)

Characterised by curved lines, curved roads and free from straight lines. It is suitable for the large areas. In this style: a/ the lawn fields are large in area and they are the dominant element in the design. b/ the trees are planted in irregular spaces and the flower beds are large and planted in the borders. c/ planted with different trees shrubs and annuals scattered as it is naturally grown. d/ water elements like natural ones and planted with aquatic and semi-aquatic plants. e/ the architectural elements are made of natural materials. f/ roads and paths are curved and made of natural break (Al qaii, 1988).

2.2.5.3 Mixed style

The formal style and the natural one can be mixed together in what is called the mixed style, which is used in large areas gardens e.g. zoo gardens, botanical gardens and home gardens.

2.2.5.4 Modern style

This design does not go with the known roles of designing styles.

2.3 The Important Roles of Parks to the Overall Quality of Life

The section discusses how parks and gardens create environmental, social and aesthetic value to the local community. It also addresses the important roles that parks play in economics, recreation and in public physical and mental health.

2.3.1 Role of parks in environmental quality

The significant increase in hard surfacing which is met by the reduction in green spaces lead to higher temperatures in towns and cities than in the surrounding countryside. Which is known as the ‘heat island effect’ (Lowry, 1967). Vegetation in public spaces or gardens can help to redress this imbalance. It brings many important environmental benefits to urban areas, including air cooling and the absorption of atmospheric pollutants (Littlefair, *et al.* 2000). Also Vegetation provides an opportunity for people to be close to ‘nature’, which is associated with positive impact that can bring in terms of mental health and pleasure. The difference in temperatures between parks and the surrounding urban areas, can gives rise to a ‘park breeze’ (a gentle wind which blows from the park out to the adjacent buildings). Poor air quality in a town may be ameliorated by the fresh air blown out from the parks. Indeed, air even in small parks has on the whole been found to be purer than that of its surroundings despite being close to heavy traffic. This depends on the layout of the town and wind direction (Upmanis, 2000). A study of four urban areas on Merseyside, declared that the greatest influence on their ecology was the proportion of green space, particularly trees. As the places with the greatest number of trees had better carbon-storage capacity and a lower level of surface water running off into drains (allowing sewers to cope better with water-flow and minimizing flood problems). Moreover, the temperature was 7 °C cooler where vegetation cover was (50%) compared to areas where the vegetation cover was only (15%) (Whitford, *et al.* 2001). Research in Tel Aviv similarly points to the benefits of trees showing that the presence of trees resulted in a cooling of the air temperature of between 1 °C in a heavily trafficked street to 4 °C in the smallest (0.15 ha) garden. Tel Aviv study also found that the shape of the green area had an impact on cooling, and that the cooling effect could be felt up to 100 m from the site (Shashua-Bar and Hoffman, 2000). Cooling can be facilitated by even a small space – parks of only one or two hectares have been found to be two degrees cooler than surrounding areas (Upmanis, 2000). Moreover, trees have the benefit of providing shade on hot days and in sunny climates.

It is stated that trees, shrubs and palms play an important role in protecting environmental balance especially in conditions of modern towns, therefore they should be carefully planted by a perfect program as Al qaii, *et al.* (1993) recommendations. Khan (1999) revealed that branches and

leaves of intensive foliage plants prevent the fall of rain particles on soil and hence reduce its effect on soil composition.

2.3.2 Effects of parks on social character

Parks are characterized by being open to all people regardless of ethnic origin, gender, age, economic and social levels of visitors and as such they represent a democratic forum for citizens and society. When properly designed, they provide meeting places, bring communities together and foster social ties. Thus they can generate community cohesion and result in a city with a unique identity one to which residents positively respond (Hagelskamp, 2003).

However, quality counts: the better the garden design, the better the quality of the social experience. In this regard, it has been shown that big, bland spaces on housing estates fail to offer the same opportunities for social cohesion as more personal spaces (Quayle and Dreissen van der Lieck, 1997).

One of the benefits of parks is its potential as a venue for social events. Well managed festivals and other events can have a positive effect on the urban environment, drawing the community together and bringing environmental, social and financial benefits. Thus, they can reintroduce the kind of civil society that has been lost in too many of our urban areas. A good example is the annual New Year's Eve 'First Night' festival in Boston, US, which has established itself as a key feature in the city's calendar, business people who were reinitiated sceptical about its potential see the festival as a major boost for their companies. To encourage events like these, cities need to plan the physical layout of their recreational parks with festivals and other social activities in mind (Schuster, 1995).

Mowbray Park, Sunderland Lower Gardens, Bournemouth Lister Park and Bradford Green recreational parks are generally well-used public space. As a study in Chicago found that people living in apartments tended to use nearby public spaces more if they were 'natural' than if they were man-made. This increased use of the green spaces led in turn to a greater amount of socializing among neighbours –initially as they met while simply pausing to sit and later to deepen social ties (Kuo, *et al.* 1998).

It is found that a view of trees, flowers and natural areas nearby is, the strongest factor affecting people's satisfaction with their neighbourhood. As green spaces surrounded by housing or are a continuation of the home environment, have a social value and significantly affects feelings of community (Kaplan, 1985). Green areas and parks within residential communities, work to enhance social relations and create opportunities for acquaintance between members of the neighborhood and also work to increase their awareness and environmental culture (Health Council of the Northern Land. 2005) Studies indicate that green spaces are clustering places that creates safer, healthier, cohesive societies (Ku and Francis, 2001). It is also revealed that good-quality-parks that contain walking tracks, are among the most important factors that are taken into account when individuals choose a place to live (Kaplan, 2009).

2.3.3 Aesthetic importance of parks

It is mentioned that there are three main uses of plants in designing parks and gardens, the first and the main use, is the aesthetic use of plants in garden design. Where plant collections are used in many forms in modern designs, especially in architectural design (Al mana and Alhamdi, 1990). The aesthetic use is the main use of plants in parks and gardens, where plants are used as an attractive individual models, they break architecture lines, provide beautiful coloration and give movement and life to parks and gardens. There must be good knowledge in distributing plants in gardens which is called science of coordinating and designing plants, which completes science of landscape design (Polat, *et al.* 2010). It is generally recognised that greenery filled public areas provide comfortable and pleasant living environments for urban residents (Lawrence, 1996). Park and gardens form a strong bond between man and his surroundings. Instinctively, man feels great need for a place in which he can rest his soul and reassure his feelings and conscience and rest in it by looking towards his beauty and relieves him from work trouble (Al dajwi, 2004). According to (Evenson, *et al.* 2006) the safety component and the aesthetic appearance of the gardens are the two important features of the parks and open areas on which visiting to the park depends. Additionally, (Noah, 2011) reported that parks and gardens play a key role in beautification of cities with their plants of different shapes and colors, and the aesthetic

views such as fountains, ponds, arches and others, which beautify the surrounding sites and attract the attention.

2.3.4 Economic value of parks

A good-quality public landscape can have a significant impact on the economic life of urban centers. It was revealed that well-planned improvements to public spaces within town centers can boost commercial trading by up to (40%) and thus, generate significant private sector investment (DoE and The Association of Town Centre Management, 1997) .

It was shown that a high-quality public space has a positive impact on the price of nearby commercial properties. In the towns of Emmen, Appeldoorn and Leiden in the Netherlands, it has been shown that a garden bordering water can increase the price of a house by (11%), while having a lake nearby or a view of water can boost the price by (7%) and (10%), respectively. A view of a park was shown to raise house prices by (8%), and having a park nearby by (6%). This compares with a view of an apartment block, which can reduce the price by (7%) (Luttik, 2000). In Dallas, many residents cited that the public green spaces running behind their back gardens as a major factor in their decision to move to the area. (60%) of these residents believed that the value of their homes was at least (15%) higher because of the presence of the green spaces. Half of the people who did not have green spaces at the back of their homes said they would prefer to have this kind of communal green area close by, even though that would mean less private open space. Almost all residents valued these public green spaces highly and most used them for recreational activities regardless of whether or not their homes backed on to them (Peiser and Schwann, 1993).

Being close to public space adds economic value, as Small businesses always choosing a new business location rank public space as a number-one priority (The Trust for Public Land, 2001). Lease rates of properties facing Post Office Square in Boston, Massachusetts, command a (10%) premium over those without a park view (Phillips, 2000). In 1980, (16%) of Denver residents said they would pay more to live near a greenbelt or park. By 1990 this figure had risen to (48%) (The Trust for Public Land, 2001). In 1985, Municipal investment in Union Square, New York,

stimulated private housing investment in the area. Restoration of the park helped to stabilize commercial and residential property values adjacent to the park. Apartments with a park view command a higher price than those without (Phillips, 2000). In Berlin in 2000, a study carried out by Luther and Gruehn (2001) showed that, proximity to playgrounds in residential areas was found to increase land values by up to (16%). While, a high number of street trees resulted in an increase of (17%) in land values by helping to increase the value of homes in this way, parks, gardens and other public spaces bring wider benefits in terms of increased taxes paid to government (or, in the US, to the state) when properties are bought and sold, thus creating tax revenue. A good example comes from San Francisco, where proximity to the Golden Gate Park has been known to increase property prices from 500 million \$ to 1 billion \$ thus generating between 5-10 million \$ for the state in annual property taxes (The Value of Parks, 1993).

2.3.5 Impact of parks on physical and mental health

Beneficial health effects of urban green spaces such as improved mental health, reduced cardiovascular morbidity and mortality, obesity and risk of type 2 diabetes, and improved pregnancy outcomes. Mechanisms leading to these health benefits include psychological relaxation and stress alleviation, increased physical activity, and reduced exposure to air pollutants, noise and excess heat (World Health Organisation, 2016). As general, access to public open space and gardens has been associated with better perceived general health (de Vries, 2003 ; Maas, 2006). Researchers explained that children with attention deficits concentrate better after walk in parks. Their findings indicate that environments can enhance attention not only in the general population but also in ADHD (Attention Deficit Hyperactivity Disorder) populations. There for, doses of nature might serve as a safe, inexpensive and widely accessible new tool in managing ADHD symptoms in children (Taylor and Kuo, 2009). Green spaces have great value for children with Attention Deficit Disorder (ADD). When parents of children with ADD were asked to nominate the activities that they had found made their children more manageable, (85%) of green-space activities (such as fishing and soccer) were said to improve the children's behavior (Taylor, *et al.* 2001). In stress rehabilitation through garden therapy: researchers confirm the

garden as a place in the recovery from stress in adults, and it is associated with shortening recovery time that the individual needs after undergoing surgery (Mass, *et al.* 2006). Also, (Grahn, 2003; Nielsen, 2007) revealed that access to public open space, parks and gardens result in reduced stress levels. There is increasing evidence that ‘nature’ in the urban environment is good for both physical and mental health. As natural views of elements such as trees and lakes promote a drop in blood pressure and reduce feelings of stress (Hartig, *et al.* 2003).

Depression is considered as a major health problem among the elderly, decreasing the quality of life and adding to the cost of care. It is noticed that parks visits were associated with enhanced emotional well-being among the elderly in long-term care, and these effects were more pronounced among those who were depressed. It is found that plants in the gardens of facilities were of great importance as emotional regulation was associated with seeing plants (Anna, 2013). This finding is confirmed by (Morita, *et al.* 2007) who revealed that access to parks and gardens, has been associated with reduced depression. Also, (Santana, *et al.* 2009) pointed out that residents of cities with a lot of green areas are healthier and suffer less depression than those who live in environments dominated by asphalt.

Evidence from Japan emphasises that living in areas with walkable green spaces positively influenced the longevity of urban senior citizens independent of their age, sex, marital status, baseline functional status and socioeconomic status (Takano, *et al.* 2002). Access to parks and gardens has been associated with more walking (Li, 2005 ; Giles-Corti, 2005). There is a substantial evidence demonstrating that increased walking improves physical and mental health (Manson, 2002; Fritz, 2006; Murphy, 2002 ; Tsuji, 2003). Further more, it has been proven that walking reduce the risk of a heart attack by (50%) and diabetes by (50%) (Hakim, *et al.* 1999), colon cancer by (30%) (Slattery, *et al.* 1997), and fracture of the femur by up to (40%) (Grisso, *et al.* 1991). If done as part of a group, walking offers social benefits too. Improvement in people’s mental well-being is one of the benefits of a better physical environment. When housing and the surrounding external environment on one typical new-town estate were upgraded in consultation with residents, ‘substantial improvements in the mental health of those residents’ were recorded (Halpern, 1995). Worldwide, mental health is a leading cause of burden of disease (World Health

Organisation, 2003) and one of the beneficial effects of urban green spaces, is the improved mental health (World Health Organisation, 2016). Moreover, physical inactivity is a major public health risk (World Health Organisation, 2002)

and in Australia, nearly half of all Australians do not meet even the 30 minute physical activity recommendations (Armstrong, *et al.* 2000).

2.3.6 Psychological and recreational effects of parks

The role of parks and gardens highlights the spreading of comfort, happiness and peace in the hearts of people, which result in the improvement of people's performance, because the psychological comfort is positively reflected on the physical health, the social relationships and then the production. Studies have proven that a person's production increases if he is in a place with permanent greenery and a beautiful sign, where plants gives a sense of permanent vitality and freshness as a result of reducing the boredom resulting from the sharp and fixed lines of buildings and walls view. (Armstrong, 2000).

Under the UN Convention on the Rights of the Child, children have the right to play, recreation and culture. (Petrie, *et al.* 2000) stated that play is important for children's development, but increasing urbanization has left children with fewer opportunities to play freely outdoors and experience the natural environment. Good-quality public spaces, including well-designed school grounds, can fill this gap, providing children with opportunities for exercise, fun and learning.

In Chicago, children were observed playing in areas surrounding apartment blocks, these play areas were similarly arranged but not all of them had trees and grass. It is found that significantly higher levels of creative play were found in the green spaces than in the barren areas. On the other hand, children playing in the green spaces also had more opportunity to be with adults, which can help in the development of interpersonal skills (Taylor, *et al.* 1998).

Both physical and mental health improvements can be maintained through 'green exercise' which can be defined by: Taking part in physical activities whilst at the same time being directly exposed

to nature. Thus, one can gain substantial public health benefits and reduce healthcare costs (Pretty, *et al.* 2003).

2.4 Previous Studies

Paraskevi, *et al.* (2016) study entitled with a perceptual study of users' expectations of urban green infrastructure in Kalamaria, municipality of Greece, was conducted to evaluate residents' perceptions and preferences concerning the urban green infrastructure of Kalamaria, Greece, to assess their value for residents' well-being and to suggest the possible management improvements. The result showed that the green spaces were insufficient in number and size. Also most respondents were unsatisfied with their distribution, design, planning and management. The equipment and facilities in the green spaces were assessed as rather mediocre. The results revealed that frequent and longer visits of green spaces significantly improved the perceived well-being, and residents can pay (20-40%) more than the average price for a house with a view of a green area.

Shamma, *et al.* (2014) study entitled with assessment the dimensions of service, environment and aesthetics of the public garden at new sham suburb, was conducted to evaluate the service, environment and aesthetics aspects of the public garden at new sham suburb, through the visitors' point of view, by conducting a questionnaire survey. Results revealed that the service dimensions were partially satisfied due to the absence or inadequate of some basic services such as: Unavailability of private parking for the garden, toilets are insufficient in number and unclean and the sources of drinking water and entertainment elements are insufficient. On the other hand, the environmental dimensions, were unsatisfied due to the small area of the garden and the lack of water facilities shaded areas and plant diversity. Additionally, the aesthetical dimensions, were also unsatisfied due to the lack of water facilities, scarcity of floral beds and bad distribution of plants in the garden.

Igbal (2009) study entitled with influence of gardens construction around the public institutions, concluded that the construction of gardens around public or private institutions, plays an

important role in improving the work environment, by providing psychological comfort and happiness which improve the workers performance and increase productivity.

Arpana and Anjana (2014) study entitled with the role of urban green spaces for the sustainable city Jammu (J and K), addressed the role of urban nature for citizens' well being and city sustainability. Results confirm that relaxing and enjoying nature, are the motives most frequently mentioned by the respondents, accounting for the (52%) and (35%) of the answers, respectively.

Ferris, *et al.* (2001) study entitled with people land and sustainability: community gardens and the social dimension of sustainable development, reported the social role of parks and gardens on the sustainable development. The article reports on research and experience from the USA. The findings are discussed at the implementation of Local Agenda 21 and sustainable development policies. When emphasis is given to exploring the social dimension of sustainable development policies by linking of education, health, food security and community development issues with the use of green space in towns and cities. The article concludes that the use of urban open spaces for parks and gardens is closely associated with environmental justice and equity.

Leon and Harvey (2009) study entitled with community in bloom, local participation of community gardens in urban Singapore. The research was intended to study the case of the national park, which is located close to the government complex. The study showed that the location of park has had a negative impact on the local community. But when the park was away from the government complex, the number of park visitors was increased.

Reihaneh S. Hajmirsadeghi (2012) study entitled with the influence of urban parks on sustainable city via increase quality of life, reported that urban parks has a positive impact on the Physical, psychological and mental health, furthermore, they provide social profits as they raise social interaction and integration between neighbors. In addition to the significant environmental services such as air and water cleaning, wind and noise filter, urban parks increase property values and therefore tax revenue. Therefore, urban parks are of a strategic significance for the quality of life of our society and the sustainable city.

Polat *et al.* (2010) study entitled with Kyoto Japanese garden in Konya, Turkey: The design principles of Japanese gardens. This study was intended to determine the factor that influence garden design in Japan. Results revealed that garden design in Japan take into considerations many factors like the religious, social, architectural and historical factors. The study also showed that the arrangement of public utilities inside the park is a very important factor to reach the local community adequacy.

Robert and Wayne (2017) study entitled with use of visual research methods to measure standards of quality for parks and outdoor recreation, reviews and assesses that visual research methods have been adapted and incorporated into measuring standards of quality for parks and outdoor recreation. As they offer advantages over conventional narrative/numerical questions to measure standards of quality. For example, they can help “standardize” such research, offer means of communicating variables that are difficult to describe in narrative/numerical terms, directly focus on the treatment variables under study and can be used to represent conditions that are difficult to find in the field or that do not currently exist. Research suggests that visual research methods may be most appropriate in front country, meet accepted standards of validity, may result in more realistic estimates of visitor standards of quality, and it may be methodologically robust. Social and technological trends suggest that, in the future, the visual research methods may continue to evolve into more dynamic formats offering opportunities for expanded applications.

Holland (2004) study entitled with diversity and connection in community gardens: a contribution to local sustainability. Sustainability requires interaction between the economical, social and environmental dimensions at the national level. In Britain, the community gardens were found in the inner cities, and there is spreading in these gardens to increase the area of the green space in these cities. Designing and construction of the gardens was accomplished by the contribution of the local aspects to achieve the desires of the local residents who use the gardens and help in their development and conservation.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Collection and Inventory of Information

This study was carried out for assessing two Sudanese parks which are: El Hurriya Park in Khartoum State and El Gezira Tourist Park in Gezira State in comparison to Zabeel Park in Dubai Emirate which is used as the standard park. The researcher collected, invented and reported data about the three parks such as: The owner of the parks, establishment years, location of the parks in the cities where they are, the area of the parks, types of the landscaping design, the qualification of the agricultural staff who design and manage the parks and time of visiting the parks.

3.2 Field Visits

Many field visits were conducted to the parks in question, where data, measurements and other observation were collected and photographed. The data collected include plant materials, supporting elements and gardening design. The field visits can be categorized into: (a) Direct field visits were conducted to El Hurriya Park and El Gezira Tourist Park and the required information were reported. (b) Indirect field visits were conducted to Zabeel Park, which is achieved by using internet information, emailing the park administration and by published and unpublished park reports due to (COVID19) outbreak the researcher could not make direct visits to Zabeel Park in Dubai city.

3.2.1 Plant materials in the study parks

Many direct field visits were carried out to study the plants in El Hurriya Park and El Gezira Tourist Park to identify the most important plant species scattered in the parks and their density. The available plants were: Identified and inventoried to groups of ornamental plants as: ornamental trees (including: shade, flowering and palms trees), shrubs, herbs (bulbs, climbers, creepers and succulents) and lawns. Then the plants were classified to their species and families and counted

in number. Additionally, the distribution of the plants in the park and the method of using these plants in designing the parks were studied. On the other hand, the respondents who answered the survey questionnaire reported information about the park plants by answering questions on the following subjects: (a) Types of ornamental plants and its species diversity. (b) Fences and hedges and the level of maintenance in clipping and greenery. (c) Abundance of dense shady trees. (d) Lawn fields and its area, greenness and types that tolerate children play. (e) Parks designing. All the respondents' answers were inventoried and recorded.

3.2.2 Supporting elements in the study parks

Supporting elements refer to architectural elements, public services and entertainment facilities which include recreational, cultural and sport facilities. The researcher carried several direct field visits where the types and numbers of the supporting elements were inventoried and reported. All the information reported by the respondents' questionnaire about the supporting elements, were also recorded. The architectural elements in the study parks like Sheddars, seating and fountains have been inventoried and reported. Public facilities present in the three parks like entrances, ticket windows, extension board, waste baskets, lights, women and men bathrooms, mosque for men and women, restaurant and cafeterias, events and weddings halls, internal radio, medical unit, commercial sites, administration site, security office, parking lots, irrigation network and electricity network have been recorded. Sport facilities which include jogging tracks, tennis playgrounds, khumasiat playground, skateboarding park, ice skating, golfing area, mini cricket pitch, fitness center and gymnasium. On the other hand, the recreational and cultural facilities include 3-D cinema, boating lake, restaurants, various monuments, exhibition hall, barbecue areas, children's play areas, electric playgrounds, stalls for various activities and access to Wi-Fi internet service have been identified and reported.

3.2.3 Designing and arrangement of the study parks

It includes measurements and distribution of territories (Location of buildings, squares, green hedges ...etc) and determining the type of landscape style.

3.3 Questionnaire Survey

The questionnaire form (refer to appendix A and appendix B), is a major and important Instrument used to collect data related to the study problem from the research sample. It can be defined as a form that includes a set of questions which directed individuals to the topic or the problem.

3.3.1 Preparation and distribution of sample questionnaire

This questionnaire was designed to obtain statistically valid results from respondents about the followings: Citizens visiting and exploiting parks and their evaluation of the park current situation, the service dimensions of the park and the environmental, social and aesthetic impacts of the park on the local community through out the selected parks. Many parks managers are adept at using public meetings and formal hearings to get input from the community, but collecting information systematically from and about park users can provide more solid facts about the park visitors how are they using park spaces and facilities, why some areas are underused and what people value most in a park.

3.3.2 Types of the study sample

The study samples comprise sample of parks and sample of park respondents.

3.3.2.1 Sample of parks

Conditions and criteria used for selecting the parks were as follows:

- (1) The park must be a public park, which is a green space separated from the surrounding area by a hedge or fence and has opening and closing hours.
- (2) It is not closed and under the service of users.
- (3) It should be used for servicing for all citizen and not intended for a specific neighborhood or intended group of people.
- (4) It should be located in a place of activity and movement, in vital area of town center.
- (5) It should have a history in the city to facilitate focusing on it and comparing its use at different times.

- (6) After listing the parks in Khartoum and Gezira states according to the above mentioned requirements, it is found that both parks were quite suitable for the study.

3.3.2.2 Sample of parks respondents

Conditions and criteria used for selecting the respondent samples were as follows:

- (1) Respondents should be in their full mental strength and they are at least 18 years old.
- (2) The sample applied to persons their presence in the garden is not related to a business or commercial purpose (intention sample).
- (3) They were randomly selected among the visitors.

3.3.2.3 Determination of the user's sample size

To determine the research sample size, the total number of visitors in July 2019 (the month before conducting the questionnaire), was counted then the mean was calculated by dividing the total number of visitors in the month over the number of days of the month. The mean of visitors is 500 visitor. Then a sample of 20% of the study society was chosen as follows: $500 * 20/100 = 100$ user.

3.3.3 Type of the survey questions

The survey form has been formulated by closed-Ended Questions. Which are either yes/no questions or questions with a specific set of possible answers. Closed-ended questions simplify analysis because respondents can only choose from a predefined set of possible answers, making their responses easy to summarize and compare.

3.3.4 Survey instrument

Questionnaire form has been designed according to the research objectives in (4) parts collectively contains (36) questions distributed as follows:

3.3.4.1 Part one: Respondents demographics

The survey questions began with general demographic information, including (14) questions related to the parks respondents, which are gender, age, educational level, occupation, monthly income, place of birth, marital status, number of people in household and total monthly household income, in addition to, where do respondents actually live, how far is their homes from the parks and if there is a public gardens in their neighborhoods. Other questions were addressed for those who are not from the cities where the parks are located, if they are from the states, and if not, what are the reasons why they are in the park's states.

3.3.4.2 Part two: Citizens visiting and exploiting the parks and their evaluation of the park's current situation

The second portion of the survey directly addressed the respondents visiting to the parks and how and why they are using it. In addition to, respondents' evaluation of the current situation of the parks. The part containing (11) questions.

3.3.4.3 Part three: Assessment of the services dimensions of the parks' designs and their impacts on the local community

This part containing (1) question with (23) branches, related to the evaluation of the different services offered to the park users.

3.3.4.4 Part four: Assessment of the environmental, social and aesthetic effects of the parks' designs on the local community

The fourth portion of the survey containing (10) questions, was related to the respondents' evaluation of the environmental, social and aesthetic effects of the parks' design and their impacts on the local community.

3.3.5 Conduction of the questionnaire

The assessment survey was conducted during August and September of 2019 to a random sample of 200 households at the park sites. Respondents were randomly selected among the visitors of the park, regardless of their social extraction or professional background. People approached in the park, were first informed about survey's objective and answering procedure. Those willing to participate were given the questionnaire and invited to fill it in during their stay at the area, so that the answers would reflect their immediate experiences. The difficult questions were explained by the researcher till they finish answering then the researcher collected the questionnaire forms and reviewed it to make sure that all questions were answered. Questionnaires have been distributed on both weekdays and weekends, as well as at varying times of the day in different hours of the day, and in different parts of the parks, in an effort to capture a representative sample of respondents. All the questionnaire forms have been distributed to the respondents (in the study parks) by the researcher himself.

3.3.6 Method of analyzing the questionnaire

Researcher collected 200 questionnaire form for both, El Hurriya Park and El Gezira Tourist Park and fed the data in the computer, then the questionnaire data was analyzed according to SPSS programmer and the closed questions have been subjected to basic descriptive statistics.

CHAPTER FOUR

RESULTS

4.1 Collection and inventory of information

Information collected and invented by researcher are shown in (Table 4.1).

El Hurriya Park is owned by Government present ship, El Gezira Tourist Park is owned by the Ethar Charity and Zabeel Park is owned by Dubai Municipality.

Zabeel Park was established in (2005), about, 7 years before El Hurriya Park (2012) and 4 years before El Gezira Tourist Park (2009).

All of, El Hurriya Park, El Gezira Tourist Park and Zabeel Park are located inside cities.

The area of Zabeel Park (47 hec.) is approximately 2 times more than El Hurriya Park (25 hec.) and approximately eleven times more than El Gezira Tourist park (4.16 hec.).

In El Hurriya Park and El Gezira Tourist Park, the landscape design is formal design, while it is natural design in Zabeel Park.

In El Hurriya Park and Zabeel Park the agricultural staff is a qualified agricultural staff where it is only gardeners in El Gezira Tourist Park.

Time of visiting El Hurriya Park is from 5:00 p.m. to 12:00 p.m. all week days. (from 5:00 a.m. to 10:00 a.m. from Saturday to Thursday for Walking and other sport activities). Time of visiting El Gezira Tourist Park is from 9:00 am to 12:00 pm all the week days. While Zabeel Park opens as follows: From Sunday to Wednesday: from 8:00 a.m. to 10:00 p.m. While Thursdays, Fridays, Saturdays and public holidays: from 8:00 a.m. to 11:00 p.m. during the Holy month of Ramadan: from noon to 11:00 p.m.

Table 4.1: Information about the study parks and the standard park

General Information	The study parks		
	El Hurriya Park	El Gezira Tourist park	Zabeel Park
The owner of the park	Government present ship	Ethar Charity	Dubai Municipality
Establishment year	April 2012	September 2009	December 2005
Location of the park	Inside the city	Inside the city	Inside the city
The area of the park	250,000 m ² (25 hec.)	41,552 m ² (4.16 hec.)	470,000 m ² (47 hec.)
Type of the garden design	Fomral design	Fomral design	Natural design
The agricultural staff	Qualified agricultural staff	Only gardeners	Qualified agricultural staff
Time of visiting the park	Only at nigh	At day and night	At day and night

Source: Data collected by researcher 2020

4.2 Field visits

4.2.1 Plant materials present in the study parks and the standard Park

4.2.1.1 Plant materials present in El Hurriya Park

4.2.1.1.1 Tree Plants present in El Hurriya Park

The field visits to El Hurriya Park showed that the park contains (10) tree species belong to (5) plant families which are: Palmaceae, Mimosaceae, Meliaceae, Myrtaceae and Annonaceae. Then the tree plants were identified to their species which are: *Phoenix dactylifera*, *Albizia lebbek*, *Azadirachta indica*, *Conocarpus lancifolius*, *Roystonea regia*, *Peltophorum pterocarpum*, *Polyalthia longifolia*, *Psidium guajava*, *Washingtonia filifera* and *Sabala palmetto*. The total number of trees in the park is (132) trees (Table 4.2).

Table 4.2: Scientific names of the trees present in El Hurriya Park, their family names, their numbers and their usage in the park

Plant type	Scientific Name of the trees	Family Names	No.of trees	Trees usage
Trees	<i>Phoenix dactylifera</i>	Palmaceae	80	In line
	<i>Albizzia lebbek</i>	Mimosaceae	18	Single
	<i>Azadirachta indica</i>	Meliaceae	13	Single
	<i>Conocarpus lancifolius</i>	Myrtaceae	6	In line
	<i>Roystonea regia</i>	Palmaceae	5	In line
	<i>Peltophorum pterocarpum</i>	Annonaceae	4	Single
	<i>Polyalthia longifolia</i>	Annonaceae	3	In line
	<i>Psidium guajava</i>	Myrtaceae	1	Single
	<i>Washingtonia filifera</i>	Palmaceae	1	Single
	<i>Sabala palmeto</i>	Palmaceae	1	Single

Source: results obtained from researcher field visits 2020

4.2.1.1.2 Shrub plants present in El Hurriya Park

In classifying shrub plants results outlined that: El Hurriya Park contains (10) shrub species grown in the park which are: *Bougainvillea spp.*, *Ixora coccinea*, *Duranta plumieri*, *Jasminum sambac*, *Rosa spp.*, *Gardenia spp.*, *Plumeria alba*, *Hibiscus spp.*, *Lagerstromi indica* and *Cycus revolute*. Belonging to the following (9) families: Nyctaginaceae, Rubiaceae, Verbenaceae, Oleaceae, Rosaceae, Apocynaceae, Malvaceae, Lythraceae and Cycadaceae. Lawn plants: *Eremochola ophiuroides* (Centipede grass) family Poaceae. There is no presence of Annual plants or Ground covers (Table 4.3).

Table 4.3: Scientific names of the shrub plants present in El Hurriya Park, their family names and their usage in the park

Plant type	Scientific Name of the plants	Family Names	plants usage
Shrubs	<i>Bougainvillea spp.</i>	Nyctaginaceae	Hedge and pots
	<i>Ixora coccinea</i>	Rubiaceae	Hedge and pots
	<i>Duranta plumieri</i>	Verbenaceae	Hedge and pots
	<i>Jasminum sambac</i>	Oleaceae	In pots and single
	<i>Rosa spp.</i>	Rosaceae	In pots
	<i>Gardenia spp.</i>	Rubiaceae	In pots
	<i>Plumeria alba</i>	Apocynaceae	Single
	<i>Hibiscus spp.</i>	Malvaceae	In bed
	<i>Lagerstromi indica</i>	Lythraceae	In pots
	<i>Cycus revoluta</i>	Cycadaceae	In pots
Lawns	<i>Eremochola ophiuroides</i>	Poaceae	Lawns

Source: results obtained from researcher field visits 2020

4.2.1.2 Plant materials present in El Gezira Tourist Park

4.2.1.2.1 Tree plants present in El Gezira Tourist Park

The researcher field surveys to El Gezira Tourist Park resulted in the following findings about the tree plants: The park contains (12) tree species belonging to (7) plant families which are: Moraceae, Annonaceae, Myrtaceae, Malvaceae, Palmaceae, Mimosaceae and Meliaceae. Then the tree plants were identified to their species which are: *Ficus benjamina*, *Polyalthia longifolia*, *Peltophorum pterocarpum*, *Conocarpus lancifolius*, *Ceiba pentandra*, *Psidium guajava*, *Roystonea region*, *Albizia lebbek*, *Eucalyptus spp.*, *Azadirachta indica*, *Khaya senegalensis* and *Phoenix dactylifera*. The total number of trees in the park is (100) tree (Table 4.4).

Table 4.4: Scientific names of the trees present in El Gezira Tourist Park, their family names, their numbers and their usage in the park

Plant type	Scientific Name of the trees	Family Names	No.of trees	Trees usage
Trees	<i>Ficus benjamina</i>	Moraceae	36	In one line
	<i>Polyalthia longifolia</i>	Annonaceae	26	In groups
	<i>Peltophorum pterocarpum</i>	Annonaceae	10	In corners
	<i>Conocarpus lancifolius</i>	Myrtaceae	4	In groups
	<i>Ceiba pentandra</i>	Malvaceae	5	Single
	<i>Psidium guajava</i>	Myrtaceae	4	Single
	<i>Roystonea regia</i>	Palmaceae	5	Single
	<i>Albizia lebbek</i>	Mimosaceae	1	Single
	<i>Eucalyptus spp.</i>	Myrtaceae	1	Single
	<i>Azadirachta indica</i>	Meliaceae	2	Single
	<i>Khaya senegalensis</i>	Meliaceae	3	In one line
	<i>Phoenix dactylifera</i>	Palmaceae	3	Single

Source: results obtained from researcher field visits 2020

4.2.1.2.2 Shrub plants present in El Gezira Tourist Park

When classifying shrub plants results revealed that El Gezira Tourist Park contains (10) shrub plants belonging to (9) plant families which are: Moraceae, Rosaceae, Verbenaceae, Myrtaceae, Sapindaceae, Oleaceae, Apocynaceae, Malvaceae and Rubiaceae. Specifically the shrub plants were identified to their species which are: *Ficus benjamina*, *Rose spp.*, *Duranta plumieri*, *Conocarpus lancifolius*, *Deodonia viscosa*, *Jasminum sambac*, *Jasminum nitidum*, *Plumeria alba*, *Hibiscus spp.* and *Ixora coccinea*. Additionally, there is (6) ornamental shade plants present in El Gezira Tourist Park belong to the following (5) families: Pandanaceae, Araliaceae, Commelinaceae, Acanthaceae and Labiatae. Then the shade plants were identified to their species which were invented as follows: *Pandanus veitchii*, *Polyscias spp.*, *Zebrina pendula*, *Graptophyllum pictum*, *Coleus plumei* and *Setcreasea purpurea*. On the other hand (2) Cacti and Succulent plants belonging to the families Amaryllidaceae and Euphorbiaceae were found. The

plants are: *Agave americana* and *Euphorbia spp.*. Moreover, the (2) plants *Altheranthera amabilis* and *Altheranthera parronychioides* that belong to the family Amarantaceae were used as lining plants in writing at the entrance of the park. Finally, Centepeda grass *Eremochola ophiuroides* that belong to the family Poaceae is grown in the lawn fields. There is no presence of annual plants in the park (Table 4.5).

Table 4.5: Scientific names of the shrub plants present in El Gezira Tourist Park, their family names and their usage in the park

Plant type	Scientific Name of the plants	Family Names	plants usage
Shrubs	<i>Ficus benjamina</i>	Moraceae	In line
	<i>Rosa spp.</i>	Rosaceae	In group
	<i>Duranta plumieri</i>	Verbenaceae	Hedge and Lining
	<i>Conocarpus lancifolius</i>	Myrtaceae	Hedge and fence
	<i>Deodonia viscosa</i>	Sapindaceae	Hedge
	<i>Jasminum sambac</i>	Oleaceae	In groups
	<i>Jasminum nitidum</i>	Oleaceae	In groups
	<i>Plumeria alba</i>	Apocynaceae	Single
	<i>Hibiscus spp</i>	Malvaceae	In line
	<i>Ixora coccinea</i>	Rubiaceae	Hedge and circle
Shade Plants	<i>Pandanus veitchii</i>	Pandanaceae	In pots
	<i>Polyscias spp.</i>	Araliaceae	In pots
	<i>Zebrina pendula</i>	Commelinaceae	In pots
	<i>Graptophyllum pictum</i>	Acanthaceae	In pots
	<i>Coleus plumei</i>	Labiatae	In borders
	<i>Setcreasea purpurea</i>	Commelinaceae	Lining plant
Herbs	<i>Altheranthera amabilis</i>	Amarantaceae	Lining plant
	<i>Altheranthera parronychioides</i>	Amarantaceae	Lining plant
Succulents and Cacti	<i>Agave americana</i>	Amaryllidaceae	Single
	<i>Euphorbia spp.</i>	Euphorbiaceae	In line
Lwans	<i>Eremochola ophiuroides</i>	Poaceae	Lawns

Source: results obtained from researcher field visits 2020

4.2.1.3 Plant materials present in Zabeel Park

As shown in (Table 4.6) below, Zabeel Park contains (3,946) tree, from this very large number: (1,031) tree is classified as date palm trees, (748) as ornamental palm trees and the rest are different ornamental trees. Moreover, there is (26,567) shrub plant in the park. In addition to (969) plant identified as bulbs and cacti plants. The length of the park fences reached 500 m. On the other hand, the area of the flower beds and the ground covers occupied for (12,748) m² and (19,887) m², respectively. While the lawn fields cover an area of (233,169) m².

Table 4.6: Density of plant species present in Zabeel Park

Plant groups	Density of plants
No of trees	3,946
No of date palm trees	1,031
No of ornamental palm trees	748
No of shrubs	26,567
No of Bulbs and Cacti	969
Fences length in (m)	500
Flower beds area in (m ²)	12,748
Ground covers area in (m ²)	19,887
Lawn fields area in (m ²)	233,169
Total planted area in (hec)	46.03

4.2.2 Supporting elements in the study parks and the standard park

4.2.2.1 The architectural elements and the services in the study parks and the standard park

The field visits showed the following results: In both El Hurriya Park and El Gezira Tourist Park, the external fences are made of wire and trees, while the external fence in Zabeel Park is designed with advertising spaces to advertise the park's activities on different occasions and for sponsors participating in the events. In El Hurriya Park there are (4) entrances and El Gezira Tourist park have (3) entrances. On the other hand, in Zabeel Park there are (7) entrances serving the three

sections of the park and equipped with light electronic maps, security monitoring devices and collectors' rooms. They are close to toilets, control rooms and first aid rooms.

Extension boards were found in the study parks and in the standard park.

In El Hurriya Park there are external and internal car parking, in El Gezira Tourist Park there is no car parking. While in Zabeel Park parking is free of charge, the parking capacity can accommodate 2,322 vehicles and there is a special free parking for people of determination.

Shedders, seats and waste baskets were found in the study parks and in the standard park.

The mosque in El Hurriya Park is divided into two sections, one for men and the other for women. But in Gezira Tourist Park visitors make prayers in small rooms and there no mosque. On the other hand, in Zabeel Park there are qualified prayer places for both sexes.

In El Hurriya Park there is one big central fountain, while in Gezira Tourist Park there is a small one. On the other hand, in Zabeel Park there are more than (5) amazing fountain and other water elements.

In El Hurriya Park there (9) cafeterias and (2) restaurants. El Gezira Tourist Park contain (6) cafeterias and (8) booths for various activities. In Zabeel Park there are: Many restaurants and (5) refreshment booths which provides cold drinks, and fast and cold lunch.

In Zabeel Park there are (40) barbecue areas with Family privacy and services such as seats, umbrellas, waste baskets and round tables. While, in both El Hurriya Park and El Gezira Tourist Park these Places were absent.

In El Hurriya Park and El Gezira Tourist Park there are many bathrooms for men and for women. While in In Zabeel Park there are (19) bathroom complexes, for both sexes, equipped with the latest equipment and accessories, and are ready to receive people with special needs.

Eacl one of the three park was prepared with medicinal unit and internal radio.

An electronic and paper library for visitors is found in both El Hurriya Park and Zabeel Park, but not found in El Gezira Tourist.

Zabeel Park provide (WiFi) service communication for free covering 100 m². This service is missed in both El Hurriya Park and Gezira Tourist Park.

Restrooms services is not found either, in El Hurriya Park or, El Gezira Tourist Park, but it is found in Zabeel Park.

In Zabeel Park there is (2) suspended bridges linking the park's three sections and passing over a main road outside the park. Also (2) trains to facilitate the visitors inside the park. But these services were not found in either, El Hurriya Park or, El Gezira Tourist Park.

Zabeel Park offers many facilities and services for people with determination including free entrance to the park, free wheelchairs which are available at the main gates, special and free parking lots, smoothness of the corridors, private restrooms, special toilets and special games. But these facilities were not found in either, El Hurriya Park or, El Gezira Tourist Park.

The irrigation and the electricity networks, and the Administration site were found in the three parks.

There are commercial sites only in El Gezira Tourist Park, while they are missed in El Hurriya Park and Zabeel Park. On the other hand, there is a platform only in El Hurriya Park, while it is missed in El Gezira Tourist and Zabeel Parks (Table 4.7).

Table 4.7: Architectural elements and the services present in the study parks and the standard park

Architectural elements and park facilities	El Hurriya Park	El Gezira Tourist Park	Zabeel park
Irrigation network	Found	Found	Found
Electricity network	Found	Found	Found
Fences and Entrances	Found	Found	Found
Extension boards	Found	Found	Found
Shedders	Found	Found	Found
Seats	Found	Found	Found
Waste baskets	Found	Found	Found
Water elements	Found	Found	Found
Restaurants and Cafeterias	Found	Found	Found
Men bathroom	Found	Found	Found
Women bathroom	Found	Found	Found
Mosque for men	Found	Found	Found
Mosque for women	Found	Found	Found
Stalls for various activities	Found	Found	Found
Internal radio	Found	Found	Found
Medical unit	Found	Found	Found
Events and weddings Hall	Found	Found	Found
Administration site	Found	Found	Found
Parking lots	Found	Not found	Found
Electronic and paper library	Found	Not found	Found
Barbequing places	Not found	Not found	Found
Restrooms	Not found	Not found	Found
Suspended bridges and trains	Not found	Not found	Found
Facilities for people of determination	Not found	Not found	Found
(WiFi) service communication	Not found	Not found	Found
Commercial sites	Not found	Found	Not found
platform	Found	Not found	Not found

4.2.2.2 The Recreational, cultural and sport facilities in the study parks and the standard park

The field visits showed that the following facilities gymnasium, 3-D cinema, electric playgrounds, electronic games hall and theater were found in all of El Hurriya Park, El Gezira Tourist Park and Zabeel Park.

The facilities Jogging track, large screens, skateboarding and Exhibition hall are found in both El Hurriya Park and Zabeel Park, but they are absent in El Gezira Tourist Park. On the other hand, bicycles rent service is found in El Gezira Tourist Park and Zabeel Park, but absent in El Hurriya Park

Results confirmed that facilities that are not found in both El Hurriya Park and El Gezira Tourist Park and they are found in Zabeel Park include cricket field, ice skating, golfing area, boats rent service, fitness center, sister city models, various monuments, Dubai frame and the cleaver palm. On the other hand, facilities that are found in both El Hurriya Park and El Gezira Tourist Park and they are not found in Zabeel Park include tennis field, Billiards hall and Khumasiat playgrounds.

The Facilities that are found only in El Hurriya Park and absent both El Gezira Tourist Park and Zabeel Park include volleyball field, basketball field, karate, taekwondo, ski and equestrian arena. (Table 4.8).

Table 4.8: Recreational, cultural and sport facilities in the study parks and the standard park

Sport and Recreational facilities	The study parks		
	El Hurriya Park	El Gezira Tourist Park	Zabeel Park
Gymnasium	Found	Found	Found
3-D Cinema	Found	Found	Found
Electric playgrounds	Found	Found	Found
Electronic games hall	Found	Found	Found
Theater	Found	Found	Found
Volleyball field	Found	Not found	Not found
Basketball field	Found	Not found	Not found
Karate	Found	Not found	Not found
Taekwondo	Found	Not found	Not found
Ski	Found	Not found	Not found
Equestrian arena	Found	Not found	Not found
Tennis field	Found	Found	Not found
Billiards hall	Found	Found	Not found
Khumasiat playgrounds	Found	Found	Not found
Jogging track (Walking)	Found	Not found	Found
Large screens	Found	Not found	Found
Skateboarding park	Found	Not found	Found
Exhibition hall	Found	Not found	Found
Bicycles rent service	Not found	Found	Found
Cricket field	Not found	Not found	Found
Ice skating	Not found	Not found	Found
Golfing area	Not found	Not found	Found
Boats rent service	Not found	Not found	Found
Fitness center	Not found	Not found	Found
Sister city models	Not found	Not found	Found
SVarious monuments	Not found	Not found	Found
Dubai frame	Not found	Not found	Found
The clever palm	Not found	Not found	Found

Source: results obtained from researcher field visits 2020

4.2.3 Designing and arrangement of the study parks and the standard park

4.2.3.1 Designing and arrangement of El Hurriya Park

The lawns and the pathways area is (149904) m² equivalent to (60%) of the total park area, in addition to the police show street with an area of (19802) m² equivalent to (8%) of the total park area. The park has external parking with an area of (31160) m² equivalent to (12.4%) of the total park area, and internal parking with an area of (12370) m² equivalent to (5%) of the total park area. The park is characterized by the walking track with an area of (16625) m² equivalent to (6.6%) of the total park area, and the main plate form with an area of (3050) m² equivalent to (1.20%) of the total park area.

4.2.3.2 Designing and arrangement of El Gezira Tourist Park

The park is planted with (9) lawns fields with an area of (17060) m² equivalent to (41.06%) of the total park area. The trees, shrubs, herbs, succulents and cacti were planted in the margins and corners of the lawn fields. The total planted area in the park is (17605) m² equivalent to (42.37%) of the total park area. The roads and paths of the park extend in an area of (4124.48) m² equivalent to (9.93%) of the total park area. El Ghabba cafee have an area of (1728) m² equivalent to (4.16%) of the total park area. On the other hand, the services buildings (management offices, bathrooms and the mousque) extend to an area of (972.103) m² equivalent to (2.34%) of the total park area. While, playing sport hall and the Khumsyat field have an area of (1470) m² equivalent to (3.54%) of the total park area. Additionally, the investment buildings (super markets and ceremony) extend to an area of (3121.43) m² equivalent to (7.51%) of the total park area. The rest of the park area is for the different play ground structures.

4.2.3.3 Designing and arrangement of Zabeel Park

The planted area in the park is (46.03) hec. equivalent to (97.9%) of the total park area, which is planted by trees (date palm trees, ornamental palm trees and other trees), shrubs, bulbs and cacti. The park is planted with lawn fields with an area of (233169) m² equivalent to (49.6%) of the total park area, ground covers with an area of (19887) m² equivalent to (4.2%) of the total park area, and flower beds with an area of (12748) m² equivalent to (2.7%) of the total park area. The park is surrounded by a fence of (500) m.

4.3 The Questionnaire Results

4.3.1 El Hurriya Park questionnaire results

4.3.1.1 Part one: The demographics of respondents results

4.3.1.1.1 Gender of El Hurriya Park respondents

Two thirds of the respondents' sample (66%) is made up of males and one third (34%) is females (Fig. 4.1).

4.3.1.1.2 Age of El Hurriya Park respondents

The questionnaire provided 7 different age categories placing the median age in the 45-54 age group. The result showed that the highest percentage of respondents (73%) in the age category 18-24 years, and that (91%) of respondents identified themselves as being less than 35 years old. Only (3%) of respondents in each of (35-44 and 55-64) age ranges and (2%) of respondents in the age group of 45-54. The lowest percentage (1%) in age category 65-74 years, while the representation of respondents in the age categories over 75 is nil (Fig. 4.2).

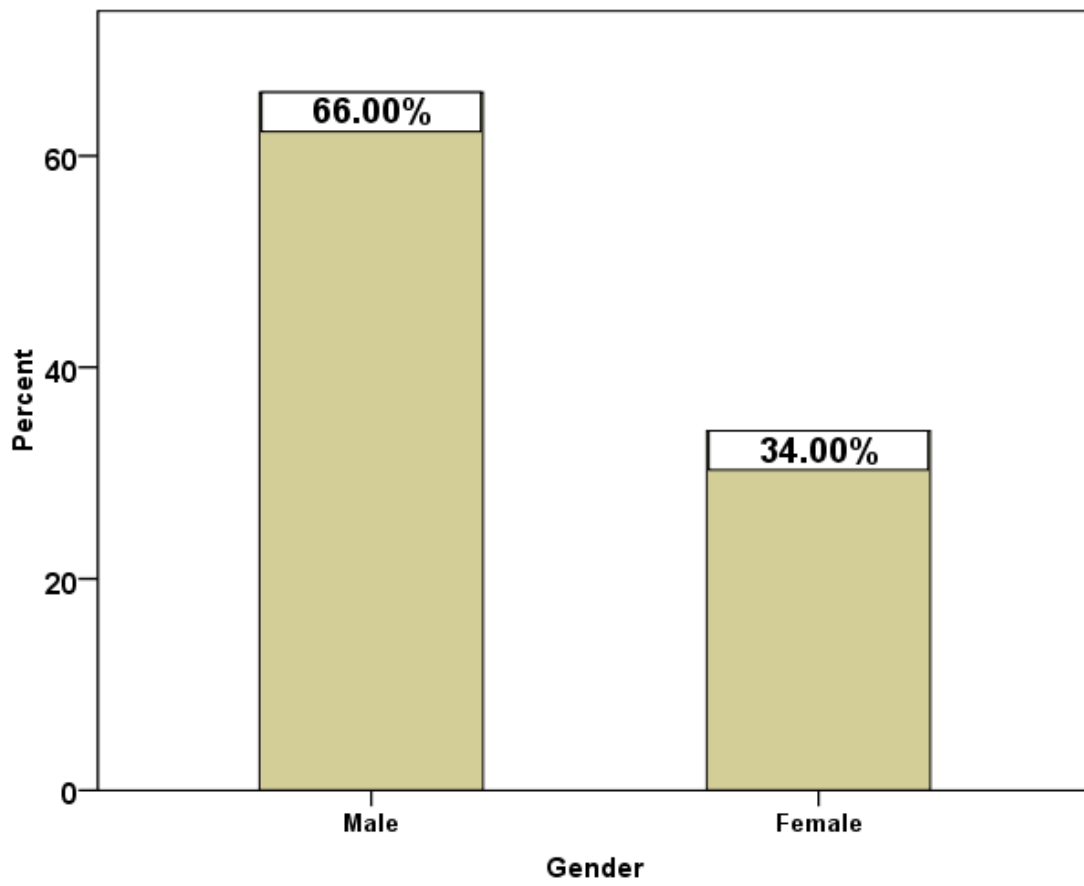


Fig. 4.1: Gender of El Hurriya Park respondents

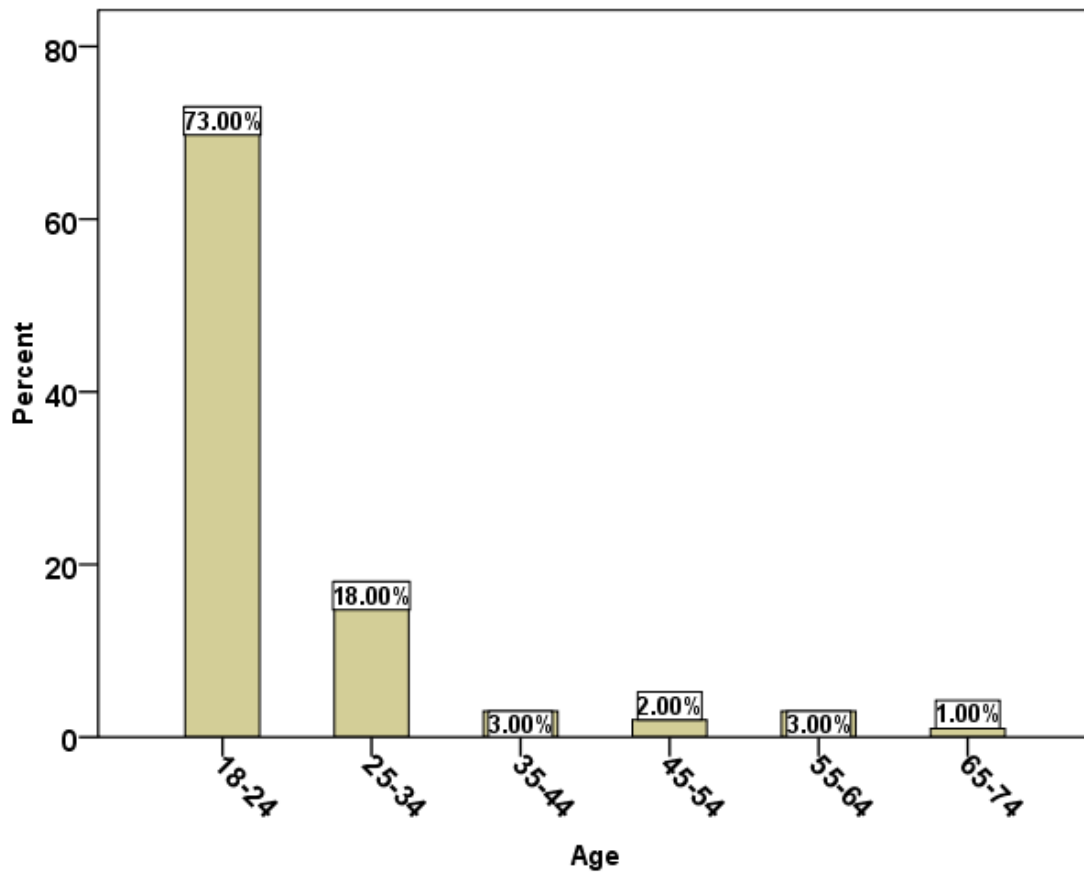


Fig. 4.2: Age of El Hurriya Park respondents

4.3.1.1.3 Educational level of El Hurriya Park respondents

Results indicate that (83%) of respondents were university educated (72% have university education and 11% have higher education), while (14%) of respondents have secondary education. Low ratio of respondents was either can read and write (2%) or have preliminary education (1%). On the other hand, there is no representation to the illiterate or khallwa education (Fig. 4.3).

4.3.1.1.4 Occupation of El Hurriya Park respondents

Analysis of the survey data indicate that about two thirds of respondents (66%) were students. Freelance respondents registered the second ratio (16%) followed by: Government employee (10%), Unemployed (4), Labor (3%) and Special sector employee (1%) follow in decreasing frequency (Fig. 4.4).

4.3.1.1.5 Monthly income of El Hurriya Park respondents

Results showed that the highest percentage of respondents (53%) in monthly income category (none), followed by (18%) and (13%) of respondents which have monthly income 1000-5000 S.P and less than 1000 S.P (respectively). Furthermore, the lowest representative groups (8%) and (8%) of respondents have either, monthly income of 5001-10000 or, more than 10000 S.P. (Fig. 4.5).

4.3.1.1.6 Place of birth of El Hurriya Park respondents

Result indicates that the majority of respondents (81%) were born in urban areas, while the rest (19%) were born in rural areas. This reflects the importance of recreational parks in urban life (Fig. 4.6).

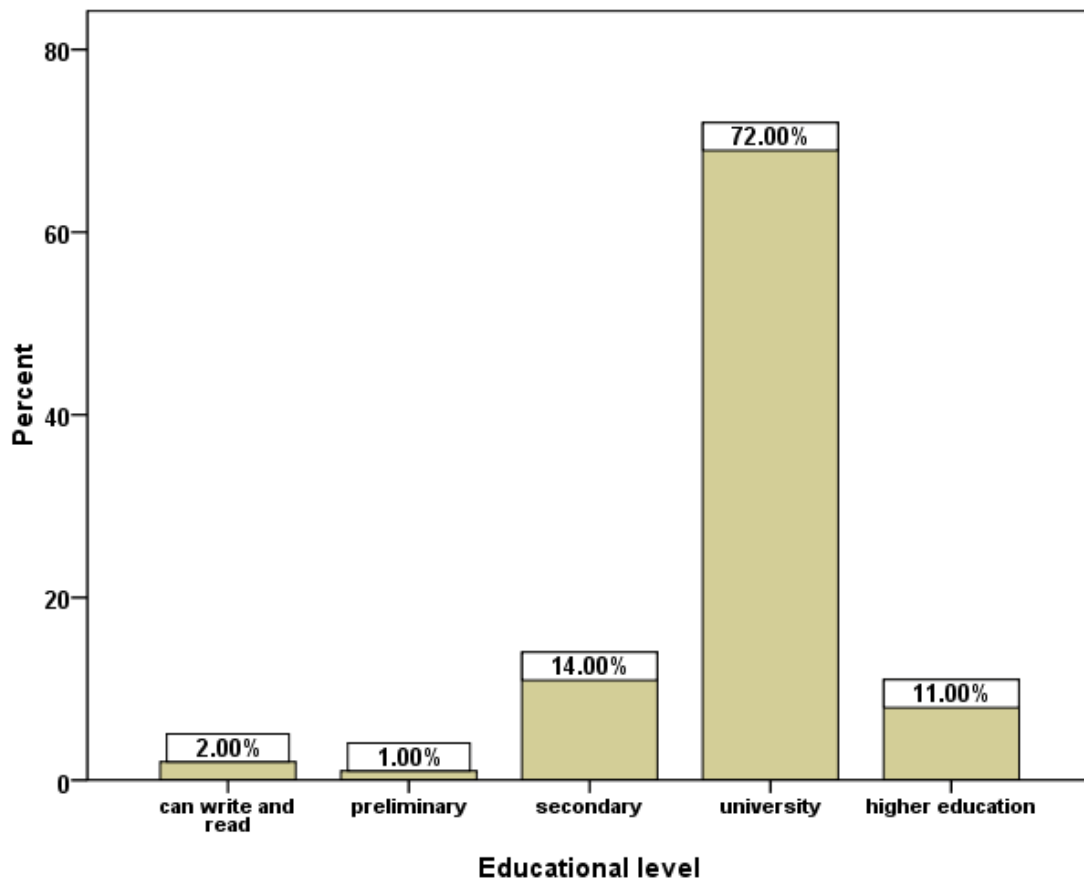


Fig. 4.3: Educational level of El Hurriya Park respondents

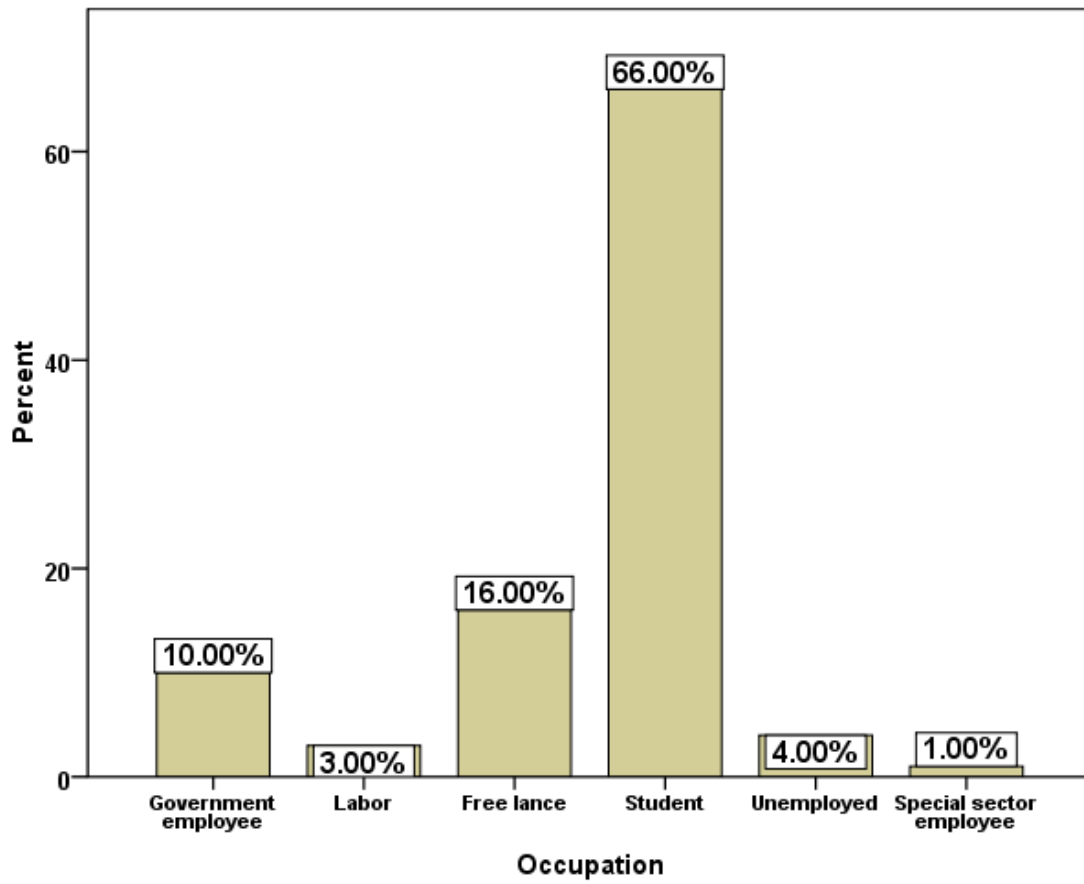


Fig. 4.4: Occupation of El Hurriya Park respondents

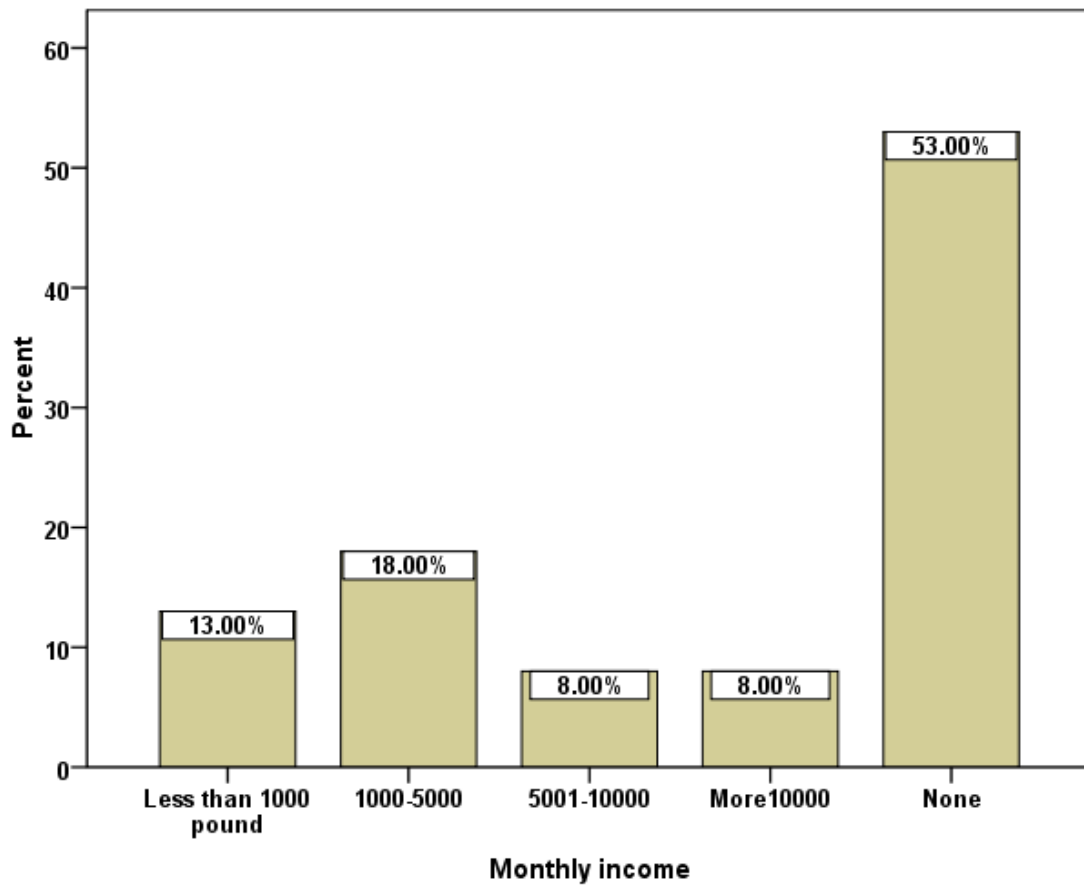


Fig. 4.5: Monthly income of El Hurriya Park respondents



Fig. 4.6: Place of birth of El Hurriya Park respondents

4.3.1.1.7 Marital status of El Hurriya Park respondents

In evaluating the marital status of the park respondents, the results showed that the bulk of respondents (84%) were bachelor while the rest (16%) were married respondents (Fig. 4.7).

4.3.1.1.8 Number of people in the household of El Hurriya Park respondents

About half of respondents (46%) have household composed of (3-6) people. While (32%) have household composed of (7-10) people. On the other hand, (11%) of respondents have household composed of (less than 3) people and the same ratio (11%) have household composed of (over 10) people (Fig. 4.8).

4.3.1.1.9 Total monthly household income of El Hurriya Park respondents

It is show that (38%) of respondents have total monthly household income of (2000-10000) S.P and (30%) of respondents have total monthly household income of (more than 20000) S.P. Furthermore, (13%) of respondents have total monthly household income of (10001-20000) S.P and (8%) of them have total monthly household income of (less than 2000) S.P. Beside (7%) of respondents do not know the total monthly household income and (4%) of them haven't total monthly household income (Fig. 4.9).

4.3.1.1.10 Are El Hurriya Park respondents living in Khartoum city?

(85%) of respondents are from Khartoum city, while (15%) are not (Fig. 4.10).

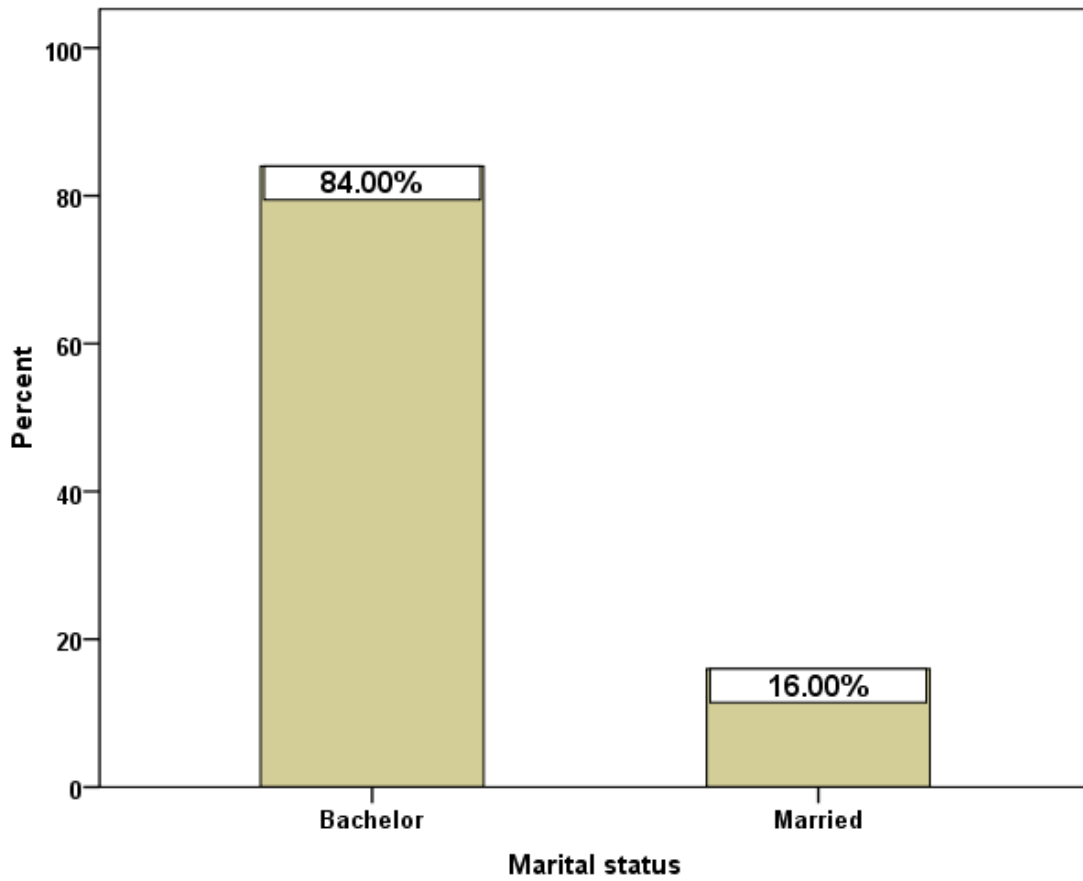


Fig. 4.7: Marital status of El Hurriya Park respondents

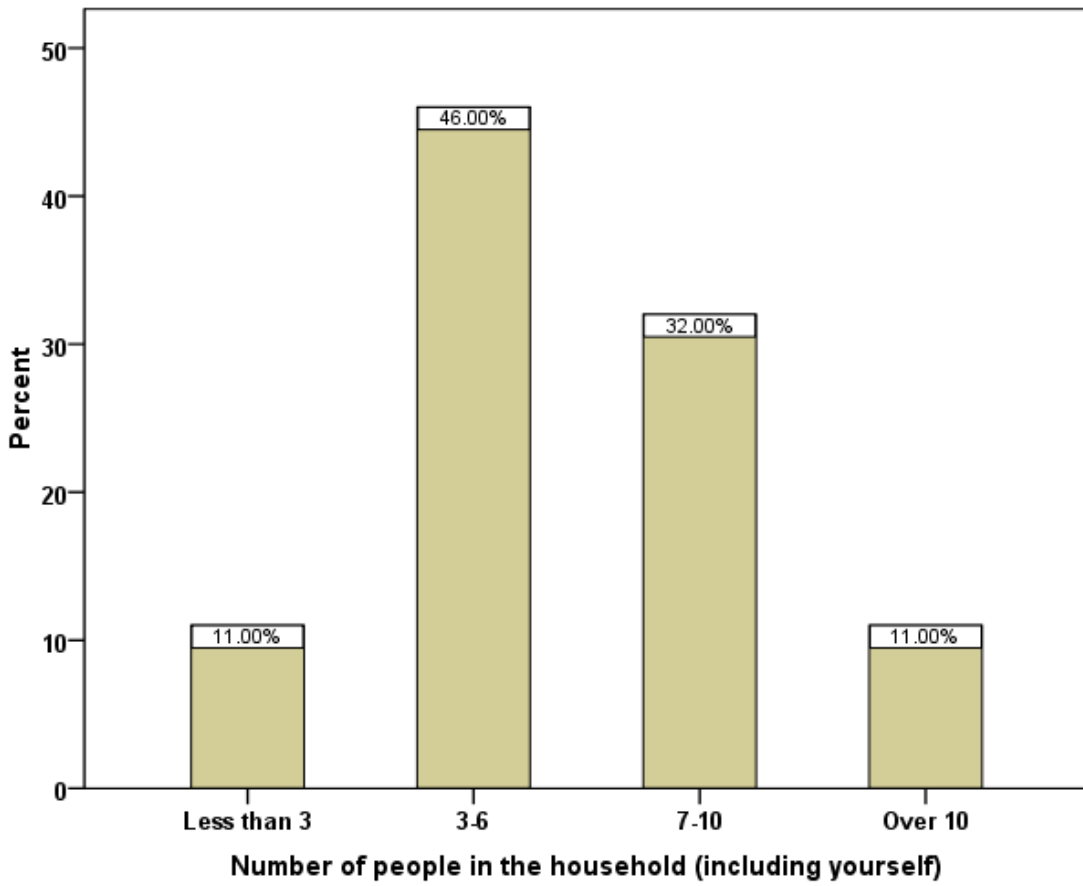


Fig. 4.8: Number of people in the household of El Hurriya Park respondents

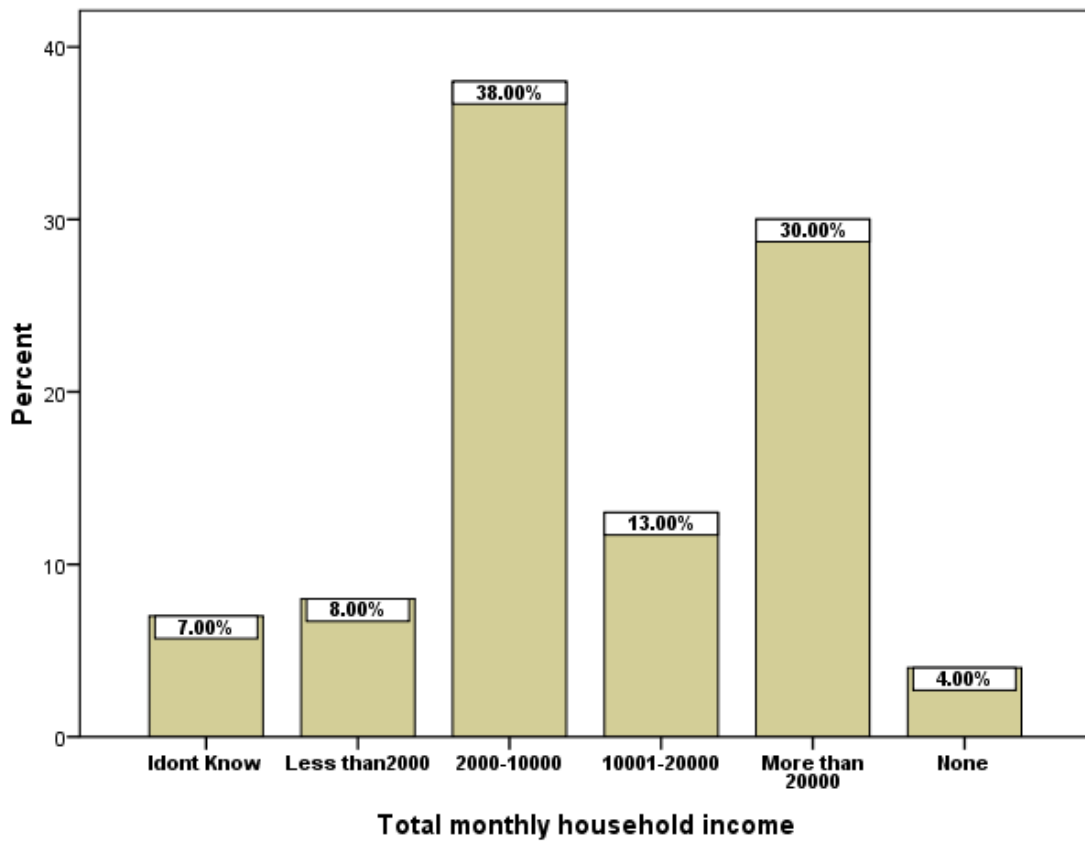


Fig. 4.9: Total monthly household income of El Hurriya Park respondents

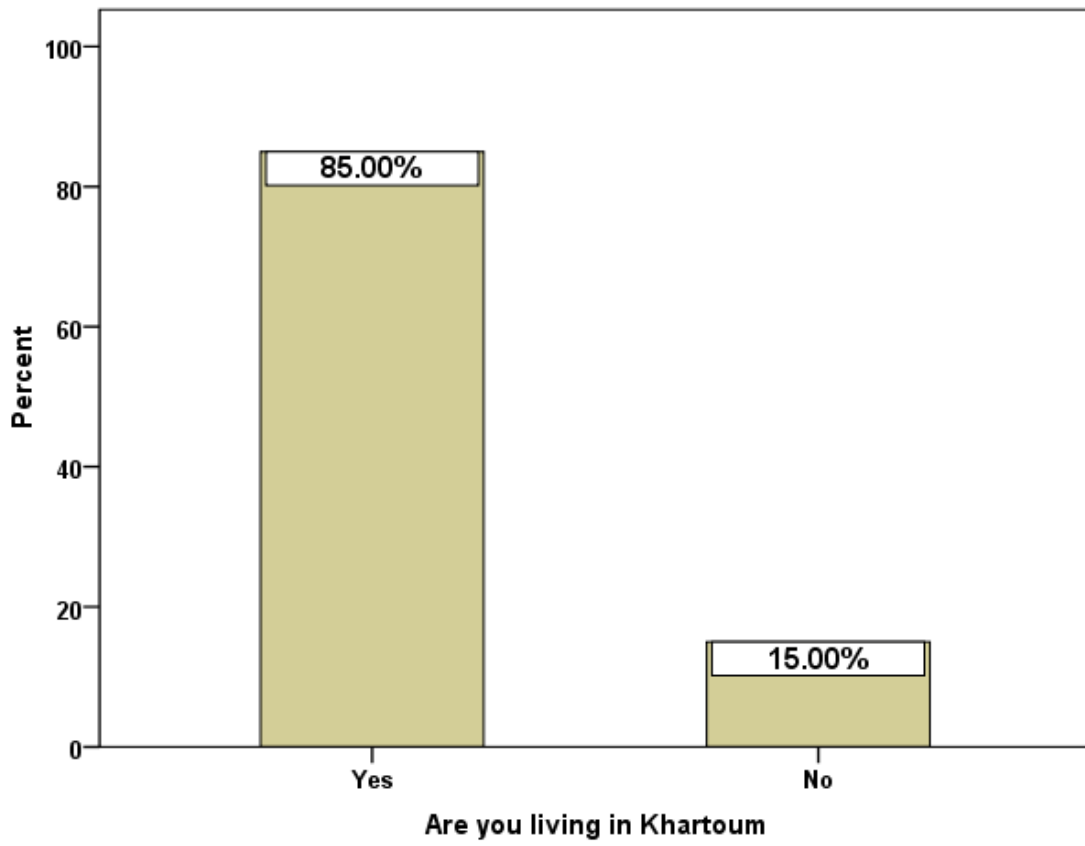


Fig. 4.10: Are El Hurriya Park respondents living in Khartoum city?

4.3.1.1.11 How far is El Hurriya Park respondents' home from the park?

From the (85%) respondents who live in Khartoum city, (11%) walk for less than 15 minutes to reach the park, (8%) walk for 15-30 minutes, (19%) walk for 31- one hour and (47%) walk for more than one hour to reach the park. (55) in the graph refers to El Hurriya Park respondents who are not living in Khartoum city (Fig. 4.11).

4.3.1.1.12 If El Hurriya Park respondents' answer is one of the last 3 answers, is there public gardens in their areas?

From the respondents (74%) who live in Khartoum and can reach the park in 15 minutes to more than one hour, only (29%) have public garden in their areas, while the rest (45%) haven't public garden in their areas. (55) in the graph refers to El Hurriya Park respondents who are not living in Khartoum city and to those who live in the city and walk for less than 15 minutes to reach the park (Fig. 4.12).

4.3.1.1.13 El Hurriya Park respondents who are not living in Khartoum city, are they from Khartoum state?

From the (15%) of the respondents who are not living in Khartoum city, (8%) are from Khartoum state and (7%) aren't from Khartoum state. (55) in the graph refers to El Hurriya Park respondents who are living in Khartoum city (Fig. 4.13).

4.3.1.1.14 El Hurriya Park respondents who are not living in Khartoum city, why they are in the city?

From the (15%) of the respondents who are not living in Khartoum, (8%) came to Khartoum for visit, (4%) came for studying, (2%) came for job and (1%) came for Mission in government offices. (55) in the graph refers to El Hurriya Park respondents who are living in Khartoum city (Fig. 4.14).

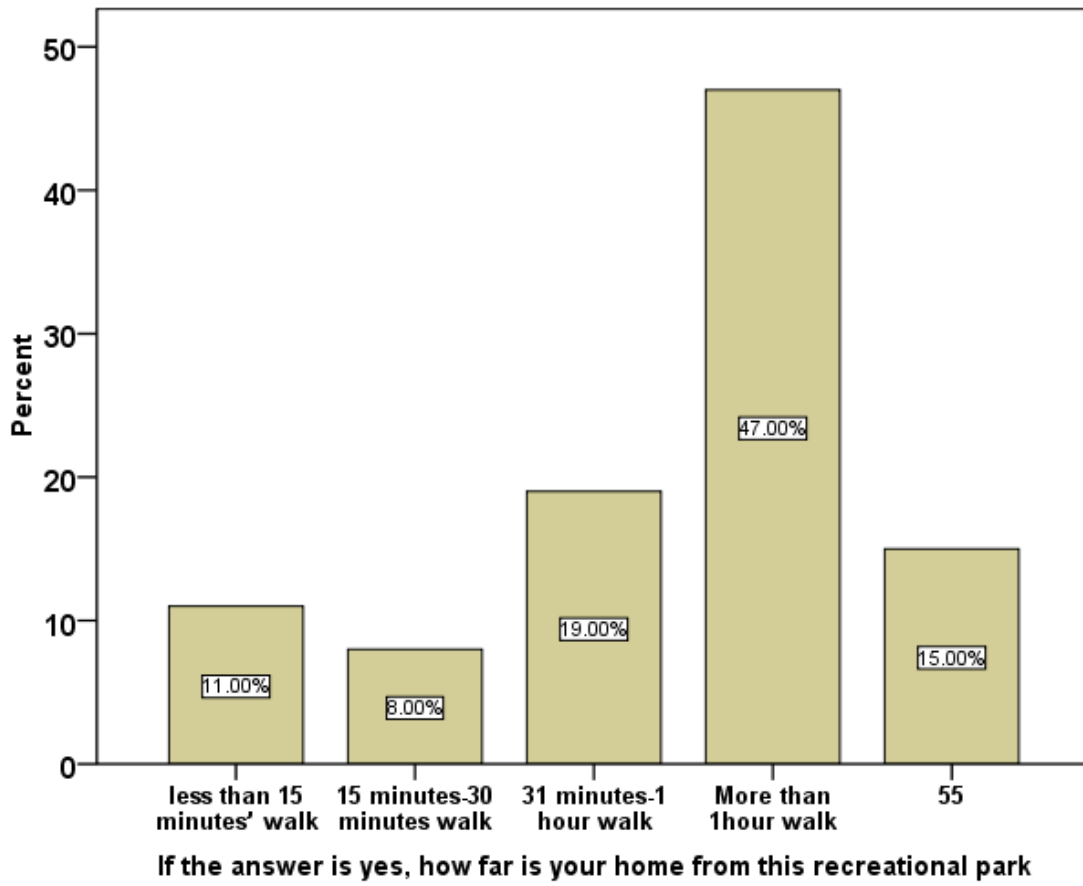


Fig. 4.11: How far is El Hurriya Park respondents' home from the park?

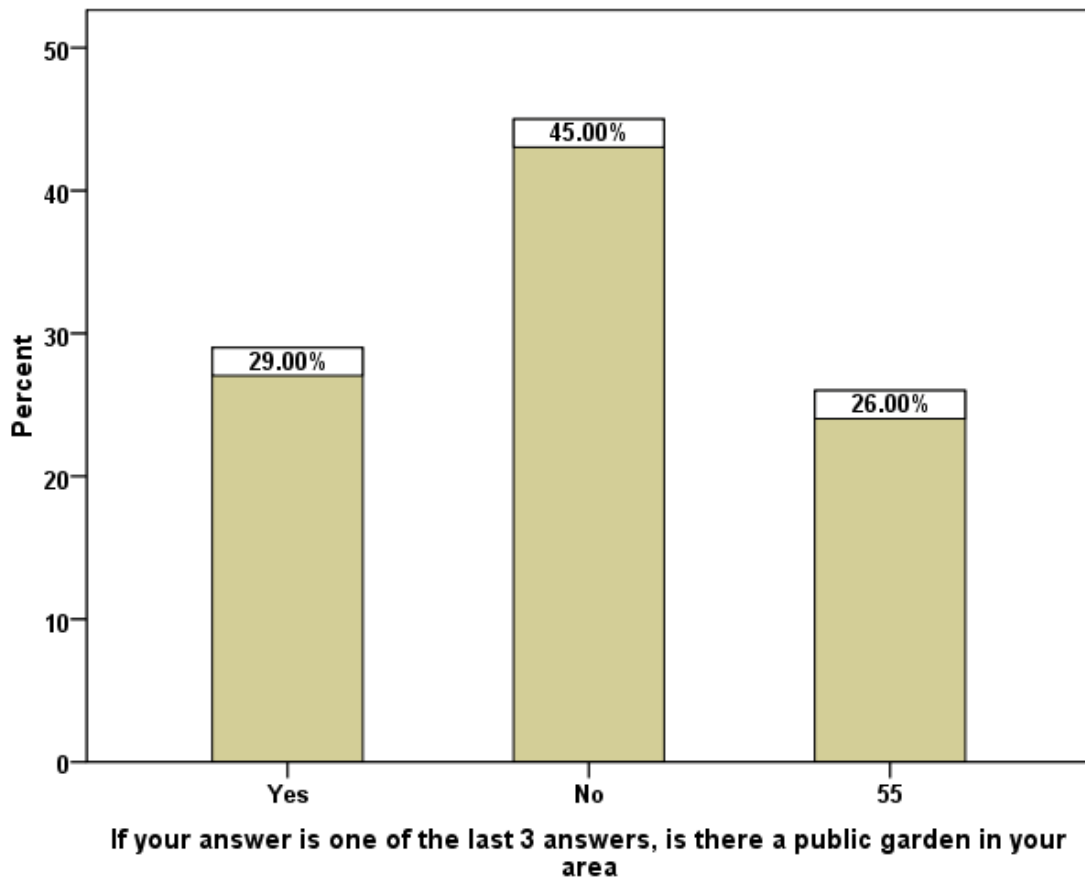


Fig. 4.12: If El Hurriya Park respondents' answer is one of the last 3 answers, is there public gardens in their areas?

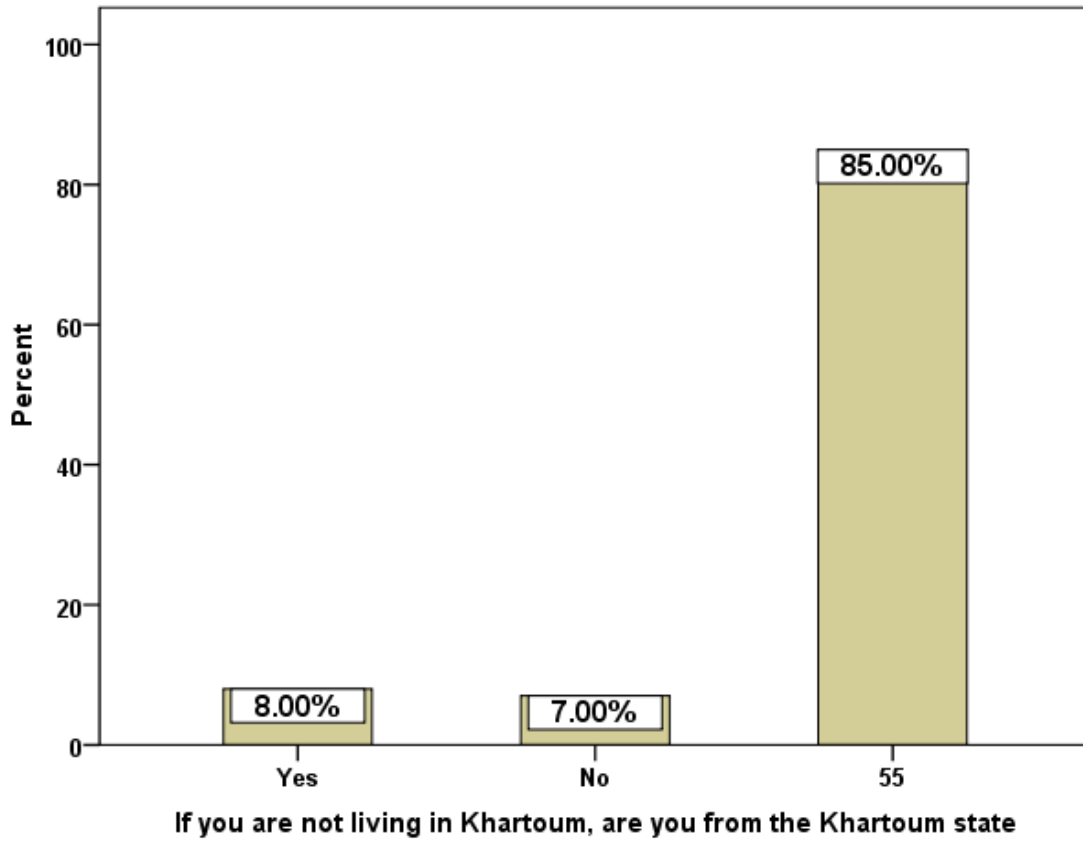


Fig. 4.13: El Hurriya Park respondents who are not living in Khartoum city, are they from Khartoum state?

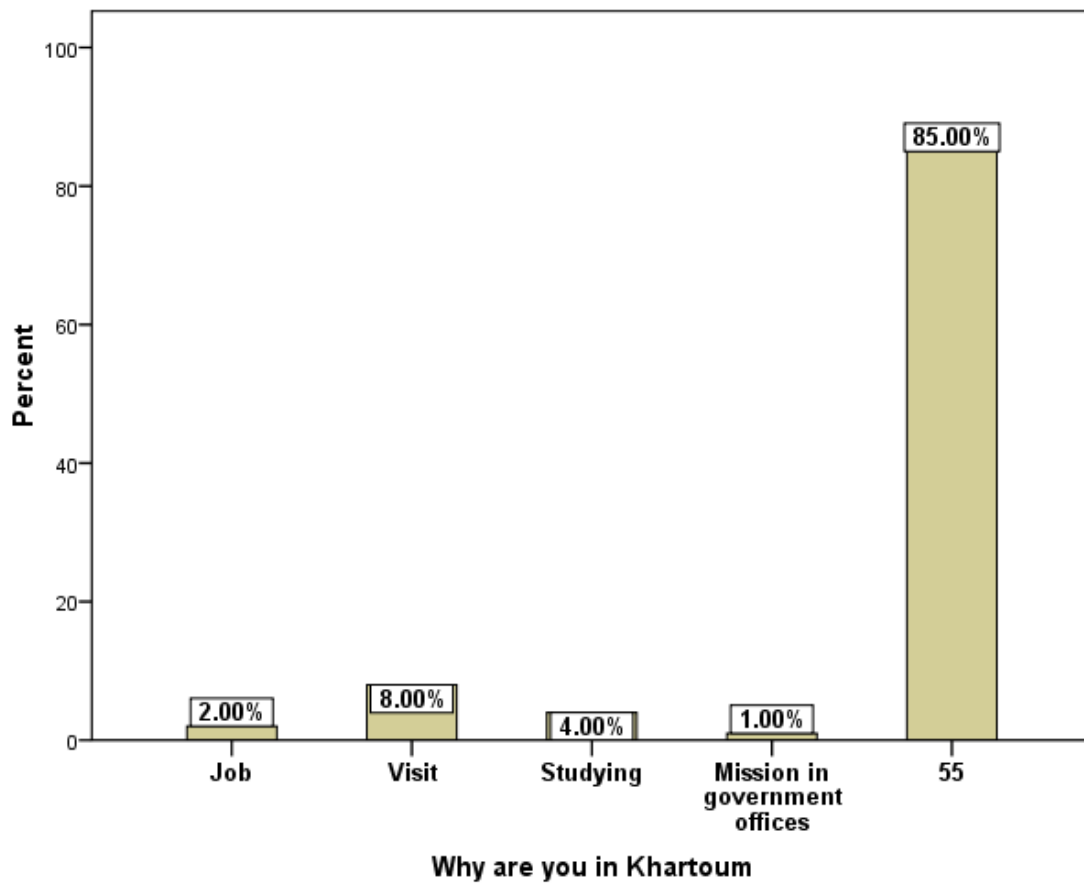


Fig. 4.14: El Hurriya Park respondents who are not living in Khartoum city, why they are in the city?

Part 2:

4.3.1.2 Respondents' visiting and exploiting of El Hurriya Park and their evaluation of the current situation of the park

4.3.1.2.1 How important are parks to the overall quality of life in Khartoum State?

Bulk of respondents (90%) rated the importance of parks to the overall quality of life in Khartoum State as either, very important (68%) or, important (22%). On the other hand, only (5%) of them rated it as either, somewhat important (3%) or, not at all important (2%), and (5%) don't know the answer (Fig. 4.15).

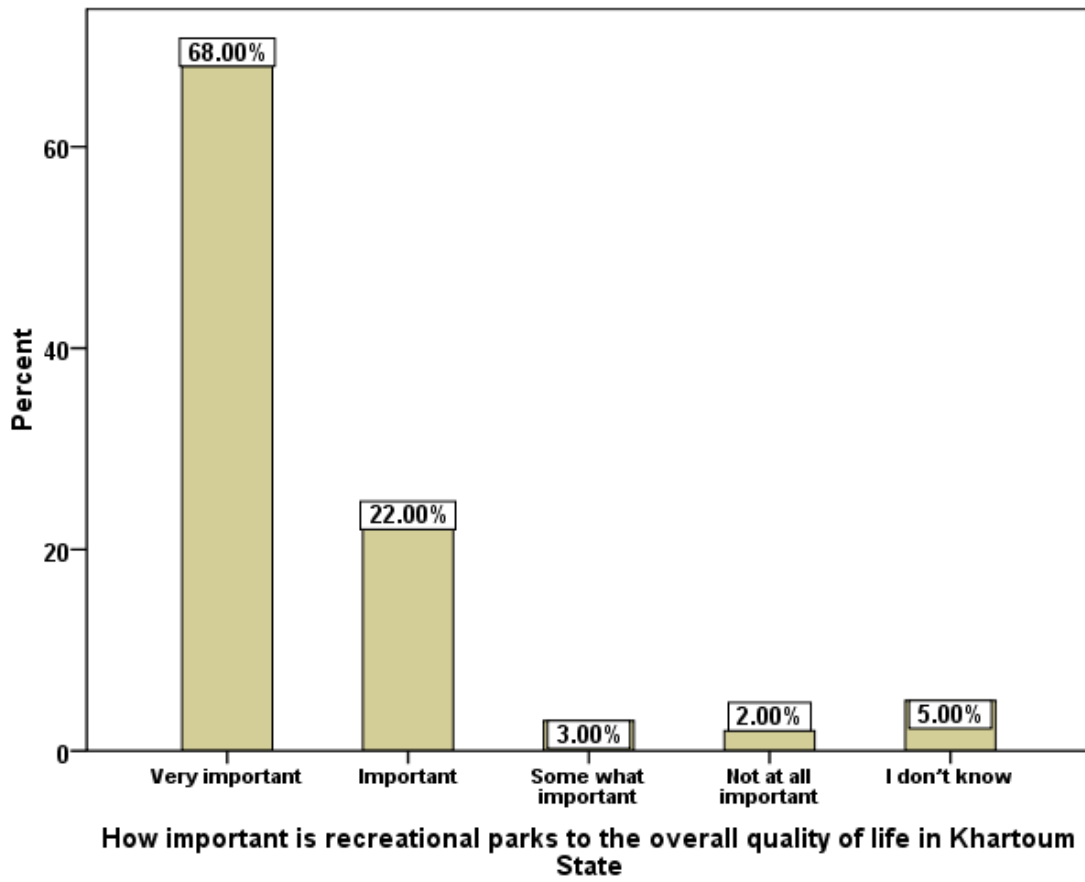


Fig. 4.15: How important are parks to the overall quality of life in Khartoum State?

4.3.1.2.2 Evaluating the visiting and exploiting of El Hurriya Park respondents

Using Likert measurements, the results determined that the characteristic of the park that: I prefer to have a section for men and another for women in the park, is partially satisfied. While the characteristics of the park that: I prefer larger central parks over smaller parks close to my house, and I can get to the park site easily, are satisfied. On the other hand, the characteristics: I enjoy spending good times in the park, more parks are needed in Khartoum State and I would like to visit the park again, are strongly satisfied. Furthermore, the overall assessment is satisfied (Table 4.9).

Table 4.9: Evaluating the visiting and exploiting of El Hurriya Park respondents

	Characteristics of the park	Strongly disagree	Dis-agree	Idon't know	Agree	Strongly agree	Mean	Trend
1	I prefer larger central parks over smaller parks close to my house	7%	24%	6%	28%	35%	3.60	Satisfied
2	I can get to the park site easily	7%	22%	5%	29%	37%	3.67	Satisfied
3	I enjoy spending good times in the park	2%	3%	9%	27%	59%	4.38	Strongly satisfied
4	I prefer to have a section for men and another for women in the park	26%	32%	7%	15%	20%	2.71	Partially satisfied
5	More parks are needed in Khartoum State	8%	2%	3%	24%	63%	4.32	Strongly satisfied
6	I would like to visit the park again	2%	1%	10%	33%	54%	4.36	Strongly satisfied
	Overall assessment						3.84	Satisfied

Source: own calculations from survey data 2019

4.3.1.2.3 Time of day respondents go to El Hurriya Park

The bulk of respondents (62%) prefer visiting the park at pm time, while (26%) of users have no specific time to visit it. The rest of users visit at either, am (9%) or, at noon (3%) (Table 4.10).

Table 4.10 Time of day respondents visit El Hurriya Park

Time of day	Frequency
Am	9
At noon	3
Pm	62
There is no specific time	26
Total	100

Source: own calculations from survey data 2019

4.3.1.2.4 The time of day respondents of El Hurriya Park spend in the park

Most respondents (57%) spend 1-3 hours in the park, (33%) spend more than 3 hours and few respondents spend either, less than one hour (6%) or, full day (4%) (Table 4.11).

Table 4.11: Time of day respondents of El Hurriya Park spend in the park

The time respondents spend in the park	Frequency
Less than one hour	6
1-3 hours	57
More than 3 hours	33
Full day	4
Total	100

Source: own calculations from survey data 2019

4.3.1.2.5 The basic goals for which El Hurriya Park respondents visit the park

The analysis of people's motives to visit the park shows that enjoy the outdoors or nature and meet relatives, friends and neighbors are the motives most frequently mentioned by the visitors accounting for the (92%) of the answers for each. Followed in sequence by picnic and general

leisure activities (81%), sitting, relaxing, leisure, escape from noise, congestion and family problems (79%), participate in family activities (77%) and entertaining children (71%).

The next less frequent motives include attend or participate in activities and events (62%), walk or bike for exercise (59%), attend special events/concerts/movies (57%) and eating meals (45%).

The less frequent motives include reading (38%), Indoor sports (31%) and play sports (28%). (Table 4.12).

Table 4.12: The basic goals for which El Hurriya Park respondents visit the park

The basic goals	Yes	No	Total
Enjoy the outdoors or nature	92%	8%	100
Meet relatives, friends and neighbors	92%	8%	100
Picnic and general leisure activities	81%	19%	100
Sitting, relaxing, leisure, escape from noise, congestion and family problems	79%	21%	100
Participate in family activities	77%	23%	100
Entertaining children	71%	29%	100
Attend or participate in activities and events	62%	8%	100
Walk or bike for exercise	59%	41%	100
Attend special events/concerts/movies	57%	43%	100
Eating meals	45%	55%	100
Reading	38%	62%	100
Indoor sports	31%	69%	100
Play sports	28%	72%	100

Source: own calculations from survey data 2019

4.3.1.2.6 The first main reason for which El Gezira Tourist Park respondents visit the park

Enjoy the outdoors or nature is the first main reason for which about one third of respondents (27%) visit the park. (19%) of respondents choose picnic and general leisure activities as the first main reason for which they visit the park. The first main reason for (17%) of respondents visit the park is to meet relatives, friends and neighbors. Walk or bike for exercise and sitting, relaxing,

leisure, escape from noise congestion and family problems are the first main reasons for which (12%) and (10%) of respondents, respectively, visit the park. Participate in family activities, play sports, entertaining children, reading and attend special events/concerts/movies are the reasons for which (6%), (3%), (3%), (2%) and (1%) of respondents, respectively, visit the park (Table 4.13).

Table 4.13: The first main reason for which El Hurriya Park respondents visit the park

The first reason	Frequency
Enjoy the outdoors or nature	27
Picnic and general leisure activities	19
Meet relatives, friends and neighbors	17
Walk or bike for exercise	12
Sitting, relaxing, leisure, escape from noise, congestion and family problems	10
Participate in family activities	6
Play sports	3
Entertaining children	3
Reading	2
Attend special events/concerts/movies	1
Total	100

Source: own calculations from survey data 2019

4.3.1.2.7 The second main reason for which El Gezira Tourist Park respondents visit the park

Meet relatives, friends and neighbors is the second main reason for which (26%) of respondents visit the park. (14%) of respondents choose picnic and general leisure activities and another (14%) choose sitting, relaxing, leisure, escape from noise, congestion and family problems as the second main reason for which they visit the park. On the other hand, (12%) of respondents choose entertaining children and (11%) of them choose enjoy the outdoors or nature as the second main reason for which they visit the park. The rest of the respondents choose the following reasons as

the second main reason for visiting the park: (6%) choose participate in family activities, (4%) choose walk or bike for exercise, (4%) choose attend special events/concerts/movies, (3%) choose reading, (3%) choose attend or participate in activities and events, (2%) choose play sports and (1%) choose eating meals (Table 4.14).

Table 4.14: The second main reason for which El Gezira Tourist Park respondents visit the park

The second reason	Frequency
Meet relatives, friends and neighbors	26
Picnic and general leisure activities	14
Sitting, relaxing, leisure, escape from noise, congestion and family problems	14
Entertaining children	12
Enjoy the outdoors or nature	11
Participate in family activities	6
Walk or bike for exercise	4
Attend special events/concerts/movies	4
Reading	3
Attend or participate in activities and events	3
Play sports	2
Eating meals	1
Total	100

Source: own calculations from survey data 2019

4.3.1.2.8 When do respondents of El Hurriya Park usually visit the park?

Bulk of respondents (63%) have a frequent visit to the park, (20%) of them Sometime visit the park and (17%) of respondents rarely visit the park (Table 4.15).

Table 4.15: When do respondents of El Hurriya Park usually visit the park?

The frequently of the visit	Frequency
Frequently (Once a week or more)	63
Sometimes (1-2 times a month)	20
Rarely (Less than 5 times a year)	17
Total	100

Source: own calculations from survey data 2019

4.3.1.2.9 Respondents who rarely go to El Hurriya Park what are the reasons?

Respondents' most common reasons for seldom using the park include: lack of facilities (12%) lack of time (11%) exorbitant material cost-too expensive (8%) the park is very crowded (7%) and the park is too far away (6%). The next most common reasons are: physically unable to participate (4%) I don't like going to recreational parks (4%) I prefer playing PlayStation or watching television (4%) feel un safe (3%) I don't know (2%) and nothing from the above (1%) (Table 4.16).

Table 4.16: Respondents who rarely visit El Hurriya Park, what are the reasons?

The reasons	Yes	No	55	Total
Lack of facilities	12	5	83	100
I'm busy (I don't have enough time)	11	6	83	100
Exorbitant material cost-Too expensive	8	9	83	100
The park is very crowded	7	10	83	100
Not conveniently located or too far away	6	11	83	100
Physically unable to participate	4	13	83	100
I don't like going to parks	4	13	83	100
I prefer playing PlayStation or watching television	4	13	83	100
Feel un safe	3	14	83	100
I don't know	2	15	83	100
Nothing from the above	1	16	83	100

Source: own calculations from survey data 2019

4.3.1.2.10 Financial expenses within El Hurriya Park

Bulk of respondents (78%) revealed that the price of the entry ticket is Suitable (17%) of them evaluate it as high (4%) rang it as low and (1%) choose the answer I don't know.

Almost half of respondents (47%) declared that the price of tickets for stadiums is high (28%) say it is Suitable (21%) don't know the answer and (4%) assess it as low.

Majority of respondents (74%) revealed that the price of food and drinks is high (17%) of them feel it is Suitable (7%) choose the answer I don't know and (2%) range it as low.

Most respondents (71%) evaluate the prices of other purchases as high (19%) assess it as Suitable (8%) don't know the answer and (2%) say it is low (Table 4.17).

Table 4.17: Financial expenses in El Hurriya Park

Financial expenses	Suitable	High	Low	I don't know	Total
Price of the entry ticket	78	17	4	1	100
Price of tickets for stadiums	28	47	4	21	100
Price of food and drinks	17	74	2	7	100
Price of other purchases	19	71	2	8	100

Source: own calculations from survey data 2019

4.3.1.2.11 Do you or your family feel harassed when you visit El Hurriya Park?

More than two thirds of respondents (69%) do not feel harassed when they visit the park only (31%) of them feel (Table 4.18).

Table 4.18: Do you or your family feel harassed when you visit El Hurriya Park?

Do you or your family feel harassed	Do you feel harassed
Yes	31
No	69
Total	100

Source: own calculations from survey data 2019

4.3.1.2.12 Do respondents El Hurriya Park go elsewhere to entertain other than this park?

The majority of respondents (70%) go elsewhere to entertain while (30%) of respondents entertain mainly on this park (Table 4.19).

Table 4.19: Do respondents of El Hurriya Park go elsewhere to entertain other than this park?

Do respondents go elsewhere to entertain other than this park?	
Yes	70
No	30
Total	100

Source: own calculations from survey data 2019

4.3.1.2.13 Number of visitors to El Hurriya Park compared with the last ten years

(46%) of respondents declared that the park visitor's increased, (26%) don't know the answer, (16%) of respondents declared that the park visitor's decreased and (12%) rated it as unchanged (Table 4.20).

Table 4.20: Number of visitors to El Hurriya Park compared with the last ten years

Number of visitors	Frequency
Decreased	16
Increased	46
Unchanged	12
I don't know	26
Total	100

Source: own calculations from survey data 2019

4.3.1.2.14 How would respondents of El Hurriya Park rate the physical condition of the park?

(31%) of respondents rated the physical condition of the parks as either excellent (7%) or good (24%). On the other hand (68%) rated it as either fair (46%) or poor (22%). Only (1%) do not know the answer (Table 4.21).

Table 4.21: How would respondents of El Hurriya Park rate the physical conditions of the park?

Rating	Frequency
Excellent	7
Good	24
Fair	46
Poor	22
I don't know	1
Total	100

Source: own calculation from survey data 2019

4.3.1.2.15 The groups that are most underserved by El Hurriya Park Services

The three groups most frequently cited as being underserved are families (95%), children\ preschoolers (90%) and youth (87%). Followed in sequence by people with disabilities (74%), old people/ seniors (70%) and people from diverse cultures (70%).

More than three quarters of respondents (76%) indicated that they feel all groups are served adequately by the park's current recreation system making this the most popular response (Table 4.22).

Table 4.22: The groups that are most underserved by El Hurriya Park services

Community layers	Yes	No	Total
Families	95	5	100
Children\ Preschooler	90	10	100
Youth	87	13	100
People with disabilities	74	26	100
old people/ Seniors	70	30	100
People from diverse cultures	70	30	100
All groups are served adequately	76	24	100

Source: own calculations from survey data 2019

Part Three:

4.3.1.3 Assessment of the services dimensions of El Hurriya Park and its impact on the local community

Results outlined that the overall assessment of the services dimensions of El Hurriya Park is partially satisfied. Two of the park characteristics are strongly dis-satisfied which are large trees are abundant in the park to sit under and (Wi-Fi) service communication operates efficiently in the park. It is also found that the following characteristics of the park are dis-satisfied seats in the park sufficient durable and comfortable, male and female toilets are constantly clean, in the park there are hand-washing for men and for women clean and in sufficient number, the park provides clean and cold drinking water, there is an ambulance or first aid room inside the park and in good condition and a complete public library is available in the park. On the other hand, the partially satisfied characteristics of the park include the park staff treats visitors with great taste, the cleanliness of the park is good, there are enough trash cans everywhere in the park, in the park there are private toilets for men and for women and in sufficient number, this park has good cafeterias and restaurants, kids games are multiple, safe and monitored, there are many adult

sports fields in the park and radio Park offers fun things and useful hints for visitors. Furthermore, the following characteristics of the park are satisfied the multiple number of entrances and their prominence may differentiate this park, there is excellent lighting throughout the park at night, private parking is available at the park, the park has a qualified mosque, visitor protection system and control of entry and exit of the park is convenient and very safe, the lawn fields are many, wide and safe for children to play and sit on them and the roads and paths of the park are wide and well paved (Table 4.23).

Table 4.23: Assessment of the services dimensions of El Hurriya Park and its impact on the local community

	Characteristics of the park	Strongly disagree	Dis-agree	I don't know	Agree	Strongly agree	Mean	Trend
1	Large trees are abundant in the park to sit under	83%	11%	5%	1%	0%	1.24	Strongly dis-Satisfied
2	The park staff treats visitors with great taste	13%	25%	16%	29%	17%	3.12	Partially satisfied
3	The cleanliness of the park is good	22%	36%	3%	25%	14%	2.73	Partially satisfied
4	The multiple number of entrances and their prominence may differentiate this park	6%	10%	4%	45%	35%	3.93	Satisfied
5	Seats in the park Sufficient durable and comfortable	26%	42%	5%	13%	14%	2.47	Dis-Satisfied
6	There are enough trash cans everywhere in the park	13%	31%	2%	31%	23%	3.20	Partially satisfied
7	There is excellent lighting throughout the park at night	5%	19%	6%	45%	25%	3.66	Satisfied
8	Private parking available at the park	10%	22%	6%	35%	27%	3.47	Satisfied
9	In the park there are private toilets for men and for women, and in sufficient number	15%	30%	8%	24%	23%	3.10	Partially satisfied
10	Male and female toilets are constantly clean	32%	29%	12%	13%	14%	2.48	Dis-Satisfied
11	In the park there are hand-washing for men and for women clean and in sufficient number	29%	33%	12%	16%	10%	2.45	Dis-Satisfied
12	The park has a qualified mosque	18%	12%	12%	27%	31%	3.41	Satisfied

13	The park provides clean and cold drinking water	37%	24%	4%	15%	20%	2.57	Dis-Satisfied
14	(Wi-Fi) service communication operates efficiently in the park	79%	10%	10%	1%	0%	1.33	Strongly dis-Satisfied
15	This park has good cafeterias and restaurants	16%	22%	10%	34%	18%	3.16	Partially satisfied
16	Visitor protection system and control of entry and exit of the park is convenient and very safe	12%	18%	6%	36%	28%	3.50	Satisfied
17	Kids games are multiple, safe and monitored	19%	34%	5%	23%	19%	2.89	Partially satisfied
18	There are many adult sports fields in the park	17%	26%	13%	24%	20%	3.04	Partially satisfied
19	There is an ambulance or first aid room inside the park and in good condition	34%	27%	19%	8%	12%	2.37	Dis-Satisfied
20	A complete public library is available in the park	35%	29%	19%	7%	10%	2.28	Dis-Satisfied
21	Radio Park offers fun things and useful hints for visitors	27%	29%	13%	14%	17%	2.65	Partially satisfied
22	Lawn fields are many, wide and safe for children to play and to sit on	13%	19%	3%	37%	28%	3.48	Satisfied
23	The roads and paths of the park are wide and well paved	9%	19%	2%	40%	30%	3.63	Satisfied
Overall assessment							2.88	Partially satisfied

Source: own calculations from survey data 2019

Part Four:

4.3.1.4 Assessment of the environmental, social and aesthetic impacts resulting from the designing of El Hurriya Park on the local community

4.3.1.4.1 The environmental impacts resulting from the designing of El Hurriya Park on the local community

The overall assessment of the environmental impacts resulting from the designing of El Hurriya Park on the local community is partially satisfied, as the hypothesis park trees provide large areas of shade is dis-satisfied. Nextly, the hypothesis that the park contains many different types of

plants is partially satisfied. More over, the hypothesis that the park reduces environmental pollution and noise and the park softens the atmosphere by providing water element (fountain, water pool or waterfall and by plants) are satisfied. On the other hand, the hypothesis that the park is large in area is strongly satisfied (Table 4.24).

Table 4.24: The environmental impacts resulting from the designing of El Hurriya Park on the local community

	The environmental impact resulting from the establishment of the park	Strongly disagree	Disagree	I don't know	Agree	Strongly agree	Mean	Trend
1	The park reduces environmental pollution and noise	7%	20%	2%	28%	43%	3.80	Satisfied
2	The park contains many different types of plants	22%	39%	3%	17%	19%	2.72	Partially satisfied
3	Park trees provide large areas of shade	39%	31%	3%	8%	19%	2.37	Dis-Satisfied
4	The park softens the atmosphere by the water element and by plants	15%	16%	4%	35%	30%	3.49	Satisfied
5	The park is large in area	3%	8%	2%	32%	55%	4.28	Strongly satisfied
Overall assessment							3.33	Partially satisfied

Source: own calculations from survey data 2019

4.3.1.4.1.1 The environmental hazards resulting from the designing El Hurriya Park on the local community

When examining the environmental hazards resulting from the designing of El Hurriya Park on the local community, results reported that the over all assessment of this dimentions is partially satisfied. As the hypotheses that the accumulation of dirt, the spread of mosquitoes and insects and the congestion and inconvenience are partially satisfied (Table 4.25).

Table 4.25: The environmental hazards resulting from the designing of El Hurriya Park on the local community

	The damages	Strongly disagree	Disagree	I don't know	Agree	Strongly agree	Mean	Trend
1	Accumulation of dirt	20%	20%	2%	22%	36%	3.34	Partially satisfied
2	The spread of mosquitoes and insects	18%	21%	1%	36%	24%	3.27	Partially satisfied
3	Congestion and inconvenience	23%	30%	5%	28%	14%	2.80	Partially satisfied
Over assessment							3.14	Partially satisfied

Source: own calculations from survey data 2019

4.3.1.4.2 The social impacts resulting from the designing of El Hurriya Park on the local community

4.3.1.4.2.1 Always, respondents visit El Hurriya Park with companion or alone?

(97%) of El Hurriya Park respondents visit the park with companion, only (3%) of them visit the park alone (Table 4.26).

Table 4.26: Always, respondents visit El Hurriya Park with companion or alone?

Always, respondents visit the park:	
With companion	97
Alone	3
Total	100

Source: own calculations from survey data 2019

4.3.1.4.2.2 If respondents visit El Hurriya Park with companion, whom they accompany with?

The research result showed that one third of respondents (33%) visit the park accompanied with: colleagues (23%), family members (7%), or relatives (3%). Interestingly, the other two thirds of respondents (64%), visit the park accompanied with all the mentioned categories. The fig. 55 in the table refers to respondents who visit the park alone (Table 4.27).

Table 4.27: If respondents visit El Hurriya Park with companion, whom they accompany with?

Respondents who visit the park with companion, they accompanied with:	Frequency
All that mentioned categories	64
Colleagues	23
Family members	7
Relatives	3
55	3
Total	100

Source: own calculations from survey data 2019

4.3.1.4.2.3 If respondents visit El Hurriya Park alone, what are the reasons?

From the (3%) of respondents who visit the park alone, (2%) of them do so because they don't prefer to be accompanied and (1%) because he didn't find someone to accompany with. The fig. 55 in the table, refers to respondents who visit the park with companion (Table 4.28).

Table 4.28 If respondents visit El Hurriya Park alone, what are the reasons?

Respondents who visit the park alone, what are the reasons?	Frequency
Don't find someone to accompany with	1
Don't prefer to be accompanied	2
55	97
Total	100

Source: own calculations from survey data 2019

4.3.1.4.2.4 Respondents who visit the park alone, do they talk with the park users?

(53%) of respondents who visit the park alone, talk with the park users and (47%) of them do not (Table 4.29).

Table 4.29: Respondents who visit the park alone, do they talk with the park users?

Do respondents talk with users of the park?	Frequency
Yes	53
No	47
Total	100

Source: own calculations from survey data 2019

4.3.1.4.2.5 Respondents who talk with the park users, do they make friendship with them (40%) of respondents who talk with the users of the park make friendship with them, while it is a temporary relationship with the remaining (60%). The fig. 55 in the table, refers to respondents who do not talk with the users of park. (Table 4.30)

Table 4.30: Respondents who talk with the park users, do they make friendship with them?

Respondents who talk with the park users, do they:	Frequency
Make Friendship with them	21
It is a temporary relationships	32
55	47
Total	100

Source: own calculations from survey data 2019

4.3.1.4.3 The aesthetic impacts resulting from the designing of El Hurriya Park on the local community

In studying the aesthetic impacts resulting from the designing of El Hurriya Park on the local community results stated that the over all assessment of this dimensions is partially satisfied. It is shown that, the hypotheses that: The park has many beautiful plants and colorful flowers, the lawns in the park are green spacious and clipped, the park design is beautiful and contains some works of art such as statues and others, and the hedges and fences of the park are cut in wonderful

shapes are partially satisfied. Further more, the hypothesis that the park has a water element in the form of an attractive fountain is satisfied (Table 4.31).

Table 4.31: The aesthetic impacts resulting from the designing of El Hurriya Park on the local community

	The aesthetic return resulting from the designing of the park	Strongly disagree	disagree	I don't know	Agree	Strongly agree	Mean	Trend
1	The park has many beautiful plants and colorful flowers	26%	31%	8%	13%	22%	2.74	Partially satisfied
2	The park has a water element in the form of an attractive fountain	15%	16%	4%	30%	35%	3.54	Satisfied
3	The lawns in the park are green, spacious and clipped	14%	21%	4%	36%	25%	3.37	Partially satisfied
4	The park design is beautiful and contains some works of art such as statues and others	24%	36%	%3	20%	17%	2.70	Partially satisfied
5	The hedges and fences of the park are cut in wonderful shapes	23%	27%	5%	24%	21%	2.93	Partially satisfied
	Over assessment						3.06	Partially satisfied

Source: own calculations from survey data 2019

4.3.2 El Gezira Tourist Park Questionnaire Responses

4.3.2.1 Part one: The demographics of respondents in El Gezira Tourist Park

4.3.2.1.1 Gender of El Gezira Tourist Park respondents

The sample was made up of (56%) males and (44%) female. The attendance of males is higher than female (Fig. 4.16).

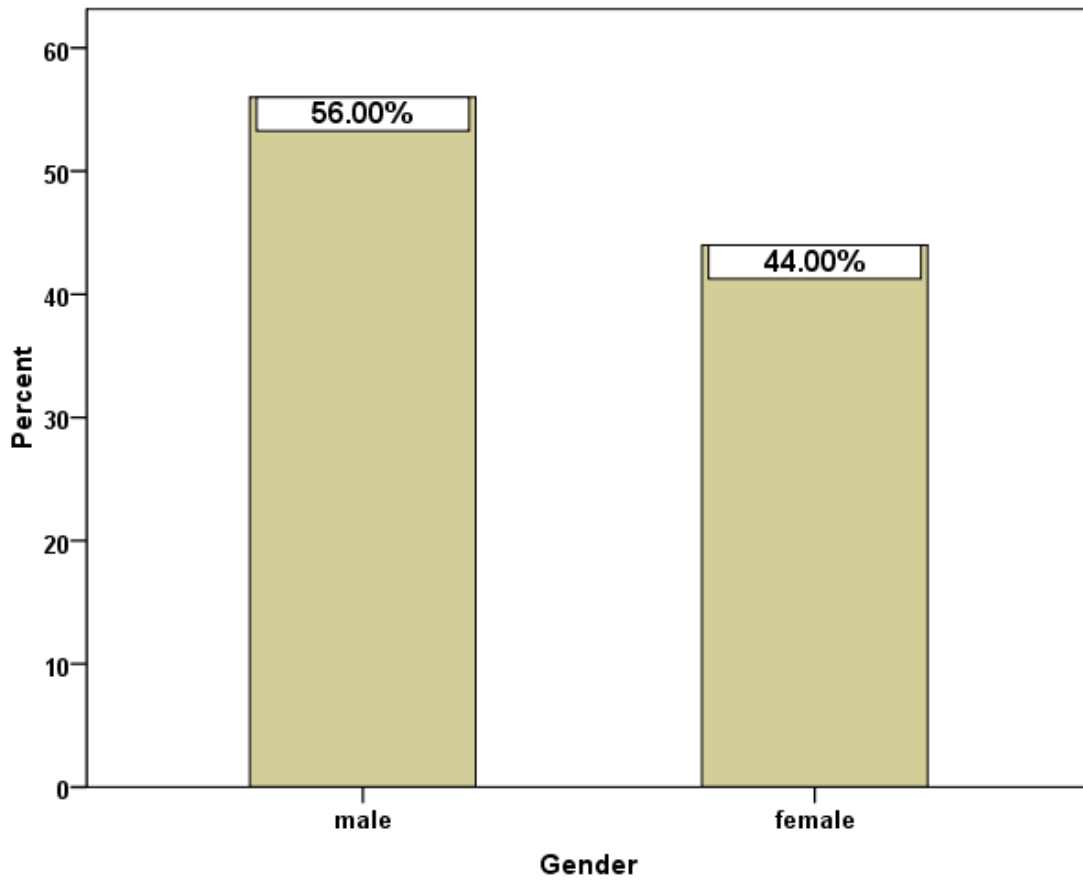


Fig. 4.16: Gender of El Gezira Tourist Park respondents

4.3.2.1.2 Age of El Gezira Tourist Park respondents

The result showed that the highest percentage of respondents (60%) in the age category 18-24 years. On the other hand, the lowest percentage (1%) in the age category 55-64 years, while the respondents in the age categories 65-74 and over 75 are (0%). There are only (7%) of respondents in 35-44 age range and (10%) of them in the age range of 45-54 (Fig. 4.17).

4.3.2.1.3 Educational level of El Gezira Tourist Park respondents

Results indicate that about three quarters of respondents (72%) were university educated, while (5%) were highly educated. (18%) of respondents have secondary education. Low ratio of respondents (4%) have preliminary education and only (1%) of respondents can read and write. On the other hand, there is no representation to the illiterate and khallwa education (Fig. 4.18).

4.3.2.1.4 Occupation of El Gezira Tourist Park respondents

Analysis of the survey data indicates that more than half of respondents (54%) were students. Freelance respondents registered the second ratio (16%), followed by house hold (9%) and government employee (8%). Furthermore, the occupation unemployed (6%), labor (4%), working outside Sudan (2%) and retired (1%) follow in decreasing frequency (Fig. 4.19).

4.3.2.1.5 Monthly income of El Gezira Tourist Park respondents

The result showed that the highest percentage of respondents (69%) in monthly income category (none). (12%) of respondents have a monthly income 1000-5000 S.P., while (9%) have more than 10000 S.P. monthly income. On the other hand, the lowest representative groups have either, monthly income of less than 1000 S.P (6%) or, 5001-10000 S.P (4%) (Fig. 4.20).

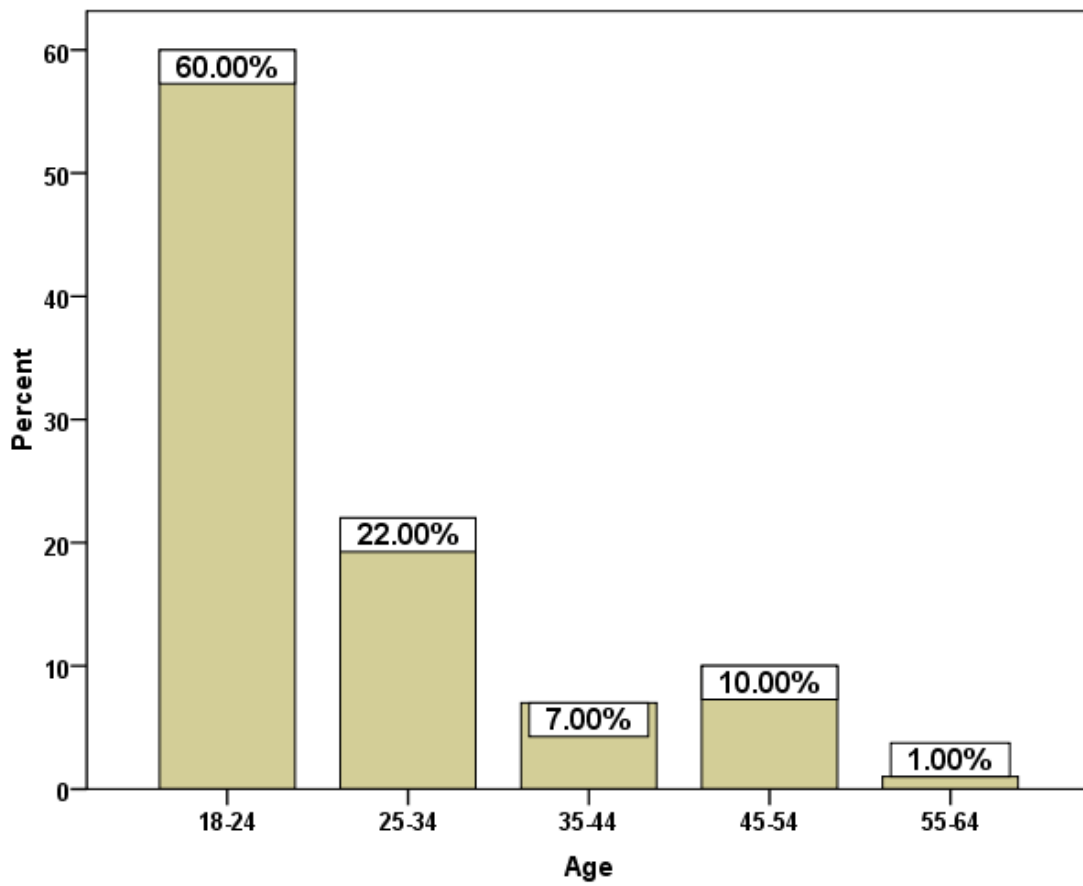


Fig. 4.17: Age of El Gezira Tourist Park respondents

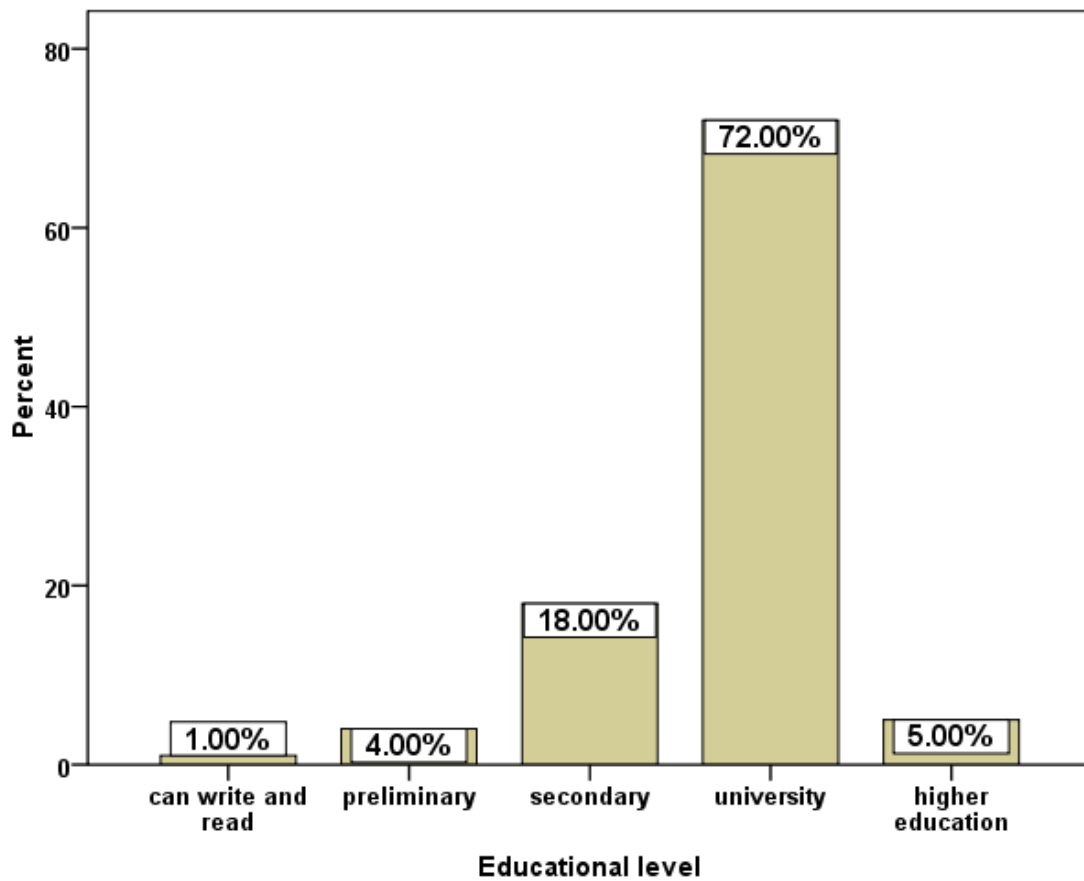


Fig. 4.18: Educational level of El Gezira Tourist Park respondents

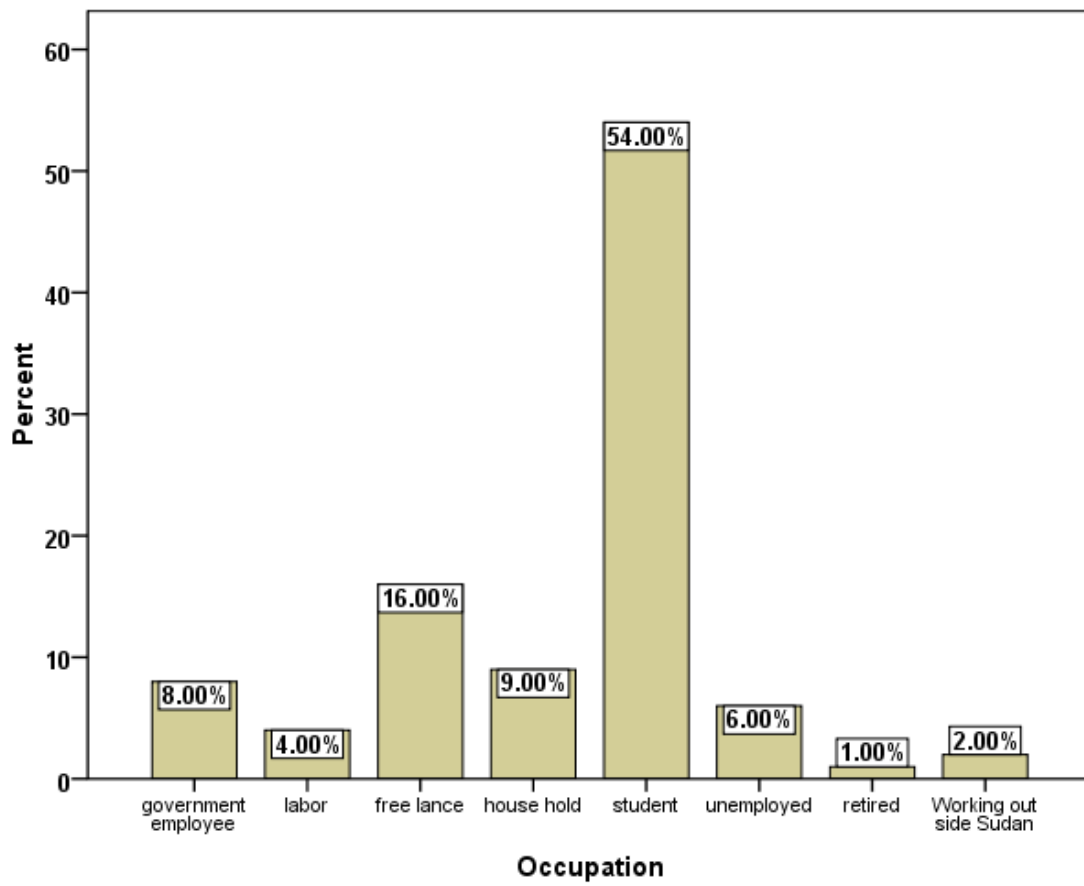


Fig. 4.19: Occupation of El Gezira Tourist Park respondents

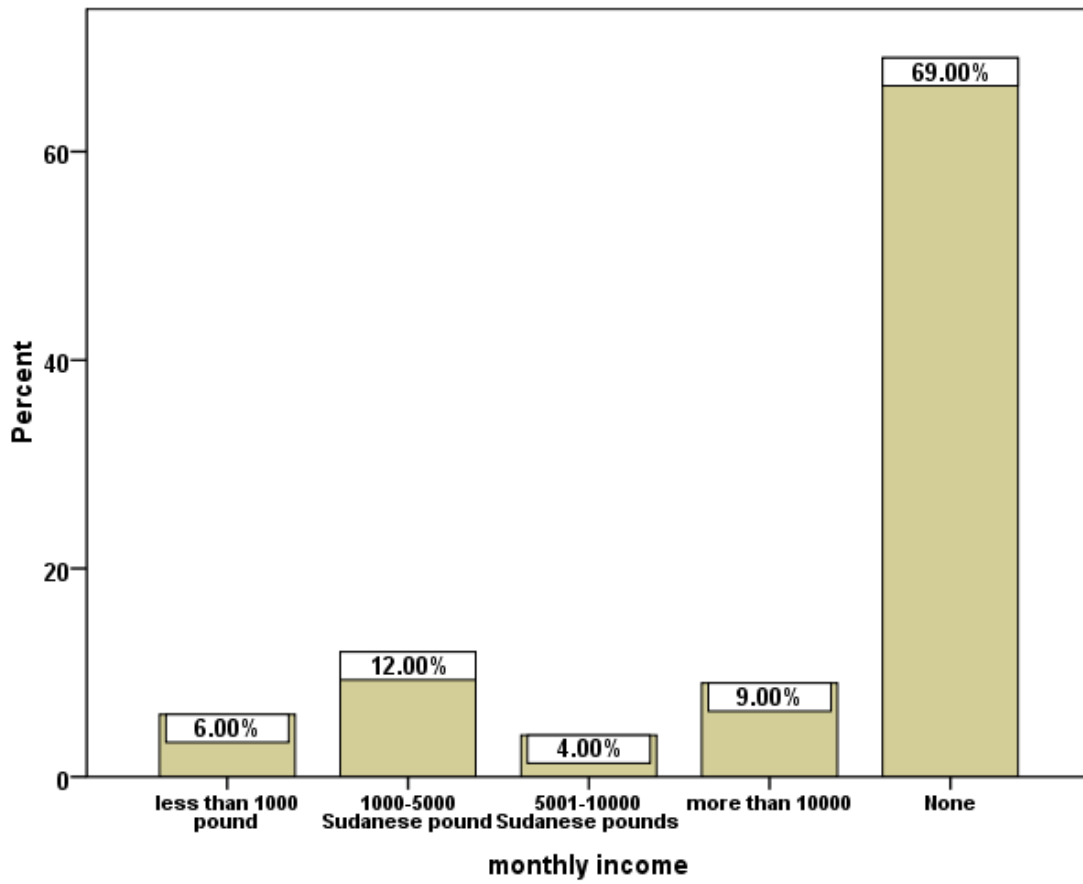


Fig. 4.20: Monthly income of El Gezira Tourist Park respondents

4.3.2.1.6 Place of birth of El Gezira Tourist Park respondents

Result indicates that the majority of respondents (79%) were born in urban areas while the rest (21%) were born in rural areas (Fig. 4.21).

4.3.2.1.7 Marital status of El Gezira Tourist Park respondents

In evaluating the marital status of the park respondents, the results showed that the highest ratio of respondents (71%) for bachelor followed by married respondents (27%). Further more, the lowest ratio (1%) is recorded for each of the widow and the divorced respondents (Fig. 4.22).

4.3.2.1.8 Number of people in the household of El Gezira Tourist Park respondents

About half of respondents (45%) have household composed of (3-6) people. While (37%) have household composed of (7-10) people. On the other hand, (11%) of respondents have household composed of (less than 3) people and (7%) have household composed of (over 10) people (Fig. 4.23).

4.3.2.1.9 Total monthly household income of El Gezira Tourist Park respondents

Results found that (40%) of respondents have total monthly household income of (2000-10000) S.P and (23%) of respondents have total monthly household income of (more than 20000) S.P. Furthermore, (14%) of respondents have total monthly household income of (10001-20000) S.P and (10%) of respondents don't know the total monthly household income. Besides (8%) of respondents have total monthly household income of (less than 2000) S.P and (5%) of respondents haven't a total monthly household income (Fig. 4.24).

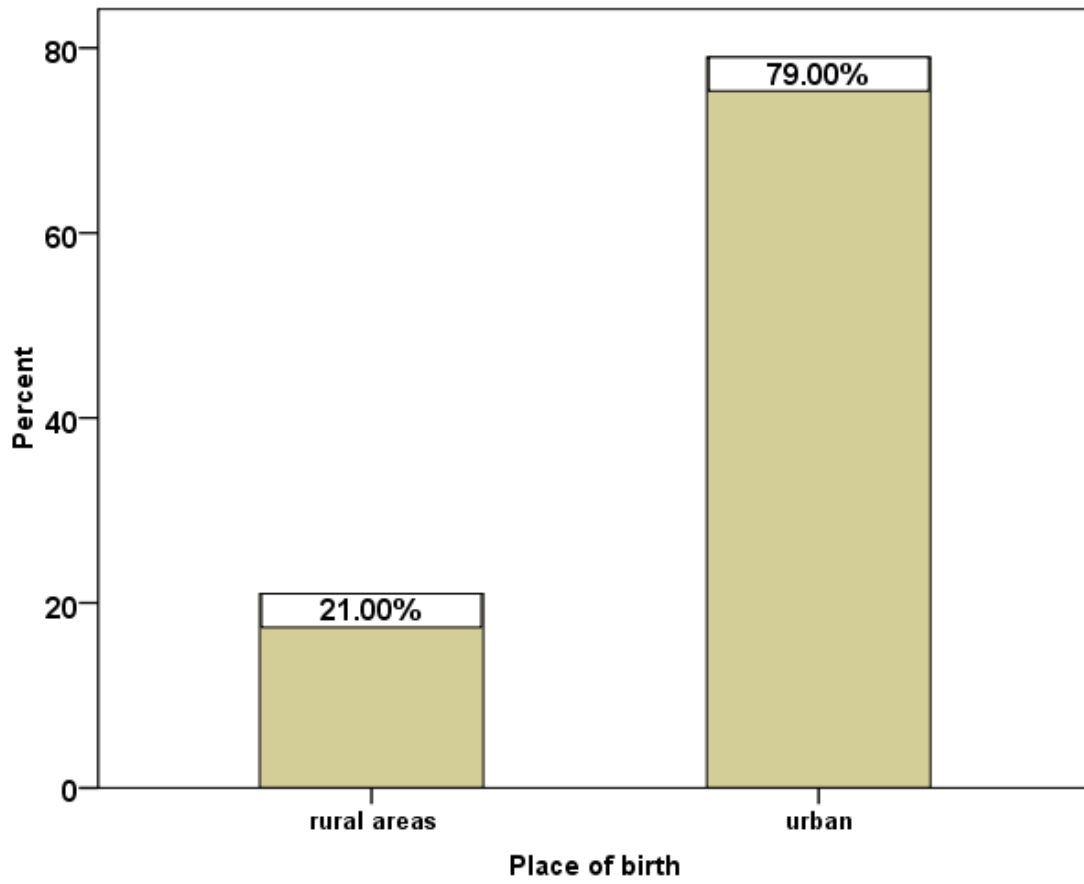


Fig. 4.21: Place of birth of El Gezira Tourist Park respondents

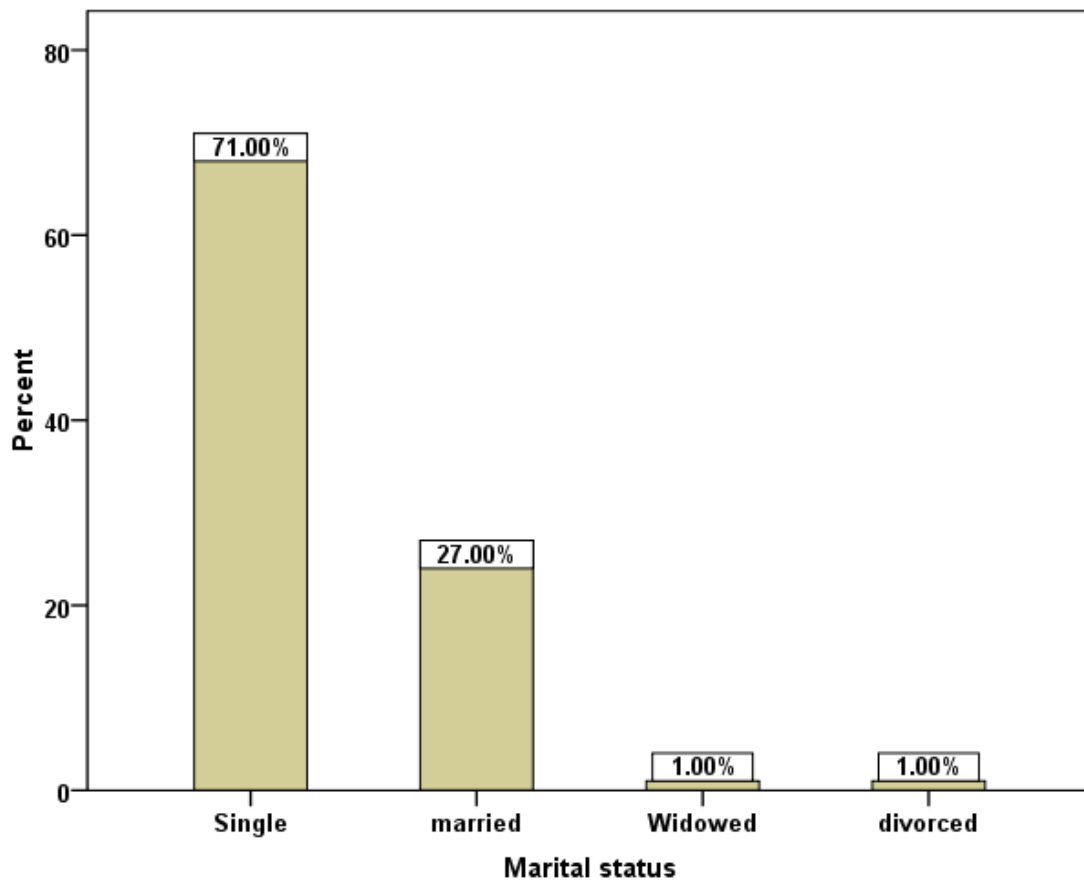


Fig. 4.22: Marital status of El Gezira Tourist Park respondents

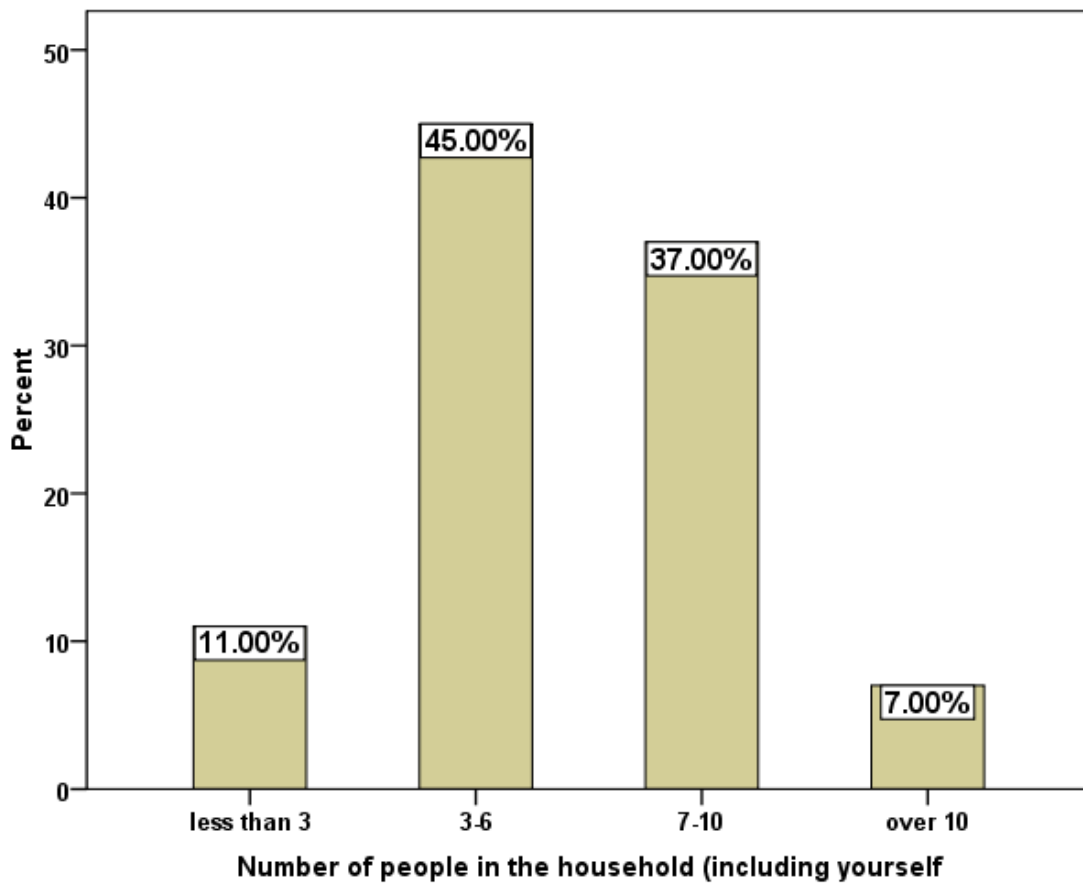


Fig. 4.23: Number of people in the household of El Gezira Tourist Park respondents

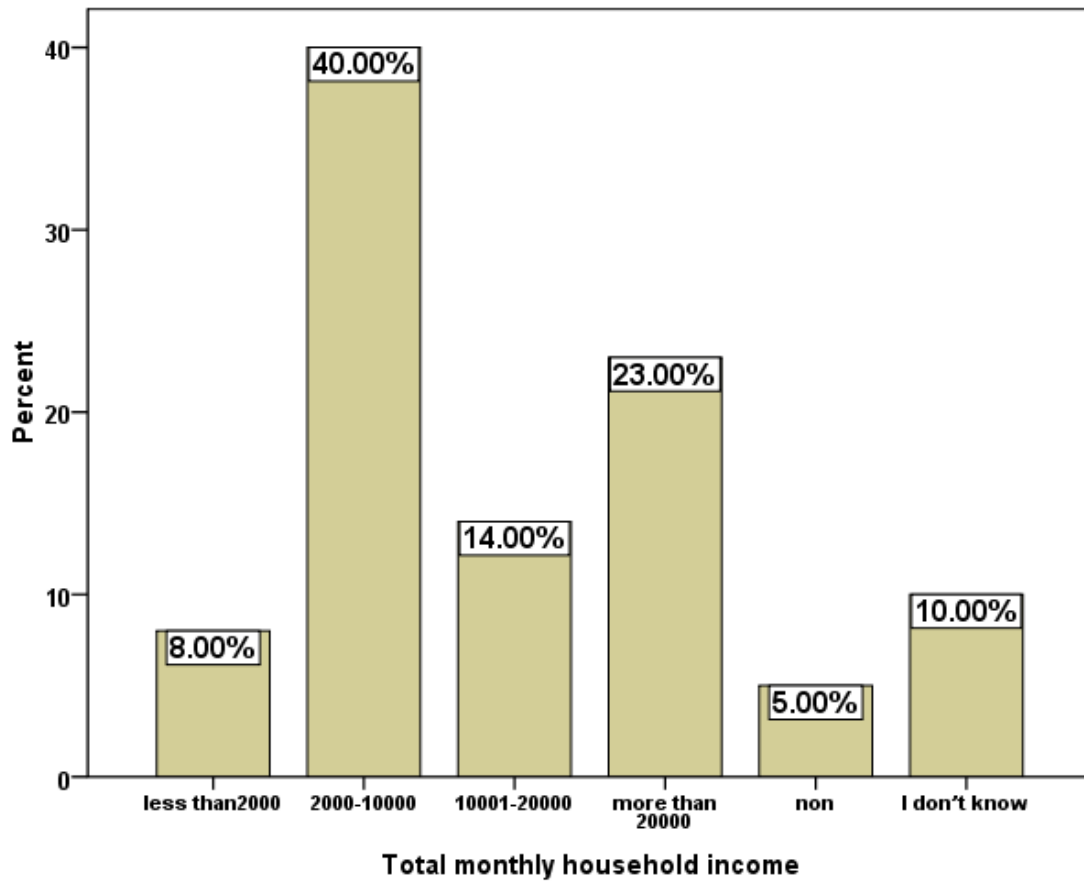


Fig. 4.24: Total monthly household income of El Gezira Tourist Park respondents

4.3.2.1.10 Are El Gezira Tourist Park respondents living in Wad Medani city?

Results found that (65%) of El Gezira Tourist Park respondents are living in Wad Medani city, while (35%) are not (Fig. 4.25).

4.3.2.1.11 How far is El Gezira Tourist Park respondents' home from the park?

From the (65%) respondents who live in Wad Medani city, (7%) walk for less than 15 minutes to reach the park, (20%) walk for 15-30 minutes (13%) walk for 31- one hour and (25%) walk for more than one hour to reach the park site. 55 in the Fig. refers to El Gezira Tourist Park respondents who are not living in Wad Medani city (Fig. 4.26).

4.3.2.1.12 If El Gezira Tourist Park respondents' answer is one of the last 3 answers, is there public gardens in their areas?

From the respondents who live in Wad Medani city and can reach the park in 15 minutes to more than one hour, only (13%) have public garden in their areas while the rest (45%) haven't public garden in their areas. 55 in the graph refers to El Gezira Tourist Park respondents who are not living in Wad Medani city. The other 55 refers to the park' respondents who live in the city and walk for less than 15 minutes to reach the park (Fig. 4.27).

4.3.2.1.13 El Gezira Tourist Park respondents who are not living in Wad Medani city are they from Gezira state?

From the (35%) respondents who are not living in Wad Medani (25%) are from Gezira state and (10%) are not from Gezira state. 55 in the graph refers to park' respondents who are living in Wad Medani city (Fig. 4.28).

4.3.2.1.14 El Gezira Tourist park respondents who are not living in Wad Medani city, why they are in the city?

From the (35%) respondents who are not living in Wad Medani city, (27%) came to Wad Medani for visit (7%) came for studying and (1%) came for job. 55 in the graph refers to park' respondents who are living in Wad Medani city (Fig. 4.29).

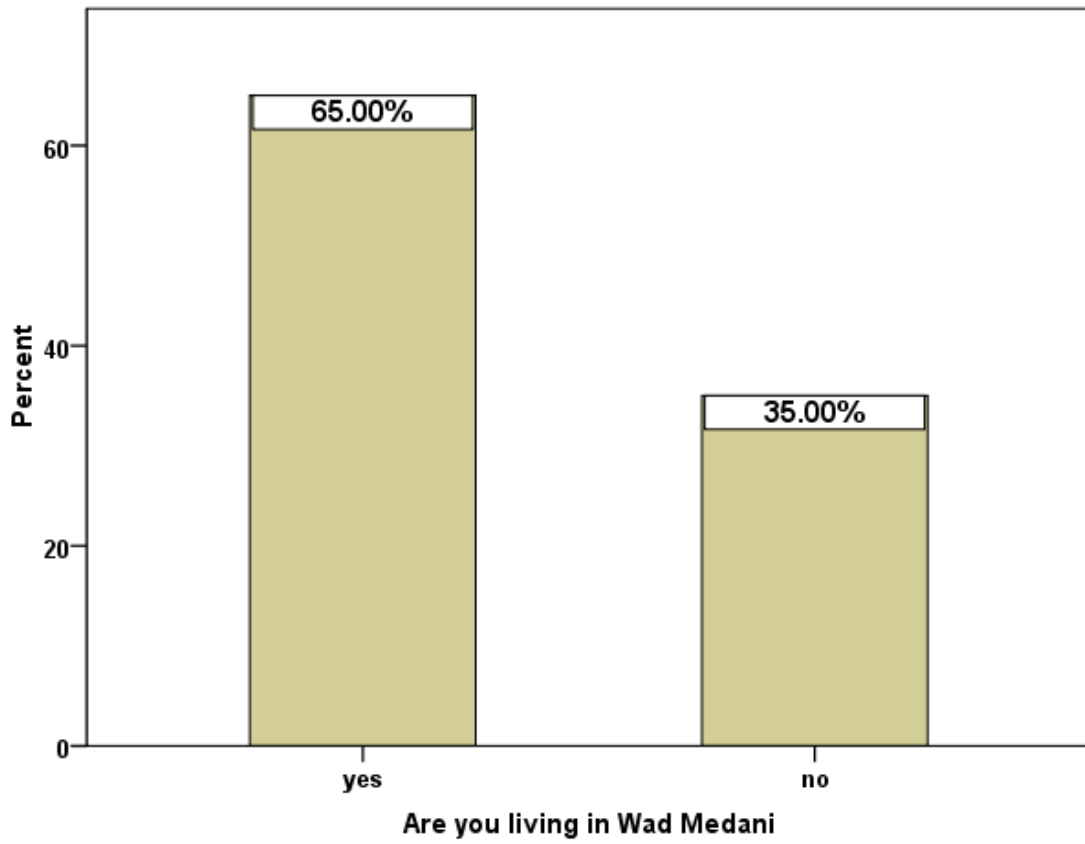


Fig. 4.25: Are El Gezira Tourist Park respondents living in Wad Medani city?

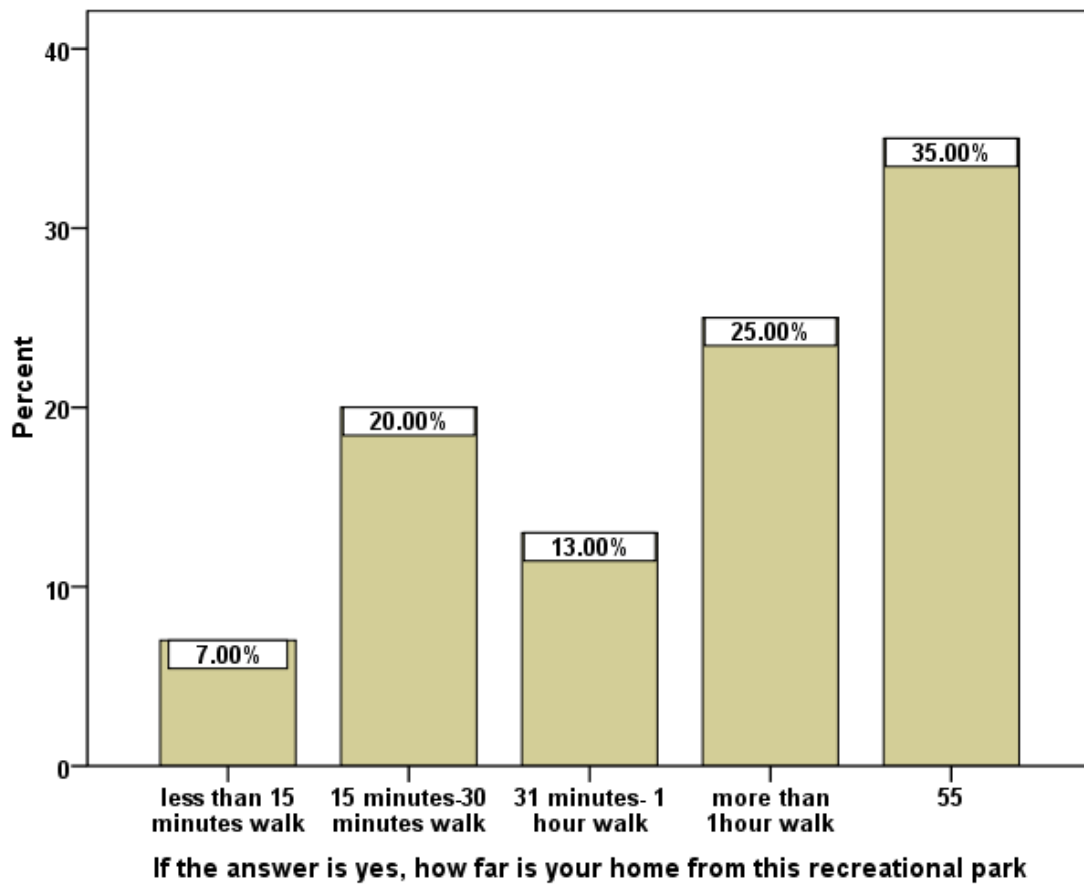


Fig. 4.26: How far is El Gezira Tourist Park respondents' home from the park?

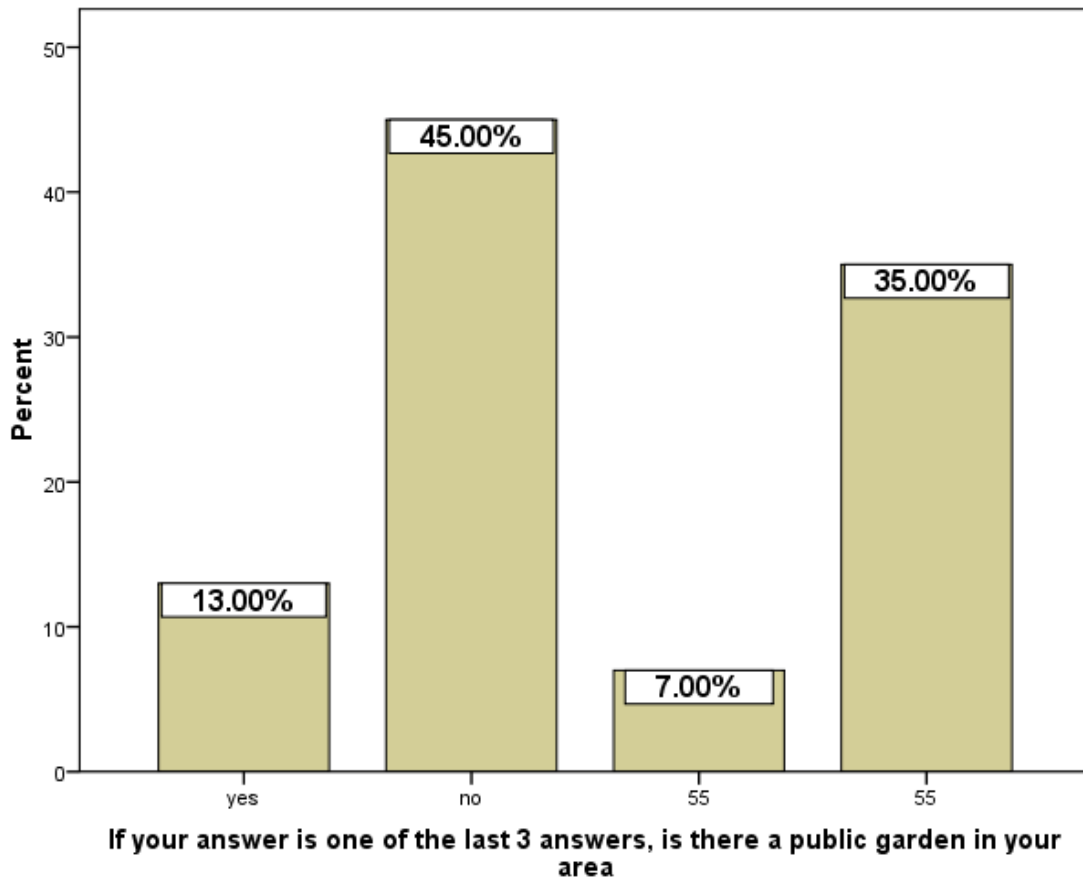


Fig. 4.27: If El Gezira Tourist Park respondents' answer is one of the last 3 answers, is there public gardens in their areas?

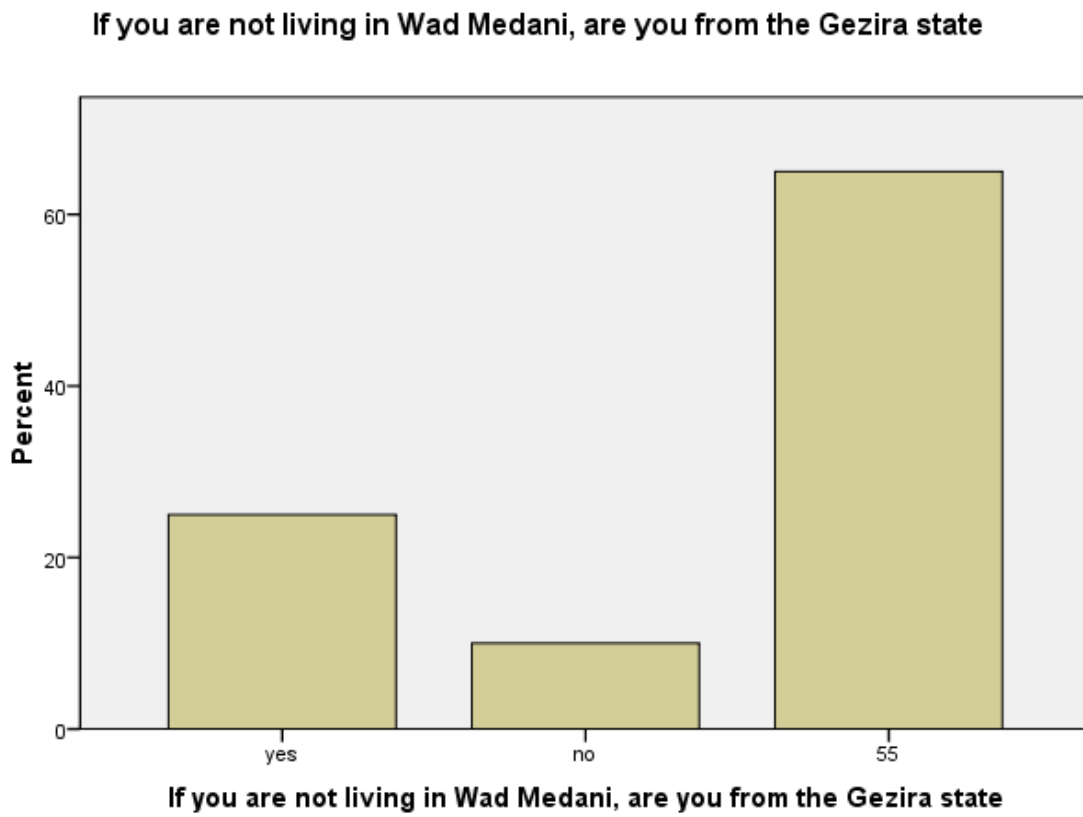


Fig. 4.28: El Gezira Tourist Park respondents who are not living in Wad Medani city are they from Gezira state?

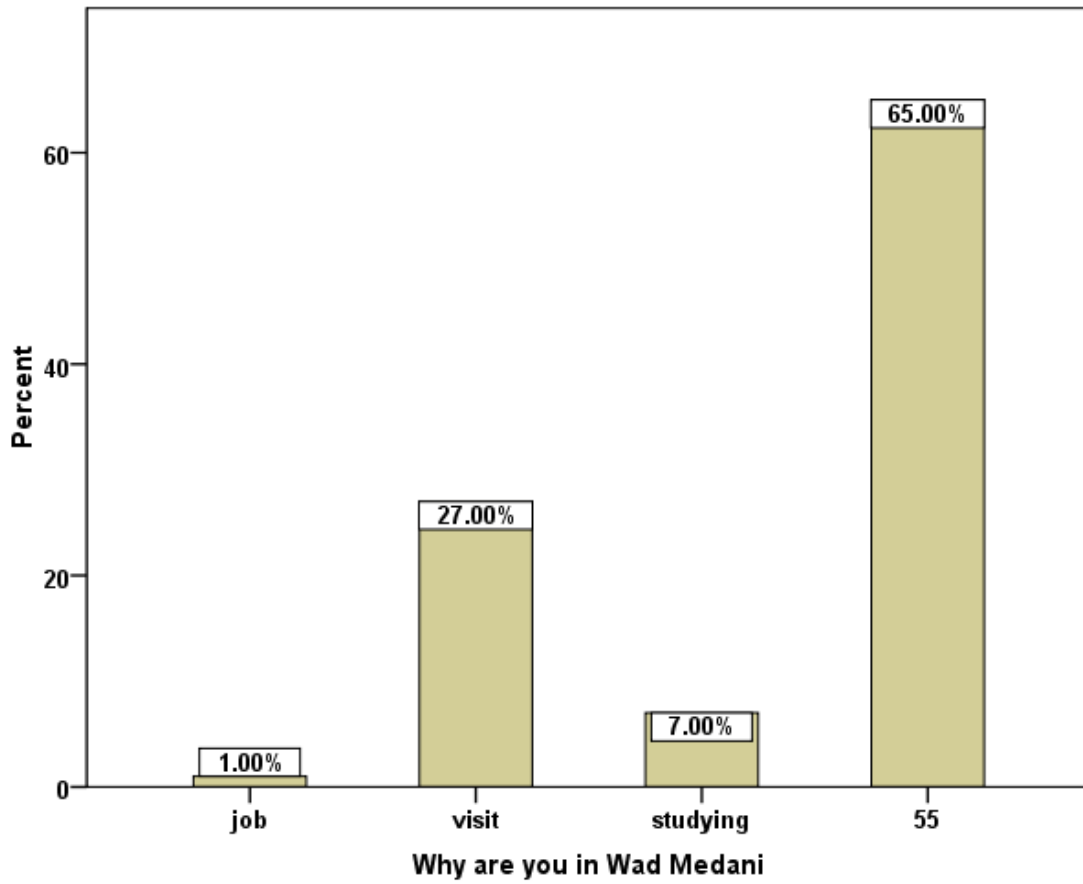


Fig. 4.29: El Gezira Tourist park respondents who are not living in Wad Medani city, why they are in the city?

Part 2:

4.3.2.2 Respondents' visiting and exploitation of the Gezira Tourist Park and their evaluation of the current situation of park

4.3.2.2.1 How important are parks to the overall quality of life in Gezira State?

Findings showed that bulk of respondents (88%) rated the importance of park to the overall quality of life in Gezira State as either, very important (64%) or, important (24%). On the other hand only, (7%) rated it as somewhat important and (5%) don't know the answer. No respondent feel that parks are not at all important (Fig. 4.30).

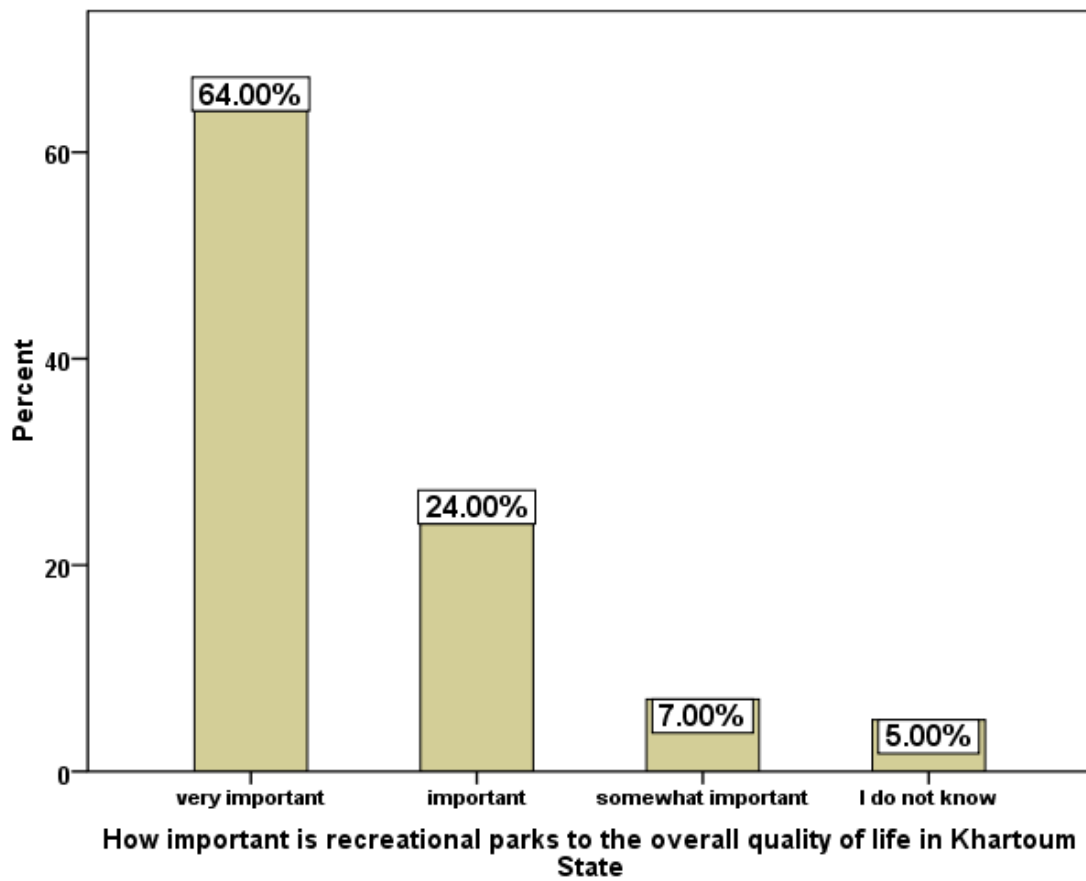


Fig. 4.30: How important are parks to the overall quality of life in Gezira State?

4.3.2.2.2 Evaluating the visiting and exploiting of El Gezira Tourist Park respondents

The verall assessment concerning respondents evaluating, visiting and exploiting of El Gezira Tourist Park is satisfied. The hypothesis that I prefer to have a section for men and another for women in the park is partially satisfied. It is also confirmed that the hypotheses I prefer larger central parks over smaller parks close to my house and I can get to the park site easily are satisfied. On the other hand, the hypotheses I enjoy spending good times in the park, more parks are needed in Gezira State and I would like to visit the park again are strongly satisfied. Further more, in El Gezira Tourist Park amazing finding showed that, nearly, all respondents (95%) agreed that they enjoy spending good times in the park and they would like to visit the park again (Table 4.32).

Table 4.32: Evaluating the visiting and exploiting of El Gezira Tourist Park respondents

	Characteristics of the park	Strongly disagree	Disagree	I don't know	Agree	Strongly Agree	Mean	Trend
1	I prefer larger, central parks over smaller parks close to my house	3%	15%	8%	31%	43%	3.96	Satisfied
2	I can get to the park site easily	5%	13%	5%	34%	43%	3.97	Satisfied
3	I enjoy spending good times in the park	2%	2%	1%	28%	67%	4.56	strongly satisfied
4	I prefer to have a section for men and another for women in the park	10%	34%	9%	18%	29%	3.22	Partially satisfied
5	More parks are needed in Gezira State	3%	2%	9%	22%	64%	4.42	strongly satisfied
6	I would like to visit the park again	1%	0%	4%	31%	64%	4.57	strongly satisfied
	Overall assessment						4.12	Satisfied

Source: own calculations from survey data 2019

4.3.2.2.3 Time of day respondents of El Gezira Tourist Park visit the park

About half of respondents (48%) have no specific time to visit the park, (31%) prefer visiting the park at pm time, while the rest of users visit either, at noon (17%) or at am (4%) (Table 4.33).

Table 4.33: Time of day respondents of El Gezira Tourist Park visit the park

Time of day	Frequency
Am	4
At noon	17
Pm	31
There is no specific time	48
Total	100

Source: own calculations from survey data 2019

4.3.2.2.4 The time of day respondents of El Gezira Tourist Park spend in the park

(43%) of El Gezira Tourist Park respondents spend more than 3 hours in the park, (41%) spend 1-3 hour and few respondents spend either, full day (14%) or, less than one hour (2%) (Table 4.34).

Table 4.34: The time of day respondents of El Gezira Tourist Park spend in the park

The time respondents spend in the park	Frequency
Less than one hour	2
1-3 hours	41
More than 3 hours	43
Full day	14
Total	100

Source: own calculations from survey data 2019

4.3.2.2.5 The basic goals for which El Gezira Tourist Park respondents visit the park

Results showed that enjoy the outdoors or nature is the motive most frequently mentioned by the visitors accounting for the (94%) of the answers. Followed by meet relatives, friends and neighbors (93%) and picnic and general leisure activities (88%). Research findings indicate that (86%) of the respondents visit the park for entertaining children. Participate in family activities accounts for (85%) and Sitting relaxing, leisure, escape from noise, congestion and family problems (70%). The reasons reading (47%), attend or participate in activities and events (47%), attend special events/concerts/movies (46%), eating meals (41%) and sport activities walk or bike for exercise (26%), indoor sports (24%) and play sports (23%) follow in decreasing frequency (Table 4.35).

Table 4.35: The basic goals for which El Gezira Tourist Park respondents visit the park

The purpose	Yes	No	Total
Enjoy the outdoors or nature	94%	6%	100
Meet relatives, friends and neighbors	93%	7%	100
Picnic and general leisure activities	88%	12%	100
Entertaining children	86%	14%	100
Participate in family activities	85%	15%	100
Sitting, relaxing, leisure, escape from noise, congestion and family problems	70%	30%	100
Reading	47%	53%	100
Attend or participate in activities and events	47%	53%	100
Attend special events/concerts/movies	46%	54%	100
Eating meals	41%	59%	100
Walk or bike for exercise	26%	74%	100
Indoor sports	24%	76%	100
Play sports	23%	77%	100

Source: own calculations from survey data 2019

4.3.2.2.6 The first main reason for which El Gezira Tourist Park respondents visit the park

Enjoy the outdoors or nature is the first main reason for which about one third of respondents (34%) visit the park. (17%) of respondents choose picnic and general leisure activities as the first main reason for which they visit the park. The first main reason for (15%) of respondents to visit the park is entertaining children. Sitting, relaxing, leisure, escape from noise, congestion and family problems are the first main reasons for (12%) of respondents to visit the park. (8%) of respondents visit park mainly to meet relatives, friends and neighbors. Reading and attend or participate in activities and events are the first main reasons for which (3%) and (1%) of respondents, respectively, visit the park (Table 4.36).

Table 4.36: The first main reason for which El Gezira Tourist Park respondents visit the park

The first reason	Frequency
Enjoy the outdoors or nature	34
Picnic and general leisure activities	17
Entertaining children	15
Sitting, relaxing, leisure, escape from noise, congestion and family problems	12
Meet relatives, friends and neighbors	8
Reading	3
Attend or participate in activities and events	1

Source: own calculations from survey data 2019

4.3.2.2.7 The second main reason for which El Gezira Tourist Park respondents visit the park

Meet relatives friends and neighbors is the second main reason for which about one third of respondents (31%) visit the park. (19%) of respondents choose entertaining children as the second main reason for which they visit the park. The second main reason for (15%) of respondents visit the park is enjoy the outdoors or nature. Sitting, relaxing, leisure, escape from noise, congestion

and family problems are the second main reasons for (8%) of respondents visit the park. (8%) of respondents visit the park to participate in family activities as the second reason. (5%) and (3%) of respondents choose reading and play sports, respectively, as the second main reason for which they visit the park. On the other hand, (2%) and (1%) of respondents choose attend special events/concerts/movies and walk or bike for exercise, respectively, as the second main reason for which they visit the park (Table 4.37).

Table 4.37: The second main reason for which El Gezira Tourist Park respondents visit the park

The second reason	Frequency
Meet relatives, friends and neighbors	31
Entertaining children	19
Enjoy the outdoors or nature	15
Participate in family activities	8
Sitting, relaxing, leisure, escape from noise, congestion and family problems	8
Reading	5
Play sports	3
Attend special events/concerts/movies	2
Walk or bike for exercise	1

Source: own calculations from survey data 2019

4.3.2.2.8 When do respondents of El Gezira Tourist Park usually visit the park?

(38%) of respondents rarely visit the park, (36%) of them have a frequent visit, and (26%) of respondents sometimes visit the park. (Table 4.38)

Table 4.38: When do respondents of El Gezira Tourist Park usually visit the park?

The frequently of the visit	Frequency
Frequently (Once a week or more)	36
Sometimes (1-2 times a month)	26
Rarely (Less than 5 times a year)	38
Total	100

Source: own calculations from survey data 2019

4.3.2.2.9 If respondents rarely visit El Gezira Tourist Park, what are the reasons?

(22%) of respondents rarely visit the park because they are busy and don't have enough time, others (22%) due to the lack of facilities. (18%) of respondents rarely visit because the exorbitant material cost-too expensive and (17%) rarely visit because the park is not conveniently located or too far away from them. (11%) of respondents prefer playing playstation or watching television rather than visiting to the park. (10%) refer their rare visit to the crowdedness of the park. (7%) physically unable to participate, (6%) don't like visiting parks, (5%) Feel unsafe and (1%) don't know why they rarely visit the park (Table 4.39).

Table 4.39: If respondents rarely visit El Gezira Tourist Park, what are the reasons?

The reason	Yes	No	55	Total
I'm busy (I don't have enough time)	22	16	62	100
Lack of facilities	22	16	62	100
Exorbitant material cost-too expensive	18	20	62	100
Not conveniently located or too far away	17	21	62	100
I prefer playing playstation or watching television	11	27	62	100
The park is very crowded	10	28	62	100
Physically unable to participate	7	31	62	100
I don't like going to parks	6	32	62	100
Feel un safe	5	33	62	100
I don't know	1	37	62	100
Nothing from the above	0	38	62	100

Source: own calculations from survey data 2019

4.3.2.2.10 Financial expenses in El Gezira Tourist Park

More than half of respondents (58%) revealed that the price of the entry ticket is Suitable, (41%) rate it as high and (1%) choose the answer I don't know.

More than half of respondents (58%) declared that the price of tickets for stadiums is high, (31%) rate it as suitable, (9%) choose the answer I don't know and (2%) assess it as low.

Bulk of respondents (77%) evaluate the price of food and drinks as high, (12%) say it is Suitable and (11%) don't know the answer.

Majority of respondents (70%) assessed the price of other purchases as high, (17%) evaluate it as suitable and (13%) don't know the answer (Table 4.40).

Table 4.40: Financial expenses in El Gezira Tourist Park

Financial expenses	Suitable	High	Low	I don't know	Total
Price of the entry ticket	58	41	0	1	100
Price of tickets for stadiums	31	58	2	9	100
Price of food and drinks	12	77	0	11	100
Price of other purchases	17	70	0	13	100

Source: own calculations from survey data 2019

4.3.2.2.11 Do you or your family feel harassed when you visit El Gezira Tourist Park?

The majority of respondents (88%) do not feel harassed when they visit the park, only (12%) of them feel (Table 4.41).

Table 4.41: Do you or your family feel harassed when you visit El Gezira Tourist Park?

Do you feel harassed	
Yes	12
No	88
Total	100

Source: own calculations from survey data 2019

4.3.2.2.12 Do you go elsewhere to entertain other than El Gezira Tourist Park?

Two thirds of respondents (66%) go elsewhere to entertain, while one third (34%) entertain mainly in this park (Table 4.42).

Table 4.42: Do you go elsewhere to entertain other than El Gezira Tourist Park?

Do respondents go elsewhere to entertain	
Yes	66
No	34
Total	100

Source: own calculations from survey data 2019

4.3.2.2.13 What do respondents think about the number of visitors of El Gezira Tourist Park, compared with the last ten years?

Almost half of respondents (46%) declared that the park visitor's increased, while (22%) of them stated that the park visitor's decreased. On the other hand, (7%) rated it as unchanged and (25%) don't know the answer (Table 4.43).

Table 4.43: What do respondents think about the number of visitors of El Gezira Tourist Park compared with the last ten years?

Number of visitors	Frequency
Decreased	22
Increased	46
Unchanged	7
I don't know	25
Total	100

Source: own calculations from survey data 2019

4.3.2.2.14 How would respondents rate the physical conditions of El Gezira Tourist Park?

(69%) of respondents rated the physical conditions of the park as either, excellent (26%) or, good (43%). On the other hand, (30%) rated it as either, fair (26%) or, poor (4%). Only (1%) of respondent doesn't know the answer (Table 4.44).

Table 4.44: How would respondents rate the physical condition of El Gezira Tourist Park?

Rating	Frequency
Excellent	26
Good	43
Fair-ok	26
Poor	4
I don't know	1
Total	100

Source: own calculations from survey data 2019

4.3.2.2.15 The groups that are mostly underserved by El Gezira Tourist Park services

The groups that are mostly underserved by El Gezira Tourist Park services are children / preschoolers (99%), families (96%) and youth (90%). Followed in sequence by people with disabilities (77%), People from diverse cultures (72%) and old people / seniors (67%). While (78%) of respondents indicated that they feel that, all groups are served adequately (Table 4.45).

Table 4.45: The groups that are mostly underserved by El Gezira Tourist park services

Community layers	Yes	No	Total
Children / Preschoolers	99	1	100
Families	96	4	100
Youth	90	10	100
People with disabilities	77	23	100
People from diverse cultures	72	28	100
Old people / Seniors	67	33	100
All groups are served	78	22	100

Source: own calculations from survey data 2019

Part three: 4.3.2.3 Assessment of the service dimensions of El Gezira Tourist Park and its impact on the local community

Results reviewed that the overall assessment of the services dimensions of El Gezira Tourist Park is partially satisfied. Firstly, the dis-satisfied characteristics of the park include private parking is available at the park, (Wi-Fi) service communication operates efficiently in the park, there is an ambulance or first aid room inside the park and in good condition and a complete public library is available in the park. Secondly, the characteristics of the park which are partially satisfied are seats in the park are sufficient durable and comfortable, there are enough trash cans everywhere in the park, male and female toilets are constantly clean in the park, there are hand-washing for men and for women clean and in sufficient number, the park provides free clean and cold drinking water, the park has good cafeterias and restaurants, there are many adult sports fields in the park and radio park offers fun things and useful hints for visitors. Thirdly, the satisfied characteristics of the park include the park staff treats visitors with great taste, the cleanliness of the park is good, the multiple number of entrances and their prominence may differentiate this park, there is excellent lighting throughout the park at night, there are private toilets for men and for women and in sufficient number, the park has a qualified mosque, visitor protection system and control

of entry and exit of the park is convenient and very safe, kids games are multiple, safe, and monitored and the roads and paths of the park are wide and well paved. Finally, the characteristics of the park which are strongly satisfied include large trees are abundant in the park to sit under and the lawn fields are many, wide and safe for children to play and sit on them.

Table 4.46: Assessment of the service dimensions of El Gezira Tourist Park and its impact on the local community

	Characteristics of the park	Strongly disagree	Disagree	I don't know	Agree	Strongly agree	Mean	Trend
1	Large trees are abundant in the park to sit under	1%	6%	0%	24%	69%	4.54	Strongly satisfied
2	The park staff treats visitors with great taste	4%	18%	13%	32%	33%	3.72	Satisfied
3	The cleanliness of the park is good	6%	22%	3%	41%	28%	3.63	Satisfied
4	The multiple number of entrances and their prominence may differentiate this recreational park	1%	10%	2%	43%	44%	4.19	Satisfied
5	Seats in the park Sufficient durable and comfortable	12%	30%	2%	29%	27%	3.29	Partially satisfied
6	There are enough trash cans everywhere in the park	24%	30%	7%	18%	21%	2.82	Partially satisfied
7	There is excellent lighting throughout the park at night	5%	24%	8%	29%	34%	3.63	Satisfied
8	Private parking is available at the park	20%	43%	14%	11%	12%	2.52	Dis-satisfied
9	In the park there are private toilets for men and for women and in sufficient number	2%	13%	7%	33%	45%	4.06	Satisfied
10	Male and female toilets are constantly clean	17%	24%	18%	17%	24%	3.07	Partially satisfied

11	In the park there are hand-washing for men and for women clean and in sufficient number	21%	35%	11%	14%	19%	2.75	Partially satisfied
12	The park has a qualified mosque	5%	32%	7%	21%	35%	3.49	Satisfied
13	The park provides free clean and cold drinking water	33%	28%	6%	12%	21%	2.60	Partially satisfied
14	(Wi-Fi) service communication operates efficiently in the park	44%	22%	22%	5%	7%	2.09	Dis-Satisfied
15	This park has good cafeterias and restaurants	16%	20%	2%	40%	22%	3.32	Partially satisfied
16	Visitor protection system and control of entry and exit of the park is convenient and very safe	4%	12%	5%	42%	37%	3.96	Satisfied
17	Kids games are multiple, safe and monitored	11%	10%	3%	39%	37%	3.81	Satisfied
18	There are many adult sports fields in the park	19%	33%	11%	16%	21%	2.87	Partially satisfied
19	There is an ambulance or first aid room inside the park and in good condition	31%	25%	29%	8%	7%	2.35	Dis-satisfied
20	A complete public library is available in the park	25%	30%	30%	8%	7%	2.42	Dis-satisfied
21	Radio Park offers fun things and useful hints for visitors	16%	22%	18%	20%	24%	3.14	Partially satisfied
22	Lawn fields are many, wide and safe for children to play and to sit on	1%	8%	4%	39%	48%	4.25	Strongly satisfied
23	The roads and paths of the park are wide and well paved	5%	10%	1%	36%	48%	4.12	Satisfied
Overall assessment							3.33	Partially satisfied

Source: own calculations from survey data 2019

Part four:

4.3.2.4 Assessment of the environmental, social and aesthetic impacts resulting from the designing of El Gezira Tourist Park on the local community

4.3.2.4.1 The environmental impacts resulting from the designing of El Gezira Tourist Park on the local community

The overall assessment of the environmental impacts resulting from the designing of El Gezira Tourist Park on the local community is satisfied, as the hypothesis that the park reduces environmental pollution and noise and the park contains many different types of plants are satisfied. Additionally, the hypothesis that the park trees provide large areas of shade and the park is large in area are strongly satisfied. On the other hand, the hypothesis that the park softens the atmosphere by providing water element and by plants is partially satisfied (Table 4.47).

Table 4.47: The environmental impacts resulting from the designing of El Gezira Tourist Park on the local community

	The environmental impact resulting from the establishment of the park	Strongly disagree	Disagree	Idon't know	Agree	Strongly agree	Mean	Trend
1	The park reduces environmental pollution and noise	9%	14%	8%	36%	33%	3.70	Satisfied
2	The park contains many different types of plants	5%	15%	3%	42%	35%	3.87	Satisfied
3	Park trees provide large areas of shade	1%	5%	1%	39%	54%	4.40	strongly satisfied
4	The park softens the atmosphere by the water element and by plants	24%	31%	6%	19%	20%	2.80	Partially satisfied
5	The park is large in area	6%	5%	1%	39%	49%	4.20	strongly satisfied
Overall assessment							3.79	Satisfied

Source: own calculations from survey data 2019

4.3.2.4.1.1 The environmental hazards resulting from the designing of El Gezira Tourist Park on the local community

When examining the environmental hazards resulting from the designing of El Gezira Tourist Park on the local community results showed that the over all assessment is partially satisfied. Additionally, the hypotheses that the accumulation of dirt, the spread of mosquitoes and insects, and congestion and inconvenience are partially satisfied (Table 4.48).

Table 4.48: The environmental hazards resulting from the designing of El Gezira Tourist Park on the local community

	The damages	Strongly disagree	Disagree	I don't know	Agree	Strongly agree	Mean	Trend
1	Accumulation of dirt	15%	38%	7%	22%	18%	2.90	Partially satisfied
2	The spread of mosquitoes and insects	12%	27%	10%	23%	28%	3.28	Partially satisfied
3	Congestion and inconvenience	15%	44%	7%	15%	19%	2.97	Partially satisfied
	Overall assessment						3.05	Partially satisfied

Source: own calculations from survey data 2019

4.3.2.4.2 The social impacts resulting from the designing of El Gezira Tourist Park on the local community

4.3.2.4.2.1 Always, respondents visit El Gezira Tourist Park with companion or alone?

Results of this study showed that (98%) of respondents visit El Gezira Tourist Park with companion, only (2%) of them visit the park alone (Table 4.49).

Table 4.49: Always, respondents visit El Gezira Tourist Park with companion or alone?

Always, respondents visit the park:	
With companion	98
Alone	2
Total	100

Source: own calculations from survey data 2019

4.3.2.4.2.1 If respondents visit El Gezira Tourist Park with companion, whom they accompany with?

About one third of respondents (32%) visit the park accompanied with: Family members (18%), colleagues (12%) and relatives (2%). Interestingly, the other two thirds of respondents (66%) visit the park accompanied with all the mentioned categories. 55 in the table refers to respondents who visit the park alone (Table 4.50).

Table 4.50: If respondents visit El Gezira Tourist Park with companion, whom they accompany with?

Respondents who visit the park with companion, they accompanied with:	Frequency
All that mentioned categories	66
Family members	18
Colleagues	12
Relatives	2
55	2
Total	100

Source: own calculations from survey data 2019

4.3.2.4.2.2 If respondents visit El Gezira Tourist Park alone, what are the reasons?

The (2%) of respondents who visit the park alone, they do so because they don't prefer to be accompanied. 55 in the table refers to respondents who visit the park in groups (Table 4.51).

Table 4.51: If respondents visit El Gezira Tourist Park alone, what are the reasons?

Respondents who visit park alone, what are the reasons?	Frequency
Don't prefer to be accompanied	2
55	98
Total	100

Source: own calculations from survey data 2019

4.3.2.4.2.3 Respondents who visit El Gezira Tourist Park alone, do they talk with the park users?

(47%) of respondents who visit park alone talk with the park users and (53%) do not (Table 4.52).

Table 4.52: Respondents who visit El Gezira Tourist Park alone, do they talk with the park users?

Respondents who visit the park alone, do they talk with the park users?	Frequency
Yes	47
No	53
Total	100

Source: own calculations from survey data 2019

4.3.2.4.2.4 Respondents who talk with the park users, do they make friendship with them?

(40%) of respondents who talk with the park users make friendship with them, while it is a temporary relationships with the remaining (60%). 55 in the table refers to respondents who visit the park alone and do not talk with the park users (Table 4.53).

Table 4.53: Respondents who talk with the park users, do they make friendship with them?

Respondents who talk with park users, do they make friendship with them?	Frequency
It is a temporary relationships	28
Make Friendship with them	19
55	53
Total	100

Source: own calculations from survey data 2019

4.3.2.4.3 The aesthetic impacts resulting from the designing of El Gezira Tourist Park on the local community

The overall assessment of the aesthetic return resulting from the establishment of El Gezira Tourist Park on the local community is satisfied. The hypothesis that the park has a water element in the form of an attractive fountain is dis-satisfied. While the hypothesis that the park design is beautiful and contains some works of art such as statues and others is only partially satisfied. On the other hand, the hypothesis that the park has many beautiful plants and colorful flowers, the lawns fields in the park are green spacious and clipped and the hedges and fences of the park are cut in wonderful shapes are satisfied (Table 4.54).

Table 4.54: The aesthetic returns resulting from the establishment of El Gezira Tourist Park on the local community

	The aesthetic return resulting from the establishment of the park	Strongly disagree	disagree	I don't know	Agree	Strongly agree	Mean	Trend
1	The park has many beautiful plants and colorful flowers	3%	18%	3%	37%	39%	3.91	Satisfied
2	The park has a water element in the form of an attractive fountain	29%	37%	9%	10%	15%	2.45	Dis-satisfied
3	The lawns fields in the park are green spacious and Clipped	6%	11%	1%	34%	48%	4.07	Satisfied
4	The park design is beautiful and contains some works of art such as statues and others	15%	27%	5%	29%	24%	3.20	Partially satisfied
5	The hedges and fences of the park are cut in wonderful shapes	12%	11%	2%	34%	41%	3.81	Satisfied
Overall assessment							3.49	Satisfied

Source: own calculations from survey data 2019

CHAPTER FIVE

DISCUSSIONS

5.1 Discussions of the field visits results

5.1.1 Plant materials present in El Hurriya Park El Gezira Tourist Park and Zabeel Park

Results reported that in El Hurriya Park there is (132) trees, while in El Gezira Tourist Park there is (100) trees, compared to the (3,946) trees in Zabeel Park, so the variation in trees number and diversity between the study parks and the standard park, is very huge.

Shrubs are important plant constituent in parks, (Al qaii, 1988) reported that it is preferred to plant flowering shrubs to give beautiful colors throughout the year. (Al halabi and Galal, 1990) mentioned that it is always preferred to use the shrubs that present in the location as it is considered good indicator of natural selection for these shrubs and it is adapted to local condition. (Anderson, 1992) reported the importance of planting rose gardens in town centre and side corridors of residential gardens. Results of this study revealed that there is only (10) shrub species in El Hurriya Park and (10) shrub species in El Gezira Tourist Park compared to the (26,567) shrub plants in Zabeel park, so the variation in shrubs number and diversity between the study parks and the standard park, is very huge.

Annual Plants are completely absent in both of El Hurriya Park and El Gezira Tourist Park this result is in line with Mohammed (2009) study who reported that, in El Reyad Park (in Khartoum State) the annual Plants are completely absent.

5.2 Discussions of the Questionnaire results of El Hurriya Park and El Gezira Tourist Park

5.2.1 Part one: The demographics of respondents in El Hurriya Park and El Gezira Tourist Parks

5.2.1.1 Gender of respondents in El Hurriya Park and El Gezira Tourist Park

The results of this study reported that in the study parks the attendance of males is greater than females. As in El Hurriya and in El Gezira Tourist Parks (66%) and (56%) of the respondents' sample, respectively, is made up of males. This result was in line with (Jasim, *et al.* 2018) who found that (64.28%) of park visitors were males. Also, (Sufian, 2010) research identified (75.50%) of respondents as males. In Sudan, this may be attributed to that, women are heavily involved in house hold responsibility (preparation of food, revising lessons with kids ... etc) and/or due to that, park services are more suitable for males than females.

5.2.1.2 Age of respondents in El Hurriya Park and El Gezira Tourist Park

Results in El Hurriya Park and El Gezira Tourist Park survey revealed that the highest percentage of respondents (73%) and (60%), respectively, are in the age category of 18-24 years. It also found (18%) and (22%) of the two parks respondents, respectively, are in the range 25-34 years. It seems that the majority of responses represent the opinion of youth and young adults as (91%) and (82%) of the study parks respondents identified themselves as being less than 35 years. This result agreed with (Jasim, *et al.* 2018) who found that (89%) of respondents identified themselves as being up to 35 years, as (60%) of respondents are in the age category of 15-25 years and (28.57%) of them are in the age category of 26-34 year, they concluded that youth are in their prime and they are more energetic so they are more frequent with recreational services in order to: Play, have fun and relax from the pressures of study, they go out with family, friends or alone. Also, Wafa (2015) found that about half of respondents (49%) were under the age of 30 years. On the other hand, this study reviewed that the presence of the age categories 65-74 years and

over 75 years in the two parks represents only (0.5%). This result may be attributed to that Sudanese parks are not attractive to elders and / or in our culture visiting parks is associated only with young people. In the contrary, (Sufian, 2010) stated that, (21.70%) of respondents were above 60 years. Also, the literature cited that seniors are walkers and they walk for walking not because they are going to places on foot. “A nation of young people is a society of hockey and tennis players. A nation of older people is a society of gardeners and walkers” (Foot and Stoffman, 1996). Also (Takano, *et al.* 2002) recommended that in the context of the healthy urban policy and to promote the health of senior citizens, close collaboration among the health, planning, civil engineering, construction and other concerned sectors should be undertaken. Additionally, many government agencies made efforts to ensure older adults walk because of the improvements in health that this exercise produces. (Payne, *et al.* 1998; Payne, *et al.* 2002)

5.2.1.3 Educational level of respondents in El Hurriya Park and El Gezira Tourist Park

Results indicated that (83%) of El Hurriya Park respondents were university educated (72%) graduates and (11%) post graduates and (77%) of El Gezira Tourist Park respondents were university educated (72%) graduates and (5%) post graduates, these results were in line with Wafa (2015) who stated that (88.4%) of respondents have university education. Also, (Shamma, *et al.* 2014) found that most of park visitors (64%) have university education. On the other hand, there is no representation to the illiterate or khallwa education groups in the study parks, those illiterate and khallwa educated are elder, thus confirming the above finding about the relation between seniors and parks in Sudan.

5.2.1.4 Occupation of respondents in El Hurriya Park and El Gezira Tourist Park

Analysis of the survey data indicates that in El Hurriya Park (66%) of respondents were students and (4%) were unemployed. Further more, in El Gezira Tourist Park (54%) of respondents were students and (6%) were unemployed. It is clear that the (70%) and the (60%) of students and unemployed respondents in the two parks, were still family dependent, this finding can conclude

that visiting parks in Sudan is easy and not expensive. This result was in line with (Shamma, *et al.* 2014) finding which declared that most of respondents (56%) are not working, and the study assumed that they are the women came to the park to entertain their children. However, in El Hurriya and El Gezira Tourist Parks the special sector employees represents (1%) and (0%), respectively, and Labor represents (3%) and (4%), respectively, those categories have low park visits, this may be due to their heavily involvement in work. In the study parks the representation of the retired is only (0.5%), another evidence of the bad relation between seniors and parks in Sudan.

5.2.1.5 Monthly income of respondents in El Hurriya and El Gezira Tourist Parks

Amazing result showed that the highest percentage of respondents of El Hurriya Park and El Gezira Tourist Park (70% and 69%), respectively, in monthly income category (none), who are still family dependent which confirm the conclusion that visiting parks in Sudan is in expensive. On the other hand, the highest monthly income category (more than 10000 SDG), have low park visits in both parks rated (5% and 9%) of respondents, respectively. It seems that they have their own means of recreation.

5.2.1.6 Place of birth of respondents in El Hurriya Park and El Gezira Tourist Park

Results identified that almost 4 in 5 park respondents were born in urban areas, as (81% and 79%) of El Hurriya Park and El Gezira Tourist Park respondents, respectively, were born in urban areas. Thus reflecting the importance of parks in urban life.

5.2.1.7 Marital status of respondents in El Hurriya Park and El Gezira Tourist Park

Results presented that most of the park respondents were bachelor, as (84% and 71%) of El Hurriya Park and El Gezira Tourist Park respondents, respectively, were bachelor. On the contrary, (Sufian, 2010) study outlined that (51.90%) of respondents were married, and they

concluded that parks are places for the married people to escape from family problems or places to entertain children and wife to strengthen the family ties.

5.2.1.8 Total monthly household income of respondents in El Hurriya Park and El Gezira Tourist Park

It seems that 2000 -10000 SDG total monthly household income is needed for (40%) and (38%) of El Hurriya Park and El Gezira Tourist Park respondents, respectively, to access the parks. While, less number of respondents, (23%) and (30%) of El Hurriya Park and El Gezira Tourist Park respondents, respectively, have higher total monthly household income of more than 20000 SDG. This result prove and confirm that those who have the higher monthly income and total monthly household income may have their own means of recreation.

5.2.1.9 Are respondents of El Hurriya Park and El Gezira Tourist Park living in Khartoum and Wad Medani cities?

The result revealed that in El Hurriya Park more than (4 in 5) of respondents are from Khartoum city, the same results were recorded by (Wafa, 2015) who found that most of respondents (83.2%) live in Khanyounis city (the center). On the other hand, in El Gezira Tourist Park, about (2 in 3) of respondents are from Wad Medani city. It seems that most of the park users live near the park.

5.2.1.10 El Hurriya Park and El Gezira Tourist Park respondents who live in Khartoum and Wad Medani cities, respectively, and their homes are more than 15 minutes' walk away from the park are there a public gardens in thier areas:

The results proved that (39% and 22%) of respondents who live in Khartoum and Wad Medani cities, respectively, and their homes are more than 15 minutes' walk away from the park, have public gardens in thier areas. They prefer to visit these parks, may be due to the smallest size of

their public gardens or to the unavailability of some services, as analyzed (Shamma, *et al.* 2014) who found that (56%) of park respondents have public gardens in their resident areas.

Part 2:

5.2.2 Respondents Evaluating, visiting and exploitation of El Hurriya Park and El Gezira Tourist Parks and their evaluation of the current situation of the parks

5.2.2.1 How important are parks to the overall quality of life in Khartoum and Gezira States

The researcher observed that, recently, parks in Sudan gain greater popularity and most of the social occasions occurs in parks and gardens. Results of this study proved this observation. When, the bulk of El Hurriya Park respondents (90%) rated the importance of the park to the overall quality of life in Khartoum State as either very important (68%) or important (22%). On the other hand, the majority of respondents (88%) of the Gezira Tourist Park rated the importance of the park to the overall quality of life in Gezira State as either very important (64%) or important (24%). This need of people to experience nature is consistent with (Kaplan and Kaplan, 1989) and (Reihaneh S. Hajmirsadeghi, 2012) studies.

5.2.2.2 Evaluating visiting and exploiting of respondents of El Hurriya Park and El Gezira Tourist Park

Results determined that the overall assessment of the evaluating, visiting and exploiting of respondents of both El Hurriya Park and El Gezira Tourist Park is satisfied. As the hypothesis that I can get to the park site easily is satisfied, the same result was achieved by (Jasim, *et al.*, 2018) who reported that (77.14%) of respondents can easily get to the park site. This finding is in line with (Abu Hajar, 2002) who reported that park location and the ease of accessibility to the park is considered as an important factors to be considered when designing a park, as the

individual's exploitation to the parks depends on the ability to access the parks in ways that are financially inexpensive. The hypothesis that I prefer larger central parks over smaller parks close to my house is also satisfied in the study parks. In other part of this study it is proved that (39%) and (22%) of respondents who live in Khartoum and Wad Medani cities respectively and their homes are more than 15 minutes' walk away from the study parks have public gardens in thier areas. They prefer to visit thiese parks may be due to the smallest size of their public garden or to the unavailability of some services. As analyzed (Shamma, *et at.* 2014) who found that (56%) of park respondents have public gardens in their resident areas. Moreover, the hypotheses that I enjoy spending good times in the park, more parks are needed in Khartoum and Gezira State and I would like to visit the park again are strongly satisfied in the two parks. Repeating parks visits may be due to the fact that visitng parks in Sudan is easy and inexpensive, which is confermed in earlier part of this study. This finding is in line with (Jasim, *et al.* 2018) study which recorded that (74.42%) of respondents repeat their visits to the park, and the study concluded that easily getting to the park site may be one of the reasons that encourage the visitors to visit the park again. In El Gezira Tourist Park amazing finding showed that nearly all respondents (95%), agreed that, they enjoy spending good times in the park and they would like to visit the park again.

5.2.2.3 The time respondents of El Hurriya Park and El Gezira Tourist Park spend in the parks

Results found that in El Hurriya Park and El Gezira Tourist Park (57%) and (41%) of respondents, respectively, spend 1-3 hours in the park, while (33%) and (43%) of them spend more than 3 hours. On the other hand, (Shamma *et al.* 2014) study found that (73%) of respondents spend 1-2 hours in the park.

5.2.2.4 The basic goals for which respondents of El Hurriya and El Gezira Tourist Parks go to the Parks

Visitors in the parks can enjoy a wide variety of community activities and recreational pursuits. Enjoy the outdoors or nature is the first main reason why respondents visit El Hurriya and El Gezira Tourist Parks accounting for (92%) and (94%) of the answers, respectively. (Arpana and

Anjana, 2014) Results confirm that relaxing and enjoying nature, are the motives most frequently mentioned by the respondents accounting for the (52%) and (35%) of the answers, respectively.

While, Meet relatives, friends and neighbors is the second main reason as mentioned by (92%) and (93%) of El Hurriya and El Gezira Tourist Parks, respectively, this finding is confirmed by (Buchan and Dianne, 2007) result who stated that: Parks provide a place for people to be engaged together in an activity, this is an important element in developing social cohesion with-in a community.

The third main reason why respondents visit El Hurriya and El Gezira Tourist Parks is picnic and general leisure activities accounting for (81%) and (88%) of the answers respectively.

Respectively, (71%) and (86%) of El Hurriya and El Gezira Tourist Parks respondents visit the parks to entertain the children. Also, (Shamma, *et al.* 2014) research reported that (97%) of respondents access to the park to entertain children. In the respect of entertaining children nature fulfils important social functions in strengthening family ties with benefits accrued to both parents and children. Nature provides safe places for children to play, which are increasingly scarce in modern cities. It has been suggested that the senses of challenge and adventure children experience in nature contribute positively to their development (Cornell and Hadley, 2001). Similarly, (Taylor, *et al.* 1998) study concluded that higher levels of creative play were observed in the green spaces than in the barren areas, and that children playing in the green spaces had good chance to be with adults a factor that can help the development of interpersonal skills.

The basic goals for which (79% and 70%) of El Hurriya and El Gezira Tourist Parks respondents, respectively, visit the parks are sitting, relaxing, leisure, escape from noise, congestion and family problems. As we experienced, in the time less and silent atmosphere of natural environments visitors can breathe freshair, forget the daily worries and relax, both mentally and physically. As (Kuo, *et al.* 1998) presentation: Greenery reduce aggression and induce relaxtion. It is also recognized that natural environments with water and vegetation causes relaxation and reduce stress in observers compared with urban scenes without vegetation (Schroeder, 1991). This ability of natural elements is beneficial in urban areas where stress is common dimentions of daily living.

Sport activities walk or bike for exercise indoor sports play sports gained the least importance in Sudanese parks counting for (26%) (24%) and (23%) in El Hurriya Park and (59%) (31%) and (28%) El Gezira tourist parks. Although (World Health Organisation, 2016) revealed that beneficial health effects of parks include reduction in cardiovascular morbidity mortality obesity risk of type 2 diabetes and improved mental health and pregnancy outcomes. Literature stated that access to parks has been associated with reduced stress levels (Ulrich, 1981; Hartig, *et al.* 2003; Grahn, 2003; Mass, *et al.* 2006; Nielsen, 2007) reduced depression (Morita, *et al.* 2007; Santana, *et al.* 2009) and positively influenced the longevity of urban senior citizens (Takano, *et al.* 2002).

People's motives least frequently mentioned by the visitors include eating meals and reading accounting for the (45%) and (38%) in El Hurriya Park and (41%) and (47%) El Gezira Tourist Park. I observed that most visitor visit parks holding the needed foods and drings this may be due to the economical reasons.

(Reihaneh, 2012) research out lined that the motive most frequently mentioned by the park visitors, in sequence, are: To relax, to be in nature, to be with the children, to sport and to meet others.

5.2.2.5 When do respondents of El Hurriya Park and El Gezira Tourist Park go to the parks?

Respondents rarely visiting the parks accounts for (17%) and (38%) of El Hurriya and El Gezira Tourist Parks, respectively. When the respondents, of the two parks, were asked why rare visit they summarized the most important reasons, in sequence, as lack of time, lack of facilities in the parks, the cost of the park visit and the park location is too far away. On the other hand, (63%) and (17%) of respondents have a frequent visit, this may be due to that young people daily go to parks in groups to play football and other people visit once a week, during the weekend, to gather with family and friends and/or to entertain the children. As (Jasim, *et.al.* 2018) results where (74.4%) of respondents have frequent visits to the park. Also (Shamma, *et al.* 2014) study found that (83%) of respondents visit the park 1-2 times per week. (Paraskevi, *et al.* 2016) indicated that frequent and longer visits of parks significantly improved resident's well-being. Also,

(Godbey, *et al.* 1992) survey revealed that there is a significant relation between the use of the parks and the perceived state of health where those who used parks frequently were more likely to report good health than those who did not.

Moreover, (20%) and (63%) of them sometimes visit the park, some of them visit the parks once a month, may be joining the parks visit with the monthly salary to benefit from it for recreation.

5.2.2.6 How would respondents rate the Physical Condition of El Hurriya Park and El Gezira Tourist Park?

About half of El Hurriya Park respondents (46%), rate the general upkeep and maintenance of the park, as fair or O.K, while the other half rate it as either good (24%) or poor (22%). Low rating may be due to the croudness to the absence of the shady areas or to the opening only at night. On the other hand, it seems that (69%) of El Gezira Tourist Park respondents satisfied with their park as they rated it as either excellent (26%) or good (43%). (Paraskevi, *et al.* 2016) recommended that resident's well-being is related to their satisfaction with urban green infrastructure. (26%) of El Gezira Tourist Park respondents rate it as O.K.

Part Three:

5.2.3 Assessment of the services dimentions in El Hurriya Park and El Gezira Tourist Park and thier impacts on the local community

Results showed that the overall assessment of the services dimensions in both, El Hurriya Park and El Gezira Tourist Park, are partially satisfied, this result is in line with (Shamma, *et at.* 2014) study results where the overall assessment of the services dimentions is partially satisfied. The partially satisfied characteristics in the two park include: 1/ There are enough trash cans everywhere in the two parks. Also, (Shamma, *et at.* 2014) study found the cleanliness of the park is partially satisfied. 2/ The parks have good cafeterias and restaurants. It is noticed that, lot of visitors come to the parks with their food and drinks, and that, (74%) and (77%) of the two parks

respondents, respectively, outlined that the prices of foods and drinks in the two parks are high. 3/ There are many adult sports fields in the two parks. 4/ Radio Parks offers fun things and useful hints for visitors. Further more, the following characteristics of the two parks are satisfied: 1/ The multiple number of entrances and their prominence may differentiate these parks. 2/ There is excellent lighting throughout the two parks at night. 3/ Visitor protection systems and control of entry and exit of the two parks are convenient and very safe. 4/ The roads and paths of the two parks are wide and well paved. The above factors were also satisfied in (Shamma, *et al.* 2014) study. 5/ the park has a qualified mosque. Results stated that the following characteristics are dissatisfied in the two parks: 1/ There is an ambulance or first aid room inside the park and in good condition. 2/ A complete public library is available in the park.

Part four:

5.2.4 Assessment of the social impacts of the study parks on the local community

5.2.4.1 El Hurriya Park and El Gezira Tourist Park, are they places for social participation or a places for isolation?

Dividing respondents groups, nearly, all respondents of El Hurriya and El Gezira Tourist parks (97%) and (98%), respectively, visit the parks in accompany. This result was in line with (Shamma, *et al.* 2014) who found that (88%) of respondents visit park in accompany. Confirming these findings many researchers reported that parks represent a democratic forum for citizens and society, they provide meeting places and bring communities together, thus they increase social interaction and integration among neighbors and shape the cultural identity of the area. (Coley, *et al.* 1997; Kuo and Francis, 2001; Baulkwill, 2002; Hagelskamp, 2003).

Interestingly, in the two parks, one third of respondents visit the parks in companion with colleagues, family members or relatives. While, the other two thirds of them, visit the park in companion with all the mentioned categories. In communities other than Sudan, as (Sufian, 2010) report, (61.30%) of respondents visit the park alone.

5.3 Conclusions

Plant materials in both El Hurriya and El Gezira Tourist Parks are very few compared to those in Zabeel Park.

Two third of the architectural elements and the public facilities present in Zabeel Park are available in El Hurriya and in El Gezira Tourist Parks.

Each one of the study parks have nearly half of the recreational, cultural and sport facilities present in Zabeel Park.

El Gezira Tourist Park showed more diversity in plants than El Hurriya Park, while El Hurriya Park is more integrated in services and other facilities than El Gezira Tourist Park.

In El Hurriya Park almost two thirds of respondents visit the park at pm time, this may be attributed to the fact that, the park have very few shade trees or other shaded areas.

The respondents of both study parks, declared thier partiall satisfaction with the services dimentions in both study parks.

Respondents of El Hurriya Park expressed their partial satisfaction with the environmental impacts resulting from the park design, while respondents of El Gezira Tourist Park expressed their satisfaction with the environmental impacts resulting from the designing of El Gezira Tourist Park.

Parks in Sudan are places for social participation communicating respondents with all community groups.

Respondents of El Hurriya Park showed their partial satisfaction with the aesthetic return resulting from the designing of the park, while respondents of El Gezira Tourist Park showed their satisfaction with the aesthetic return resulting from the park designing.

The service, environmental and aesthetic dimentions in El Hurriya Park, and the service dimentions in El Gezira Tourist Park, did not gain the required importance at thier costruction.

5.4 Recommendations

From the evaluation of this study the following improvement proposals can be recommended:

(1) For both El Hurriya Park and El Gezira Tourist Park: The number of trees, shrubs, bulbs and cacti should be increased. Moreover, areas for flower beds and ground covers. All services and facilities as well as, barbequing places, restrooms, newly facilities for people of determination, the communication service (WiFi), cricket field, golfing area, fitness center, ice skating and various monuments could be added.

(2) For El Hurriya Park open all day time and adding bicycles rent service and some arty elements to the park design. Moreover, fertilization and mowing of lawns fields, hedges and fences.

(3) For El Gezira Tourist Park add an electronic and paper library and parking lots services. Facilities such as Jogging track, large screens, skate boarding and exhibition hall could be added. Also, add water and arty elements to the park design and use qualified agricultural staff.

(4) Respondents who assess the parks through the questionnaire survey are less than 35 years, highly educated and born and live in urban areas. So park's managers can get use of their improvement proposals for the study parks.

(5) In the study parks the presence of males is higher than females. There-for the parks services should be improved to be more suitable and attractive to females.

(6) Elder representaion in the study parks is very week so efforts should be done to attract this community group.

(7) The research results stated that: More parks are needed in Khartoum and Gezira states and that the use of large central parks is preferred over the use of small public gardens, there for awareness should be given to increase the number of parks in the two cities. At the same time, attention should be paid to improve the small public gardens to serve the nearby visitors and to reduce stress on the large central parks.

(8) In the two parks the financial expences for stadiums, food and drinks, and the other purchases are high. There for efforts should be done to manage this proplem.

(9) For people with determinations El Hurriya Park and El Gezira Tourist Park managers can do as in the Zabeel Park where a/ The entrance fees is free for people with special needs. b/ Special parking lots were allocated for them close to the parks entry gates. c/ Smooth corridors. d/ Special toilettes, rest rooms and games were designed for them.

The researcher have some recommendations from his own observations including:

(10) I think it is better to develope boxes for suggestions and complains in the parks and the management should study and use what inside the boxes.

(11) I think the turf grass grown in the lawn fields under the trees in El Gezira Tourist Park should be changed by a grass type able to tolerate shade.

(12) I noticed that recently in Sudan most of the social occasions occairs in parks so park designer and the developemental proposals should take into acount the needed services.

(13) It is well known that Sudan is rich in elements needed for parks developement only scientific researches and governmetal efforts are very much needed.

(14) All the mentioned development proposals can help decision makers to formulate strategies for further parks developement in Sudan.

It should be reported that the researcher was faced with many obesticles like the lack of books scientific journals researches thesis and other references related to gardens and parks in Sudanese libraries. Also the lack of data bases publications and periodicals in Sudanese government institutions related to gardens and parks burdens the researcher in obtaining the necessary information to conduct the study. In addition to the lack of experts and specialized persons in this field. All these limitations nesseciate more efforts and integration work between government and universities to inrich this dimentions in Sudan.

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APPENDIX (A)

جامعة السودان للعلوم و التكنولوجيا

كلية الدراسات العليا

استبانة علمية عن متنزه الحرية بولاية الخرطوم

الأخ الكريم / الأخت الكريمة:

السلام عليكم و رحمة الله تعالى و بركاته

تحتوي هذه الاستبانة على مجموعة من الأسئلة التي تهدف لعمل مقترحات تقييم و تقويم لبعض المنتزهات في ولاية الخرطوم مقارنةً بمنتزه قياسي.

أرجو تكرمكم بالإجابة الدقيقة عن كل الأسئلة الموجودة بالاستبانة و ذلك بوضع علامة (صاح) أمام الإجابة التي تراها مناسبة.

نؤكد لكم بأن هذه المعلومات ستعامل بسرية تامة و سوف تستعمل فقط لأغراض البحث العلمي.

و جزاكم الله خيراً

الباحث

المحور الأول: البيانات الشخصية لمستعملي المتنزه :

1/ الجنس:

() ذكر () أنثى

2/ العمر:

() 24-18 سنة () 34-25 سنة () 44-35 سنة () 54-45 سنة

() 64-55 سنة () 74-65 سنة () أكبر من 75 سنة

3/ المستوى التعليمي:

() أمي () خلوة () يقرأ و يكتب () أساس () ثانوي () جامعي () تعليم عالي

4/ المهنة:

() موظف حكومي () عامل () صاحب أعمال حرة () ربة منزل () طالب

() لا يعمل () متقاعد

5/ الدخل الشهري:

() أقل من 1000 جنييه () 5000-1000 جنييه

() 10000-5001 () أكثر من 10000 جنييه () لا يوجد دخل

6/ مكان الميلاد:

() ريف () مدينة

7/ الحالة العائلية:

() أعزب () متزوج () أرمل () مطلق

8/ عدد أفراد الأسرة (شاملاً شخصك):

() أقل من 3 () 6-3 () 10-7 () أكثر من 10

9/ مجموع الدخل الشهري لكل أفراد الأسرة:

- () أقل من 2000 جنيه
 () 2000 - 10000 جنيه
 () 10001 - 20000 جنيه
 () أكثر من 20000 جنيه
 () لا يوجد دخل

10/ هل تقيم في مدينة الخرطوم؟

- () نعم
 () لا

11/ إذا كانت الإجابة بنعم، كم يبعد منزلك عن هذا المنتزه؟

() أقل من 15 دقيقة من المشي

() أقل من 30 دقيقة من المشي

() أقل من ساعة من المشي

() أكثر من ساعة من المشي

12/ إذا كانت إجابتك بأحد الثلاث حالات الأخيرة، فهل يوجد في حيك حديقة عامة؟

- () نعم
 () لا

13/ إذا لم تكن مقيماً بمدينة الخرطوم، فهل أنت من ولاية الخرطوم؟

- () نعم
 () لا

14/ ما هو سبب تواجدك في مدينة الخرطوم؟

- () عمل
 () زيارة
 () دراسة
 () خدمات ادارية

المحور الثاني: ارتياد و استعمال المواطنين للمتنزه و تقييمهم لحالته الراهنة :-

15/ كيف تُقيم أهمية المتنزهات للمجتمع المحلي؟ (اختر إجابة واحدة)

() هامة جداً () هامة () قليلة الأهمية () غير هامة بالمرّة () لا أدري

16/ فيما يلي مجموعة من الجمل المتعلقة باستعمال و تقييم المتنزه ، حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	خصائص المتنزه
					أفضل متنزهات مركزية أكبر على متنزهات أصغر قريبة من منزلي
					أستطيع أن أصل إلى موقع المتنزه بسهولة
					أستمتع بقضاء أوقات جميلة بالمتنزه
					أفضل أن يكون هناك قسم خاص بالرجال و اخر بالنساء في المتنزه
					هنالك حاجة للمزيد من المتنزهات في ولاية الخرطوم
					أرغب في زيارة المتنزه مرات أخرى

17/ هل تشعر أنت أو أفراد أسرتك بمضايقات حين زيارتكم المتنزه ؟

() نعم () لا

18/ كيف تُقيم الحالة الراهنة للمتنزه ؟ (اختر إجابة واحدة)

() ممتازة () جيدة () متوسطة () سيئة () لا أدري

19/ في أي وقت من اليوم تذهب إلى المتنزه ؟ (اختر إجابة واحدة)

() صباحاً () في وقت الظهيرة () مساءً () لا يوجد وقت معين

20/ الزمن الذي تقضيه في المتنزه ؟ (اختر إجابة واحدة)

() أقل من ساعة () 1-3 ساعات () أكثر من 3 ساعات () اليوم بأكمله

21/ ما هي الأهداف الأساسية التي من أجلها تذهب إلى المتنزه ؟ (ضع علامة صح أمام كل غرض)

و متى تذهب لهذه الأهداف ؟ (ضع علامة صح أمام الوقت الذي تذهب فيه)

الغرض	نعم	لا	مرة أو أكثر في الأسبوع	1-2 مره في الشهر	أقل من 5 مرات في السنة
التمتع بالهواء الطلق أو الطبيعة					
لعب كرة القدم					
ممارسة رياضة الركض، المشي أو ركوب الدراجات					
المشاركة في الأنشطة العائلية					
ترفيه الأطفال					
ممارسة الرياضة في الاماكن المغلقة					
التنزه و الأنشطة الترفيهية العامة					
القراءة					
حضور المناسبات الخاصة و الحفلات و الأفلام					
لقاء الاهل أو الاصدقاء أو الجيران					
حضور أو المشاركة في الأنشطة و الفعاليات					
تناول الوجبات					
الجلوس/الاسترخاء/قضاء وقت الفراغ/الهروب من الضجيج و الازدحام و المشاكل الأسرية					

22/ من الجدول أعلاه أذكر أهم سببين من أجلها تذهب إلى المتنزه ؟

السبب الأول:.....

السبب الثاني:.....

23/ إذا كنت نادراً ما تذهب إلى المتنزه، ما هي الأسباب ؟ (أختَر نعم أو لا)

لا	نعم	الأسباب	لا	نعم	الأسباب
		جسدياً غير قادر على المشاركة			التكلفة المادية الباهظة
		لا أرغب في الذهاب إلى المتنزهات			موقع المتنزه غير ملائم أو بعيد جداً
		أفضل لعب البلاي إستيشن/أو التلفزيون			أنا مشغول/ لا أملك الوقت الكافي
		لا أدري			النقص في المرافق و المنشآت
		لا شي مما بالأعلى			أشعر بعدم الأمان
					المتنزه مزدحم جدا

24/ فيما يلي مجموعة من الجُمَل المتعلقة بالمصروفات المالية داخل المتنزه ، حدد مدى موافقتك أو معارضتك لكل جملة

باختيارك لإجابة واحدة فقط:

لا أدري	منخفض	مرتفع	مناسب	المصروفات المالية
				سعر تذكرة الدخول
				سعر تذاكر الملاعب
				سعر المأكولات و المشروبات
				سعر المشتريات الأخرى

25/ هل ترى أن عدد زوار المتنزه مقارنة مع العشر سنوات الماضية ؟

() تناقص () تزيد () لم يتغير () لا أدري

المحور الثالث: تقييم الأبعاد الخدمية للمتنزه و تأثيرها على المجتمع المحلي:-

26/ فيما يلي مجموعة من الجمل المتعلقة بالخدمات الموجودة في المتنزه ، حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	خصائص المتنزه
					الأشجار الكبيرة توجد بكثرة في المتنزه للجلوس في ظلها
					العاملون بالمتنزه يتعاملون بذوق عالٍ مع الزوار
					مستوى النظافة العامة في المتنزه جيد
					تعدد المداخل و وضوحها ما يميز هذا المتنزه
					المقاعد الموجودة في المتنزه كافية ومتينة و مريحة
					هنالك عدد كافٍ من صناديق النفايات موزعة في كل مكان داخل المتنزه
					توجد إنارة ممتازة في جميع أنحاء المتنزه ليلاً
					توجد مواقف سيارات خاصة بالمتنزه
					يوجد في المتنزه دورات مياه خاصة للرجال وأخرى خاصة للنساء ، و بعدد كافٍ
					دورات المياه الخاصة بالرجال و الخاصة بالنساء نظيفة باستمرار
					يوجد في المتنزه مغاسل للأيدي خاصة للرجال وأخرى خاصة للنساء، نظيفة و بعدد كافٍ
					يوجد بالمتنزه مسجد مؤهل
					المتنزه يوفر مياه للشرب نظيفة و باردة
					خدمة الإنترنت ال(واي-فاي) تعمل و بكفاءة في المتنزه
					يتميز هذا المتنزه بوجود كافيتريات و مطاعم جيدة
					نظام حماية الزوار والسيطرة علي الدخول والخروج مناسب و امن
					ألعاب الأطفال متعددة و آمنة ومراقبة
					تتوفر بالمتنزه العديد من الملاعب الرياضية للكبار
					توجد سيارة إسعاف أو غرفة للإسعافات الأولية داخل المتنزه و بحالة جيدة
					تتوفر مكتبة عامة مكتملة في المتنزه
					إذاعة المتنزه تقدم أشياء ممتعة وتنويهات مفيدة للزوار
					ميادين النجيلة كثيرة و واسعة و امنة للعب الأطفال و الجلوس عليها
					الطرق والممرات بالمتنزه واسعة و مرصوفة جيداً

المحور الرابع: تقييم التأثيرات البيئية والاجتماعية والجمالية للمتنزه على المجتمع المحلي:-

27/ فيما يلي مجموعة من الجمل المتعلقة بالمرود البيئي الناتج عن قيام المتنزه حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	المرود البيئي الناتج عن قيام المتنزه
					المتنزه يقلل من التلوث البيئي و الضوضاء
					المتنزه يحتوي على أنواع كثيرة ومختلفة من النباتات
					أشجار المتنزه توفير مساحات واسعة من الظل
					المتنزه يلطف الجو بتوفير عنصر الماء، و بفعل النباتات
					يتصف المتنزه بسعته و كبر مساحته

28/ فيما يلي مجموعة من الجمل المتعلقة بالأضرار البيئية الناتجة عن قيام المتنزه حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	الأضرار الناتجة من قيام المتنزه
					تراكم الاوساخ
					انتشار البعوض و الحشرات
					الازدحام و الازعاج

هل المتنزه مجال للمشاركة الاجتماعية أم مجال للإنفراد و العزلة عن المجتمع ؟

29/ هل تجلس في المتنزه: () برفقة () لوحدهك

30/ إذا كنت برفقة فمن ترافق؟ () أفراد أسرته () أقارب أو جيران () أصدقاء أو زملاء () كل ما ذكر

31/ إذا كنت لوحدهك فما هو السبب؟ () لا تجد من يرافقك () لا تفضل أن تكون برفقة

32/ هل تتحدث مع المستعملين للمتنزه؟ () نعم () لا

33/ إذا كانت الإجابة نعم: () هل تكون علاقات صداقة معهم () هي علاقات وقتية فقط

34/ هل تذهبون إلى أماكن أخرى للترفيه غير هذا المنتزه ؟

() نعم () لا

35/ فيما يلي مجموعة من الجمل المتعلقة بالتأثيرات الجمالية الناتجة عن قيام المنتزه حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	المردود الجمالي الناتج عن قيام المنتزه
					يتوفر بالمنتزه العديد من أنواع النباتات الجميلة و الأزهار الملونة
					يوجد بالمنتزه عنصر الماء في شكل نافورة جذابة
					ميادين النجيله بالمنتزه خضراء، واسعة و مقصوفة
					تصميم المنتزه جميل و يحتوي على بعض الاعمال الفنية كالتماثيل و غيرها
					يوجد بالمنتزه أسوار و أسيجة مخضرة و مقصوفة بأشكال رائعة

36/ برأيك ما هي شرائح المجتمع المستهدفة للانتفاع من هذا المنتزه ؟ (اختر نعم أو لا)

لا	نعم	شرائح المجتمع	لا	نعم	شرائح المجتمع
		الأجانب			الأطفال
		ذوي الاحتياجات الخاصة			الشباب
		كل الشرائح تلقى نفس الاهتمام			كبار السن
					الأسر

(الاستمارة من تصميم الباحث)



APPENDIX (B)

جامعة السودان للعلوم و التكنولوجيا
كلية الدراسات العليا

استبانة علمية عن متنزه الجزيرة السياحي بولاية الجزيرة

الأخ الكريم / الأخت الكريمة:

السلام عليكم و رحمة الله تعالى و بركاته

تحتوي هذه الاستبانة على مجموعة من الأسئلة التي تهدف لعمل مقترحات تقييم و تقويم لبعض المنتزهات في ولاية الجزيرة مقارنةً بمنتزه قياسي.

أرجو تكرمكم بالإجابة الدقيقة عن كل الأسئلة الموجودة بالاستبانة و ذلك بوضع علامة (صاح) أمام الإجابة التي تراها مناسبة.

نؤكد لكم بأن هذه المعلومات ستعامل بسرية تامة و سوف تستعمل فقط لأغراض البحث العلمي.

و جزاكم الله خيراً

الباحث

المحور الأول: البيانات الشخصية لمستعملي المنتزه :-

1/ الجنس:

() ذكر () أنثى

2/ العمر:

() 24-18 سنة () 34-25 سنة () 44-35 سنة () 54-45 سنة
() 64-55 سنة () 74-65 سنة () أكبر من 75 سنة

3/ المستوى التعليمي:

() أمي () خلوة () يقرأ و يكتب () أساس () ثانوي () جامعي () تعليم عالي

4/ المهنة:

() موظف حكومي () عامل () صاحب أعمال حرة () ربة منزل () طالب
() لا يعمل () متقاعد

5/ الدخل الشهري:

() أقل من 1000 جنية () 5000-1000 جنية
() 10000-5001 () أكثر من 10000 جنية () لا يوجد دخل

6/ مكان الميلاد:

() ريف () مدينة

7/ الحالة العائلية:

() أعزب () متزوج () أرمل () مطلق

8/ عدد أفراد الأسرة (شاملاً شخصك):

() أقل من 3 () 6-3 () 10-7 () أكثر من 10

9/ مجموع الدخل الشهري لكل أفراد الأسرة:

- () أقل من 2000 جنيه
 () 2000 - 10000 جنيه
 () 10001 - 20000 جنيه
 () أكثر من 20000 جنيه
 () لا يوجد دخل

10/ هل تقيم في مدينة ود مدني؟

- () نعم
 () لا

11/ إذا كانت الإجابة بنعم، كم يبعد منزلك عن هذا المتنزه؟

() أقل من 15 دقيقة من المشي

() أقل من 30 دقيقة من المشي

() أقل من ساعة من المشي

() أكثر من ساعة من المشي

12/ إذا كانت إجابتك بأحد الثلاث حالات الأخيرة، فهل يوجد في حيك حديقة عامة؟

- () نعم
 () لا

13/ إذا لم تكن مقيماً بمدينة ود مدني، فهل أنت من ولاية الجزيرة؟

- () نعم
 () لا

14/ ما هو سبب تواجدك في مدينة ود مدني؟

- () عمل
 () زيارة
 () دراسة
 () خدمات ادارية

المحور الثاني: ارتياد و استعمال المواطنين للمتنزه و تقييمهم لحالته الراهنة :-

15/ كيف تُقيم أهمية المتنزهات للمجتمع المحلي؟ (اختر إجابة واحدة)

() هامة جداً () هامة () قليلة الأهمية () غير هامة بالمرّة () لا أدري

16/ فيما يلي مجموعة من الجُمَل المتعلقة باستعمال و تقييم المتنزه ، حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	خصائص المتنزه
					أفضل متنزهات مركزية أكبر على متنزهات أصغر قريبة من منزلي
					أستطيع أن أصل إلى موقع المتنزه بسهولة
					أستمتع بقضاء أوقات جميلة بالمتنزه
					أفضل أن يكون هناك قسم خاص بالرجال و اخر بالنساء في المتنزه
					هنالك حاجة للمزيد من المتنزهات في ولاية الجزيرة
					أرغب في زيارة المتنزه مرات أخرى

17/ هل تشعر أنت أو أفراد أسرتك بمضايقات حين زيارتك المتنزه ؟

() نعم () لا

18/ كيف تُقيم الحالة الراهنة للمتنزه ؟ (اختر إجابة واحدة)

() ممتازة () جيدة () متوسطة () سيئة () لا أدري

19/ في أي وقت من اليوم تذهب إلى المتنزه ؟ (اختر إجابة واحدة)

() صباحاً () في وقت الظهيرة () مساءً () لا يوجد وقت معين

20/ الزمن الذي تقضيه في المتنزه ؟ (اختر إجابة واحدة)

() أقل من ساعة () 1-3 ساعات () أكثر من 3 ساعات () اليوم بأكمله

21/ ما هي الأهداف الأساسية التي من أجلها تذهب إلى المتنزه ؟ (ضع علامة صح أمام كل غرض)

و متى تذهب لهذه الأهداف ؟ (ضع علامة صح أمام الوقت الذي تذهب فيه)

الغرض	نعم	لا	مرة أو أكثر في الأسبوع	1-2 مره في الشهر	أقل من 5 مرات في السنة
التمتع بالهواء الطلق أو الطبيعة					
لعب كرة القدم					
ممارسة رياضة الركض، المشي أو ركوب الدراجات					
المشاركة في الأنشطة العائلية					
ترفيه الأطفال					
ممارسة الرياضة في الاماكن المغلقة					
التنزه و الأنشطة الترفيهية العامة					
القراءة					
حضور المناسبات الخاصة و الحفلات و الأفلام					
لقاء الاهل أو الاصدقاء أو الجيران					
حضور أو المشاركة في الأنشطة و الفعاليات					
تناول الوجبات					
الجلوس/الاسترخاء/قضاء وقت الفراغ/الهروب من الضجيج و الازدحام و المشاكل الأسرية					

22/ من الجدول أعلاه أذكر أهم سببين من أجلها تذهب إلى المتنزه ؟

السبب الأول:.....

السبب الثاني:.....

23/ إذا كنت نادراً ما تذهب إلى المتنزه، ما هي الأسباب ؟ (أختار نعم أو لا)

لا	نعم	الأسباب	لا	نعم	الأسباب
		جسدياً غير قادر على المشاركة			التكلفة المادية الباهظة
		لا أرغب في الذهاب إلى المتنزهات			موقع المتنزه غير ملائم أو بعيد جداً
		أفضل لعب البلاي إستيشن/أو التلفزيون			أنا مشغول/ لا أملك الوقت الكافي
		لا أدري			النقص في المرافق و المنشآت
		لا شي مما بالأعلى			أشعر بعدم الأمان
					المتنزه مزدحم جدا

24/ فيما يلي مجموعة من الجمل المتعلقة بالمصروفات المالية داخل المتنزه ، حدد مدى موافقتك أو معارضتك لكل جملة

باختيارك لإجابة واحدة فقط:

لا أدري	منخفض	مرتفع	مناسب	المصروفات المالية
				سعر تذكرة الدخول
				سعر تذاكر الملاعب
				سعر المأكولات و المشروبات
				سعر المشتريات الأخرى

25/ هل ترى أن عدد زوار المتنزه مقارنة مع العشر سنوات الماضية ؟

() تناقص () تزايد () لم يتغير () لا أدري

المحور الثالث: تقييم الأبعاد الخدمية للمتنزه و تأثيرها على المجتمع المحلي:-

26/ فيما يلي مجموعة من الجمل المتعلقة بالخدمات الموجودة في المتنزه ، حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	خصائص المتنزه
					الأشجار الكبيرة توجد بكثرة في المتنزه للجلوس في ظلها
					العاملون بالمتنزه يتعاملون بذوق عالٍ مع الزوار
					مستوى النظافة العامة في المتنزه جيد
					تعدد المداخل و وضوحها ما يميز هذا المتنزه
					المقاعد الموجودة في المتنزه كافية ومتينة و مريحة
					هنالك عدد كافٍ من صناديق النفايات موزعة في كل مكان داخل المتنزه
					توجد إنارة ممتازة في جميع أنحاء المتنزه ليلاً
					توجد مواقف سيارات خاصة بالمتنزه
					يوجد في المتنزه دورات مياه خاصة للرجال وأخرى خاصة للنساء ، و بعدد كافٍ
					دورات المياه الخاصة بالرجال و الخاصة بالنساء نظيفة باستمرار
					يوجد في المتنزه مغاسل للأيدي خاصة للرجال وأخرى خاصة للنساء، نظيفة و بعدد كافٍ
					يوجد بالمتنزه مسجد مؤهل
					المتنزه يوفر مياه للشرب نظيفة و باردة
					خدمة الإنترنت ال(واي- فاي) تعمل و بكفاءة في المتنزه
					يتميز هذا المتنزه بوجود كافيتريات و مطاعم جيدة
					نظام حماية الزوار والسيطرة علي الدخول والخروج مناسب و امن
					ألعاب الأطفال متعددة و آمنة ومراقبة
					تتوفر بالمتنزه العديد من الملاعب الرياضية للكبار
					توجد سيارة إسعاف أو غرفة للإسعافات الأولية داخل المتنزه و بحالة جيدة
					تتوفر مكتبة عامة مكتملة في المتنزه
					إذاعة المتنزه تقدم أشياء ممتعة وتنويهات مفيدة للزوار
					ميادين النجيلة كثيرة و واسعة و آمنة للعب الأطفال و الجلوس عليها
					الطرق والممرات بالمتنزه واسعة و مرصوفة جيداً

المحور الرابع: تقييم التأثيرات البيئية و الاجتماعية و الجمالية للمتنزه على المجتمع المحلي:-

27/ فيما يلي مجموعة من الجمل المتعلقة بالمرود البيئي الناتج عن قيام المتنزه حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	المرود البيئي الناتج عن قيام المتنزه
					المتنزه يقلل من التلوث البيئي و الضوضاء
					المتنزه يحتوي على أنواع كثيرة ومختلفة من النباتات
					أشجار المتنزه توفير مساحات واسعة من الظل
					المتنزه يلفظ الجو بتوفير عنصر الماء، و بفعل النباتات
					يتصف المتنزه بسعته و كبر مساحته

28/ فيما يلي مجموعة من الجمل المتعلقة بالأضرار البيئية الناتجة عن قيام المتنزه حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	الأضرار الناتجة من قيام المتنزه
					تراكم الاوساخ
					انتشار البعوض و الحشرات
					الازدحام و الازعاج

هل المتنزه مجال للمشاركة الاجتماعية أم مجال للإنفراد و العزلة عن المجتمع ؟

29/ هل تجلس في المتنزه: () برفقة () لوحدهك

30/ إذا كنت برفقة فمن ترافق؟ () أفراد أسرته () أقارب أو جيران () أصدقاء أو زملاء () كل ما ذكر

31/ إذا كنت لوحدهك فما هو السبب؟ () لا تجد من يرافقك () لا تفضل أن تكون برفقة

32/ هل تتحدث مع المستعملين للمتنزه؟ () نعم () لا

33/ إذا كانت الإجابة نعم: () هل تكون علاقات صداقة معهم () هي علاقات وقتية فقط

34/ هل تذهبون إلى أماكن أخرى للترفيه غير هذا المنتزه ؟

() نعم () لا

35/ فيما يلي مجموعة من الجمل المتعلقة بالتأثيرات الجمالية الناتجة عن قيام المنتزه حدد مدى موافقتك أو معارضتك لكل جملة باختيارك لإجابة واحدة فقط:

أوافق بشدة	أوافق	حيادي	لا أوافق	لا أوافق بشدة	المردود الجمالي الناتج عن قيام المنتزه
					يتوفر بالمنتزه العديد من أنواع النباتات الجميلة و الأزهار الملونة
					يوجد بالمنتزه عنصر الماء في شكل نافورة جذابة
					ميادين النجيله بالمنتزه خضراء، واسعة و مقصوفة
					تصميم المنتزه جميل و يحتوي على بعض الاعمال الفنية كالتماثيل و غيرها
					يوجد بالمنتزه أسوار و أسيجة مخضرة و مقصوفة بأشكال رائعة

36/ برأيك ما هي شرائح المجتمع المستهدفة للانتفاع من هذا المنتزه ؟ (اختر نعم أو لا)

لا	نعم	شرائح المجتمع	لا	نعم	شرائح المجتمع
		الأجانب			الأطفال
		ذوي الاحتياجات الخاصة			الشباب
		كل الشرائح تلقى نفس الاهتمام			كبار السن
					الأسر

(الاستمارة من تصميم الباحث)



APPENDIX (C)

PICTURES

Picture 4.1: Aerial photograph for El Hurriya Park



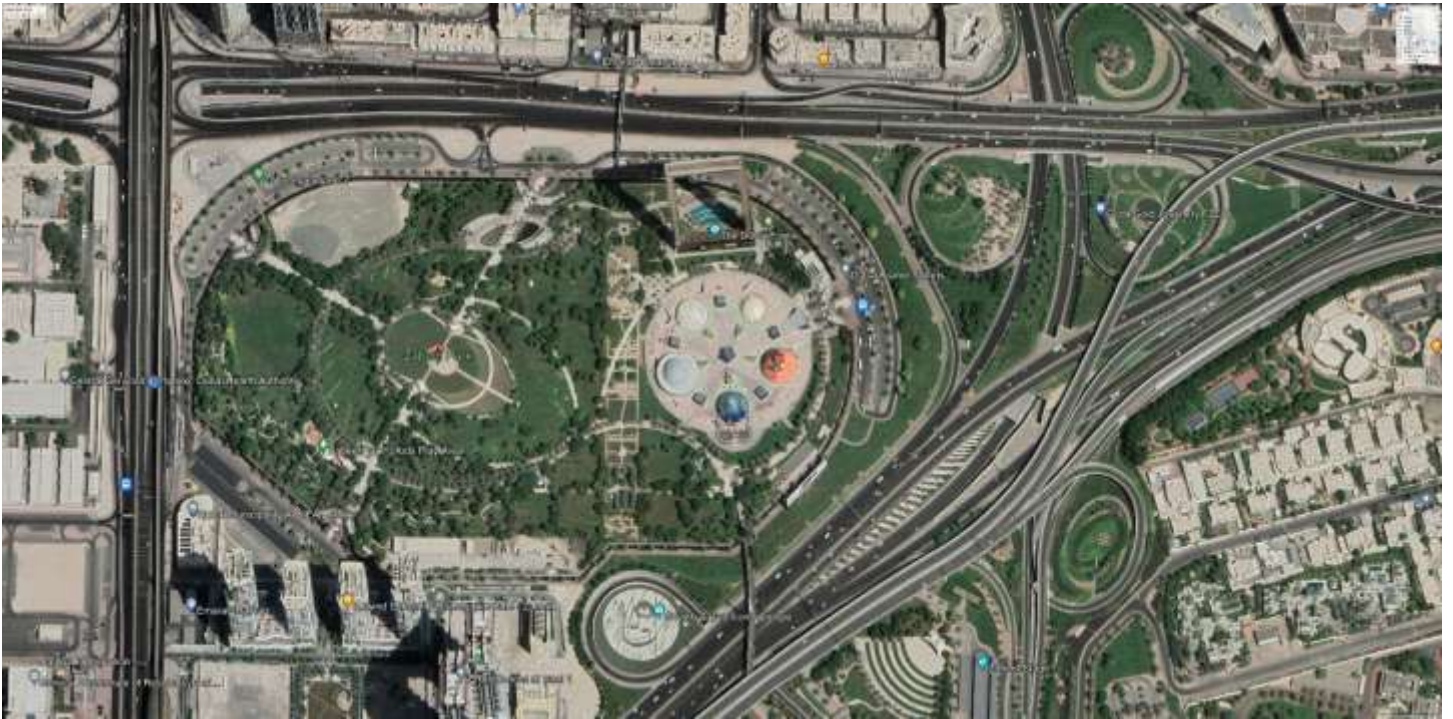
Source: Google Earth 2022

Picture 4.2: Aerial photograph for El Gezira Tourist Park



Source: Google Earth 2022

Picture 4.3: Aerial photograph for Zabeel Park



Source: Google Earth 2022

Picture 4.4: The large lawn fields and the long walking track in El Hurriya Park



Source: Researcher's own photos 2020

Picture 4.5: Small garden north the plateform in El Hurriya Park



Source: Researcher's own photos 2020

Picture 4.6: The fountain in El Hurriya Park



Source: Researchers own photos 2020

Picture 4.7: The large lawn fields in El Gezira Tourist Park.



Source: Researcher's own photos 2020

Picture 4.8: The wonderful pruned hedges and trees in El Gezira Tourist Park.



Source: Researcher's own photos 2020

Picture 4.9: Long wide and shady pathways in El Gezira Tourist Park.



Source: Researcher's own photos 2020

Picture 4.10: Flower beds and Fountain in Zabeel Park.



Source: www.alamy.com

Picture 4.11: The boating lake in Zabeel Park



Source: <http://www.destinationsbeyondindia.com/dubai/zabeel-park.php>

Picture 4.12: Sister City models in Zabeel Park



Source: <https://www.propertyfinder.ae/blog/zabeel-park-dubais-escape-to-peace-of-mind>

APPENDIX (D)

PUBLICATIONS

- (i) Suad Khider Ahmed and Mahmood Ebraheem Yagi (2021). The Important Roles of Parks and Gardens in the Quality of Life. A Review Middle East Journal of Agriculture Research. Volume 10 Issue 03 PP. 937-944. (ISSN: 2077-4605).

https://www.curreweb.com/mejar/mejar_July-sept-2021.html

- (ii) Suad Khider Ahmed and Mahmood Ebraheem Yagi (2021). Some traits of parks visitors in Sudan. Middle East Journal of Agriculture Research. Volume 10 Issue 04 PP. 1250-1258. (ISSN: 2077-4605).

https://www.curreweb.com/mejar/mejar_Oct-Dec-2021.html

