Determinants of Green Space Development and Management under Urban Landscape in Debre Berhan Town, Amhara Regional State, Ethiopia

By

Mesay Girma

A Thesis Submitted to the Department of Geography and Environmental Studies, Debre Berhan University, in Partial Fulfillment of the Requirement for the Degree of Master of Arts in Urban Development and Management

June 2020

Debre Berhan, Ethiopia

Determinants of Green Space Development and Management under Urban Landscape in Debre Berhan Town, Amhara Regional State, Ethiopia

By

Mesay Girma

A Thesis Submitted to the Department of Geography and Environmental Studies, Debre Berhan University, in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Urban Development and Management

Advisor

Adugna Endalew (PhD)

June 2020

Debre Berhan, Ethiopia

DEBRE BERHAN UNIVERSTIY

College of Social Science and Humanities

Department of Geography and Environmental Studies

This is to certify that the thesis prepared by Mesay Girma Tassie entitled Determinants of Green Space development and management under Urban Landscape in *Debre Berhan* Town, North Shewa Zone, Amhara Region, Ethiopia. And, submitted in partial fulfillment of the requirements for Degree of Masters of Art in Urban Development and Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approved by Examining Board:

Name	**Signature**	**Date**
Advisor _____	_____	_____
Internal Examiner _____	_____	_____
External Examiner _____	_____	_____
Chairperson _____	_____	_____

Abstract

The main objective of the study was to investigate the challenges of urban green space development and management under urban landscape ANRS, North Showa Zone in the case of Debre Berhan City. The study employed both qualitative and quantitative research methods. Data were obtained from 124 respondent's selected using simple random sampling from two kebele.4 Key Informant Interview (KII) was used to supplement the data obtained from household survey. Binary Logistic Regressions (BLR) Models were used for data analysis. Results of binary logistic regressions model revealed that age of respondents, Budget allocated administration, responsible, Sufficient green area, Accessibility of green space area, Population density and average income were the major determinates and astatically significant at p=0.01 and 0.05 level. The study also tried to assess the perception of community towards benefit of green space areas to wellbeing of the society. Descriptive statistics applied to look their perception the benefit of green space management in environmental, socio economical and health.

The thesis recommends some basic issues to alleviate the constraints and make the city as competitive and sustainable as other cities in Ethiopia. Professional training, awareness creation through different means, integration with stakeholders for development participation are some of the recommendations suggested by the Thesis. Moreover, the Thesis strongly suggest that, city officials who have a mandate and responsibilities should be armed with the concept of Urbanization and creating sustainable suitable environment for the community.

***Key Words**: green space, urban landscape, sustainable develoment, determinants, Debre Berhan,*

Acknowledgments

First, I would like to praise my heavenly father God and His Mother, St. Mary's, for their guidance and support throughout my life. I have received various forms of assistance from many people in the course of producing this thesis. I am glad to use this opportunity to express my indebtedness to all of them. First and for most, I want to convey my sincere gratitude to my thesis advisor, Dr. Adugna Endalew for his overall responsible guidance, encouragement, and follow-up from the beginning to the end, provided an endless enthusiasm of the study. His unreserved professional guidance and supervision and positive attitudes towards me had helped to complete this work with its present shape.

My second gratitude goes to all staff members of the Department of Geography and Environmental Studies, Debre Berhan University, for their encouragement and cooperation during my work. The cooperation from Dr, Ephrem Tegegn, Dr Gebre Tafere, Dr. Arragaw Alemayehu and Argaw Tesfaye in editing, guidance and encouragement was so great and memorable. The motivation and moral support from Belay Walelign was unforgettable.

Finally, I also want to thank my family (my father Girma Tassie and my mother Abebech Tesema, Rama Teshome and all my sister and brothers.) for their curiosity for my overall success.

Table of Contents

Contents Page

List of figures

List of Tables

Acronyms

GHG	Greenhouse Gas
GAOS	Green and Open Spaces
CRGE	Climate Resilient Green Economy
NUPI	National Urban Planning
ANRS	Amhara National Regional State
HA	Hectare
CSA	Central Statistical Authority/Agency
m.a.s.l	Meter Above Sea Level
EMA	Ethiopian Metrological Agency
UNFPA	United Nations Population Fund
EPA	Ethiopian Environmental Protection
EEA	European Environmental Agency
UK	United Kingdom
USA	United State of America
SPSS	Statistical package for social science softwar
UGS	Urban green space
UN	United nation
UND	United Nations Development
NGO	None Governmental Organization
MS-Excel	Microsoft -Excel

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Across the world, high population growth coupled with high density constrained urban green areas which are characterized by rapid growth in transportation demands, concrete buildings, settlement areas and overall intensive infrastructure development (Dorina & Dominic, 2015). The urban land use has increased tremendously with 4.17 km^2 in 2003 and further 66.33 km^2 added from 2003 to 2011 at the cost of, agricultural land, forest land, grazing land and; shallow water bodies. The built-up area increased by about 17% from 1997 to 2008 (Uttara *et.al*, 2012).

Urbanization process increased through industrialization with many environmental problems including noise, heating, and water and air pollution and through changing the land use to build up areas (Wang et al., 2009). Extended human activities in urban areas cause emission of greenhouse gases to the atmosphere carbon dioxide which is the major green gas sourced from burning of fossil fuels, industrial wastes and crowded transportation in urban areas. The accumulation of this gas in the atmosphere increases temperature as it traps the radiation from land (the terrestrial radiations to pass through the atmosphere. Especially in urban areas, the problem is severe because of factories, extended infrastructure and high population density (Creutzig *et.al*, 2016).

In an era of global climate change and rapid urbanization, innovations on governance of urban systems are critically required as 50% people are now living in less than 3% of the earth's urbanized terrestrial surface, and the quality of urban life is given much attention than ever (Grimm *et al*., 2008). Urban growth is occurring at an unprecedented rate worldwide with 60% of the population expected to reside in urban areas by 2030 (UNFPA, 2007). According to UNFPA (2007) undoubtedly urbanization will continue to have substantial impact on the ecology, economy and society at local, regional, and global scales. Increasing urbanization trends have changed the structure of cities to a greater extent, such as natural ecosystems increasingly being replaced by urban development. One of the most affected components of urban landscape is green and open spaces. They have an exceptional environmental importance with regard to their contribution to the reduction of various types of pollution and the modification of local hydrological and climatic conditions. In particular, many urban residents use green and open spaces as a way to escape the daily stresses and demands of city living (Maller *et al*., 2006).

Green and open spaces (GAOS) are vital constituents of the urban environment. These are breathing, recreation and interaction spaces for urban centers that are becoming overpopulated, congested and polluted. A city or town without sufficient green space can be qualified as an organism without a breathing organ. Even some environmentalists are referring them as "the lungs of the city" pointing out that, not only they are a source of natural beauty but also they are working constantly to provide us a service: processing carbon dioxide and many air-born toxins into breathable oxygen (Tibbatts, 2002).

The fact that vegetation and water are present in cities all around the world is a sign that the benefits of UGS outnumber its drawbacks, and/or that its drawbacks can be managed. UGS has become an indispensable part of the urban fabric and in many countries its presence is regulated by law. for instance, in Berlin where each citizen should have access to at least 6 m^2 of greenery and a park within 500 m, a threshold that is recommended by the Dutch 'Green City Guidelines' (Kabisch *et al*., 2016a). More than just being present, UGS is increasingly cherished. Home owners perfect their lawns while tourists flock together in iconic city parks, and botanists explore historical gardens while office folks network on their green rooftops. UGS caters to diverging needs of diverse user groups, and its role is continuously changing as it adapts to time, space, users, and context. UGS and its role in city life have been given thought since the early days of urban planning. Ebenezer Howard's Garden Cities were surrounded by greenbelts and Corbusier's high-rises were intertwined with green open space for residents to spend their free time in clean, bright, noise-free surroundings (Dummett, 2007). The earliest hype in studying the role of UGS revolved around recreation patterns and preferences, followed by studies on health outcomes, economic value, and biophysical functioning.

Recreational studies are commonly set in a local case study context and take on a user perspective. Increased attention for urban pollution and the influence of spatial configuration on people's well-being opened the floor to studies on environmental health. These range from longitudinal cohort studies on air pollution and lung cancer (Raaschou-Nielsen *et al*., 2013) to local case studies investigating associations between UGS visits and mental health (van den Berg *et al*., 2016) or how park characteristics influence physical activity (Brown *et al*., 2014; Hunter *et al*., 2015; Veitch *et al*., 2012).

Economic studies value direct and indirect ecosystem benefits (Johnston and Russell, 2011). In urban regions for example, scenic views, tree cover and access to recreation areas are found to

positively influence home sale prices (Sander and Haight, 2012; Tu *et al*., 2016). There are biophysical studies after UGS functioning, especially concerning the quantification and mapping of ecosystem services (Baró *et al*., 2016; Dobbs et al., 2014; Haase *et al*., 2014b; Holt et al., 2015; Larondelle *et al.*, 2014) and the role of UGS in moderating environmental effects of urbanization such as the urban heat island (Bowler et al., 2010; Chen et al., 2016; Davis *et al*., 2016).

Recently, UGS is increasingly being promoted as a tool in climate adaptation strategies (Geneletti & Zardo, 2016; Matthews *et al*., 2015). The realization that heat waves and flooding have detrimental (financial) effects on infrastructure and public health has spearheaded the changing climate to the top of both research and policy agendas (EEA, 2012; Steiner, 2014). At the same time, the 'old' topics of recreation, aesthetics and health remain highly relevant. With an urban population that continues to expand worldwide (UN, 2014), UGS plays an essential role in providing citizens with a healthy, comfortable and safe living environment (Kabisch *et al*., 2016b). It is not surprising that in this time of global change and uncertainty, employing UGS' multifunctional character is in full swing. The ecosystem services concept helps defining, assessing and valuing the multifunctional character of UGS.

Ethiopia has already set a vision to join middle-income country status by the year 2025. This vision has inspired the hope of the country to transform from an agrarian economy to Industrialization and this vibrant growth has also started to shift rural life to urbanization. The Government of Ethiopia's Climate Resilient Green Economy (CRGE) vision has also set the goal of reaching middle-income country status by the year 2025 with net-zero greenhouse gas (GHG) emissions (FDRE, 2011). Ethiopian cities and towns have undergone profound reforms in recent times especially in the urban development politicians, decision-makers and planners have sought to ensure the built environment remain livable and can adapt to new lifestyles and demographic trends. However, for urban green and open spaces to contribute to their fullest to the quality of our cities they have to be thoughtfully planned, diligently created and inclusively managed. The reality in the town of Debre Berhan, with a few welcome exceptions, is far from satisfactory. Despite a renewed interest in green and open spaces, there is very little accurate information about how green and open spaces are managed in the urban landscape of Debre Berhan, where they are, who owns them, what condition they are in, or how many people are employed in looking after them.

Without this basic data, it is hard to ensure sustainable and high-quality urban environments. As one of the fast-growing cities in population number and a relatively sophisticated business center in

north-central parts of Ethiopia, the aforementioned problems are also true in the town of Debre Berhan town. Open and green spaces are severely inadequate. The green coverage is drastically decreasing as open and green areas are invaded by the construction of buildings. The town lacks sufficient places for children, adolescents, and adults to play and recreate in a healthy environment. The green coverage inside the built-up area is also highly degraded due to the high and increasing density of the town and the lack of adequate greening activities.

1.2. Statement of the Problem

Ethiopia is being challenged with over population, environmental degradation, food insecurity, unemployment in urban areas (UNDP, 2016). Employment opportunities and access to infrastructure in cities attract people to migrate from rural areas towards urban areas and highest urban growth increase urban and peri-urban areas than the former cities (Tsegaye, 2010). Demographic change pressures the urban development to focus on building of houses, market, transportation stations and other infrastructures than environmental issues of the urban areas (Minwuyelet, 2005). The establishment and management of urban green areas across the urban centers have not been uniform and there is a great deal of variation among the urban centers. Some of them have established some of the green areas components. Furthermore, the establishment and management of green areas across the urban centers in the country have not been standardized and the urban dwelling communities in the country have not been receiving the goods and services that well-planned and well-developed green areas are supposed to provide (Manual for Recreational Parks Development and Management, 2015).

Even though the impact of urbanization is high in the city. Greater population density in urban areas increase demand for green areas but the city is facing diminishing of green areas. Urban green areas have seen as merely the left over spaces, which have not yet been developed with in an urban area. And that function as improving image of the city than ensuring quality of life of the public.

One of the main problems that the town is facing today is the lack of properly planned and designed public green and open spaces proving unwelcoming to people.

They also lack a coherent approach to their management of green areas with uncoordinated and often conflicting interventions by a multitude of agencies, without clear overall responsibility; and viewing the community as passive and idle in the development of GAOS. There is no enough urban green and open space for the use of the public and the existing spaces lack proper development. The only public spaces available are the streets, street joints, unplanned leftover spaces which are

usually reserved for future building projects and very few neighborhood playgrounds that are not evenly distributed and enough for the population of the town. The other problem related to the development of urban green and open public spaces in Debre Berhan is their level of cleanliness or they are poor in quality beyond this the status and overall challenges faced by Debre Berhan.

With respect to the determinants of green area management under urban landscape dynamics Buzayehu (2018) conducted a study for Bahar Dar City. The study gave an emphasis on green areas management and development under urban landscape dynamics by assessing the nature and dynamics of green areas, perception of community towards benefit of green areas to wellbeing of the people and determinants of communal green area management. A similar study by Abebe (2009) on the development and management of green areas in Fenote-Selam town showed that various stakeholders had developed their own green areas though the development plan of the town did not include green area compounds government institutions, individuals and schools in the design. The study further showed that there were various factors for the low development of the sector in the town. The low attention given for it by the officials and residents, the need for using green areas for illegal purposes and the lack of professionals are the main constraints for the underdevelopment of the area.

However, as far as I know there is no study conducted to investigate aspects of green and open spaces in the town of Debre Berhan.

1.3. Objectives of the study

1.3.1 General objective

The main objective of the study was to investigate the determinants of urban green space development under urban landscape in Debre Berhan Town, North Showa Zone, Amhara National Regional State of Ethiopia.

1.3.2 Specific objectives

- To Assess the determinants of green areas development and management in Debre Berhan
- To identify the current situation of green spaces development
- to identify the accessibility of green spaces
- To examine the perception of community and stakeholders towards the benefit of green spaces to the wellbeing of the local community.

1.4. Research Questions

1. What does different determining factors affect the green area development and management differently
2. What does the current development practices of green and open spaces look like in Debre Berhan town?
3. How accessible are green spaces in the context of the study area?
4. What is the perception of communities and stakeholders towards the benefits of green spaces to their wellbeing?

1.5. Significance of the Study

The researcher assumes that this study even if it cannot bring complete change and absolute solution to the problem, will at least pave the way for a further detail investigation require for a complete solution. The study will explore the development and management problems related to green and open spaces. The study is also assessing the role of stakeholders in green and open space development including the factors that inhibit their active involvement. This will inform policymakers, planners, politicians and other development actors about the bottlenecks in green and open space development and its consequent outcomes especially on the image of urban areas and in general on the urban environment. This will help them to address the limitations and achieve a broad-based urban environment improvement that benefits urban dwellers and in keeping urban ecology. In this regard, the study gives policy implications that indicate how to tackle green and open space development problems and how to enhance win-win management strategies (strategies that do not favor economic progress at the expense of the environment) of these spaces. Apart from its contribution to improving urban environment through better management of green and open spaces.

1.6. Scope of the Study

The issues around the urban green and open spaces are very wide. There are economic, social, environmental, health and many other issues that are related to the idea of green and open spaces in a city. However, this study is subject matter wise that it is focused particularly on the development

aspects of urban green and open spaces. In discussing urban green and open spaces, they are different types. These could be streets, road medians, parks, cemeteries, squares, neighborhood playgrounds, stadiums, schoolyards and the like. Among these green frames; however, this study is tried to assess only the green and open spaces assigned by the master plan in the city of Debre Berhan. Geographically the scope of this research is delimited to the administrative boundary of Debre Berhan city excluding the recently annexed rural *Kebeles*. Whereas the temporal scope of the research is cross-sectional that the research was designed to be studied at a particular point in time.

1.7. Limitation of the study

Even if budget and time constraints is the bottleneck of the study, lack of organized secondary data and basic information from the officials and professionals take the lion share of the constraints in the study. The pandemic disease of COVID19 ignores to make focus group discussion. There is also lack of sufficient and detailed studies in the area, which bring lack of literatures related to the field. These in turn bring deficiencies of better concepts and theories about the problem under study.

1.8. Organizations of the Thesis

This thesis is organized into five chapters in a manner closely linked to research objectives. Chapter one presents the introduction background of the study, statement of the problem, general and specific objectives as well as significance and scope of the research. Chapter Two Review literature includes the Theory of urban expansion, effects of urban expansion, Land use changes and its Impacts, five capitals, livelihood strategy, reasons for lacking long term, Benefit package of compensation and the role of local government. Chapter Three describes Research Methodology it includes Research designed, Data Collection Methods, Sample Techniques, Chapter Four present major finding that obtained from sample household survey. Finally, chapter Five concluding the main finding of the research and forward the recommended remarks.

CHAPTERTWO

LITERATURE REVIEW

2.1. Theoretical and conceptual literature

Since half of our planet's 7 billion people now live in urbanized areas (Davis *et. al*., 2012), it is expected that CO_2 emissions will be significant in these areas. It is also known that plants remove CO_2 (the major greenhouse gas) from the atmosphere during photosynthesis. Therefore, green infrastructures play a paramount role in carbon storage and sequestration. This is why urban forests are eligible clean development mechanisms (CDM) projects.

Studies suggest that forest stands in urban environments have the potential to sequester and store more carbon than rural sands of the same canopy species composition (McNeil & Vava, 2006) and similarly according to Richard et.al. (2006), urban soils at pervious areas sequester large amount of CO_2. Thus, green infrastructures are very important in counteracting anthropogenic CO2 emissions not only because they store and trap CO_2 in their biomass but also increase the soil surface of cities which otherwise would have been in a non-permeable surface.

The management of urban landscapes concerns existing urban open spaces such as public parks, playgrounds, and residential green spaces. It involves many different actors and organizations and its practice is of importance for the sustainable development of cities. As a research field, it needs further theoretical development and common definitions. For example, the central term 'management' is seldom defined in the relevant literature regarding an urban landscape context, and public participation in management processes is unusual. Urban landscape management as an overarching concept that brings together knowledge about the management of urban landscapes from fields such as urban forestry, park management, and landscape planning. Based on a literature review, a common understanding of management in an urban landscape context is proposed, including organizational and strategic aspects of managerial activities. Our approach is that urban landscapes are ultimately managed to provide useful benefits. Urban landscape management can be viewed as a complex process that includes several different actors, elements and relationships, mutually affecting each other (Jansson & Lindgren, 2012).

In Ethiopia, urban green areas have been consumed by industrial, commercial, residential and infrastructural developments, as well as by spontaneous and illegal settlements along mountain slopes, river valleys and other open spaces. However, following the Rio Summit held in Brazil in 1992, Ethiopia took a number of initiatives to address its environmental problems, including minimizing environmental impacts induced by the urbanization process. The country introduced a number of legal instruments to help implement Agenda 21 at local level. This included the enactment of Article 44 of the country's Constitution (1995) which states that the people of Ethiopia have the right to live in a healthy environment. The country also established the Ethiopian Environmental Protection Authority in 1995, and went on to formulate the Ethiopian Environmental Policy in 1997 (Mpofu, 2013)

2.2. Urban Landscape Management

The landscapes concerned are existing open spaces in urban and peri-urban settings, which are mainly green, e.g. public park space. We propose that urban landscape management be regarded as the activities performed by a management organization to maintain and develop existing urban green space for users. Such management organizations are often municipal park authorities but can also be other agencies, e.g. housing companies Urban landscape management can encompass elements of planning and design but its focus is on dealing with existing structures through development and maintenance. In our thinking, the work performed by the management organization and the people within it are the main focus, but the open space managed and those most affected by management, the users, are also important. This conservation objective, as each space, will offer different habitats for species. For example, flourish or die-if the level of management and intervention was related at some time in the future.

2.3. Management of Green Areas

Green areas are a single entity with interrelated multifunctional values. This multi-functionality character makes the management very complex. Because the management of green areas needs to understand the whole benefits and characteristics of green areas to maximize the values. Therefore, the management of green areas, defined by the multi-

functionality behavior, need to impress local politicians to help them to see green areas as a multi-faceted enterprise, recognizing the link and interdependency of the strands. This may help to avoid anyone strand gaining priority at the expense of others, particularly in competing for resources, and in securing specialist management expertise across the functions, and encouraging a unified and coherent management structure and system. Then, to do these multi-functionality benefits of green areas, the integrated management system is essential. The best example of the integrated management system, which focused on the multipurpose of green areas, is the model of management.

Table 2. 1. The way for multi-functional Green Areas

Function	**Rational**	**Typical management issues**
As an agent for community development and education	- Local park and green areas help to strengthen the spirit of community a money set resident propagation who share as an interest in their welfare. Community involvement king's social benefits and, local politics, helps to conserve the quality and multifunctional use of the green area system. Children, in particular, can learn about the natural environment, and develop skills through play.	-providing volumes for community events. - creating opportunities for volunteers. -Supporting families and intergenerational mixing. - Creating partnerships with business and voluntary groups. - Enabling alternate, sociable transport routes. - As a focus or catalyst for a participatory planning exercise.
As landscape to be conserved	- Parks and green areas area cultural landscapes and integrated part of the built form of urban settlements. Land capes help to define a sense of place, local character, and identity. Whole city escapes are celebrated and action is taken to conserve their quality. Natural features with in the city are often conserved as the landscape in their own right.	- conserving historic land serapes, woodlands and nature reserves. - conserving views from and into green land escapes. - Maintaining structural elements such as true, lakes and pathways.

		- using park and green landscapes as settings for a cultural activity such as outdoor theatrical and musical performances. - using landscapes as an educational resource through schools and volunteer programs.
As an ecosystem providing urban services.	- Green areas provide service to the urban environment through sustainable natural processes. This includes delaying food water, moderating urban temperatures and humidity, redacting air and water-borne pollution and supporting wildlife. Their proximity to recreation and community activity helps to reduce air pollution and energy consumption generated by motor traffic.	- supporting sustainable urban drainage systems. - Creating and managing wildlife habitats. - promoting and recycling, environmental education. - improving connectivity between green areas for walking and cycling. - Planting for shade and wind – protection.
As a recreational resource for health and well – being.	- Recreation is the use of leisure tie mot refresh and regenerates mind, body, and spirit. - Green areas system enable a wide range of recreational activity for urban dwellers, local and largely free to users. Parks and green areas -provide an escape to tranquility and access to the hearting power of the natural world within the urban environment.	- staring events, promoting sports, encouraging healthy lifetimes conserving train quality, providing facilities such as changing rooms, cafes, and toilets. - providing safe areas for children's play. Reserving conflicts between users.
As a contributor to the local economy.	- - good quality green areas enhance properly prices, and the value of the taxable urban asset base recreational use contributes to raising productivity, saving on the cost of medical care and prompting domestic and social harmony. Increasing community involvement and programming diversionary	- Monitoring surrounding property values. - contributing to tourism. - promoting divisionally youth activity schemes.

	activity can reduce crime. Green areas can help to promote tourism and create a favorable image of a place to encourage inward investment and improve recruitment and retention of staff. It can help to nurture skills such as food production, horticulture and nature conservation craft skills.	- running health and education programs in partnership with social employers and schools. - Promoting and marketing recreational opportunities. Creating opportunities for conservation and horticultural skills development.

Source: Alan Barber, 2005; p: 21

2.4. Problems in Development and Management of Green Areas

Even if there are great and various benefits of urban green areas, both in developed and developing countries, there are various problems for development and management. Great environmental problems emanate from urban areas (industries, transport, high consumption of a resource, etc.) than rural areas, wherein the opposite direction reduction in green areas (generally to maintain environmental problems) and other activities are seen in urban areas. In many cases, the area changed from the overall recreational quality. Nillson & Randrup in Zeleke (2008) indicated that in Mexico City, the green areas share of the city is falling by 3.7 percent annually. Buildings often replace and reduce green areas of the city. The common but very dangerous problems in cities that lost the quantity and quality of green areas are illegal settlements on the green areas and other open reserved public places. These problems are common especially in the fringes of urban areas. In general, the problems can be grouped as planning problems, development (investment) related problems, lack of awareness about the benefits of green areas, and lack of professionals in the field.

2.5. Planning Related Problems

Here the planning problem implies that both the implementation and preparation (participatory planning) process deficiency. In the implementation process, as Belachew (2001) described the preparing and implementing body are different; therefore, they have different perceptions about the green areas for urban society and environment Beached (2001, p: 22). In the planning

process, most planning authorities including the Ethiopian National Urban Planning Institutes (NUPI) and Regional Urban Planning Institutes (RUPI) lack community participation. Barber (2005, p: 45) implied that out of 290 planning authorities 8, which is only 6 percent of the 290, in England had undertaken an assessment of the needs of their community for the full range of outdoor facilities, only one planning authority, which is 0.3 percent, said it had adopted a local standard for all categories of green space.

2.6. Development Investment Related Problems

Here there are greater conflicts between urban green areas and other land uses for different purposes. One of these lands uses which create conflict with green areas is the need for investment and development for business activities. Freeman and Senior in (2008) depicted that there were high arguments supporting development at an expense Zeleke of green spaces gave priority for economic development. These and other related opinions affected the networks of green areas and undervalued their multifunctional benefits for sustainable community development (Zeleke, 2008, p: 18). In England, out of 131 towns green areas found in 75 towns, were threatened by the development of various kinds. Public green areas within urban areas had been lost to encroaching development and too much of what is left has been neglected and poorly maintained (Barber, 2005 p: 27).

2.7. Lack of Awareness

Urban green areas have multifunctional benefits. Some of the benefits are direct uses of green areas like for playing, seating or resting under the shade of the trees while other benefits are intrinsic indirect, which is the major benefits, not directly used the physical state of the green areas. These intrinsic benefits include regulation of the urban microclimate, creation of social cohesion between different groups of users and as an identity for a specific city. Even if green areas have irreplaceable values, both the community and local authorities undervalued and put at the bottom of priorities to develop and manage it. Because of this lack of awareness, the community, prefer the green areas to use for other purposes like grazing, dumping site for wastes, crop production, as a local market (open market). On the other hand, the local authority neglect and gave less attention and tried to change the proposed land use for green

areas to other land uses like residential, commercial and investment purposes. Because of these and other related problems, urban environmental deterioration is increasing and contributes to global warming at the global level. Lack of Skilled and Committed Professionals Green areas gave a multifunctional purpose to the realization of a sustainable community. Then its nature of multifunctional needs multidisciplinary professionals for development and management. Therefore, local authorities need these specialists for their green areas. But there are acute shortages of professionals and, even the professionals are present, they are unwilling to work as a park and green area workers. For example, as CABE space/The Commission for Architecture and Built Environments in England report in 2005/ indicated the principal obstacles in recruiting skilled and young staffs are feeling as they are lower in status and no recognition by the society, poor career development prospects and bureaucratic difficulties with recruitment procedures. Low pay in the sector, particularly as entry-level is also a contributory factor, at the managerial level, there is a clear need identified for training in strategic thinking, vision, and leadership across the sector. It is already apparent that some of the basic skills, needed to promote the multi-functionality of the full range of green areas that make up a typical green area portfolio, are not present in many city administrations. Even when they are present, skills like recreation programming, ecology, and landscape management are poorly integrated with the management cohort. The lack of special provision for graduate entry looks like creating bigger problems for the future (Barber, 2005: P: 53). Therefore, today environmental problems are a hot global issue of perpetuating species, a question of living and save human life from climatic catastrophes. To this, the global population launched a scenario towards achieving the objectives of Agenda 21 and implementing locally the Local Agenda 21. However, local authorities are either unaware or involuntary to do towards this scenario of reducing climatic and environmental problems; because their priority for the local environment in budgeting and recruiting professionals is very limited, it is only for the matter of the report.

2.8. Problems of green areas development and management in Ethiopia

The constitution of Ethiopia (1995) provided the principle of "environmental rights" and declared in article 44, sub-article 1 that "all persons have the right to a clean and healthy environment". In line with this constitutional principle, the Federal government legally

established the environmental protection authority to advise the government, create awareness at all levels, and coordinate and regulate environmental activities in Ethiopia. Even if the above-indicated initiatives promoted and guaranteed the well-being of the environment, Ethiopia has significant backlogs of environmental challenges to tackle and many new problems to combat. Environmental problems that have been witnessed over the years in Ethiopia could be related to both rural and urban settings. Urban Ethiopia, because of the increased influx of migrant population from rural areas in search of livelihood, is mainly affected by sanitation and waste management problems. As the national and international environmental problems intensified, the world population started to take measures towards a sustainable environment since the Stockholm conference of 1972 and following this the Rio-summit of 1992, ushered a new era of global fusion between development and environment in the concept of sustainable development.

2.9. Functions of planned and managed urban green areas

Properly planned and managed urban green areas can provide and maintain a wide range of basic ecological, social and economic functions and values upon which human well-being depends.

2.9.1. Social functions

Socially, benefits from urban greenery can accrue to urban communities through access to urban green spaces, healthy living and education. Many public green areas provide the local community and visitors with opportunities for physical recreation and relaxation, as well as for social interaction. For this purpose, green spaces do not have to be necessarily large to be enjoyed (Wlodarczyk, 2007). However, one concern that is sometimes raised about public open spaces is their potential to attract criminal activities such as drug dealers and other undesirable elements from outside the immediate community. This is because the public green spaces are often deserted at night, thus providing secluded and convenient venues for the crime. However, if the community has been involved in the planning and implementation of a green area, its presence could be increased as it takes over management and ownership of the green areas in their locality.

2.9.2. Economic function

Economically, urban greens, once mature, can be a source of raw materials for local handicrafts and small scale commercial activities. Similarly, in poor urban areas, where food purchasing makes up a large part of a household's income, the produce from urban agriculture or gardens can be used for home consumption and as an effective way of supplementing income, thus contributing towards poverty reduction. High-quality parks and green spaces often add economic value to a city by improving the quality of the townscape. This can assist in urban regeneration and renewal; improve the attractiveness of locations for business investments; create community enterprises and generate new employment opportunities (Wlodarczyk, 2007). Greenspace areas can also provide shaded cool areas for vendors and customers seeking to escape from the heat.

2.9.3. Ecological function

Ecologically, green spaces are significant for nature conservation as they provide habitats for a wide range of flora and fauna. The very presence of plants in a city improves the visual appearance of the urban environment, contributes towards climate change prevention, creates lower densities of development and reduces levels of activity in an area. This contributes to a more peaceful and relaxed ambiance, a benefit equally important in commercial and residential areas. Plants can improve the atmosphere by absorbing atmospheric carbon and releasing oxygen to improve the quality of air. Vegetation can also act as a buffer by absorbing and reducing noise. Like air conditioners, plants transpire water that, in turn, reduces the temperature. Well-drained green areas can enable water to infiltrate the soil and reach the water table without causing too much run-off. This, in turn, can reduce urban flooding and the accumulation of stagnant water. Flooding can cause sewer systems to overflow, thereby bringing the bacteria-rich waste to the surface, while stagnant water may provide breeding grounds for malaria and dengue fever-carrying mosquitoes. Bamboo, water reeds or willow can help prevent soil erosion along river banks.

2.10. Green areas in Ethiopia

Early History of Green Areas in Ethiopia Early History of Green Areas in Ethiopia Development of urban green areas of Ethiopia was relating to the history of Addis Ababa, which was established in 1886 by Emperor Minilik II. Accordingly, in the early development of Addis Ababa, the king divided the location of the residences of his noblemen and gave land according to their respective positions. The chiefs, in turn, redistribute their land to their immediate followers and create several clusters of residents known as "Safars" which means "Camp". The common meeting places for these safars were the "Ghibi" the current grand palace area, the church area, and the Arada Market. As Johnson in his Ph.D. thesis explained, the city's evolution was that "an increase in population and the coming and going of regional governors and other people, to pay homage to the king promoted the development of commercial services around the Ghibbi and it made the Ghibbi an important place of public meeting and gathering. The services of commercial activities make Arada the most popular fabric of the city with its scene of varied life of the people" (Johnson, 1976: P: 87)

The Present Situation of Green Areas of Ethiopia Smart growth and development of urban centers demanded the collaboration of public, private and non-profit sectors on growth and development to achieve holistic advantages of the town (Zeleke, 2008, p: 24). This means that the management of urban green areas is essential for realizing smart urban growth. The Ethiopian urban development policy/EUDP of 2005, emphasized that there should be effective urban environmental management while undertaking economic activities. The urban administrations, government, and the people should give proper attention to environmental protection to avoid continuous suffocation and pollution followed by the expansion of cities (EUDP. 2005: P: 37). It also emphasized the delineation of green areas within the framework of the urban plan, at the town and kebele level and considering environmental protection issues in the overall urban development activities. (EUDP, 2005, P:38).

In addition to the policy, as Zeleke added, the decentralization administrative process has enhanced urban administration to be effective in managing urban-based local development (Zelke, 2008, p: 24). There should be integration between different stakeholders to play the role of problem-solving (PASDEP, 2006). Ethiopia, besides signing and ratifying

international conventions and protocols related to environmental problems, it also adopted environmental managing instruments in its constitution and other related proclamations at home/domestic level. The 1995 constitution of Ethiopia emphasized citizen's environmental rights in Article 44 and for environmental objectives in Article 92 (Constitution of 1995). Therefore, to realize this Proclamation No. 9/95 established the Ethiopian environmental protection Authority (EPA) in 1995 with mandates and responsibilities. Following the establishment of EPA, the Ethiopian environmental policy was developed and enacted in 1997 and gave somehow little attention to planning and development of green areas in urban settlements. Again, the Amhara National Regional State/ANRS established the land use, administration, and environmental protection authority in 2005 and in the same year established the bureau for works and urban development with its full mandate and responsibility at the regional level.

2.11. Determinants of use of public green spaces

The determinants of use of public green spaces are also complex, interconnected, and varied. The availability of urban green space is first and foremost a key requirement. There is some suggestion that size matters, with greater benefits associated with larger green spaces. The size of the urban green space may also dictate how it is used, in that larger spaces may be more likely to be used for physical activity, while smaller spaces are primarily used for "socializing" and "rest and restitution". Another key determinant for use of green spaces, cited in numerous studies, is their accessibility. This includes the distance from home, in that persons living near a green space are more likely to use it and to do so more frequently. The optimal distance has been said to be less than 0.5 km or 5 minutes' walking time. Ease of accessibility is also important, such as the presence of cycle paths and minimal obstruction (e.g., no need to cross busy roads).

2.12. Description of Ethiopian, s Recreation Park Standard

The competent authority shall provide sufficient and easily accessible formal recreational parks for their citizens. Therefore, parks should be located within the town so that every inhabitant can reach from his/her home within a maximum distance of:

- 500 m a neighborhood park (or a bigger park, or a comparable green open space) of a

size of at least 0.3 ha;

- 1,000 m to 1,500 m Woreda park (or a bigger park);
- 4,000 m Sub-city park (or a bigger park);
- 6,000 m City park.

The parks should have following approximate minimum sizes, carrying capacities and locations:

i. Neighborhood Park

Park site located in the approximate center of each neighborhood (sub-district or Kebele level) structure plan. The park may provide active (e.g., walking, jogging, bicycling) and passive (e.g., reading, bird-watching, talking) recreation opportunities, but maybe dominated by facilities and sports fields. Every inhabitant that uses a neighborhood park should be able to access the park within an average distance of 500m. A neighborhood park should be around 5,000m2 and can serve up to 5000 people.

ii. Woreda (district level) park

A park site located in the approximate center of an area structure plan that accommodates major recreation centers, primarily active outdoor sports fields and natural recreation sites. Every inhabitant that uses a Woreda (district level) park should be able to access the park within an average distance of 1000 to 1500m. A Woreda (or district level) park should be around 30,000m2 and can serve up to 40, 000 people.

iii. Sub-city Park

A park site located in the approximate center of a sub-city (or kifle-ketema) and that can serve and attract people from across the sub-city (kifle-ketema). It can provide active or passive recreation opportunities, primarily for residents of the sub-city. Every inhabitant that uses a sub-city (kifle-ketema) park should be able to access the park within an average distance of 4000m. A Sub-city park should be around 80,000 m2 and can serve up to 160,000 people.

iv. City level park

The park may provide active or passive recreation opportunities for every resident of the city. Every inhabitant that uses a city level park should be able to access the park within an average distance of 6000m. A City park should be more than 150,000m2 and can serve up to 300,000 people. (Ethiopia National Urban Green Infrastructure Standard, 2015)

2.13. Threats to urban green area management

Despite the many aforementioned benefits, some cities have faced several obstacles in developing and managing their green areas. Increased urbanization and development have placed some urban green spaces under extreme pressure, while unplanned urban growth has resulted in the loss of urban landscape and ecosystems (Wright & Nebel, 2002). As the percentage of urban population increases, many cities have found themselves unable to cope with housing provision. This has forced some residents to illegally live in fragile and sensitive areas such as swamps, riversides, steep mountain slopes and other areas generally reserved for urban greeneries. Other constraints include lack of political will, declining revenue budgets, lack of skilled employees, increased maintenance responsibilities, lack of information or knowledge about green areas, and encroachment by other activities into existing green spaces. These have led to declining quality of green spaces, often at a time when there is an increasing demand by urban populations for recreation areas.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Description of the Study Area

According to the chronicler of Emperor Zara Yaqob, Debre Berhan was founded by the Emperor Zara Yaqob as a capital for his empire in 1454 in connection with the appearance of Orthodox Church which was ordered and established by the Emperor in response to a miraculous light that was seen in the sky. During this time its name was Debre Eba, which was changed into the present name (that is Debre Berhan) during his reign in association with that light descended on it near the present Debre Berhan Sellassie Church Birhanu, K. (2018).

3.1.1. Physical Feature of Debre Berhan

Debre Berhan is found in the North Shewa Zone of ANRS. It is astronomically located in an approximate geographical coordinate between $9^0$38'00"-$9^0$41' North Latitudes and $39^0$30'00"$39^0$32' East Longitudes (EMA). In relative terms, it is situated at about 130 k.ms road distance from Addis Ababa (the national capital) and at about 696 k.ms from Bahir Dar (the regional capital) on the main highway to Dessie and or to Mekele. The town is bounded by woredas of North Shewa Zone of ANRS which is an indication of good potential. Currently, it is classified with 9 *Kebeles* under The total area of Debre Berhan under the municipal (woreda level) jurisdiction (including the surrounding rural areas) is estimated to be about 18,000 hectares while the existing built-up area under urban occupation is some about 2200 hectares that, in general, implies the available excessive expansion areas within its jurisdiction. (Da-Ya consulting planers and engineers plc.2014)

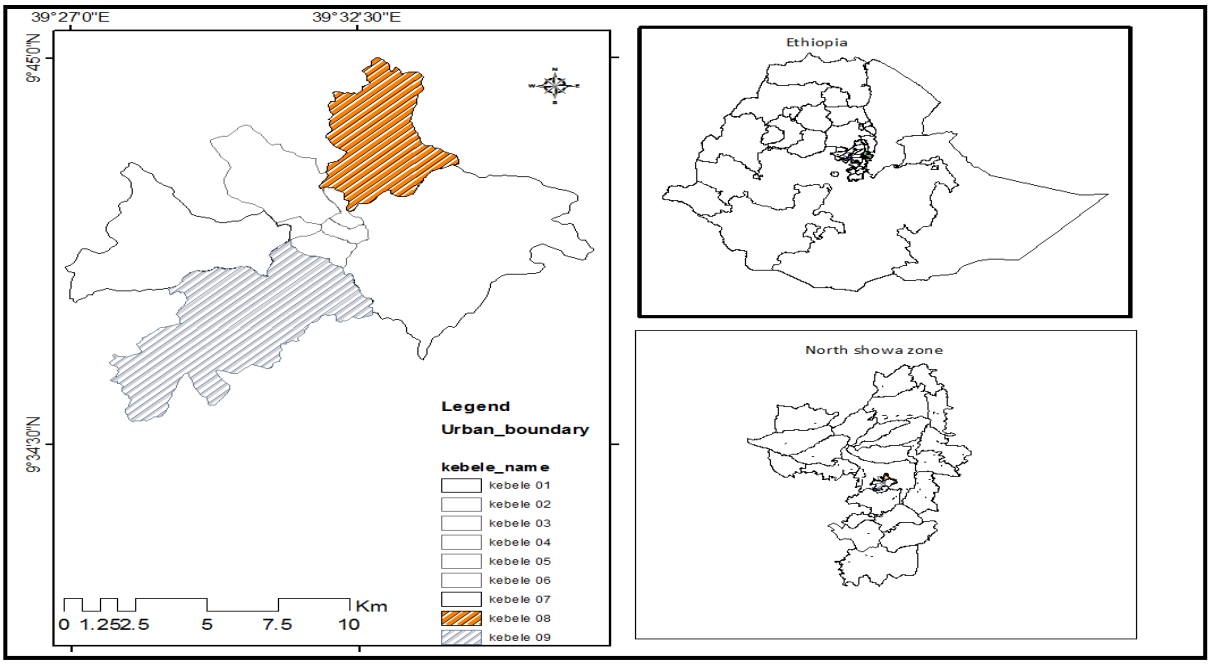


Figure 3. 1. Map of the study area

Source: Ethi-GIS (2020)

3.1.2. Climatic Condition

With an average elevation of 2750 meters above sea level (m.a.s.l), Debre Berhan is classified under the agro-climatic zone. With an average maximum temperature of 20.1c^{o} and an average minimum temperature of 6.5 c^{o}, the town has got a mean annual temperature of 13.3c^{o} (2008 to 2013 G.C). This, though may be cold for some time (October, November, and December), is favorable for human settlement and to undertake any developmental activities. Debre Berhan, with a mean annual rainfall of 965. 25m.m (2008-2013 G.C), has moderate annual rainfall amount that is sufficient to undertake any developmental activities, help full to sufficiently recharge the ground and surface water, and made the town the most preferable area with ample water supply coverage attracting different investments where water is one of the inputs for production. Thus, this structure plan preparation should consider such a favorable climate and abundant rainfall (via plot assignment). The dominant prevailing wind directions of Debre Berhan are Southeasterly and Easterly winds (that blow from southeast to southwest and from east to west). Thus, pollutant establishments (industries) that emit any smokes, dust, sounds, and odors should be allocated against these directions in the southwest and western parts of the town in this structure plan preparation (EMA,2014 as cited in Da-Ya, 2014).

3.1.3. Population

Debre Berhan is also increasing in population from time to time. According to CSA report of (1984), (1994), (2007) and (2013) the population of Debre Berhan has been increasing from time to time. The Table 3.1. Shows the population size, distribution and growth rate of the town.

Table 3. 1. Population Size, Distribution and Growth Rate of Debre Berhan

Year	Male		Female		Total	Growth Rate
	No	Percent	No	Percent		
1984	11637	45.4	13998	54.6	25635	4.12
1994	17918	1 46.3	20799	53.7	38717	4.02
2007	31668	48.5	33563	51.5	65231	4.0
2013	40527	48.5	42952	51.5	83479	4.1

Source: CSA (1984), (1994), (2007) and (2013)

3.2. Design of the Study and Methods

The design of the study is a cross-sectional survey design involving both descriptive and explanatory types of research. The reason for using a descriptive type of research in this study is to describe the existing phenomenon of the issue under study. Descriptive research is important to provide an accurate depiction of a given phenomenon or experience (Kothari, 2004). Explanatory type of research has also been applied in this study to answer why a certain phenomenon happens about the issue of study. Explanatory research is important to explain why a certain phenomenon is happening in a particular (Kothari, 2004).

Based on the logic of reasoning, the research has followed a deductive approach. The study focused on collecting, analyzing, and mixing both quantitative and qualitative data to provide a better understanding of the research problem and research questions. The reason for mixing for both approaches is to offset the weaknesses of the approaches and to benefit from their strength (Kothari, 2004).

Therefore, the study has followed both quantitative and qualitative research approaches. The study is a cross-sectional study in which the samples of the population have been studied at a

given point in time. The most common approach to mixing methods is convergent design; first researchers are going to collect and analyze both quantitative and qualitative data during the same phase of the research process and then merge and interpret the result. (Creswell et al., 2003).

3.3. Data types and sources

As this research is both quantitative and qualitative in nature, the study employed both quantitative and qualitative types of data obtained from primary and secondary sources. The primary data were obtained from interview, questionnaire, Key Informant Interviews and observation. The secondary data, on the other hand, were collected from secondary sources such as: different government reports and published and unpublished documents.

3.4. Methods of Data Collection

The study employed different instruments to collect primary and secondary data. Both close and open-ended questionnaire as a primary data collection method distributed to sampled respondents. Semi-structured interviews were prepared and conducted to get relevant information about the issue under study. The interview was important to gain an in depth understanding of key informant's attitudes, preferences or behavior towards a phenomenon (Kothari, 2004).

Moreover, participant observation used to cross-check data gained from other sources and to have a practical image of the situation. Accordingly, field observations in sampled *Kebeles* have been administered. Observation of the study *Kebeles* was carried out before and during the data collection period. Before collecting data, different sites were visited to know green and open space area, ground tens place and topography of the area and others. This contributes to substantiating some of the findings from other data sources.

Secondary data collected through reviewing relevant literature; empirical studies, program documents, policies, performance reports, strategic and annual plans which are related to urban green space management was reviewed. In general, the data obtained through the above-listed instruments are substantiated and triangulated to come up with conclusions and generalizations.

3.4.1. Sampling Design

Sampling design is a crucial step in scientific research if properly undertaken it gives reliable and representative inferences about the population of the study (Kothari, 2004). In the deductive research approach, the researcher determines in advance the population of the study, sampling units and sample size of study before going to the field for data collection (Kothari, 2004). The study conducted consistent with the deductive logic of reasoning and the way of sampling is discussed as follows.

3.4.2. Study population, sample frame and Units of analysis

According to CSA (2013), the latest estimation of Debre Berhan's population reached that of 114,652. The city of Debre Berhan is currently divided into 9 Kebele administration units. The study employed simple random sampling techniques to select sample respondents. This is because simple random sampling techniques equal chance for respondents. As the study sought to generate in-depth information from various individuals who are actively involved in the management process of green and open spaces or have expert knowledge about the issue, it relies on a purposive sampling of key informants and resource persons. Thus, about 4 Key informants were selected purposively.

Multi-stage cluster sampling for clustering *Kebeles* was followed in the study. About the sampling procedure, the researcher would better utilize to clustering the 9 *Kebeles* into two clusters based on their distinctive characteristics.

Thus, cluster one consisted of *Kebeles* 07, 05, 06, 02, and 08, these *Kebeles* which are business corridors of the town and geographically located at the center. While *Kebeles* under cluster two included 01, 03, 04, and Kebele 09. These *Kebeles* are geographically located on the periphery of the town and they are more of residential areas and also characterized by mixed land-use practices. From these two clusters of *Kebeles*, one Kebele from each cluster is purposely selected for this study. Accordingly, Kebele 08 from cluster one and Kebele 09 from cluster two are selected purposively considering their large proportion of green areas.

3.4.3. Sample Size

According to the census report of CSA (2012), the total population of Debre Berhan town (the 09

Kebeles) is 83,479 and the total population of the two target *Kebeles* (target *Kebeles* only for sample size determination) i.e. Kebele 09 and Kebele 08 is 10,915 and 6,221 respectively. the two *Kebeles* have total size of 17,136. Therefore, to draw sample and to determine the sample size from these based on the purpose of study, geographical area, time and cost from the grand population 17,136 take The 124 households were determined using 1967 model of determining the sample size, to determine the required sample size at 95% confidence level with degree of variability = 0.5 and level of precision (e) = 9%.

This formula is presented below Equation

$$n = \frac{N}{1 + (e^2)}$$

n= the sample size;

N= the population size, in this case 17,136

e= level of precision (9%);

1= constant value

$$n = \frac{17136}{1 + 17136(0.0081)}$$

n=124

Table 3. 2. Sample size information

Kebele	No of population	Sample proportion
08	6,221	45
09	10,915	79
Total	17,136	124

3.5. Data Analysis and Presentation

The qualitative data the interviews were record with the consent of the respondents. The data generate by in-depth interview is first transcribe and then it was translating to English. The translate transcript is review and examine line-by-line and then categorize into primary codes or themes. Then two techniques of data analysis are use these are condensation- paraphrasing long interviews into short and snappy statements; narrative creating a coherent story out of the many happenings report in an interview and observation and analyze accordingly. In the quantitative data, the collect data was code, enter into a computer database and analyze using Statistical Packages for Social Sciences (SPSS) version 20. MS-Excel was also use for drawing graphs and plots depending on its convenience. The descriptive statistics such as proportions, means, percentages, and appropriate graphic presentations were used in the analysis. Moreover, binary logistic regression was used to identify the determinants of green space development under urban landscape in the study area.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Socio demographic and economic characteristics of respondents

4.1.1. Sex and age of respondents

Different age groups had different implications for green area development and management of the town. Well developed and managed green areas contribute more to the psychological, health and social developments of children. This is also useful for practical teaching and learning processes of students and for development of interactive life among age mates. For adults, green areas create conducive environment for socio cultural development and social cohesion and for celebration of different ceremonies. For the aged, it provides a place for leisure, rest, reading books and information exchange among each other from different sources like magazines, journals and social media or internet.

Table 4. 1. Age Structure of Respondents

Age	Frequency	Percent	Valid Percent	Cumulative Percent
<25	8	7	7	6
25- 35	47	38	38	44
36- 45	33	27	27	71
46- 55	34	27	27	98
56-65	2	1	1	100
Total	**124**	**100**	**100**	

Source: filed survey, 2020

From the table, one can understand that green area development is very important bv for all age groups or residents, i.e. for youth's and children and who account for 44 % of the respondents. It helps in mental and social development and practical education about the environment and nature. For adults who account for 54 % of respondents it creates fertile ground for different socio-cultural cohesion and ceremony, and for aged people who account for 1% it is used as restful place and for leisure activities and also information exchange.

4.1.2. Sex Distribution

Sex distribution of respondents had a different interpretation in relation with green areas in a given area. Women had access to use the green areas for intended values if it is well developed, because mothers are the first person from the family to care for their children and observe what it need from the green areas. On the contrary, they have access to use or illegal activities because it is near the open spaces for dumping solid wastes. If the level of awareness of women is increased in the use of green areas for intended values, it will help to improve the development and management. Therefore, the sex distribution of respondents affects the intention of using green areas especially for those women who are not educated and had low awareness of green areas, or had an intention of using green areas for dumping solid waste and grazing. Below is the sex distribution of the respondents.

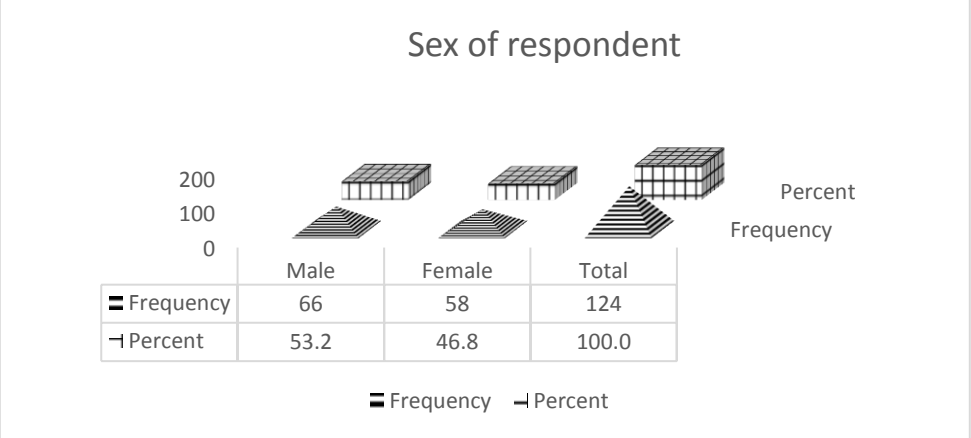


Figure 4. 1. Sex distribution of the respondents

Source: filed survey, 2020

Table 4. 2. Marital status of respondents

Marital status	Frequency	Percent
Married	84	67
Not married	37	29
Divorce	3	2
Total	**124**	**100**

Source: filed survey, 2020

4.1.3. Level of Education of the Respondents

Regarding education level of the respondent, on Figure 4.2 below showed that the majority of the respondents 50 %Degree and above. Among the respondents 6 % were Read and write and whereas 10 % of respondents were attendee primary school (1-8 grade).

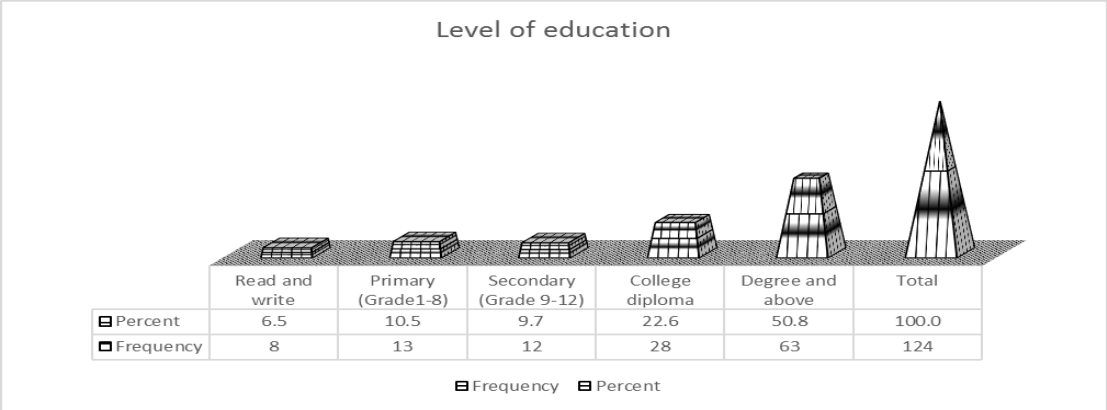


Figure 4. 2. Level of Education of the Respondents

Source: filed survey, 2020

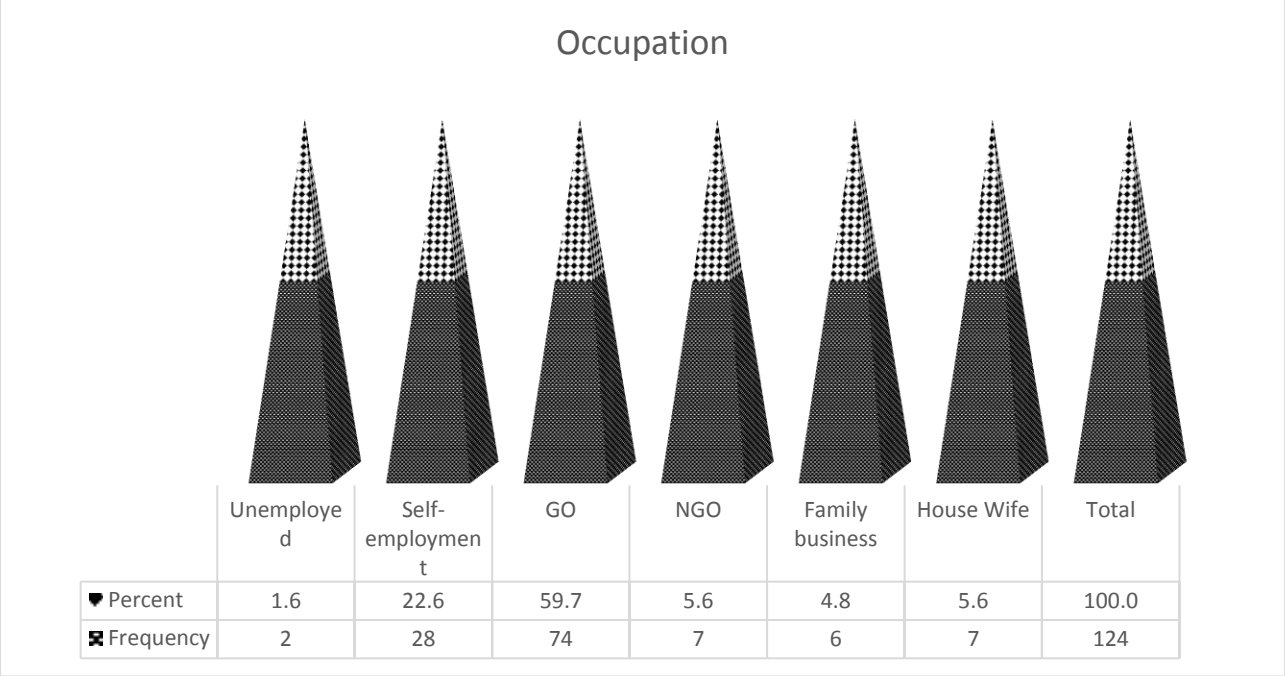
Table 4. 3. Level of education of respondents

Level of education	Frequency	Percent	Valid Percent	Cumulative Percent
Read and write	8	6	6	7
Primary (Grade1-8)	13	10	10	17
Secondary (Grade 9-12)	12	10	10	27
College diploma	28	23	23	49
Degree and above	63	51	51	100
Total	**124**	**100**	**100**	

Source: filed survey, 2020

The education level and the attitude or awareness of green areas development and management had a direct relation. If the level of education is high then the awareness about the values or benefits of green areas will be high, which in turn lead to increased contribution for development and management of green areas. For an illiterate society, green area means nothing except simple open spaces for solid waste dumping, for putting construction material and cemetery purposes,

while for literate and modern society green areas is a means for leisure and recreation. Therefore, education is one instrument necessary for the creation and development of green areas in cities.



	Unemployed	Self-employment	GO	NGO	Family business	House Wife	Total
Percent	1.6	22.6	59.7	5.6	4.8	5.6	100.0
Frequency	2	28	74	7	6	7	124

Figure 4. 3. Occupational status of respondents

Source: Filed survey, 2020

4.1.4. Income Level of Respondents

Income of individuals and town as an entity affect directly the development and quality of green areas. As income of individuals' increases, then the tendency of using green areas for dumping solid waste and other illegal activities decreases due to their ability to raise funds to develop and maintain the green space and willingness of people to use them. But as shown in the below table 56% of the respondent's income level of is not more than 4,000 birr per month. This implies that most of the respondents give more attention to fulfill their basic needs.

Table 4. 4. Income Level of Respondents

Income	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 2000.00	8	6.5	7.0	7.0
2,000 - 3,000 birr	27	21.8	23.5	30.4
3000 birr -4000birr	26	21.0	22.6	53.0
>4000	54	43.5	47.0	100.0
Total	115	92.7	100.0	
	9	7.3		
	124	100.0		

Source: Filed survey, 2020

4.2. Nature of green areas in Debre Berhan

Green areas development and management in Debre Berhan was assessed by considering the nature of green areas. Key informants raise issues that express the nature of green areas in Debre Berhan. Availability of green areas, status of green areas and hours to reach the nearest green area mentioned as indicators to show accessibility of green areas and accessibility of green areas may have association to green areas management. The response of sample respondents indicated that majority of respondents, 91%, answered no sufficient number of green areas in their residence. Regarding to distribution of green areas said that, the town administrators perceived benefit of green areas as a way to emphasize Bahir Dar as a tourist town than its benefit to the local community and based on this distribution of green areas focused on road side part of town and development of green areas for recreational park have less focus. Green areas are not justly distributed and stratified based on socio economy of urbanities, socio political factors and geographical factors. Uneven distribution of urban green areas among the community regarded as environmental injustice (Wolch, 2014).

Table 4. 5. Sufficiency of number of green areas

Answer	Frequency	Percent
Yes	10	8
No	114	92
Total	**124**	**100**

Source: filed survey, 2020

For the overall current availability of green spaces that majority of respondents 92% answered they have not satisfied current availability of green spaces in the town is not well managed, emphasis given for only road side plantation than other form of green spaces and in some green areas around the town are dumping waste this is challenging the status of green areas.

Table 4. 6. Hours to reach the nearest green area

Hour	Frequency	Percent
Less than Half hour	6	4.8
Half hour	58	46.8
more than one hour	17	13.7
Total	81	65.3
System	43	34.7
Total	**124**	**100**

Source: filed survey, 2020

Majority of respondents which is about 58 % takes less than half hour to reach their nearest green area on their foot. Studies explain that accessibly to green areas may be measured by distance to walk to reach the nearest green area from one's resident. Shorter distance from a resident to green areas assumed to increase accessibility of people to green areas as European Environmental Agency (EEA) recommends 15 minute of hour to reach to the nearest green areas on foot and this has an association to management of green areas (Peschardt & Stigsdotter, 2013 as cited by Lidia, 2016).

Table 4. 7. Frequency of visiting green areas

Frequency of visit	Frequency	Percent
Weekly	12	9.7
Monthly	14	11.3
Once in 3 months	5	4
Once in 6 months	6	4.8
Annually	25	20.2
Total	62	50
No at all	62	50
Total	124	100

Source: filed survey, 2020

4.3. Reasons for not frequently visiting green areas

The result of the study shows green areas are not well managed and not in good condition to visit was mentioned as a reason not to visit green areas frequently by the majority of respondents which is 61% and 12% of respondents agreed up on distance and transport cost. In contrast with this idea key informant listed some factors that limit the frequency of people to visit green areas. Green areas not enough in number, grass and flower eaten by animals and currently new planed areas have enough green areas but the middle part of the town there is no enough open areas for greenery and others they are not well managed to visit as they are compounded for the purpose of symbol and in most cases solid wastes are dumping inside.

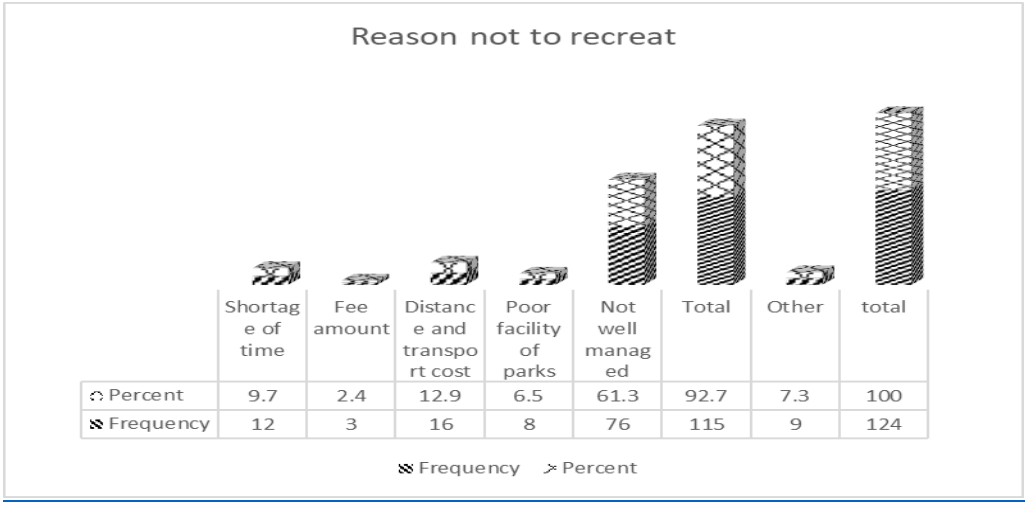


Figure 4. 4. Reason not to recreate

Source: filed survey, 2020

4.4. Population growth and green areas Management

Now a day's urban areas are expanded because of rapid population growth. Ethiopia is among developing countries that experience unplanned urbanization that affect different components of urban structure. This enables the country to have several emerging secondary cities with the potential to become the primary one. The study tried to assess the status of green areas in the context of population growth of Debre Berhan. Based on this, 62% of respondents answered that green area coverage affect in the context of rapid population growth of the town.

Table 4. 8. Effect of population growth in green area

Population growth affect	Frequency	Percent
Yes	77	62
No	43	35
Total	**120**	**97**
Other	4	3
Total	**124**	**100**

Source: filed survey, 2020

4.4.1. Benefits of Green Areas to wellbeing as perceived by Respondents

The study explored how respondents perceive the socio-economic and environmental benefits of green areas. The result of the study shows in the below table that majority of respondents perceived as green areas are beneficial for physical and urban environment Moreover, green areas can have a beneficial impact on mental wellbeing and cognitive function (Wodarczyk, 2007). The study explored how respondents perceive the socio-economic and environmental benefits of green areas. The result of the study shows that majority of respondents perceived as green areas are beneficial for physical and spiritual health 97%. Majority of respondents perceived that green areas are beneficial for urban environment.

Green areas benefit to health as perceived by respondents

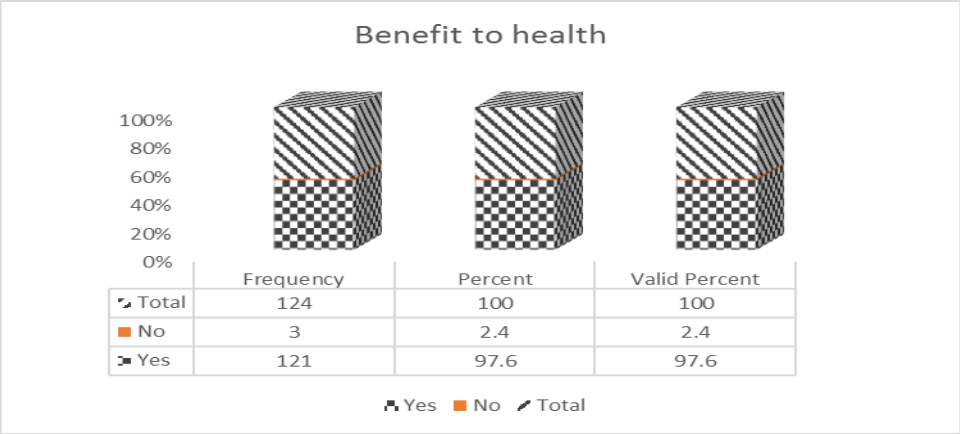


Figure 4. 5. Benefit to health

Source: filed survey, 2020

Rapid population growth and urbanization is altering land use system and this result in distortion of environmental system of urban environment including climate, ecosystem and the whole biodiversity. The results of thesis done by Justine, (2010) have shown that all respondents to the survey were very positive about urban trees, regardless of the type of street they lived on and any socioeconomic variables. Small variations existed between streets, but this was only in the strength of agreement or disagreement. Respondents in the UK rated benefits more highly and problems less highly than respondents in the USA, but overall there were little differences in the responses.

Table 4. 9. Green areas benefit to socio economy as perceived by respondents

	Frequency	Percent	Valid Percent
Yes	118	95.2	98.3
No	2	1.6	1.7
Total	120	96.8	100
System	4	3.2	
	124	100	

Source: filed survey, 2020

The results indicated widespread recognition of environmental benefit of urban green areas and negative response were weakly expressed. Climate change mitigation and environmental benefit were emphasized. Environmental functions focus respondent's attention as majority of respondents agreed up on green areas benefit to climate change mitigation, protecting ecosystem and protecting biodiversity.

Respondents are aware about benefits of green areas to the environment including conservation of habitat, species conservation, other natural ecosystem and contribution to mitigate climate change impacts whereas; respondents had limited concern about economical services of green areas. Communal urban green areas did not structure with infrastructures that create job opportunities to earn income. Urban areas support the stabilization of faltering relationships between urban residents and provide a landmark element and point of pride in urban communities. Respondents argue on administrators plan to develop green area to improve the image and character of the town than assuring socio-economic benefit of green areas. When working in connection with other social benefit issues such as reducing crime, green areas development and improvement offer quick and tangible actions that help redefine and improve lifestyles in urban centers. They revitalize responsible and friendly interactions of individuals and communities that live in and around cities and towns and especially for youth this helps to refresh and control other evil activities.

4.5. Determinants of green space development and management

The study employed binary logistic model to estimate the effect of each on green areas management. From variables that are assumed as factors that determinate green space development and management, the result of binary Logistic regression model estimates variables that are significant factor to develop and management of green space areas in Debre Berhan town, these include age of household head, average salary of household, marital status, sufficiency of green areas, and accessibility of green areas, participation in plantation tree, sufficiency of budget and hour to reach the nearest green area.

Table 4. 10. Logistic Regression Result

Determinate of green space area development	B	S.E.	Wald	Sig.	Exp (B)	95% C.I.for EXP(B) Lower	Upper
Age	.026	.018	2.049	.032**	1.026	.991	1.062
Sex	-1.195	.621	3.705	.054*	.303	.090	1.022
Maternal	.836	.364	5.264	.022**	2.307	1.130	4.713
Education	-.706	.311	5.139	.023**	.494	.268	.909
Tree planting	-.293	.141	4.319	.038**	.746	.565	.983
Budget allocated	.288	.124	5.371	.020**	1.334	1.045	1.701
Town administration responsible	1.211	.456	7.043	.008***	3.357	1.373	8.211
Nearest green area	1.177	.521	5.111	.024**	3.245	1.170	9.004
Sufficient green area	1.493	.622	5.767	.016**	4.449	1.316	15.042
Accessibility	1.351	.595	5.149	.023**	.259	.081	.832
Population density	1.504	.589	6.521	.011**	.222	.070	.705
Average Income	2.700	.835	10.463	.001***	14.874	2.898	76.356
Constant	-1.509	2.412	.392	.531	.221		

Source: Filed survey, 2020

*** Significant at 0.01 level, ** Significant at 0.05 level, * Significant at 0.1 level,

Age of the Respondents:

The model result show that positive relationship between age of respondents and green space area management This indicates that when the age of household head increased by one year, the probability of the decision of the household to green areas management increase by .026 times at p=0.05 level. This means that when one-person increase age. they have more chance to move other place and more knowledge to gain by experience about the important of green space area. The result is consistent with a research conducted by Aziz, (2012), logistic regression modelling indicated significant differences in probabilities of using and managing green space areas in terms of age groups.

Income of the Respondents:

The binary logistic regression model reveled that average income of the respondents positive and significant effect on the greenspace area management at p=0.01. In keeping other factors constant, the probability of green areas management increase 2.700 times when average income of household increase by one additional birr. Respondents with high annual income found to manage green space areas than those respondents with lower average monthly income. Previous

study conducted by (Ali, 2007 & Telaw ,2018) revealed similar result that participation in environmental concerns like tree plantation was factor for green management system.

Marital status:

The relationship between marital status of household head and green area management has become significant and positive relationship with p=0.05 level of significance. keeping other factors constant, probability of communal green areas management increases by .836. This might be due to unmarried household heads decide by themselves than married ones as they decide without any influence and take responsibilities to their households. This result is in harmony with finding of Aziz (2012) which found marital status was important factor in green area management

Sufficiency of budget allocated:

Budget allocated by the government and concerned body to green space areas management was found a significant factor in determining to green space areas management p=0.05 significant level .288 times. The .288 indicates that the probability green area management increase by .288 times for one additional unit of budget allocate to green areas management. As respondents observing the budget allocate for green area management is sufficient, green space area management. To manage green space area, finance critical role. This finding is consistent with previous study by Akola, (2007) & Ketsela, (2016) that found budget allocation was determinant to green space area management.

Hour to reach the nearest green area:

Hour to reach the nearest green space area from their resident found that statistically significant at and positively influence for green space area management relationship. The result shows, p=0.05 significant level. management of green space area increase by 1.177 times than households which have green area that is near to their resident. Previous study by Aziz, (2012) and Sari, (2009) & Annika, (2011) indicates similar finding, distance from resident is an important factor that explain management green space areas.

Sufficiency of number of green areas available:

The relation between sufficiency of number of green areas available has shown a significant and positive relationship with the green space areas management with the p =0.05 level. keeping other factors constant, as number of green areas increases by one the likelihood to manage green areas increase by

1.493. This is because as to manage green space areas large number of green areas available in their residence area. Previous study done by Annika (2011) indicated similar result as available number of green area determines management of green space areas.

Participation in tree plantation:

The household`s participation in tree plantation were found to be a positive and statistically significant factor that determines decision to management of communal green areas but the result is un expected it shows, p=0.05 significant level. Management of green space area decrease by -.293 times households that participate in tree plantation. This is for the reason that, households that participate in tree plantation campaign not aware more about benefit of managing green areas and have no motivation to manage green areas than those who participate in tree plantation in the Town. The result is harmony with Ali (2007), concern to environment determine green area management.

Accessibility:

The binary logistic regression model reveled that accessibility of the respondents to green area is positive and significant effect on the green area management at p=0.01. In keeping other factors constant, the probability of green areas management increase 1.351 times when the accessibility of household increase. Respondents with high accessibility more advantage to manage green space areas than those respondents with lower accessible. Previous study conducted by (Ali, 2007 & Telaw, 2018) revealed similar result that accessibility of green area was factor for green area management system.

Support of the town administration for green area development and management:

Support of the town administration for green area development and management found that statistically significant at and positively influence for green space management relationship. The result shows, p=0.05 significant level. Management of green space area increase by 1.211 times than households which have support by town administration. Previous study by Aziz, (2012) and Sari, (2009) & Annika, (2011) indicates similar finding, Support of the town administration for resident is an important factor that explain management green space areas.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The main objective of the study was to investigate the determinants of urban green space development under urban landscape in Debre Berhan Town. The town ministration had open spaces intended for green areas in the development plan of the town but they are not well managed to visit and they are compounded for the purpose of symbol and in most cases solid wastes are dumping inside.

Underdevelopments of green areas are a result of the absence of the required professionals with experience and sufficient budget. The municipal authority human resource structure has no urban planner and professional personnel for related fields for developing the sector. This implies no attention is given for the sector's development.

The study tried to assess perception of the community towards benefit of green areas to wellbeing of the society. The result showed that respondents are aware about benefits of green areas to the environment including conservation of habitat, species conservation, other natural ecosystem and contribution to mitigate climate change impacts whereas; respondents had limited concern about economical services of green areas. Urban green areas did not structure with infrastructures that create job opportunities.

To assess the factors that determine green space development and management, binary logistic regression model was employed. Results of the binary logistic regression model indicated that age of household head, income of household, marital status, sufficiency of green areas, accessibility of green areas, participation in plantation tree, sufficiency of budget and distance to reach the nearest green area are significant factor to develop and management of green space areas in Debre Berhan town.

5.2. Recommendations

Based on the key findings of the study the following recommendations were drawn to enable optimal utilization of urban green areas management and to capitalize the benefits of green areas through improved management of green areas.

- ✓ In order to create ownership among the community members and other stakeholders, the town Sanitation, Beautification and Green Area Management Office should develop more participatory system; this can be done through local institutions with sufficient budget allocation. Active community involvement in green area development and management also enhance administrators` motivation to work more on green areas management.
- ✓ The municipality should develop one model green area in the town and celebrate different ceremonies to increase the people's awareness about the benefits of green areas. Again the administration should implement the rules and regulations of green areas to keep the green areas clean and should develop by-laws with the participation of the whole population to penalize those who use green areas for illegal activities.
- ✓ Officials should be aware of on the concepts of livable, competitive and sustainable development of cities and pattern of urbanization locally and globally using different source of information in additional to workshops and short term trainings.
- ✓ There should be integration among residents and other stakeholders in the town; the community based organizations like Edir, Equip, Teachers Associations, Rotary Club, and other Associations are potential stakeholders in the development and management of the sector under study. These bodies should not only participate in planting and caring of seedlings, but also be given the opportunity to deliver and transmit environmental education and awareness to the population in the town. Therefore, the town administration should work intimately with community based organizations and strongly encourage other government institutions to develop green areas in their compound.
- ✓ Generally, the town Urban Planning Sanitation and beatification Office should strength its collaboration with other stakeholders including educational institutions, local institutions, NGOs, private sectors, community and other governmental offices. Multidisciplinary way of stakeholder involvement is essential elements of successful urban sustainable. Responsibility of each respected stakeholder needs to be studied with

further research to come up with more effective and efficient green area development and management.

References

Akola, J., & Jones, R. O. (2007). Structural phase transitions on the nanoscale: The crucial pattern in the phase-change materials Ge 2 Sb 2 Te 5 and GeTe. Physical Review B, 76(23), 235201.

Alemu, A., Moges, F., Shiferaw, Y., Tafess, K., Kassu, A., Anagaw, B., & Agegn, A. (2012). Bacterial profile and drug susceptibility pattern of urinary tract infection in pregnant women at University of Gondar Teaching Hospital, Northwest Ethiopia. BMC research notes, 5(1), 197.

American journal of obstetrics and gynecology, 193(1), 103-113.

Auxier, R. E., & Hahn, L. E. (2007). The Philosophy of Michael Dummett.

Banerji, S., Cibulskis, K., Rangel-Escareno, C., Brown, K. K., Carter, S. L., Frederick, A. M., ... & Cortes, M. L. (2012). Sequence analysis of mutations and translocations across breast cancer subtypes. Nature, 486(7403), 405-409.

Barber, M. D., Walters, M. D., & Bump, R. C. (2005). Short forms of two condition-specific quality-of-life questionnaires for women with pelvic floor disorders (PFDI-20 and PFIQ-7). American journal of obstetrics and gynecology, 193(1), 103-113.

Bekele, E., & Worku, Z. (2008). Women entrepreneurship in micro, small and medium enterprises: The case of Ethiopia. Journal of International Women's Studies, 10(2), 3-19.

Berhanu, K., Shoa, E., & Raj, S. Therelationship between tourist satisfaction and post-travelbehaviour: Evidence from international tourists visiting Ethiopia.

Bermejo-Deval, R., Assary, R. S., Nikolla, E., Moliner, M., Román-Leshkov, Y., Hwang, S. J., ... & Davis, M. E. (2012). Metalloenzyme-like catalyzed isomerizations of sugars by Lewis acid zeolites. Proceedings of the National Academy of Sciences, 109(25), 9727-9732.

Bertagnolio, F. (2005). EUDP ProjectLow Noise Airfoil'-Final Report. J. Fluid Mech, 532, 345-364.

Brandt, U. S. (2014). The implication of extreme events on policy responses. Journal of Risk Research, 17(2), 221-240.

Cortinovis, C., & Geneletti, D. (2019). A framework to explore the effects of urban planning decisions on regulating ecosystem services in cities. Ecosystem Services, 38, 100946.

Degnechew, G. D., & Buzayehu, D. B. (2018). Applications of Arthrospira platensis as an alternative source of food, maintaining nutritional security and awareness creation; there by reducing problems of malnutrition in the society. World News of Natural Sciences, 19, 1-8.

Devaux, N., & Dubé, J. (2016). About the influence of time on spatial dependence: A meta-analysis using real estate hedonic pricing models. Journal of Real Estate Literature, 24(1), 31-66.

Fisher, R., & Tibbatts, A. F. (2002). U.S. Patent No. 6,416,824. Washington, DC: U.S. Patent and Trademark Office.

Foshee, V. A., Reyes, H. L. M., Chen, M. S., Ennett, S. T., Basile, K. C., DeGue, S., ... & Bowling, J. M. (2016). Shared risk factors for the perpetration of physical dating violence, bullying, and sexual harassment among adolescents exposed to domestic violence. Journal of youth and adolescence, 45(4), 672-686.

Genovese, M. C., Durez, P., Richards, H. B., Supronik, J., Dokoupilova, E., Mazurov, V., ... & Ikawa, T. (2013). Efficacy and safety of secukinumab in patients with rheumatoid arthritis: a phase II, dose-finding, double-blind, randomised, placebo controlled study. Annals of the rheumatic diseases, 72(6), 863-869.

Goyal, M., Menon, B. K., van Zwam, W. H., Dippel, D. W., Mitchell, P. J., Demchuk, A. M., ... & Donnan, G. A. (2016). Endovascular thrombectomy after large-vessel ischaemic stroke: a meta-analysis of individual patient data from five randomised trials. The Lancet, 387(10029), 1723-1731.

Groop, C. (2017). Controlling the unruly agents–linkages between accountability and corruption within the executive structures of Botswana. Journal of Contemporary African Studies, 35(1), 34-53.

Heiber, J. F., & Barber, G. N. (2011). Vesicular stomatitis virus expressing tumor suppressor p53 is a highly attenuated, potent oncolytic agent. Journal of virology, 85(20), 10440-10450.

Hunter, R. F., Christian, H., Veitch, J., Astell-Burt, T., Hipp, J. A., & Schipperijn, J. (2015). The impact of interventions to promote physical activity in urban green space: a systematic review and recommendations for future research. Social science & medicine, 124, 246-256.

Jansson, M., & Lindgren, T. (2012). A review of the concept 'management'in relation to urban landscapes and green spaces: Toward a holistic understanding. Urban forestry & urban greening, 11(2), 139-145.

Johnston, R. J., & Russell, M. (2011). An operational structure for clarity in ecosystem service values. Ecological economics, 70(12), 2243-2249.

Jung, U. J., & Choi, M. S. (2014). Obesity and its metabolic complications: the role of adipokines and the relationship between obesity, inflammation, insulin resistance, dyslipidemia and nonalcoholic fatty liver disease. International journal of molecular sciences, 15(4), 6184-6223.

Kabisch, N., Frantzeskaki, N., Pauleit, S., Naumann, S., Davis, M., Artmann, M., ... & Zaunberger, K. (2016). Nature-based solutions to climate change mitigation and adaptation in urban areas: perspectives on indicators, knowledge gaps, barriers, and opportunities for action. Ecology and Society, 21(2).

Kahsay, G., & Zeleke, G. (2019). Factors Affecting Use of Accounting Records on Small & Micro Enterprises (the Case of Debre Berhan City, Ethiopia). Journal of Investment and Management, 8(1), 1-7.

Kothari, C. R. (2004). Research methodology: Methods and techniques. New Age International.

Maller, C., Townsend, M., Pryor, A., Brown, P., & St Leger, L. (2006). Healthy nature healthy people:'contact with nature'as an upstream health promotion intervention for populations. Health promotion international, 21(1), 45-54.

McNeil, J., & Vava, C. (2006). Oakville's urban forest: Our solution to our pollution. Town of Oakville, Parks and Open Space Department, Forestry Section. (8 February 2012.

Nguyen, L., Rigo, J. M., Rocher, V., Belachew, S., Malgrange, B., Rogister, B., ... & Moonen, G. (2001). Neurotransmitters as early signals for central nervous system development. Cell and tissue research, 305(2), 187-202.

Noorbakhsh, S., Schoenau, J., Si, B., Zeleke, T., & Qian, P. (2008). Soil properties, yield, and landscape relationships in south-central Saskatchewan Canada. Journal of plant nutrition, 31(3), 539-556.

Perry, E. E. (2018). Cityscape connections: National Park Service relevance and resilience in urban areas.

Pojani, D., & Stead, D. (2015). Sustainable urban transport in the developing world: beyond megacities. Sustainability, 7(6), 7784-7805.

Raaschou-Nielsen, O., Andersen, Z. J., Beelen, R., Samoli, E., Stafoggia, M., Weinmayr, G., ... & Xun, W. W. (2013). Air pollution and lung cancer incidence in 17 European cohorts: prospective analyses from the European Study of Cohorts for Air Pollution Effects (ESCAPE). The lancet oncology, 14(9), 813-822.

Richards, D. P., Barber, F. A., & Herbert, M. A. (2005). Compressive loads in longitudinal lateral meniscus tears: a biomechanical study in porcine knees. Arthroscopy: The Journal of Arthroscopic & Related Surgery, 21(12), 1452-1456.

Richmond, T. D., Chohan, M., & Barber, D. L. (2005). Turning cells red: signal transduction mediated by erythropoietin. Trends in cell biology, 15(3), 146-155.

Schetke, S., Lee, H., Graf, W., & Lautenbach, S. (2018). Application of the ecosystem service concept for climate protection in Germany. Ecosystem Services, 29, 294-305.

Smith, P., Davis, S. J., Creutzig, F., Fuss, S., Minx, J., Gabrielle, B., ... & Van Vuuren, D. P. (2016). Biophysical and economic limits to negative CO 2 emissions. Nature climate change, 6(1), 42-50.

Teshome, A. (2006, March). Agriculture, growth and poverty reduction in Ethiopia: policy processes around the new PRSP (PASDEP). In a paper for the Future Agricultures Consortium Workshop, Institute of Development Studies, University of Sussex, UK (pp. 20-22).

Tzoulas, K., & James, P. (2010). Peoples' use of, and concerns about, green space networks: A case study of Birchwood, Warrington New Town, UK. Urban Forestry & Urban Greening, 9(2), 121-128.

Uttara, S., Bhuvandas, N., & Aggarwal, V. (2012). Impacts of urbanization on environment. International Journal of Research in Engineering and Applied Sciences, 2(2), 1637-1645.

Wang, Q., & Zhou, T. (2014). Alternative-splicing-mediated gene expression. Physical Review E, 89(1), 012713.

Wang, Y. P., Wang, Y., & Wu, J. (2009). Urbanization and informal development in China: Urban villages in Shenzhen. International Journal of Urban and Regional Research, 33(4), 957-973.

WHO, U., & UNFPA, W. (2007). Maternal mortality in 2005. Geneva, Switzerland.

Wiese, F. K., & Ryan, P. C. (2003). The extent of chronic marine oil pollution in southeastern Newfoundland waters assessed through beached bird surveys 1984–1999. Marine Pollution Bulletin, 46(9), 1090-1101.

Wlodarczyk, N. (2007). The effect of music therapy on the spirituality of persons in an in-patient hospice unit as measured by self-report. Journal of Music Therapy, 44(2), 113-122.

Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'. Landscape and urban planning, 125, 234-244.

Zajączkowski, K. EU Development Policy 4003-ERASMUS-EUDP-OG.

Zelle, B. A., Gollwitzer, H., Zlowodzki, M., & Bühren, V. (2010). Extracorporeal shock wave therapy: current evidence. Journal of orthopaedic trauma, 24, S66-S70.

Appendix

Debre Berhan University

College of Social Science and Humanities

Program of Urban Development and Management

Appendix I Questionnaire.

This questionnaire is designed to gather data to develop a thesis for academic purpose and so, that are intended to investigate the determinants of Green Space development and management in Debre Berhan city. The success of this academic research depends on your honest response and, thus you are kindly requested to respond clearly and genuinely. You do not need write your name and you may not respond if you are not comfortable with the questionnaires.

Your response will have kept confidently

Thank you in advance for your collaboration!

Date _____

Part I Socioeconomic and demographic profile of sample household heads:

1. Code_____

2. Sex: 1= Male 2= Female

3. Age: 1. < 30 2. 31- 45 3. 46- 60 4. >61

4. Marital Status: 1=Married 2= Not married 3= Divorce 4=Widowed

5. Family size male ----------female-------- total--------

6. For how long live in this area?

1. <10 years 2. 11-14 years 3.> 15 years

7. Level of education:

1. Illiterate 2. Read and write 3. Primary (Grade1-8) 4. Secondary (Grade 9-12) 5. College diploma 6. Degree and above

8. Occupation

1. Unemployed 2. Self-employment 3. GO 4. NGO 5. Family business 6. House Wife

9. Income: 1. Less than 2000.00 birr 2. 2,000 - 3,000 birr 3. 3000 birr -4000birr 4.>40

Part II. Questions on Green Space Development and Management

1.Are there Green spaces around your residence?

1. Yes 2. No

2. If yes, how many green spaces are there?

1. 1 2. 2 3. 3 4. 4 and above

3.Are you satisfied with the current availability of green spaces in the city?

1. Yes 2. No

4. green spaces are accessible to the people? 1. Yes 2. No

5. If no why?

1. Few green space 2. green space is not in good condition 3.not beneficial

6. How many minutes you spent to reach at the nearest green space on foot?

1. Less than quarter hour 2. Less than Half hour 3. Half hour
4. more than one hour

7. Have you ever visit green space?

1. Yes 2, No

8. If yes what is the frequency?

1. Weekly 2. Monthly 3. Once in 3 months 4. Once in 6 months
5. Annually 6. Not at all

9. What was the reason not to recreate in the green space?

1. Shortage of time 2. Fee amount 3. Distance and transport cost
4. Poor facility of parks 5. Not well managed

10. Who frequently visit green space in Debre Berhan?

1. Females 2. Males

11.population growth dose affect green space development

1.Yes 2. No

12.if your answer is yes how? ----------

13. By whom the green space was developed and managed now? _____

14. How frequently is the green spaces maintained? _____

Part III. Benefits of green space

1.Green space have benefit for the wellbeing of the community

1. Yes 2. No

2. Benefits of green space for community

No	Benefit of green area	1. Yes	2. No
1	Carrying out different Ceremony		
2	Psychological happiness		
3	Create job opportunity		
4	For beautification and recreation		
5	Contesting climate Change		
6	Biodiversity preservation		
7	Health		
8	Educational purpose		

3.Who is responsible in development management, maintenance and protection of green space?

1. Residents 2. Community 3. Kebele administration
4. City administration 5. Double response is possible

4. Are you willing to participate in green space development?

1. Yes 2. No

5. If your answer is no, why? ----------

6. What is your responsibility in development of green space?

1. Financial support 2. In kind support 3. Participating in areas community discussion

7. Are the city administrative official's play important role in the green space development?

1. Yes 2. No

8. Do you develop green space in your surrounding?

1. Yes 2. No

9. If Yes: 1. Contribution in kind 2. Contribution in cash 3. Participate in meetings

10. How do you evaluate community participation in green space development of the city?

1.high 2. Medium 3. Low

11. What are the factors that hinder the development of green space

1. poor government strategy 2. Urbanization 3. lack of awareness of community
4. shortage of budget

12. In your opinion necessarily skillful consultancy services require for green space development in the city?

1. Yes 2. No

13. In your opinion is there good coordination with the aliened bodies in green space development in the city?

1. Yes 2. No

14. In your opinion is there low awareness to green space development in the city?

1. Yes 2. No

15. Do you think that low awareness of community to green space development affect green spaces?

1. Yes 2. No

16. Low priorities have been given to green space development in the city of Debre Berhan

1. Yes 2. No

17. If yes, why? _____

18. If no, why? _____

19. Good attention given to green space development?

1. Yes 2. No

Appendix II Key Informant Interviews

This questionnaire is designed to gather data to develop a thesis for academic purpose and so, that are intended to investigate the determinants of Green Space development and management in Debre Berhan city. The success of this academic research depends on your honest response and, thus you are kindly requested to respond clearly and genuinely.

Your response will have kept confidently

Thank you in advance for your collaboration!

Office----------

Work position----------

1.Which government body is responsible for planning and management

of green space development?

---

2. What is the role of city administration in green space development and

management?

---

3. What are the challenges and opportunities of green space development in Debre Berhan?

---

4. What are the problems that affect the management of green space development Debre Berhan?

---

5. Do you think urbanization and industrialization affect green spaces? How? ----------
---

6. In your opinion what should be done by government, community and stake holders to solve the challenge of green space development in the city?

---

7. What are the factors that hinder the development of green space?

---

8. In your opinion, what are the opportunities that create conducive environment to develop and manage green space development?

9. Do you think green spaces are accessible to the people? 1. Yes 2. No

10. If your answer is no why?

10.What do you think about the benefits of green spaces to the urban environment?

---

11. Are there enough skills man power in number in Urban Planning, Sanitation and Beautification office

1.Yes 2. No

13.What should be done by government and community in management of green space development?
