

MIDLANDS STATE UNIVERSITY



THE IMPACT OF URBANIZATION ON ENVIRONMENTAL SUSTAINABILITY: THE CASE OF CHITUNGWIZA.

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DEDICATION

My special dedication goes to Mrs. Muyambo, who is my mum and Mr. and Mrs. Tennett who have always encouraged me to work hard in this research. Your inspirational messages and comfort shall be cherished in this research. You have been with me always in spirit and prayers from the date of commencement up to the submission date. I greatly appreciate your presents in this research.

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ABSTRACT

The geometric or unprecedented increase in urban population caused by massive rural to urban migration and natural increase has exacerbated urbanization. Urbanization has manifested itself by the distraction of the ecological footprint and largely violated the principals and traits of environmental sustainability. Land which supports the ecological footprint has been largely degraded by the scrambling and partitioning of land parcels by local authorities and land barons. This paper sought to explore the impact of urbanization on environmental sustainability, drawing ample evidence from Chitungwiza, Zimbabwe where its periphery is experiencing some modicum of changes caused by doldrums of urbanization. The researcher used a qualitative methodology which includes the use of semi-structured interviews, questionnaires, archival method and focus-group discussions. The research was under-pinned by urban developed models and environmental theories. SPSS version 20.0 was used to analyze data obtained by a questionnaire. It was observed that urbanization negatively impacted the environmental sustainability of Chitungwiza, reducing the aestatic beauty and environmental quality of the area. Activities such as commercial sand extraction, agriculture within fragile areas such as wetlands, land clearing had a deleterious impact to the environment. Strong policies and measures should be aimed to restore the degraded environment and achieve environmental sustainability in the long run.

KEY WORDS: IMPACT, URBANIZATION, ENVIRONMENT, SUSTAINABILITY

ABBREVIATIONS AND ACRONYMS

CBD	-	Central Business District
CBOs	-	Community Based Organizations
CCD	-	Concentric Zone Model
CHRA	-	Combined Harare Residents Association
CSO	-	Central Statistical Office
CSR	-	Corporate Social Responsibility
DNA	-	Deoxyribonucleic Acid
EIA	-	Environmental Impact Assessment
EMA	-	Environmental Management Agency
EMPS	-	Environmental Management Plans
EPA	-	Environmental Protection Agency
FDI	-	Foreign Direct Assessment
GoZ	-	Government of Zimbabwe
ILO	-	International Labor Organization
LA	-	Local Authority
LEAP	-	Local Environmental Action Plans
MDGs	-	Millennium Development Goals
NGOs	-	Non Governmental Organizations
NPOs	-	Non-profit Organizations
ORV	-	Off-Road vehicles
RDC	-	Rural District Councils
RTCP	-	Regional town and country Planning Act

SAPs	-	Structural Adjustment Programs
SCP	-	Sustainable Cities Program
SMEs	-	Small to Medium Enterprise
SPSS	-	Software Package for Social Sciences
SPM	-	Suspended Particle Matter
TNCs	-	Transnational Corporations
UCA	-	Urban Councils Act
UFIC	-	United Family International Church
UNEP	-	United Nation Environmental Program
UN	-	United Nations
UNCTAD	-	United Nation Convention on Trade And Development
UNIDO	-	United Nation International Development Organization
US	-	United States
USA	-	United states of America
WHO	-	World Health Organization
ZETDC	-	Zimbabwe Electricity Transmission and Distribution Company
ZIMASSET	-	Zimbabwe Agenda for Sustainable Socio Economic Transformation
ZINWA	-	Zimbabwe National Water Authority

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CHAPTER ONE: INTRODUCTION

1.0. Introduction

The expansion of urban areas was thought to be a noble idea in development circles. However, the rapid expansion being experienced today is now characterized by environmental degradation, deterioration in its quality thereby compromising the quest to achieve environmental sustainability. It is the concern of this research to explore the impact of urbanization on environmental sustainability. The world commission on Environmental and development also known as the Brundtland commission published a report, 'our common Future' in 1987 emphasizing the unity of environment and development. GREEN issues are spearheading discussions on resource management , biodiversity and global warming, while environmental problems known as BROWN Agenda have been neglected(Urban Poverty and Environmental Report,2000).Challenges in addressing and meeting the brown agenda in the cities have acquired prominence among the planning and development professionals around the world. It is well accepted that rapid urbanization has aggravated problems like sanitation and drainage, solid waste management, degradation of soil and land, uncontrolled emissions from domestic and industrial activities, street congestions and improper disposal of hazardous waste, resulted in poor health of people in urban areas (Munzwa et al, 2010). Cities and towns have been hubs of economic development but how this economic development must be achieved is a questionable issue in the urban and environmental arena.

According to UNEP (2000), environment is the sum total of water, air and land, the inter-relationships among them and also with human beings and living organisms as well as property.

Brundtland report of 1987 states that the environment does not exist as a sphere separate from human actions, ambitions and needs and attempts to defend it in isolation from human concerns will therefore be fruitless. The report also expanded the meaning of the word 'development' to mean a healthy environment in which economic activities, human livelihoods and good governance can flourish. As noted, 'development is what we all do in attempting to improve our lot within our environment. The nexus between environmental management and urban development must be given a due respect and recognition especially with the environmental phenomenon such as climate change, global temperature rise, disappearance of forests, wetlands and other atmospheric phenomenon being experienced all over the world.

It is well documented that physical and cultural environments are interrelated, although in many cases of highly different importance to low income groups the access to employment and income and provision of basic services (water, electricity and primary health care and education) is much more important than for example protection of biodiversity, cultural values and protection of specific sites and animals. To other groups, cultural environmental values, like access to scenery, environmental protection of vulnerable sites and endangered species and animals, are all viewed as of importance and playing a role in managing environmental health(Stephen,2002). From a broader perspectives, the environmental degradation is in many cases not only related specific to low income clusters, but have potential to submerge the life and environmental quality for specific urban region and even beyond(Zhiqiang et al,2000).

It is a fact that cannot be denied that anthropological activities such as issues of urbanization have caused more harm than good on the environment. Therefore it's of paramount significance

that developmentalists must ensure that development activities 'fit' within a given ecological footprint. According to Munzwa (2010), the unprecedented or geometrical population expansion in most urban areas of developing countries such as Zimbabwe exacerbated with massive rural-urban migration worsened urbanization. This called for a huge demand of houses in urban areas and the massive exploitation of the gifts of nature such as land, forests, water by urban dwellers in order to cushion themselves from the doldrums of poverty.

Whilst these kinds of development are taking place, the physical environment is the one to be affected because huge tracts of prime land are acquired for urban expansion in order to circumvent a multi-dimensional of urban problems being experienced today in most urban areas. On the other hand the quest for sustainable development is gathering a momentum all over the world and a number of questions can be asked to local authorities whether they are aware of this concept of sustainable development enshrined in the Millennium Development goals (MDGs). The reason why local authorities have to face these questions is because the rate of urbanization is increasing in African countries such as Cape Verde with a 68% rate of urbanization (Markotulio, 2008).

One cannot deny the fact that the environment has been forgotten and is continually to be degraded if serious measures are not in place. Due to the need for urban development, forests have been destroyed, wetlands have disappeared and it's unfortunate that this urban development is taking place on preserved sites such as wetlands, sacred shrines of which now having a bearing impact on our natural rains. It is the destruction of flora and fauna that is causing the environmentalists, climate experts', development and urban practitioner's dissatisfaction because

of mismanagement of the environment thereby is reducing the quest for environmental sustainability. The gap between environmental management as a way to achieve environmental sustainability and urban development is being widened and causes of this gap are many and varied.

It is the thrust of this research to unravel the impact of urbanization on environmental sustainability focusing on the city of Chitungwiza in Zimbabwe which is bursting into Mayambara, Chitsvatsva, Chigumba, Masona, Mushayahama, Murisa and Kuora villages' in Seke communal lands. The problem started with the urbanization of Mayambara, Chitsvatsva, Kuora which are in ward one of Seke District. Mayambara is in close proximity to Guzha Township popularly known as Chikwanha. This urbanization has continued along the Harare-Hwedza National Road (Maoneni, 2014). The proximity to the Harare-Hwedza road provides easy access to the capital city at low cost hence the attraction of many settlers to the area. This urban sprawl has led to unprecedented levels of urbanization of rural communal lands in Seke area to an extent that most of the land is now under urban type development.

1.1. Background to the Study

The history of urbanization in Zimbabwe is directly related to colonialism (Munzwa, 2010). He further went on to say that, before colonization the predominant nature of human settlements were entirely scattered and sparsely populated rural settlements with no cities and towns except the long deserted pre-colonial city states of great Zimbabwe, Khami, and DhloDhlo. During that period population was still very meager relative today, and also the disposition of economic activities was mainly primary based that is farming, very small mining, and limited trade especially in petty kind of commodities. Urban development in the colonial period was

characterized by expanding colonial politics of control segregation, control and exploitation (Raftopolous, 2009). In the same manner, urban development had continued between town and countryside. Urban settlements were regarded as ‘white cities’ and the only African residents were regarded as cheap labor. Their stay in the urban areas was only for a short period of time as marked by the Urban Areas Act, the Pass laws as well as the Native Regulations Ordinance which made whites overlords of the Africans. In the same manner Africans were regarded as the subjects while the whites were the proper citizens (Mamdan, 2009). With this in mind, African amenities were not developed since they were subjects. Most of their residential areas were either bachelor flats or were located on the western side of the town near the industrial areas.

When the country attained its independence these were some of the issues which the government tried to solve, however, since the problems were many, some of these problems were neglected (Muzondidya, 2009). It was also due to the strain on the government’s budget in which they were supposed to pay the debt left by the smith regime .Despite the developments in the education and the health sector during the first decade of independence, adaptation of Structural Adjustment Programs(SAPs) aggravated the situation. So from the above, it’s clearly evident that the urban problems being experienced in present day moment are inherited from the past colonial period.

Chirisa et al, (2012) is of the view that, the increasing proportions of populations of a country, region of the world living in urban areas have presented a numerous of challenges to urban planners, developers and environmentalist. The same sentiments was also echoed by Munzwa(2010) who states that the local authorities are now failing to grapple with the ever

increasing populations in urban areas therefore presents challenges of urban sprawl, urban poverty, inadequate housing especially for the urban poor, inadequate provision of infrastructure and services include clean potable water, sewerage reticulation, power supply, garbage collection and disposal, environmental degradation due to anthropological activities such as deforestation of dense forest such as Seke communal lands in Chitungwiza.

In developed countries industrialization spurred urbanization mainly because when industry advanced, it offered more jobs and attracted people to the city especially in developing countries. As a direct result of this, massive rural to urban migration increased urban populations. By 2008, more than half of the earth became city dwellers and, the United Nations (UN) projected analysis states that 30 years from 2006, the world urban population would have risen by 60%(United Nations Report,2006).In the African experience approximately 38 % of the population of West Africa lives in urban areas. Cap Verde is the most urbanized with its 62% lives in urban areas and Burkina Faso is the least with just 18, 5 % of its population in urban areas.Urbanisation is accompanied by the physical growth of towns and cities and this is termed urban growth (Madondo et al, 2013).There has been a marked growth of urban areas as indicated by the increase in population as shown by the table below:

Table 1.0 Percentage Urban population growth 1970-2020

	1970	1990	2020
World	37,1	45,2	57,4
Developed Countries	66,6	73,0	77,2
Developing Countries	29,4	37,1	53,1
Africa	22,5	33,9	52,2

Source: Madondo et al (2013)

It is clearly evident that population in urban areas is continuing to grow and these will presents a lot of problems to the surrounding environment since these populations need to be housed. Urbanization has also resulted in the growth of large cities each with a population of over one million people. Already in 1920 there were 24 such cities in developed countries, in 1940 there were 41 cities, in 1960 the number rose to 113 and in 1990 there were 240, with an increasing number in developing countries (Madondo et al, 2013).The major cause of urbanization in developing countries has been rural to urban migration. This has seen the proportions of people living in urban areas increasing, especially after the independence of most countries, as better job opportunities arise that offer high incomes. The table 2.0 below shows the increase in urbanization rates in different regions of the world in 1980 and 2010.

Table 2.0 Rates of urbanization (%)

Region	1980	2010
Sub Saharan Africa	28,3	57,8
North Africa and the Middle East	56,5	75,5
Southern and South East Asia	27,1	49,3
East Asia	33,2	58,4
Latin America	71,5	84,4
North America	72,0	83,5

Source: Madondo et al (2013)

As urban settlements grow due to urbanization, it engulfs some rural areas which are supposed to be protected and used primarily for agriculture. This encroachment of urban areas into rural areas had led to indiscriminate cutting down of forest (deforestation) and land degradation due to heavy machinery being used to bulldoze the land, with all these calamities happening in our environments, its clearly evident that the environment (mother nature) has been forgotten and in the long run, the idea of environmental sustainability will be a wishful thing, utopian idea to say!

Such urban population growth in Africa is a direct response to economic pressures and climatic changes in rural areas on one side and the lure of urban employment, bright light effect, better health care, educational, housing and recreational amenities concentrated in cities (Markotulio, 2008). However, urban growth rates are exceeding the capacity of municipalities and local government to provide adequate housing and other services. The pressures in urban areas makes them more susceptible to uncontrollable shanty settlements which encroach on forested and grasslands in the outskirts of towns and even on sacred shrines and preserved sites, such as preserved wetlands by Ramsar convention of 1971. Urban development therefore marks a key land use transformative phenomenon with monumental concentration of people, buildings, factories, roads, vehicles, and associated social systems (Markotulio et al 2008).

Cities are becoming driving forces in environmental trends due to the following reasons: the increasing share of the global population that resides in urban areas and the increasing intensity of activities that these populations are doing to the urban areas is such an urban development. Theobald et al (1972) noted the following impacts of urbanization on the environment: urban development activities alters habitat through housing, road, and pavement construction which resulted in deforestation and land transformation (Theobald, 1972). Chirisa and Dumba

(2012) stated that expansion of human habitat implies the consumption of land to locate housing units, administrative and other infrastructure. These modifications during urban growth have no prospects of recovery as they are often permanent and the intensity done to an ongoing trends of growth, humans are therefore the ultimate universe species, when they settle on new territory they often consume environmentally sensitive and displace wildlife (flora and fauna)(Krausman 2000 and Mackenne 2002). They further asserts that, the results is permanent habitat loss and the extinction of many organisms, for example habitat loss due to urbanization directly endangered 64 species in Florida, 61 species in California and 26 in Texas as at 2000. Urban road networks alone including highways have endangered 94% species in Texas through their construction, maintenance and use(Krausman 2000 and Mackenne 2002).

1.2. Statement of the Problem

The land acquisition by land barons and local authority in Chitungwiza for urban expansion has caused a multitude of environmental problems such as indiscriminate cutting down of trees, massive exploitation of land, forests, water and soil which forms the natural environment.. It is quite shocking that Seke communal land which was densely vegetated had been converted to a bare ground with countable standing trees. Also, sacred shrines which are used by the chiefs and the community for certain rituals such as rain making ceremonies has been displaced by the uncontrolled urban expansion (Mackotulio, 2000). A preserved site such as wetlands has been disappearing as people continue to develop on those wetlands of which these wetlands have got its significance to the environment. This scenario is an indicative of a mismatch between urbanization and environmental planning, yet these two must work in harmony. The major question becomes: how are the two planning systems working together to achieve sustainable

environmental and development of urban areas. The destabilization of natural ecosystem in that area is compelling the researcher to carry out an investigation on the impacts of urbanization on environmental sustainability since the environment is the Mother Nature that needs to be sustainably managed. It seems as the environmental authorities are not aware of this growing environmental phenomena that is happening in the periphery of Chitungwiza. Simply put, urbanization is no longer fit in the ecological footprint of the area or considering the green issues. The massive deforestation will greatly affects the environmental quality since urban development is accompanied by urban nuisances such as pollution (land, air, and water) causing the environment fail to serve a regulatory role of purifying the atmosphere, causing residents to launch some complains about urban environmental quality (CHRA, 2011) and in the same vain reducing the quest of achieving environmental sustainability.

1.3. Theoretical Framework

Various models, hypothesis and theories of environmental management and urbanization have been postulated with the aspect of urbanization not fully articulated. Some of the environmental models include the ethical model, economic model and the ecological model (Sykes, 2004). These environmental models greatly emphasize the value and need for managing the environment. The ethnic model states that, the environmental resource management strategies are driven by undertakings of human nature relationship. The ethical perspective says that ‘all human activities takes place in the context of certain type) of relationships between society and the bio physical world (the rest of nature), that is significance is placed in understanding the ethical values of different groups around the world. Two schools of thought exist in environmental ethics: the anthropocentric school and the Egocentric School. The former is based

on an inclination to evaluate reality exclusively in terms of human values which supports an understanding of nature as existing solely for the benefit of man or nature as a commodity to be exploited for the good of humanity (Sprung, 2006). According to Sykes (2004) anthropocentric environmental resource management is therefore about the conservation of the environment which however focuses on human needs. However, a critical analysis reveals that the anthropological model emphasized much on human needs ignoring the need to protect the environment for the benefit of the present generation without compromising the ability of future generation to benefit as well from the gifts of nature (sustainable development).

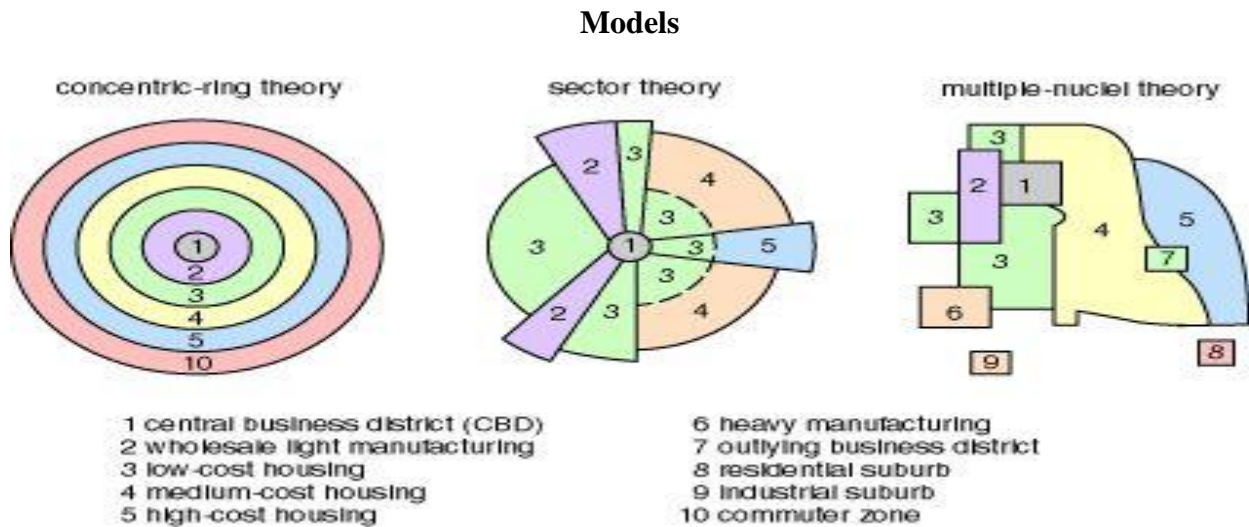
The egocentric schools stress the intrinsic value of nature while maintaining an understanding that human beings must use nature wisely to survive. Ecocentrists navigate between 'fair use and downright abuse of the ecological values (Sprung, 2006).

The economic model stresses the relationship between the economy and natural resource management. The economy is dependent upon goods and services provided by the natural ecosystems. With the prevalence of environmental problems, many economists embrace the notion that 'if environmental sustainability must co-exist with economic sustainability, the overall system must be one which permits the identification of an equilibrium between the environment and the economy (Sykes, 2004). He also noted that, economic policy makers who follow the economic model have already begun to incorporate the functions of natural capital or natural environment as a sink for wastes and for the preservation of raw materials which needs to be preserved and managed in a sustainable fashion.

Related to development and management, is the ecological model. A common scientific concept and impetus behind environmental resource management is carrying capacity. Simply put, it

seeks to ensure that development meets the carrying capacity of the given environment. Carrying capacity refers to the maximum number of organisms a particular resource can sustain (Waugh, 2000). The development of urban areas can take any form and shape. In many cities and towns, it is possible to identify zones with a particular type of land use (Waugh, 2000). Geographers have put together models of land use to show how a typical city is laid out. Most of the famous of these models are the Concentric zone model or the CCD model and the Sector model, also known as the Hoyt model. The image below illustrates the most famous urban land use models.

Fig 1: Urban Land use



Source: www.bbc.co.uk

The concentric zone model was expanded by Burgess (1924) and is based on the idea that land values are highest in the city centre of town or city. However, the concentric model is limited in its approach, the model failed to realize that population in urban areas is increasing at a geometric or unprecedented rate and cause urban areas to develop outwardly. In the present day moment, new working and housing trends have emerged since the model was developed. Many

people now choose to live and work outside the city on the urban fringe—a phenomenon that is not reflected in the Burgess model (www.bbc.co.uk). Though the model illustrates the development of a city but issues of environmental management were not considered.

The sector model was expounded by Hoyt in 1939. This model was based on the circles on the Burgess model, but adds sector of similar land uses concentrated in parts of the city (www.bbc.co.uk). Hoyt observed that it was common for low income households to be near rail road lines, and commercial establishments to be along business thoroughfares. Recognizing the various transportation routes, into an urban area, including rail road, the ports and train lines, represented greater access. Hoyt, theorized that cities tended to grow in wedge-shaped patterns or sectors emanating from the Central Business District (CBD) and centered on major transportation routes. Higher levels of access meant higher land values, thus many commercial functions would remain in the CBD but manufacturing functions would develop in a wedge surrounding transportation routes. Residential functions would grow in wedge-shaped patterns with a sector of low income housing bordering manufacturing or industrial sectors (www.bbc.co.uk)

1.4. Research Aims and Objectives

The study is aiming to identify the impact of urbanization on environmental sustainability in Chitungwiza giving much emphasis on the under mentioned objectives.

1.5. Research Objectives

Specific objectives of this study are to find out:-

- I. To explore activities that degrades the physical environment in an urban area ,
- II. To find out the impact of the activities on the environment,
- III. To establish ways of mitigating environmental degradation in urban areas,

IV. To explore challenges hindering efforts to ensure environmental sustainability.

1.6. Research Questions

- I. What are the activities that degrade the environment in urban areas?
- II. What are the impacts of these activities on the environment?
- III. What are some of the mitigatory measures of environmental degradation in urban areas?
- IV. What are the challenges faced by stakeholders in ensuring environmental sustainability?

1.7. Significance of study

It is very crucial that organizations in environmental management and urban development become aware of the impacts of urbanization on environmental sustainability. It is also of paramount significance that environmental stakeholders and urban development stakeholders are informed about these impacts on the environment so that sustainable environmental measures can be taken. This shall help them to make informed, robust and prudent decisions in policy blue print named Zimbabwe Agenda for Sustainable Social and Economic Transformation(ZIMASSET).The policy prescribe the construction of 125 000 housing units nationally(GoZ 2013:75 cited by Maoneni 2014). Considering the present state of most cities, the peri urban zone will be targeted for such expansion in order to bring the lime light of the dream to fruition. The research shall throw an elumination of light to the environmental darkness of development in urban area. In addition, if the research is proved and accepted by the relevant authorities shall go a long way in cushioning environmental vagaries caused by ill-informed urban development in some urban areas with main reference to Seke communal lands whose

physical environment is under threat of urbanization. Also this research shall contribute to the body of academic knowledge and shall be used for reference purposes and open other avenues of research.

1.8. Limitations of the study

Urbanization is a multifaceted concept which implies the development or expansion of urban areas either formally or informally, encroaching into the surrounding areas and environmental management concerns with the wise conservation of the natural resources. The study will be focusing much on the physical environment that surrounds the city of Chitungwiza, that is, Seke communal lands and how the environment has been degraded by urbanization not forgetting the main thrust on the impacts of urbanization environmental sustainability.

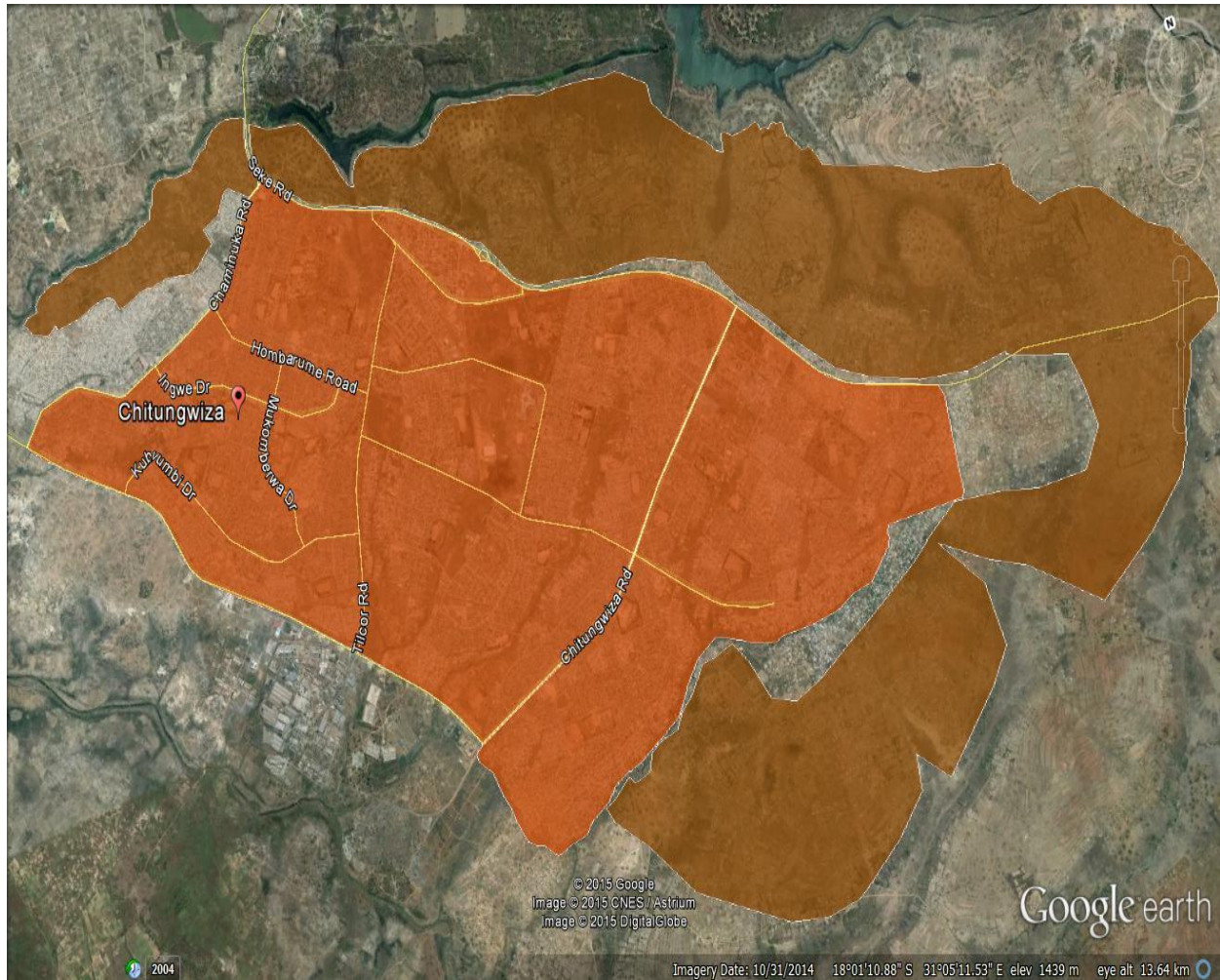
1.9. Study Area

Chitungwiza is colloquially known as “Chi-Town”, is a high density dormitory town in Zimbabwe. The city is approximately 30 km south of the capital city, Harare. It was formed in 1978 from three townships namely Seke, Zengeza and St Mary’s. Chitungwiza is the largest high density suburb in Zimbabwe, it is popularly known for its name, Chitungwiza. It came into existence in the late 1970s with most black people who stayed in oldest high density towns like High field migrating to Chitungwiza (Musemwa, 2008). The town has several suburbs and the oldest suburbs is St Mary’s which is divided into two sections namely Manyame Park (New St Mary’s) and old St Mary’s. Chitungwiza gained full municipal status in 1996 and is the third largest and fastest growing urban centre in Zimbabwe.

According to Central Statistical Office (CSO) (2013), the 2012 census revealed that Chitungwiza had a population closer to one million with female’s constituting 52, 8% and males 47, 2%. To

date Chitungwiza has got 25 wards. Most of the people work in Harare, as there is very little industry in Chitungwiza. Chitungwiza has been equally affected by the ever escalation housing demand which has seen the housing backlog estimated to be at 13 thousand (Ministry of Local Government, 2008) being an indicator of the dire demand for urban housing. Manyame Rural District council was established in 1994 through amalgamation of Harava RDC, Muda-Marirangwe and Beatrice rural councils after the promulgation of the Rural District Councils Act in 1987. Owing to its proximity to Chitungwiza, the areas bordering Chitungwiza have witnessed rapid urbanization characterized by illegal land developments (Daily News, 02 April 2013). Below is a diagram showing a map of Chitungwiza with its main boundaries and where urbanization is taking place.

Fig. 2 A Map of Chitungwiza



Source: Google Earth

The above map shows an area where urbanization is taking place. The brown shaded area indicates villages which are adjacent to Harare Hwedza main road, engulfed by Chitungwiza urban. These villages include Mayambara, Chitsvatsva, Murisa and Kuora.

1.10. Ethical Considerations

The researcher got a student confirmation letter from Midlands State University which confirmed that the student is carrying out a research. All necessary protocols were observed before getting data from relevant authorities. The permission was got from the town clerk of Chitungwiza Municipality who authorizes the researcher to interact with town planning officers and the research to be carried out in Chitungwiza. Also the researcher got a permission to conduct interviews with Environmental management district officer, administering a questionnaire and attending environmental awareness campaigns conducted by Environmental Management Agency in Chitungwiza. In Zimbabwe, the Public Order Security Authority (POSA) and AIPPA law prohibits the gathering of people without seeking a clearance from the Zimbabwe Republic Police, so the researcher got a police clearance from Dema Police Station that enabled the researcher to gather people in and around Chitungwiza for group discussions and having images from the area. Special appointments for interviews with the Environmental Management Agency district officer, Provincial Planning Officer for Mashonaland East Province, Chief Seke for Seke District were made in time through phone calls.

1.11. Limitations of the Study

The limitations of this research lied within the methods used to gather primary data which were the interviews and questionnaires. During the process of interviewing various officials at Chitungwiza municipality and Manyame Rural District Councils officials tended to give indirect information filtered through their views. For instance , the researcher was expecting to get information on why the local authorities are failing to cope up with environmental degradation in urban areas and these officials did not cited major problems faced by local authorities in

managing urban environment. Also these officials were not equally articulated and perceptive as was expected by the researcher. In trying to mitigate this problem, the researcher went on to interview several relevant department officials in the organization. Also it was difficult for the researcher to reflect the authenticity or reliability of secondary data sources such as newspaper. In trying to reflect the authenticity of information, the researcher summarized at least three different newspapers with the information required by the researcher.

1.12. Organization of study

The dissertation is structured as follows

Chapter 1: This chapter discusses the background of study, problem statement, and justification of study, research aim and objectives. This chapter also discusses the introduction of study.

Chapter 2: A review of literatures on the impacts of urban development on environmental sustainability was done in this chapter. The chapter focused on the views, opinions, thoughts of different authors on urbanization and environmental sustainability. Discussions of relevant concepts, theories and models were done in this chapter. In addition gaps in the existing literature and body of knowledge were exposed in this chapter.

Chapter 3: Methods used to obtain data for the research were described in this chapter. Research instruments used to find solutions to the problems were given in this chapter. Of importance, sampling technique was described and a reason why that sample has been chosen was given in this chapter.

Chapter 4: This chapter discusses data presentations and analysis of findings.

Chapter 5: Conclusions and recommendations drawn from the study findings were discussed.

This was in line with the problem statement.

CHAPTER 2: LITERATURE RIVIEW

2.0. Introduction

The Christian world View sees the universe as created by God, and human kind accountable to God for the use of resources entrusted to human kind. Ultimate values are seen in the light of being valuable to God. This applies both in breadth of scope, which is caring of people (Mathew vs. 25) and environmental issues, for example environmental health (Deuteronomy 22:8, 23, 12-14) and dynamic motivation. From the above theological point of view, the environment is viewed as something of significance to people's health which must notbe destroyed or reduced.

In order to give a detailed understanding of environmental sustainability and urbanization, a plethora analysis of various literatures and identification of research gaps is given in this chapter. Various definitions of terms, concepts and case studies shall be revealed in this chapter. It will not be a complete literature review without a conceptual framework underpinning the research. The study shall be buttressed by examples from those areas experienced some modicum of changes in environment caused by urbanization at national, region and local levels.

2.1. Conceptual Framework

2.1.1 Definitions of Terms

Impact: Is a measure of the tangible and intangible effects (consequences) of one thing or entity's action or influence upon another (www.businessdictionary.com). It also means to have a strong and often bad effect on something or someone (Oxford English dictionary).

Urbanization: According to Madondo (2013), urbanization is the increases or extension of a city's boundaries to encompass the surrounding areas and settlements. An urban area is a settlement having at least 2500 people involved in industry and commerce (Madondo, 2013). It can also be defined as an increase in a population in cities and towns versus rural areas. Urbanization is when more and more people move away from countryside into suburban areas near cities (www.information.com). This also leads to cities growing bigger and more cities being created. Urbanization began during the industrial revolution, when workers moved towards manufacturing hubs in cities to obtain jobs in factories as agricultural jobs become less common (www.businessdictionary.com).

Environment: The term environment means the surroundings and everything that affects an organism during its life time (Waugh, 2000). Sykes (2004) defined the environment as the total sum of water, air, and land, the interrelationships among them and also with human beings and other living organisms and property.

2.2. Environmental Sustainability Explored

Environmental sustainability is the ability to maintain the qualities that are valued in physical environment. Threats to this aspect of the environment mean that there is a risk that these things will not be maintained (www.bbc.uk). According to UNEP (2000), environmental sustainability is about making responsible decisions that will reduce a business negative impact on the environment.

The term environment can have a broader meaning to include physical, social, political, economic, technological environment. Literally, the term environment means the surroundings' and everything that affects an organism during its life time(Waugh,2000).Sykes (2004) viewed

the environment as the total sum of water, air , and land, the interrelationships among them and also with human beings and other living organisms and property. According to the 1987 Brundtland Commission, sustainable development mean the ability to make development sustainable, that is, to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.

The need for the world's population to achieve sustainability can be tracked back to the development of thinking on economic development and environmental issues during the 1970s (Michael, 2008). This new thinking recognized major failings in the current developments path, seeking instead to balance economic growth with environmental sustainability and social justice. David (1994) stated that different schools of thought perceive the earth as an organism which is greater than the parts that make it up. In this case human domination over nature is seen as crematory and, and the destruction of environments by humans is seen as ultimately leading to the destruction of humans themselves. The earth will then repair the damage over the hundreds as of millions of years which will come after humanity's demise. However, Sykes (2008) argued that this view fully supported and illustrates the need for environmental and developmental process to be regarded as parallel, not separate concerns. The environmental destruction currently being wrought upon the earth is not just a catastrophe for the natural environment; it is also a catastrophic for the social and economic survival of human communities.

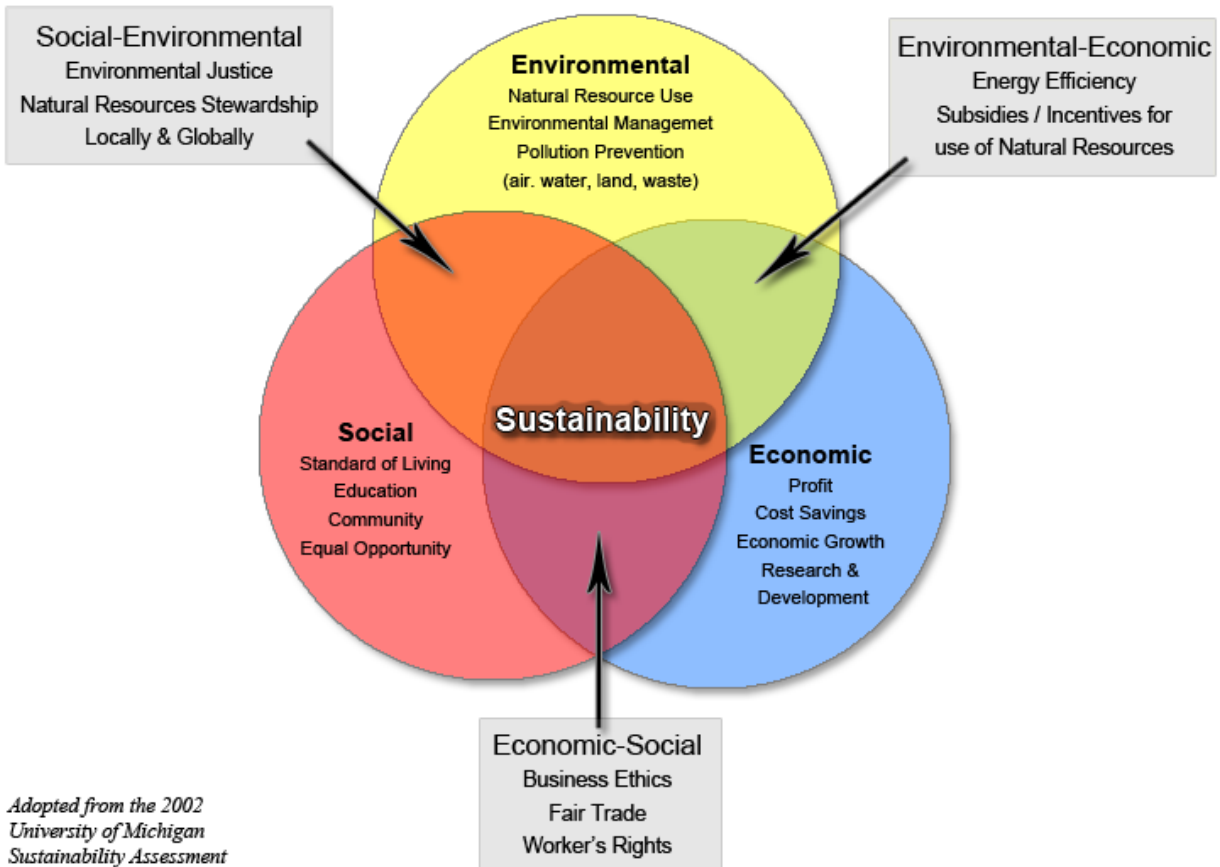
Eleanos(1999) also documents the origins of environmental sustainability and further explored the concept of sustainability to include environmental sustainability. He stated that the most important event for the widespread acceptance of sustainable development as both a local and international political target was the Unite Nations (UN) Conference on Environment and Development, held in Rio de Janeiro in 1992 popularly known as the Rio Earth Summit. This

conference was the largest ever gathering of world leaders, and together they endorsed the international action program called Agenda 21(Eleanos,1999).According to Environmental Assessment Handbook(1991), Agenda 21 is a comprehensive blue print for the global actions needed to effect the transition to sustainable development. It is an Agenda for the 21st century , bringing together the need to protect and conserve the natural environment with the social and economic development needs of communities(Environmental Assessment Handbook,1991).Living sustainably pervades all aspects of life, it is not just about planting more trees or re using bottles, valuable as those actions are but embraces three interlinked dimensions that is economic, social and environment(Eleanos,1999).Any single action can have a different impact on social, economic or environmental development. In light of the above, development cannot occur in space or vacuum but within the economic, political, social and environmental spheres.

Sustainability Assessment Report (2002) documents three important spheres of sustainability namely social environment, environmental economic and economic –social, these three aspects of sustainability are shown by the diagram below and the diagram is accompanied by explanation on the three spheres.

Fig .3. Spheres of Sustainability

The Three Spheres of Sustainability



The three spheres of sustainability illustrated above are explored. Social function include self employment initiatives, they absorb part of the otherwise state-covered social costs of modernization such as unemployment and under employment (Eleanos,1999).This dimension calls for greater acceptance and of diversity, which means all sectors of society are valued and have equal access to services , basic needs, and decision-making powers(Michael,2008).Internationally there is a need for greater respect for indigenous cultural

values, as opposed to the imperialism of the north in which market-values, consumerism and western science are the yardsticks used to measure the value of others. A healthy forest enterprise would support a thin local community, reducing the number of degradations and maintaining local traditions and social groups (Eleanos, 1999).

Environmental function shoulders part of the ecological costs of development by processing wastes which the state would otherwise dispose it off. This dimension calls for a way of living in which the natural environment and other species are valued in their own right, and not just for their usefulness to humans (Michael, 2008). This means the development institutes need to be appraised according to their impact on the natural environment, with more positive action taken to reverse the loss of species and habitats. Eleanos (1999) asserts that a sustainably managed forest would support a myriad of natural life, not only keeping local enterprise and communities alive, but ensuring the future of important species and biodiversity.

Economic function contribute to the efficiency of the formal sector providing raw materials from recovered wastes at comparatively lowcosts (Eleanos, 1999). Michael (2008) added that the economic dimensions calls for more support for local based enterprise and development, in which peoples livelihoods are not at the whim of the international market. A sustainably managed forest can support many kinds of local enterprise.

One can criticize the above three spheres of sustainability on a number of grounds. Despite the explicit reference to balancing current needs with the future, the definition of sustainability and its three spheres leaves unsaid the needs to redress inequalities in the needs of the present. This view concurs with Eleanos, (1999) where he also said the noble concept of sustainability failed to distinguish between the desire for luxuries and the provision of basic needs. In addition,

humanity is depleting the earth's natural resource base, including both renewable and non-renewable resources, but is also witnessing deep inequality between the haves and 'have nots'

To this standard definition was added the three pillars concept, that is, 'the interdependent and mutually reinforcing pillars of sustainable development and environmental protection', sustainable development would focus on preserving the ecological footprint, that is, the area of biologically productive land, water, and air required to produce the resources consumed and to assimilate the wastes produced by humanity and other organisms (Michael, 2008). Sustainability in environmental resource management thus emphasizes that rather than competing for endless growth on finite planet development must improve quality of life without necessarily having to consume more resources (Sykes, 2002). This concept calls for the mainstreaming of environmental policies into development planning, at local, national and corporate levels.

Various definitions proffered above clearly restrict this study to mean the physical environment, that includes the land, air, flora, water and fauna because that's where issues and effects of urban development are seen and taking place. Urban development does not operate in 'space' or vacuum or in isolation but on the physical environment of which a harmonious relationship between the two is required so that conflicts between the two are minimized though conflicts in the real world are inevitable. The United Nations Millennium Ecosystem Assessment Report (2005) defined environmental management as a purposeful activity with the goal to maintain and improve the state of environmental resources affected by human activities. The report emphasizes the management of the interaction and impact of human societies on the environment. With the call for achieving environmental sustainability concept enshrined in the Millennium Development Goals (MDGs) dated 2000 to 2015 which are already overdue, the environmental management programs aims to ensure that the ecosystem or environmental

services are protected and maintained for equitable use by future human generations(UN REPORT,2000).Due to a multitude of resources and processes that are supplied by the natural environment or ecosystems, there is a strong need to preserve and protect the environment in a sustainable manner.

The United Nations 2005 Millennium Ecosystem Assessment categorized ecosystem services to include provisioning, that is the production of food and water, regulating such as the control of levels of impurities in the air and diseases, supporting role such as nutrient cycling and cross pollination and cultural services such as spiritual and recreational benefits. The significance of the above proffered roles of the environment gave development practitioners, policy makers and urban planners and other relevant practitioners a rejuvenated impetus to call for sustainability so that it will not be a wishful thinking.

An increasing number of people in developing countries live in urban areas (Munzwa, 2010). In most countries 50% of the population live in cities, and an increasing number of people live below the poverty line (Soeren et al, 2006).Moreover many of these poor people experience hazardous living environments. It is often assumed that urban populations are healthier, more literate and more prosperous than rural populations. The last 25 years of development has lead to major increases in the percentage of the population living in urban areas, from 40% in 1980 to 50% in 2000 and an estimated 66% in 2030(UN 2003).The number of mega cities is growing, but also medium sized and smaller urban agglomerations are experiencing explosive growth and the pressure on the urban areas has increased dramatically. In spite of allocation of vast funds over the last 30 years, commitment at the earth summits in Rio and Johannesburg, emphasis on achieving the Millennium Development Goal (MDG) and other efforts, progress has not met the

expectations (UN 2003). The development has not led to an increase in the absolute and relative number of urban poor and increase in equality (Hasan, 2005, page 5).

According to Munzwa (2010), the provision of service such as water, sanitation, waste management, health, education has not been sufficient and issues of housing and land are left unsolved. However, recent research has broken new ground showing that the urban poor suffer from urban penalty: slum dwellers in urban areas are as badly off if not worse than their rural relations (UN-HABITAT, 2006). Environmental risk factor play a role in more than 80% of the diseases regularly reported by the world health organizations. Soeren (2006) stated that, there is a generally wide consensus in international literature regarding the underlying dynamics that determine the quality of the living environment in the urban areas. It is characterized by poor quality housing and settlements are often on land ill-suited for habitation and mostly illegally occupied a subdivided.

The 1972 United Nations (UN) Environmental Conference in Stockholm described a concern for global environmental problems, and outlined the need for a global environment program. The RIO Conference in 1992 highlighted more specific environmental issues or challenges regarding biodiversity, the role of local government (local Agenda 21) and the role of the private sector and industry. A certain emphasis was the recognition of the link between economic development, environment and poverty (UN, 2003). The earth summit in Johannesburg in 2002 emphasized the importance of the urban environment to the marginalized groups in developing countries. In addition , the conference emphasized issues concerning infrastructure and service provision, that is water, sanitation, and housing or slum upgrading and improved air quality as areas of

priority (UN, 2002). One change in emphasis has been to focus directly on the conditions of the poor and to pursue initiatives that should improve these, for example provision of water, waste management, improved housing, while initiatives with an indirect effort of targeting industries in reduction of pollution and enhancement of cleaner production, have received less attention and funds over recent years. Munzwa (2010) asserts that urban environmental problems are threats to people's present or future wellbeing, resulting from human induced damage to the physical environment originating in or borne into urban areas.

The anthropocentrism places human at the centre of the universe (Singer, 1985). The human race for environmental resource utilization in urban areas must not always be its own primary concern. In western countries, it has become customary to consider only our species when considering the environmental ethics of a situation. Therefore, everything else in existence should be evaluated in terms of its utility for people. Marshall (1999) supported the idea of intrinsic value of the environment to people which gives people the impetus to conserve the environment. Singer (1985) is of the view that the preservation of world "heritage sites", unspoilt parts of the world that acquire a scarcity value is important since it contributes to environmental sustainability and these environmental resources diminishes if not preserved over time. Their preservation is a bequest for future generations as they have been inherited from our ancestors and should be passed down to future generations as they have been inherited from our ancestors and should be passed down to future generations so that they can have the opportunity to decide whether to enjoy unspoilt countryside as an entirely urban landscape (Singer, 1985). Michael (2008) documents a case of tropical rainforest, a very specialist ecosystem that has taken centuries to evolve. He also further states that, clearing the forest for farmland often fails due to soil conditions, and once disturbed can take thousands of years to regenerate. This calls for the

need to reduce environmental degradation since it takes a long period of time to replace or regenerate itself.

From the conservation ethics suggested by Marshall (1999), much of emphasis is on extension of use value into the non-human biological world. It also gives its focus only on the worth of the environment in terms of its utility or usefulness to humans. The conservative ethics argues for the preservation of the environment on the basis that it has extrinsic value- instrumental to the welfare of human beings. Conservative is therefore a means to an end and fairly concerned with mankind and inter-governmental considerations. It could be argued that it is this ethic that formed the underlying arguments proposed by governments at the Kyoto Summit in 1997 and these agreements reached in Rio in 1992.

2.3. Land use Planning and Human Settlement

Urban planning and settlement planning has in most developing countries failed to provide adequate shelter options for the urban poor (UN-HABITAT,2006).Planning of the urban expansion lacks far behind the actual urban development and most urban expansion is unplanned and unauthorized. Often huge slum cities develop not least on the African continents. Growth in urban areas as formation of new informal settlements and densification of existing informal settlements at the urban periphery and in pockets in the urban morphology on vacant land(UN-HABITAT,2006).Furthermore there is an intense densification process taking place in many built environments(Anderson et al 2006,Trippl 2000).

In Africa, commonly 60 % of the urban population lives in informal settlements with little or no basic infrastructure provision (UN-HABITAT, 2006). It is estimated that up to 80% of the urban growth takes place in informal settlements in many developing countries (Maclean, 2006). These

informal settlements are filled with an increasingly young population, unemployed and dissatisfied and African cities are becoming a source of instability and discontent (Commission for Africa, 2005). These settlements are often located on appropriate sites prone to floods, landslides, close to polluted rivers or streams, nearby polluting industries, close to highways or railways lines and far from bulk infrastructure services.

According to many noted ecologists, including those at Cornell University, urbanization is one of the primary causes of environmental degradation? As population increased, so did the need for land for homes and farms. Wetlands are drained, prairies are plowed over. Today less than 5% of the nation's wetlands still exists (North Carolina State University, Water Quality Group).

To counteract some of the problems of urban settlement highlighted above, UN-HABITAT and United Nations Environmental Program (UNEP) launched the sustainable cities program in august 1991, which entails case towns mostly in third world countries. The sustainable cities program includes a wide range of cross sectoral interventions, typically involving improvements in solid waste management and environmental health, water resources management , urban transportation and air pollution, and activities specifically targeted at benefiting the urban poor(UN-HABITAT,2006 UNEP,2006).Central to the approach is the environmental planning and management that prescribes certain logical steps that in a participatory are intended to involve stakeholders in a project managed process. Walter (1991) stated that Sustainable Cities Program aims to assist cities in achieving environmental sustainable growth and development. through a program activities UN-HABITAT and UNEP support local authorities to implement well balanced environmental management strategies including meaningful public participation in development decision making and planning (UN, 2006).Walter (1991) further asserts that the

success of participatory environmental planning has resulted in ordinary citizens in helping to design a long term vision for the city, this has led to broad based city development strategies.

Wekwete (1994:35) cited by Munzwa (2009) comes up with a time stage approach to viewing the chronology of urban development in Zimbabwe. The first stage, which spans between 1890 and 1939 saw the establishment phase of colonial domination with a special thrust of settle speculation and ‘Sniffing –to-get-the wind in terms of where to gainfully invest. He further argued that, mining centre’s was at the core of attracting settlements especially where gold was mined and later, a greater number of the prospects then turned to farming .In this period a large number of the urban settlements established basically represented service centers for farmers and miners, such centers included Kwekwe, Redcliff, Kadoma, Bindura were developed (Munzwa,2009).

In this first phase of urban development, it is clearly evident that all activities were not environmentally friendly and environmental issues were not given much emphasis as compared to economic deals. Wekwete (1994) pegs the second stage of urban development between 1940 and 1960. In the post 1945 era, Zimbabwe (the then Rhodesia) experienced the growth of the manufacturing sector. During that period alone, it is estimated that the country had influxes of European immigrants of 5000 per year (Munzwa, 2009). In this phase, urban expansion was highly notable and it saw for example, the establishment of suburbs in Harare such as Malbereign after the concept of the garden city and the Radburn concept. In other major urban centers such as Bulawayo, Gweru, and Mutare similar levels of growth were experienced.Munzwa and Jonga (2009) states that with the lifting of controls at independence, urban populations grew by leaps and bounds and this was caused by massive growth in urban populations. The observed population changes have been accompanied by a number of

challenges like housing shortage (Auret, 1990), general space constraints (Zinyama et al 1993), transport blues (GoZ, 1991), and not forgotten environmental problems (pollution and degradation (Moyo, 1998).

2.4. General Causes of Environmental Degradation in Urban Areas

As highlighted earlier that, the last one hundred years have witnessed a phenomenal increase of the world's population due to a number of factors such as advances in medical technology resulted in increasing pressure and demands on the limited earth's resources such as soils, minerals, forests, and water (Munowenyu, 2000). This development has been accompanied by widespread pollution of water resources we depend on for domestic, agricultural and industrial uses, the soils, minerals, and forests has also been witnessed. These activities has transformed the environment and caused a large scale disposition of the environment causing a ware some to environmentalists and other influenced stakeholders.

The primary cause of environmental degradation is human disturbance. The degree of the environmental impact varies with the cause, the habitat, and the plants and animals that in habitat it. These causes are causing a lot of nuisances in urban areas and now prevent the quest to achieve environmental sustainability. The primary causes of environmental degradation in urban areas are habitat fragmentation and others explored below. Kreimer (1992) attributed causes of environmental degradation in urban areas to unplanned and hardly coordinated interplay of socio-economic, institutional and technical activities. There are many factors, which have greater impacts on the urban environmental but poverty still remains at the root of several environmental problems. Chifamba (2012) is of the view that urbanization and industrialization have provided livelihoods and opportunities to the millions of people but at the same time they have brought in

the accompanied problems such as waste disposal, environmental degradation, accumulation of problems in homes and work places, disease causing agents and pollutants, contamination of air, soil, surface water.

Habitat fragmentation carries long term environment impacts, some of which can destroy entire ecosystems (Chifamba, 2012). The term ecosystem here was thoroughly defined by Chifamba, (2012) as a distinct unit and it includes all the living and non-living elements that resides within it. Plants and animals are obvious members, but it will also include other components on which they rely on such as streams, lakes and soils. Habitats become fragmented when development breaks up solid stretches of land, examples include roads which may cut through forests or even trails which wind through prairies, (Chifamba, 2012). While it may not sound all bad on the surface, there are serious consequences. The largest of these consequences are initially felt by specific plant and animal communities, most of which are specialized for their bio region require large areas of land to retain a healthy genetic heritage(Chifamba,2012).

Some wildlife species require large stretches of land in order to meet all of their needs for food, habitat, and other resources. These animals are called area sensitive (Kreimer et al, 1992).when the environment is fragmented, the large patches of habitat no longer exist, it becomes more difficult for the wildlife to get the resources for them to survive and they become endangered. A more critical result of habitat fragmentation is land disturbance. Chifamba (2012) added that water and air pollution are unfortunately the common cause of environmental degradation. Pollution introduces contaminants into the environment that can maim or even kill plant and animal species.

According to Environmental Protection Agency (EPA) (2006), acid rain occurs when sulphur dioxide from coal plant emissions combines with fumes present in the air. A chemical reaction creates acid precipitation. Acid rain can acidify and pollute lakes and streams. It causes similar effects to the soil. If enough acid rain falls in a given environment, it can acidify the water or soil to a point where no life can be sustained and plants can die off (EPA, 2006). The animals that depend upon them disappear and this can cause the condition of environment to deteriorate.

Walter (1991) attributed the causes of environmental degradation in urban areas to economic growth and population expansions. The two highlighted by Walter (1991) often diminish the effectiveness of pollution controls overtime. The increases in the number of automobiles in united states has increased 25%, from 147 million to 187 million, and 41 million new trucks have appeared during that time(Environmental PoliticsReport,1991). This vehicle population explosion counteracts the emission reductions achieved for individual vehicles and leads eventually to widespread urban violations of federal air quality standards. In the summers of 1988 street level ozone nearly doubled in many American cities and remained unacceptably high in the following summers (Walter, 1991).

Continuing scientific and technical innovations also contribute to environmental problems by creating new substances as technologies with potentially serious environmental risks(Michael,2008).It is stated that 500 and 1000 new chemical substances are created and used in urban areas especially in developed countries(UNEP,2000).Walter(1999) is of the view that advances in biotechnology pose significant questions about the environmental risks associated with the products of recombinant DNA techniques currently being used in academics, commercial, and governmental laboratories. Enious (1991) added that new energy technologies based on fossil fuels or atomic energy always entail potentially adverse environmental

consequences that must be weighed in decisions about. Sykes (1998) argued that scientific and technical innovations in urban areas no matter how ultimately beneficial, almost always pose trade-offs between environmental risk and social or economic benefit. Michael (2008) also stated that toxic sludge, for example, is a very recent problem resulting from vastly increased municipal waste water treatment. Since 1972, municipal sludge has doubled in volume to about 7 million dry metric tones annually, and this volume is expected to double again within a decade.

The development of urban areas also follows the construction of industries which discharges a lot of wastes into rivers and dams which are the sources of water for urban dwellers. Environmental Protection Agency (EPA) (1991) in America documents that industrial discharges remain another serious contributor to surface water degradation. Many billion gallons of industrial waste, often containing many hazardous and toxic wastes are still discharged daily into American surface waters through municipal waste water systems. The EPA estimates that currently only about 15% of the 300 000 industrial discharges are regulated by federal or state discharge points. Also the EPA reports that almost 50% of the U.S population and 95% of its rural residents depend upon groundwater for domestic uses. Because of the complexity of ground water systems and the expenses of monitoring highlighted as major challenges in purifying water by EPA,the agency has identified an enormous number of actual or potential sources of ground water contamination to include: millions of septic systems, more than 180,000 surface impoundments such as pits, ponds and lagoons, an estimated 500 hazardous waste land disposal facilities , and about 16,000 municipal and other landfills, millions of underground water storage tanks, thousands of underground injection wells, millions of tons of pesticides and fertilizer spread on the ground mostly in rural areas.

The Nations municipal waste has been steadily increasing since the end of world war 11 (EPA report, 1990) .while municipal wastes produced represents only 3 percent of the six million tones of solid waste produced yearly in the United States of America. Walter (1991) stated that there are many reasons for American indifference about recycling or incineration of wastes. The nation's tax codes and pricing mechanisms discriminate in many ways against recycled materials when placed in market competition with virgin materials.UNEP (2000) documents that most local governments have little experience with recycling or incineration and are seldom pressured by local citizens to explore the possibilities.

Most hazardous and toxic substances are an inheritance of the worldwide chemical revolution that followed world war 11(EPA Report, 1990). The creation and manufacture of synthetic chemical society had registered more than 4 million chemicals, an increasing proportion of which were synthetics created by American chemists since 1945.Today more than 70,000 of these chemicals are used daily in US commerce and industry and this increased due to the development of some urban areas in the country. Agricultural runoff is a deadly source of pollutants in urban areas which can degrades the environments, so much so that the EPA identifies agriculture as the prime source of water pollution.

Environmental degradation is one of most urgent environmental issues which need to be mitigated. In order to reduce any future impacts, city planners, industrialists, and natural resource managers must consider the long-term effects of development on the environment. With sound planning, future environmental degradation can be prevented.

2.5.Urban Expansion and the Environment

Munzwa (2010) asserts that the physical expansion of urban settlements was the outcome of economic, institutional and social forces. Other authorities such as Moyo (1999) are of the view that cities and towns have become a quandary of environmentally challenges like pollution (land, air and water) and degradation of the resources as ruralisation of some certain cities has become a trite development. Evidence of massive urbanization and the environment is witnessed in Albania, where population of greater Tarana, one of the city in Albania increased from 275 000 to 800 000 citizens in a short time(Albania Urban Report,1991).In parallel, the construction sector has also developed rapidly. New construction had to take place mostly on prime agricultural land (outside the yellow line which defines city boundaries) around the largest cities and also on village boundaries. This had a deleterious impact on the environment but there were no clear policies and measures regulating such urban development and environment management. A case of Albania can be used to buttress the issue above. According to United Nation Environmental Program(UNEP) study published in 2000, there was generally lawlessness of environmental responsibilities by the government of Albania, this was evidenced by widely disposed and often overlapping policies which were not coordinated, implemented and lack of enforcement in its urban areas. Also rampant construction, urban expansion and encroachment of settlements into peri urban was discovered to be a major threat to the environment especially the natural environment (UNEP 2000).Also, Albania experienced energy crisis during that year and they had to resort to firewood as an alternative source of energy which exacerbates the degradation of the peri urban area with preventing checks in place.

According to Mumford (1995) towns increased from 2422 in 1951 to almost 5000 in 1991, the total urban population increased more than ten folds from 26 million in 1951 to 285 million in

2001. With this rapid urbanization, the following negativities occurred and witnessed. India is a case in point experienced such negativities. India experienced a housing backlog and it was difficult to secure accommodation especially for poor majority and a large population of metropolitan cities such as Mumbai, Kolkata and Delhi lives in slums. In Mumbai, by 2012, between 49 and 50% of its population were slum dwellers as compared to 31% of 1981.

Mumford (1951) asserts that increased population and increased slum dwellers negatively impacted the environment since it was difficult for the responsible authority to provide inclusionary services. Different solid wastes clogging India's metropolitan cities include those used for packaging consumer goods such as paper, plastics, and also textiles, leather, plastics, metals, glass and ash. Compared to Kolkata and Mumbai, Delhi exhibits the highest percentage of ash, which is about 52% of the weight of all the solid waste. This is because the city is a large industrial center whose industries uses coal as a source of power and the growing number of industries is fuelling rapid urbanization. Mumbai generates the largest amount of Municipal solid waste which is 5355 tons per day compared to Kolkata and Delhi due to rapid urbanization (Sprung, 2006). However in Mumbai, the municipal authorities collect about 90% of the generated Municipal solid wastes, while in Delhi, the system of collection is inadequate with over 30% of Municipal solid wastes uncollected which causes more harm than good to the environment especially when decomposed. With this rapid urbanization, it followed that, motor vehicle ownership also increases which increases vehicular emissions. According to Indian report (2002), the number of vehicles constantly increased in number since the year 1990 with Delhi's numbers of registered vehicles exceeding those in both Mumbai and Kolkata by over 30%. This explains increasing emissions of hydro Carbon, Nitrogen Oxide, carbon monoxide and other Suspended Particulate Matter (SPM) from motor vehicle emissions in Mumbai,

Kolkata and Delhi, with Delhi having the highest total amount at 1046 tons per day. Also the report documents that air pollution, water pollution and also wastage is a growing problem due to the growing population, wasteful consumption and general neglect. With rapid urbanization and industrialization, huge quantities of waste water enter rivers. The volume of domestic waste water generation and industrial waste water is also highest in the metropolitan city of Mumbai. The Fig below is an illustration of pollution both water, land air in a certain city.

Fig. 4. Air Pollution in Urban Areas



Source: Google Maps

Because of the very generous population increase, particularly in urban areas and the high levels of urbanization in the country's towns and cities are generally "bursting at the seams" for example Chitungwiza is bursting into Seke communal lands, Harare is developing towards and is now merging with Ruwa in the east, Epworth in the south east (Munzwa 2010). It is quite interesting that all such urban calamities are taking place on the natural environment of which to

trace back the evolution stages of urbanizations, much emphasis was on economic development without putting the physical environment in their planning philosophies and epistemology. In an article entitled ‘ ‘ Critical factors influencing urban development in Zimbabwean cities and towns: Reflections on issues of urban governance, 2009’ ’ (not published), Wellington Jonga and Killian Munzwa (2009) argue that the role of local government is to look at all interests of the population, plan and coordinate activities of the city, supply services such as adequate housing so that the sprawling of squatter settlements is brought to halt. It is this form of urban development that brought some changes to the natural environment where urban expansion had encroached into prime land which was suitable for farming and this uncontrolled expansion of urban settlements into sacred sites accompanied by massive deforestation of land. This massive indiscriminate cutting down of trees brought a change in environmental quality.

Rapid urbanization has forced the sprawling town of Chitungwiza to tuck in communal lands in order to address the sharply rising demand for houses. The ministry of Local Government, Rural and Urban development recently commissioned a taskforce that looked in into illegal land allocations and developments in rural areas bordering Chitungwiza especially Manyame rural district council.(GoZ,2013).however, the committee recommended that the boundaries be adjusted to incorporate developments around Unit O including the illegal developments of United We Stand Housing Corporatives. Urbanization of the area should be done urgently to curb further illegal subdivision of the land and Chitungwiza municipality should change the residents of the areas to be incorporated into municipal areas service fees for provision of sewerage and water reticulation services to their stands. Villages such as Chitsvatsva, Murisa, Kuora, Marimbi, Ruseri which do not have village heads will soon be incorporated into

Chitungwiza as an answer to rapid urbanization not only in Chitungwiza but also Harare (GoZ, 2013).

2.6. Potential Environmental Impacts of Urbanization

Environmentalists estimate that urban expansion has encroached on or displaced habitats for a total of 139 amphibian species, 149 mammalian species and 35 bird species already critically endangered in USA alone (Krausman et al, 2000 pg594).It is quite shocking that the above statistics in USA, one tends to put a question on global statistics of displaced animal and bird species and some of these species are endangered. Also this urban expansion has been seen of not in favor with the environment. Marcotulio et al (2008) document the impact of urbanization on soils. He stated that urbanization alters the biological, chemical, and physical properties of soil and there by degrading its quality leading to loss of vegetation, poor water infiltration, excessive water runoff and thereby degrading its quality leading to loss of vegetation, poor water infiltration, excessive water runoff and soil erosion. According to U.S Geological Survey(2010), urban settlements encroaches into nearby forested or vegetated areas, and the expansion of built up areas and transportation networks into steeper terrain destabilizes slopes and weakening the soils thereby leading to landslides which further affects the soil condition.

Population growth and urbanization explains why many rivers and streams globally, are impaired or polluted. According to UNEP (2008), in USA, more than a third of rivers and streams are polluted as a direct result of rapid urbanization. In Zimbabwe, the Mukuvisi River is now one of the dirtiest rivers in the country given that rapidly rising urban population and corporations are dumping waste in the river. The rivers waters are now too tainted with the waste contamination so severe that more than 50 percent of the water is urine, sewage, and industrial chemicals

(EMA, 20:27).Mukuvisi river flows from its source around Cleveland dam on the eastern part of the city of Harare cutting through the Msasa industrial sites, Granite side and Mbare industrial sites before finally receiving more heavy industrial and residential waste between High field and Waterfalls on its way to the larger Manyame River. It is also very close to residential location of Mbare, Highfields and Waterfalls which it receives its domestic wastes. All these find their way into the main water source for the capital city, Lake Chivero, affecting aquatic ecosystems (City of Harare, 2009).

The water resource in many urban areas are limited, the limitation are mainly due default maintained water infrastructure, contamination of drinking water and general accessibility to water (Blor, 1999). Polluted and insufficient water resources, contamination of soils by toxic chemicals emitted by industrial, agricultural and municipal waste have the potential to leach to drinking water reservoir and have drastically impact on the cost of water treatment(WHO,2000) and further a reduced accessibility of water resources to the urban population because of closing of contaminated reservoir(WHO,1997). The lack of proper sanitation closely related to the water infrastructure, the population density in urban areas and this had resulted in several epidemics of diarrhea, cholera (WHO, 2006).

Waste management has not been spurred in urban areas.,(Holgate,1999) is o the idea that, waste management is not only a local problem, burning, illegal dumping and emission from waste disposal contribute with, dioxin, chlorinated organic component and heavy metal all persistent and have impacted global warming, bio contamination and bio diversity. Inadequate waste management also has local impact on health regarding hygiene, diseases and environmental degradation. Often waste are burn locally which contribute a significant exposure of particulate matter and chlorinated solvent which are causing respiration infection, cardiovascular problems

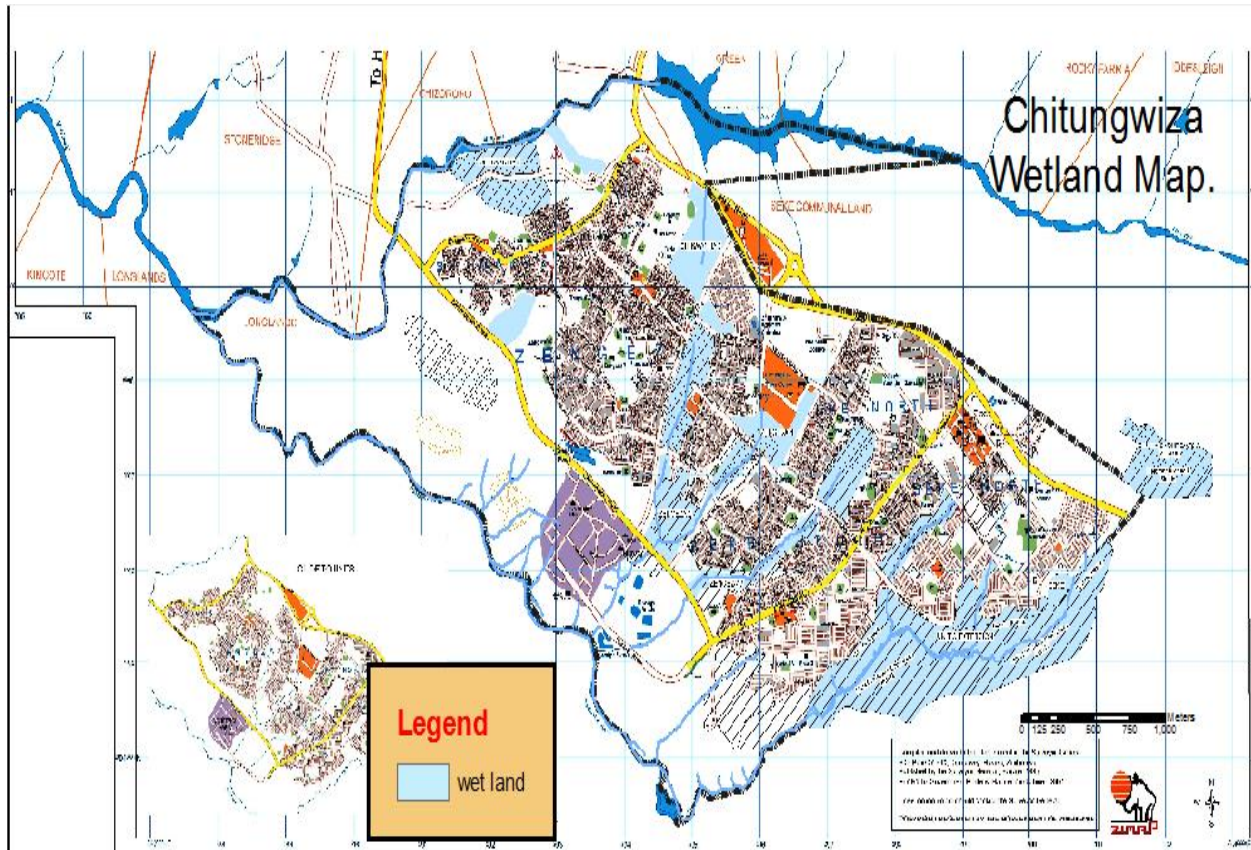
and other respiratory related human impact which in worst cases are causing morbidity or mortality (WHO, 2006).

The Ramsar Convention of 1971 is one of the most powerful conventions ratified by many countries including Zimbabwe in 2011 that preserves and prohibits development on wetlands. The convention defines a wetland as a land area that is saturated with water, either permanently or seasonally. Wetlands are distinct from other land forms by the characteristics vegetation that is adapted to their unique soil conditions. Wetland consists primarily of soils which support aquatic plants. The definition of wetlands was further purified to include lakes, rivers, swamps, marshes and wet grasslands among others. Environmentally, wetlands forms an important part of an ecosystem, therefore deserves the right to be conserved and protected from vagaries of urban development such as residential and commercial development on wetlands as evidenced by the construction of Long Cheng Plaza(Chinese owned Mall) on wetland area off SamoraMachel avenue in Belvedere, Harare . To mention a few of its significances, wetlands serves regulatory roles of the environment of prevent flooding by holding water like a sponge. By doing so, wetlands absorb water during storms and whenever water levels rise. When water levels are low, wetlands slowly release water, thus, they help keep river levels normal. Also, they filter and purify surface water because of their many cleansing benefits, wetlands have been compared to kidneys since they both help control water flow and cleanse the system(Mutodi,2009).Wetlands are therefore vital to the health of plant and wildlife as well as humans. They directly improve other ecosystems and their disturbance means that wildlife habitats, especially species of waterfowl have also been destroyed (Waugh 2010).According to the UNEP (2006), many animals and birds that live in other habitats use wetlands for migration and reproduction, for example, birds such as herons nest in large trees, but need areas of shallow water in order to

wade for fish and aquatic food. Amphibians often forage in wetlands, but return to the water to mate and reproduce.

Urbanization however affects this important natural space globally. For instance, at some point in time, the United States contained more than 220 million acres of wetlands, however in 2004 due to urban expansion, the total area of wetlands declined to an estimated 107.7 million acres (Dahl, 2006). In West and North Africa, urbanization with its concomitant solid wastes, human excreta and industrial chemicals pollute wetlands and water systems as occurred in and along the Nile river where some major North African cities are situated. This is having far reaching results for people, animals and other species. With global wetlands thus threatened, global intervention have seen some rivers and sites declared as wetlands of international importance under the 1971 Ramsar Convention, and are now protected, though Chitungwiza do not have internationally recognized wetlands but it has got a number of wetlands sites which deserves protection , the city is now bursting into some wetlands which even see the construction of some institutions like churches being developed on wetlands through a process known as urban in fill. Below is a map of Chitungwiza showing some wetlands sites which are now under threat of urban development taking place in the area? It is of paramount significance that these wetlands are given enough protection.

Fig. 5. A wetland Map of Chitungwiza



Source: Chitungwiza Municipality Report (2009)

As land is cleared for new sites especially in the densely forested tropics, carbon is released into the atmosphere. In addition, the carbon and greenhouse emissions from cities are large due to the increased construction and other activities which may consume energy. In urban environments temperatures are always warmer than in the surrounding areas creating a “heating island” (Harms, 1994). This is because in cities, the sun's energy is not used in the same way as in open landscapes with vegetation and trees. Concrete, stone and asphalt, as well as roofs tend to act as

solar collectors and emit and absorb heat. This is exacerbated by the fact that the growth of cities also results in greater energy needs, which in turn results in elevated carbon and pollution. The burning of fossil fuels for electric energy generation for domestic and other urban uses emit these greenhouse gases like carbon dioxide that heat up the atmosphere (Mabuya, 2011) is also of the high view that high rates of urbanization and the high cost of imported fuels, poor urban populations resort to the use of wood fuel for cooking and heating as evidenced by massive deforestation around many urban peripheries of the developing world. This is done at a price with many serious repercussions like air pollution and environmental degradation.

It is important to note that, shrines to be used for worship and other rituals forests needs to be protected, with this urban encroachment into rural areas, such shrines and ritual forests have been displaced. These protected areas tend to have multiple functions, that is, elements of the environmental management such as biodiversity, forest, wetlands conservation, land use control for example Kinga shrine in ,Mfangano forest, western Kenya(Berkes,1999). Besides spiritual value, the shrine has also provided a sanctuary for a variety of indigenous trees, plants, animals, birds and insects. The forest itself was protected by strong traditional rules and prohibitions. Based on cultural artifacts, totems, rules and taboos, beliefs and prohibitions, every young boy in the villages of western Kenya was restrained from killing frogs by creating the fear that his mother's breast would disintegrate if he did so, the purpose was to protect frogs from extinction as they had traditional medicinal value. The diagram below is an illustration of degraded forest due to urban expansion in a city in Kenya. A lot of animal sanctuary has been destroyed and this reduces the quest for environmental sustainability.

Fig .6.Forest Destruction Due to Urban expansion



Source: Google Maps

However some scholars stress that the movement of people from the country side to the on city(rural to urban migration) may reduce pressure on rural land, and allow the environment to recover since the rural land use is dominated by agriculture which also have a debilitating effect to the environment(Frank and Stoops,2002). This is especially so in desperately poor countries like Madagascar, where residents in the countryside slash and burn forests (shifting cultivation)

also known as Chitemene system in Zambia, to clear space for farming and this according to the Frank and stoops,(2002).

Electricity power transmission lines are linear facilities that will affect natural and socio-cultural resources. The effects of short transmission line scan be localized, however, long transmission line can have regional effects(Environmental Assessment Handbook(1991).In general, the environmental impacts to natural, social and cultural resources increase with an increasing line length. Negative environmental impacts of transmission lines are caused by construction, operation and maintenance of transmission lines. Clearing of vegetation from sites and construction of access roads, tower pads, and sub stations are the primary sources of construction related impacts (Environment Assessment Handbook, 1991). Operations and maintenance of the transmission line involves chemical or mechanical control; of vegetation in the vicinity. On the positive side, power line, when properly managed, can be beneficial to wildlife. Cleared areas can provide feeding and nesting sites for birds and mammals. The edge effect is well documented in biological literature; it describes the increased habitat diversity resulting at the contact between the ROW and existing vegetation. Power lines and stretches can serve as nesting sites and perches for many birds, especially raptors.

Industrial activities have as a consequence of economic development unleashed a direct environmental degradation with the pollution of air, land and sea (Haq, 2013). With the increased focus on the private sector and industry following the RIO conference in 1992, environmental management –as pollution control tended to be relabeled. But prominence on the international and bilateral donor agencies, including the Danish was short lived and down played after the earth summit in Johannesburg in 2002.With the intention of assisting in improving the use of input in industry, a range of studies and many reports of a technical nature were

conducted. Regulation with reference to particular forms of resources use and disposal (water, energy, liquids, chemicals and metals) in particular industries, often conceived as the most polluting ones in urban areas. However, in African countries a key priority of many developing country government was industrial development and environmental concerns were perceived as limiting this development and hence of less priority.

2.7. Mitigatory measures

Methods to involve the public in environmental planning and management are changing rapidly as agencies attempt to pursue management objectives within an increasingly turbulent and social and potential environment (Marshall, 1990 cited by Tanz and Howard, 1991). There is a growing interest among managers and scholars in collaborative approaches to public involvement. Among resource management agencies searching for solutions to these problems, there has been a growing interest in collaborative approaches to natural resources decision making. Further voluntary or induced by public pressure, agencies have improved their ability to integrate public participation into their decision making. There is a trend towards collaborative decision making is made by a consensus of affected parties(Tanz and Howard,1991).A coalition of forest interests called 'friends of the forest' became a forum for debating the control of Off-Road Vehicles(ORV) near forests or surrounding rural areas(Tanz,1991). Marshal (1990) is of the idea that management needs new skills to move from the expert opinion role in traditional environmental management to an empowerment role as a mediator, catalyst, or books in the new order. In addition, environmental managers often conceptualize resource problems from organizational policies and procedures will be needed to facilitate elaborative solutions to protracted resource conflicts.

Walter (1991) asserts that difficulties in environmental protection often arise from limited understanding of the causes and consequences of ecological degradation. Walter (1991) attributed these difficulties to the following: existing data on environment quality are often scarce, environmental monitoring in these areas is often undervalued and underfunded. In addition data collection on environmental issues in urban areas has only begun in many countries as an away to establish major causes and ways to circumvent the problem.

The Environmental Protection Agency in America documents that significant environmental problem is fixed in a matrix of ecological , economic, political and scientific causes and consequences that usually frustrate quick and simple solutions(EPA,1991).In addition, the report also documents activities done in other countries such as America which helped to protect and conserve the environment, the federal government of America has continually monitored a variety of environmental indicators and published current assessments of environmental quality using the following indicators. The most important of these relate to the quality of the nation's ambient air, surface and ground waters, hazardous and toxic waste management and solid waste management (Walter, 1999).

Regarding to issues of waste management in urban areas, most local authorities have little experience with recycling or incineration and are seldom pressured by local citizens to explore the possibilities. In addition, Washington DC has been slow to provide the economic incentives or regulatory pressures required to move local governments towards recycling or incineration and technical problems must also be overcome (David, 1994).However, critics of incineration by environmentalists are gathering a momentum, environmentalists have argued that the incineration process can liberate dangerous airborne toxins and leave behind hazardous and toxic sludge's to be managed. Plastics an increasing common component of municipal wastes which is

difficult to recycle or incinerate safely because they are seldom bio degradable and their combustion creates several toxic gases. UN-HABITAT and UNEP launched the Sustainable Cities Program (SCP) in August 1991, which entails case towns mostly in third world countries. The SCP includes a wide spectrum of cross sectoral interventions, typically involving improvements in solid waste management and environmental health, water resources management in urban areas, urban transport and air pollution, and activities specifically targeted at benefiting the urban poor (UN-HABITAT, 1991). Central to this approach, is the environmental planning and management that prescribes certain logical steps that in a participatory way are intended to involve stakeholders in a project managed process. Sustainable City Program (SCP) aims to assist cities in achieving environmentally sustainable growth and development (UNEP, 2000). Through program activities UN-HABITAT or UNEP support local authorities' to implement well balanced environmental management strategies, including meaningful public participation in development decision making and planning. After 2002, there has been more focus towards developing capacity for national replication.

Nkaya and Andreason (2005) reported from Tanzania that awareness of environmental issues was not created and that common people were in fact never involved in problem identification and decision making. However, several successes were noticed, for instance the achievements in improving solid waste management in Dar el Salaam. The main problem faced in implementing this noble idea of Sustainable City Program is that a program operating for over 15 years have relatively few lessons (positive or negative) to offer. SCP, however, issues many statements, publishing their performance, for instance, the success of participatory environmental planning has resulted in ordinary citizens in helping to design a long-term vision for their city, this has led to broad based city development strategies. UNEP (2000) emphasized much on issues of health

in newly urbanized areas. This augurs well with a report by world Health Organization (WHO) (2006) stating that issues regarding water and sanitation and relationship between poverty and health have been extensively investigated. In addition, aspects concerning waste management have received some attention in urban areas. Also the importance of domestic energy in particular for cooking and heating has only more recently been targeted.

Gunter(1989) is of the view that research is of paramount significance and is needed on the extent of inter dependence between manmade activities and natural resource systems, for example between deforestation, land clearance and over grazing on the one hand, and soil degradation and erosion, watershed destruction and sedimentation. He further went on to say that efforts should be made to quantify the impacts at each stage of the interrelated ecological system in physical or monetary terms in order to determine the points in the system at which it would be most socially profitable to intervene with explicit policy measures.

Public authorities were encouraged to engage in projects such as reforestation and pollution control, prevent degradation by building ameliorative components into industrial projects or irrigation schemes which remedy past abuse of the environment as a traditional approach to environmental problems (Gunter, 1989).The above stated measures can go a long way to reduce environmental damage though holistic measures are needed to reduce the extent of environmental damage. Finally, Gunter (1989) added that public intervention may be required to manage or ameliorate both the catastrophic and more gradual effects of natural degradation. He advocated for the designing of measures in light of costs and benefits of the ameliorative action. Mabuya (2011) added that damages from natural forces and human activity need to be disentangled, and the set of incentives or other policies designed accordingly, for example, flooding caused by natural erosion and sedimentation might be mitigated by incentives to induce industry

or residences to move to less damage prone areas, to the extent commercial logging is responsible, the focus should be on incentives designed to improve management of natural resources.

2.8. Stakeholders and their roles in Managing the Urban Physical Environment

Various stakeholders are rolling their heads to discuss the growing concern of managing the physical environment in both urban and rural areas. This attention is drawing all disciplines across the divides to discuss how each stakeholder can contribute to environmental management and campaign for reduction of environmental degradation. Various researches have been carried out on environmental management stakeholders and their responsibility. Stakeholders have been drawn from various disciplines. The field has been characterized by many contributions from political scientist, public administration, town or urban planners, technicians, engineers, economists and business managers (UNEP, 2000). These stakeholders are working tirelessly to protect and conserve the environment as a move to achieve environmental sustainability in urban areas. The noble idea of environmental sustainability requires a multi sectoral approach whereby everyone to be affected by environmental issues fully participates in environmental issues.

A report by UNEP in 2000 stated that the roles and responsibility of governments have changed overtime in urban environmental management and this had also applied to pollution management and environmental degradation in urban areas whereby governments used to play a central role in pollution management. The government used to regulate those industries polluting (command and control approach) but overtime shifted goal posts to a self-regulatory (market based or voluntary approach).The different perceptions of the role of regulation have theoretically been

aligned with different stands of development economies and business management. Basically viewing regulation as an obstacle to growth and development rational choice and principle agent approaches have support self or market regulation, while other maintain that regulation can raise standards and spur innovation, arguing and highlighting the potential possible role of government for enhancing green competitiveness(improving economic development and the environment(Porter et al,1995).

With the command and control approach, the governments were supposed to formulate environmental legislation, set up relevant regulatory institutions, provide license to industry and enforce the legislation in order to control industrial emissions and protect the residents from extensive pollution in urban areas (World Bank, 2000). However a number of flaws existed over this approach: firstly the environmental regulation was seldom high on the agenda among developing country governments as economic development was seen as a key objective and environmental regulation viewed as hampering economic development(trade- off between economics and environment(Cole,2000).Secondly, related to changes of the role of governments and the move towards governance, the standardized approaches embedded in command and control types of regulation were ill suited to handle the different conditions that the industrial sectors operate under (World Bank, 2000). Thirdly, regulation on environmental pollution was perceived as benefiting all citizens, though often to the benefit of the influential and better off groups.

In developed countries, corporate environmental responsibility is becoming an increasingly important strategic concern for companies, their stakeholders, and Non Profit Organizations(NPOs)(Michael,2008).The issue of corporate social responsibility is gaining momentum across the divides with the main concern of including the private sector in

environmental management. Although many corporations now provide financial support, equipment, or personnel to assist environmental interest groups, the relationship between companies NPOs has typically remained one of tension and mutual distrust (Michael, 2008) corporations and NPOs are increasingly recognizing the benefits of collaborating on a wide range of social and environmental issues.

Michael (2008) stated that, the corporate social responsibility was done in different ways in America. Boston's College Centre for corporate Community Relations surveyed 255 corporate executives and reported that 89% agreed or strongly agreed that corporations should encourage and support their employees in volunteering to help pursue their social and environmental activities. In addition, Michael (2008) added that 85% agreed that corporations should contribute money and leadership for social causes and nearly all agreed that corporate citizenship is likely to become agreed that corporate citizenship is likely to become even more important over the next five years. Several companies such as Home depot and Uniliever have engaged in more interactive collaboration, they have their materials sourcing policies certified by environmental interest groups (Michael, 2008). Still holding the view, corporation between NPOs and Private companies can also be attributed to the fact that environmental responsibility is an increasingly important issue for stakeholders. Corporations are pursuing more formal alliances with NPOs to tackle internal environmental management problems. These NPOs are seeking to prevent pollution in urban areas and environmental damage before it occurs by working more directly with companies to change their products or process.

The literature on the use of resources and types of effluent has been dominated by technical disciplines, technicians, biologists, chemistrists and engineers of different kinds, depending on the types(liquid effluents including water, solid and aerial) and the (technical) solutions to the

pollution problems(Holgate,1999). The initial focus was on the wastes products and how to limit the spread of these so called ends of pipe solutions. The focus has shifted to pollution prevention where the companies adjust their production in order to reduce waste through polluter pay principle where companies are expected to pay in relation to the pollutants.

Hardlock,(1994) postulates that various disciplines such as management engineers, geographers, business management are aimed to see and understanding reasons why the industrial firms are not seeking a win –win opportunities and why the firms are not implementing environmental management systems. The idea is gaining momentum across the divides. As urban areas expand, it follows that industries also grow. These industries as highlighted in this literature that industries heavily contributes to environmental degradation in urban areas.

Also other stakeholders such Transnational Corporations(TNCs), Foreign Direct Investment(FDI) and Non-Governmental Organizations(NGOs) have contributed to an improved environmental management(Hardlock,1994) .However, one strand of thought argues that the TNCs brings in new technology and less resources compared to the local firms as well as the exploitation of local resources.

However, from NGOs and organizations like IIED, much emphasis has been given in highlighting the damaging effects on the livelihood of the poor in areas close to industries (UNCTAD, 2000).Pollution management programs and initiatives have been carried out by international agencies like UNEP, UNIDO, ILO and the World Bank, as well as bilateral donor agencies. While some agencies have worked mainly with reference to government and the ability to per sue pollution control, like UNEP and the World Bank, others have focused more on the industry and firm side(UNIDO and UNCTAD,2000).UNEP has advocated a number of programs

, of which is the National Cleaner Production Centers, which has become a major initiative focusing on establishing national bodies, centers which could TNCs have shifted from being the exploiters of developing countries to the savers(Wad and Jefferson,2006).

The literature is mainly oriented towards the possibilities of industrial development which entails the enhancement of environmental management as means of upgrading and increased competitiveness of industries or firms and the environmental impact in urban context (Jefferson, 2005). The perspective is on win –win situations, viewing economic environmental benefits as going hand in hand. To further augment this view,(Wad,2006) used a case of UNIDO ,recently UNIDO has along with other international agencies and many donors, placed increasing attention on the role of Small, Micro and Medium sized Enterprises (SMEs) and issues covering Corporate Social Responsibility (CSR) while UNIDO highlights the potential of SMEs in improving the urban environment.

2.9. Environmental Legislations and Urbanization

Environmental Impact Assessment (EIA) has over the last two decades been perceived by international organizations and donor agencies as a management tool to improve the transparency and suitability of many industrial activities in the developing countries being developed and implemented (World Bank, 2008).During 1988 the world bank and UNEP recommended that EIA should be an integrated part of larger project with possibility for co assistance, financial support and supervision. UNEP firmly established protocols and roadmaps during the late eighties for the use of EIA in the development sector(UNEP,1888).EIA is now in many projects, a well-established procedure, but has in many cases been ineffective due to the above mentioned factors(Ashunaikhat,2005). Despite the existence of EIA guidelines and

legislations, the pollution burden is increasing in urban areas (Mage, 1996) the environmental degradation continues to be a major problem in the developing countries (World Bank, 2008).

Also local authorities are guided by various legislations in their operation, these legislations include Rural District Councils Act of 1996, Communal Lands Act, Urban Councils Act. Environmental legislation includes Environmental Management Act (EMA), Forestry Commission Act. All of the above mentioned statutes have got special sections which prevents environmental degradation from any harmful activities. Rural District Councils Act, sections 88 and 89 of this Act empowers Rural Local Authority to make by-laws that protect any water source from pollution, management of sewer disposal, refuse removal and protection of vegetation among a wide range of duties (RDC Act revised 1996).also the Communal Land Act emphasizes the importance of local authorities in management of communally owned resources with the aid of traditional leaders

2.10. Conclusion

The literature review looked at various literature documents by various scholars on urbanization and environmental sustainability. It also looked at activities that have caused environmental degradation as well as solutions to circumvent problems caused by environmental degradation. Also the literature review highlighted the research gap on researches made by others. A mere look was also given to the roles of urban stakeholders and constraints faced by different stakeholders. Lastly, various legislations used by different stakeholders were also reviewed.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0. Introduction

Research is about knowledge production, seeking answers to questions through inquiry (Mikkelson, 2004). Research methods have been defined as tools to be used for answering a specific set of questions and for solving different scientific or practical problems (Enderud, 1984). In this research, various tools were used by the researcher in order to get solutions to the impacts of urbanization on environmental sustainability. The research was carried out in Chitungwiza particularly areas where urbanization is taking place that is the periphery of Chitungwiza to include Seke communal lands where villages such as Mayambara, Chitsvatsva, and Kuora near Unit O are no longer succumbing to an avalanche of urbanization of Chitungwiza.

3.1. Research Design

A research design is a preconceived plan according to which data is collected and analyzed to investigate a problem (Hausmann, 1996 cited by Maoneni, 2014). Data occurs in two forms namely, qualitative and quantitative data. Controversies have raged over appropriate research methods, for example, over the justification of using qualitative and quantitative method. Gin (1987) asserts that the qualitative-quantitative divide should not make us forget that moving beyond qualitative and quantitative strategies is the focus of the comparative method. In this study, the researcher used qualitative research methods. Qualitative style research dominates in development studies, but this may be as much a reflection of the much conditionality of time and resources which guard development cooperation (Ragin, 1994 in Nueman, 2003). It has been argued that qualitative research has expanded greatly and is rapidly displacing quantitative style

of research in the social sciences. Qualitative research was used because it captures the views of participants which will form the basis of research.

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Qualitative research spans a wide spectrum to include discourse analysis, content analysis, phenomenology (Olsen, 2002). The reason why the researcher used qualitative method is because, the method is best understood as data enhancers. Ragin (1994) argued for qualitative methods because it makes it possible to see key aspects of cases more clearly. Qualitative method involves various techniques for collecting data and the researcher used the following methods, participant observation, sample surveys, structured and semi structured interviews, open interviews, questionnaires, archival method. Regardless of the kinds of data involved, data collection in a qualitative study takes a great deal of time. The researcher obtained potentially useful data thoroughly, accurately, and systematically, using filed notes, sketches, photographs, or some combination of these are the assumptions of qualitative and quantitative research.

3.2. Sampling Technique

According to Francis (2012), sampling is the act, process, or technique of selecting a suitable sample (a finite part of a statistical population where properties are studied to know about the whole), or a representative part of a population for the purpose of determining parameters or characteristics of the whole population. There are various sampling methods that can be used in research namely purposeful or purposive sampling, random sampling, stratified sampling, systematic sampling, and cluster sampling to mention a few. The researcher used purposeful or purposive sampling. In this sampling, the researcher selected particular people from the population that represented or informative about the topic. Francis (2012) stated that, on the basis of the researcher's knowledge of the population, a judgment shall be made on people to be selected to provide the best information to address the purpose of research.

3.2.1 Sample Size

Gerad (2003) cited by Maoneni (2014) argues that there is no universal formula for calculating the size of a sample. It is argued that the larger the size the more representative the information given about the population. The sample size was determined using the guidelines proposed by Gay (1987) cited by Maoneni (2014).

Table 3: Sample size determination

Size of Population	Sampling %
0-100	100%
101-1000	10%
1001-5000	5%
5001-10000	3%
10 000+	1%

Source: Gay (1987)

Number of questionnaires which were distributed by the researcher was 150. Out of 150 questionnaires distributed, about 90 questionnaires were completed by the respondents in Chitungwiza. Challenges such as illiteracy and level of question interpretation were noticed by the researcher .however, the number of people responded to questionnaire was within the range 0 -100 which means the sample size was 100% according to Gay (1987).

3.2.2. Population Sample

Jeanings et al (2001) define a sample as a portion of the elements of a population. In this research the sample shall be made up of three wards which contribute a population of almost 150

people. Systematic random sampling was used to select the number of people who participated in the research and to be issued with a questionnaire and a group of eight from each ward for group discussions. Mikkelson (2004) defined systematic random sampling as a system which ensured that each unit had an equal chance to be included in the sample. Key informants were selected using purposeful sampling and in this research six key informants were the Mashonaland East Provincial Planning officer, District planning officer for Manyame Rural District Officer, Environmental Management Agency District Officer, Chief Seke (village headman), environmental coordinator for Chitungwiza residents trust and few residents in Chitungwiza.

3.3. Data Collection Tools

Inns (1983) defined primary data as the data gathered by the researcher expressly to solve the problem at hand at that particular time. This data is raw, observed and recorded as part of the original study and has not been previously published as it is straight from the field. It is hard data fresh from the field (Inns, 1983). In this research primary data was required since it helped the researcher to put the researcher in direct contact with the problem. Primary data was collected using questionnaires and structured interviews, participant observation and focus group discussions. As they collect data, many qualitative researchers also began by jotting down notes, sometimes called memos about their initial interpretations of what they are seeing and hearing (Leedy and Ormrod, 2010 page 148 cited by Francis, 2012). The researcher made use of memos, jotting down of important notes as part of data collection.

3.3.1. Questionnaires

It is a group of sequence of questions designed to elicit information upon a subject from an informant (Inns, 1983). Questionnaires generate ideas, opinions or information from a selected

target population. Mossar and Kalton (1979) are of the view that, a survey can be better than its questionnaires. Francis (2012) recommended the use questionnaire method in data collection. He described questionnaires as good methods of data collection when there is a need for a particular class of people to be questioned.

Questionnaires were used to obtain data that is not captured using interviews. This data included the rate of land degradation caused by urban expansion, costs of repairing damaged environment, time taken by the environment to replace itself or regenerate, alternative sources of energy fuels used by residents in Chitungwiza, challenges faced by people in trying to preserve the environment, efforts being done in trying to protect the environment.

The researcher obtained permission and authority to conduct this study from stakeholders listed below. Questionnaires was prepared by the researcher according to the data he required and administered to the Chitungwiza Municipality, Environmental Management Agency (EMA) Officials, Manyame Rural District Council officials, Seke village representatives, residents of Chitungwiza. The researcher left a questionnaire to the above mentioned stakeholders and was collected once the authorities were done with it. A questionnaire checklist for each stakeholder is attached to this dissertation under index section. See appendix for a questionnaire checklist.

3.3.2. Interviews

Interviews generate ideas and gathers information by posing relevant questions to the respondents (Ragin, 1987).The researcher made use of personal interview to get first hand information. Francis (2012) stated that conducting personal interviews is probably the best method of data collection to get first-hand information. However, unsuitable in cases where there are many people to be interview or questioned. A structured interview was also used by the

researcher. Francis (2012) defined a structured interview as an interview in which the question and answer categories have been predetermined. In this research, specific questions were asked following order on the interview checklists.

Interviews were also used by the researcher in order to get different views about urbanization and environmental sustainability from relevant stakeholders, to get an overview picture of what's happening in urban and environment circles, to capture various stakeholders' feelings and perceptions. This technique assisted the researcher to establish gaps not covered by questionnaires, generation of more ideas in the areas of concern according to each stakeholder and give a holistic view by all stakeholders. Stakeholders interviewed by the researcher included urban development practitioners with specific reference to urban planners and engineers of Chitungwiza. Each department was interviewed separately by the researcher. Also, officials from EMA were interviewed by the researcher. Francis (2012) laments that in a simple survey method, participants answer questions administered through interviews or questionnaires. After participants answer the questions, researchers shall describe the response given. Jeanings et al (2001) reiterates that in order for a survey to be both reliable and valid and it is important that the questions are constructed properly.

In order for the researcher to get the general position of the government on urbanization and environmental sustainability, the deputy minister of local government and urban development, who is also the resident minister of Mashonaland east province as well as the minister of environment, water and climate change in Zimbabwe was interviewed by the researcher. Lastly, chief Seke of Seke communal lands whose villages have been affected by urban development was also interviewed. Interview checklists for different stakeholders are attached to this dissertation under index section.

3.3.3. Focus Group Discussions

The researcher also made use of focus group discussions to obtain primary data. Morgan(1988) cited in(Mwaruta,2007) points out that the whole mark of focus groups is the explicit use of group interaction to produce data and insight that would be less accessible without the interaction found in the group. Group discussions are good data collection techniques where the researcher has to know what the people in a group think (Francis, 2012).Focus group discussions were conducted where EMA had environmental campaigns in the community. 3 different environmental awareness campaigns were conducted in Chitungwiza in the following areas: Makoni, St Mary's, Taita, and Zengeza. Group discussions were conducted soon after the campaign by EMA. A group size of 8 people consists of 4 males and 4 females were formed and questions were administered. The researcher facilitated and directed questions and topics to the group, capturing views of different respondents.

In this research, the role of the researcher was more of a moderator or facilitator and less of an interviewer. The group interaction was facilitated and directed by questions and topics supplied by the researcher. The researcher facilitated and recorded the group proceedings of the discussions.(Mwaruta,2007) is of the view that, well facilitated group interaction can assist in bringing to surface aspects of a situation which might not otherwise be exposed. The group situation can stimulate people in making explicit their views, opinions, perceptions and motives (Jeanings, 2001).Focus group discussions are cheap as compared to other methods of data collection. Also, focus group discussions are flexible, stimulating and dynamic. Focus group discussions of 8 people were conducted with residents in Chitungwiza and this was sufficient enough to nurture the researcher with data because when the group is too large, it will be a

cumbersome operation and become inefficient, whilst a small group is not permitted because the researcher can miss important data.

3.3.4. Detailed Observations or Field Observation

Data can also most effectively be obtained with means of observational skills or techniques. The researcher visited a place where urbanization is taking place that is Chitungwiza and its periphery and took down details of what he observed which was actually required for aiding in his research. Here, the researcher had to make sure that what he observed was real.

3.3.5. Secondary Data Collection

Secondary data consists of information that has been collected by others and can be readily available from secondary sources (Conyers and Hills, 1984). This data was collected using archival method. Data pertaining to statistics of Chitungwiza was obtained from Central Statistical Office (CSO). In addition latest publications and journals on urban development and environmental sustainability, internet websites, annual reports on urban development from the municipality and government legislations and publications such as the urban councils Act, rural councils Act, Regional, Town and Country Planning (RTCP) Act were analyzed by the researcher in order to elicit data for the study.

3.3.6. Archival research

Archives are the non current records of individuals, groups, institutions, and governments that contain information of enduring value (Francis, 2012). He also added that, formats represented in the modern archival repository include photographs, films, video and sound recordings, computer tapes, diaries and manuscripts from the above definition of the archives it becomes

clear that what is called an archive research is more of a technique of data collection than a type of research. Jeanings et al (2001) added the definition of archival research to include, the analysis of existing records that have been produced or maintained by persons or organizations other than researcher. Francis (2012) strongly emphasized that when doing archival research, researchers must consult, among other sources of information, newsletters, government statistics, newspaper, and speeches. The researcher used archival method to obtain secondary data; speeches were done on environment management in Chitungwiza. Various plays pertaining environmental management were done by residents and the researcher obtained the essence of environmental management from plays and speeches.

3.4. Procedure for Data Analysis

According to Francis (2012), the process of data analysis should be described in detail. He further went on to say, the process of data analysis is determined by the research methods or techniques used in data collection. This is because different methods or techniques require different ways of analyzing data. The analysis of data in this research was done within qualitative (description and thematic text, image analysis) and quantitative (descriptive and inferential, numerical analysis) approach. In this research personal interpretation was not escaped in qualitative data analysis. In order to obtain a highest degree of qualitative data, it has to be coded. Data Coding is a process of organizing the material into ‘chunks’ before bringing meaning to these ‘chunks’ (Rossman et al, 1998, p171). This process was done through converting text data or picture, segmenting sentences (or paragraphs) into categories with a term, often a term based on the actual language of the particular findings called an in vivo term (Rossman et al 1998). a software package known as Software Package for Social Science (SPSS) was used by the researcher to analyze data obtained from the questionnaire which was

administered to Chitungwiza residents and other relevant officials in the periphery of Chitungwiza. As highlighted above, data was coded first before it was entered into the SPSS package for analysis. This was done to get meaning of it.

CHAPTER 4: DATA PRESENTATION AND ANALYSIS

4.0. Introduction

This chapter delves much to the presentation and analysis of how urbanization has impacted environmental sustainability in Chitungwiza with main reference to the areas surrounding Chitungwiza. The researcher made use of qualitative data results. In this chapter data was collected and analyzed using a Software Package for Social Sciences (SPSS), image analysis. Responses from EMA, Chitungwiza municipality and residents were presented in a descriptive way. Data analyzed was also obtained through the questionnaire administered to the EMA officials, Chitungwiza Municipality and Seke residents, feedback from focus group discussions and interviews conducted with relevant officials.

4.1. Activities that Degrades the Environment in Chitungwiza

This section seeks to address the first objective of the study which sought to explore the activities that degrades the physical environment in Chitungwiza. It is clearly evident that the physical environment that surrounds the city of Chitungwiza has been reduced in its quality especially in villages' surrounding the city such as Chitsvatsva, Mayambara, and Kuora and Murisa where the city is bursting into. Interviews with key stakeholders revealed that, critical housing shortages in most urban areas is one of the drivers of urbanization. The unprecedented or geometrical increase of urban population due to rural to urban migration has exacerbated urbanization in Chitungwiza. This caused a serious shortage of houses as evidenced by huge numbers of people on housing waiting lists. This view is substantiated by the Housing Database of 2007 which reflect considerable housing challenges in all major cities. The database cites high occupancy rates in the Harare Metropolitan Region for instance 22 people per housing unit of Chitungwiza, 20 in

Epworth and 9 in Harare (Mlalazi and Chatiza 2009 cited by Maoneni, 2014). It is against this background that villages ‘surrounds the city of Chitungwiza got an avalanche of urbanization as people sought alternatives to the housing crisis. Also, from several group discussions conducted by the researcher, some respondents highlighted the delay in the provision of residential stands by local authorities such as Chitungwiza municipality after a person has joined the housing waiting lists. ‘It takes ages to get a formal residential stand in town, you go on a waiting list and wait for years to be given a stand’, one of the residents in Chitungwiza said. In addition some of the stands will be very expensive such that the little income earners cannot afford and land barons have manipulated this loophole and created informal schemes at the periphery of Chitungwiza where people get stands instantly with flexible terms. However, these schemes are not done by professionals so they endanger the environment as they created stands on environmentally fragile land, wetlands and sacred shrines.

Just like human beings, cities and towns grow. In this instance, they outgrow their originally set boundaries. Chitungwiza boundaries were set in 1978 at its formation, and no extensions were done after that. The land within the existing urban nodes has been used up, leaving no other option but to encroach and overspill into the surrounding Seke communal lands. There are two layouts prepared by Chitungwiza which encroached into Seke area which have a total of about 1000 residential stands. The surrounding peri urban of Chitungwiza is Seke Communal land implying that it is communally owned. The land vests with the President of Zimbabwe under the custodianship of Traditional Leaders (chiefs, Headman and village heads) and administration of the Manyame Rural District Council (RDC). The land suffered the tragedy of the commons as the traditional leaders embarked on operation “*Gara wadya Munda Unotorwa*” where they parceled

out land so as to benefit before the urbanization came into their areas. The Ministry of Local Government, Public works and National Housing Audit report of 2013 revealed that there were in excess of 6000 stands created by land barons within Seke communal area as an extension of Chitungwiza urban developments.

4.1.1. Land Clearing

Interviews conducted with town planning authorities in Chitungwiza and Manyame Rural District Council (RDC) showed that land clearing heavily impacted environmental sustainability of Chitungwiza. Land clearing was cited as one of the major cause environmental degradation in urban areas. Vasts tracts of forested land has been cleared for urban development such as housing construction, road network development including servitudes maintenance, electricity mains supply, commercial sand and concrete extraction. The above highlighted developments are clearly evidenced on the picture below.

Fig.7. Urban Clearance Paving Way for Residential Development in the periphery of Chitungwiza



Photo was taken on 12/04/15

The above activities shown on the photograph has left many hectares of fertile topsoil degraded and reduction of its fertility. This also exacerbated erosion, which is the wearing away of soil, usually by water, wind(agents of erosion).Munowenyu(2000) stated that if processes of erosion continued unabated, land will be reduced to a fine dust bowls which could lead to the turning of land into a desert, which is a long term impact of land clearing.

This activity has negatively impacted the physical environment and attainment of environmental sustainability will now be a 'pie in the sky' meaning to say, the idea as noble as it is, it cannot be achieved. This augers well with the view of Markotulio et al(2008), who proffered the impacts of land clearing on animal species and amphibians. Krausman et al (2000) puts it, 139 amphibians species, 149 mammalian endangered by land clearing for urban development. Also Markotulio (2008) documented the impact of land clearing on soils where he stated that urbanization alters the biological, chemical and physical properties of soil and thereby degrading its quality leading to loss of vegetation, disturbed infiltration processes, excessive urban runoff and uncontrolled overland flow.

4.1.2. Sewage and Refuse Disposal

Poor sewage and refuse disposal in areas inhabited by urban dwellers has been cited by many residents as another cause of environmental degradation in Chitungwiza and its periphery. Burst sewer pipes is now common in Chitungwiza and effluent discharged into nearby rivers and streams is causing more harm than good. Aquatic life is part of an ecosystem which is now under threat by excessive effluent being discharged into rivers. Pollution of land and water by discharged effluent had left the environment in a quandary state in Chitungwiza. This is exacerbated by the construction of latrines by some people in urbanized villages. On site sewer disposal proved to be effective if it is properly planned and sited. In this area, latrines are not deep enough, less than 2m deep which cause health dangers to humans and threatens underground ecosystem. This poor sewage and refuse disposal heavily pollutes air water and soils; this negatively impacted the physical environment. The refuse collection by the Chitungwiza municipality has not been so frequent and this had aggravated the problem of land pollution in the area and the surrounding area being used as dumping sites by residents. These caused residents to

have uncontrolled and unauthorized dumping sites such as along roads and open spaces as shown on the image below:

Fig.8. Unauthorized dumping of waste by residents



Photo was taken on 12/04/15

The poor location of waste dump sites and storage facilities have created a major environmental problem in many parts of the world, especially in developing countries where urbanization is on its highest ebb (Munowenyu, 2000). As a result of this practice, toxic wastes have been leaching into the soil and water and thus creating a serious danger to animal and water life. A situation observed by the researcher in Chitungwiza pertaining to dumping sites coincided with the case of the United States (US) documented by the United States Environmental Protection Agency cited by Munowenyu (2000) where in 1980 there were 750 000 industrial plants in the USA producing 57 million tonnes of dangerous wastes each year in urban areas.

This view was further proffered by UNEP (2008), where more than a third of rivers and streams in America are polluted as a direct result of urbanization. In Zimbabwe, the Mukuvisi River is now one of the dirtiest rivers in the country given that rapidly rising urban populations and industrial development are producing a lot of wastes which are dumped in rivers and open spaces in urban areas. The situation is now worsened by the increased number of activities being done by people in urban areas; these activities are a source of their livelihoods.

Industries also produce huge volumes of wastes which are then deposited in rivers and open spaces which are preserved as city lungs or breathing spaces for the city. City of Harare (2009), documents that most toxic wastes are generated from industries and homes and need proper disposal. The researcher observed that residents in urbanized environments of Chitungwiza have a culture of 'use and throw' and increasing use of biodegradable packing material, the quality and composition of wastes is likely to increase in the coming decades. In addition to the view above, residents in Chitungwiza do not have proper designated dumping sites except open spaces

and rivers; this largely degrades the environment and compromising the ability to achieve environmental sustainability. Also the researcher observed that, due to large accumulations of wastes in some parts of Chitungwiza, residents are now resorting to waste incineration in order to reduce volumes of wastes. Such methods are discouraged in urban areas as this has a long term impact on urban climates.

4.1.3. Urban Agriculture within Environmentally Fragile Areas

In a bid to increase agricultural productivity and to reduce urban poverty levels as and to meet the first goal of the MDGs, poverty reduction by 2015, human beings have engage in agriculture activities which have resulted in the poisoning soils of which soils forms the basis of environment and sustainability of the environment depends on soil conditions. A comprehensive report by Institute for Agriculture and trade policy (1999), demonstrates how agriculture can be the victim and the cause of climate change. Fertilizers applied to the soils, enteric fermentation, manure management, rice cultivation in some countries affected climate change in the long run (IDS paper, 2005). As the rain continue to soak the country, farmers are busy cultivating their crops in rural and urban areas, most of the crops taken up available open spaces. Urban farming has always been a large part of the city. Residents in the high density suburbs take advantage of undeveloped land, whether it is land kept aside for service delivery or because it is not favorable for construction. These farmers grow crops on stream banks, wetlands and other designated places. This is in violation of city's by laws that forbids residents to farm on wetlands and stream banks. It is also forbidden to plant crops on road verges as it puts residents at risks. Cultivation of stream banks still continue even with threats of crops being destroyed, flooding of their plants, farmers cultivate on ridges, destabilizing water flow while

contaminating rivers with chemicals used for farming. The Mukuvisi River in Harare is one of such victims of the practices.

Agricultural practices in urban areas harm the environment through a number of ways proffered above, in addition soil poisoning highlighted above has been largely caused by irrigation as a supplement to unreliable rainfall being experienced. This view was further substantiated by Munowenyu(2000) who stated that high evaporation rates in dry areas leave a crust of salt deposits on the surfaces thus causing the soil to be too alkaline which will exacerbate environmental degradation. Also bad agricultural practices are associated with massive leaching and oxidation processes. Leaching and oxidation processes have destroyed the productivity of millions of hectares, especially in the tropics and arid regions of the world(Munowenyu,2000).In Brazil, which is a tropical rainforest zone, the topsoil has been deprived of its original fertility by rainwater percolating through the soil and simultaneously carrying mineral particles downward(Munowenyu,2000).

Agriculture is dependent on available soil moisture, which is directly affected by climatic dynamics, with precipitation being the input in the system. With this in mind, agriculture in most areas needs irrigation already, which depletes further water supplies, both by the physical use of the water and the degradation agriculture causes to the water. It has been observed that residents in Chitungwiza are practicing irrigation farming and pesticides are being applied to crops. Irrigation increases salt and nutrient content in areas that would not normally be affected, and damages nearby streams and rivers. Fertilizers enter both human and livestock waste streams that eventually enter ground water, while nitrogen, phosphorus, and other chemicals from fertilizers can acidify soils and water. The use of fertilizers retards the natural nitrogen fixation processes

in the soil. In addition fertilizers introduce toxic nitrates into water supplies and this destroys aquatic life which is a critical component of the environment, this greatly compromise the ability of the environment to achieve its sustainability. Pesticides applied to crops and herbicides (weed killers); poison the numerous soil micro organisms that are essential for the soils containing fertility.

4.1.4. Industrial Effluent and Pollution

The research revealed that there is a significant increase in industrial effluent which is being deposited on the surrounding lands. This heavily polluted the land. This significant increase in the deposition of industrial effluent has been largely caused by rapid urbanization in Chitungwiza. Singh (2004) stated that rapid urbanization has caused a wide spread environmental degradation in most countries. He went on to say, increased pollution levels in urban areas is largely caused by increased vehicle ownership and discharge of effluent by industries. There has been a substantial increase in Suspended Particulate Matter (SPM) in the air, which suggests the presence of dust and carbon particles coated with toxic gases (Singh, 2004). Research has been castigated that the SPM levels in the residential areas of all industrial cities have reached a critical level. All these calamities happening in Chitungwiza will leave the environment in a disarray of state thereby reducing or negatively impacted environmental sustainability. Rapid urbanization of Chitungwiza together with other assented problems of shelter and provision of infrastructural facilities has caused a pernicious effect on the eco stability of the country on a national scale.

Munowenyu(2000) added that, large scale developments in such activities as manufacturing , agriculture, transport, and recreation, people all over the globe have accidentally or on purpose

harmed and thus endangered the environment by making water dirty in such a way that it becomes useless and even harmful to all living things including human beings themselves, and making unwanted change in the quality of the earth's atmosphere through the emission of gases and particulates (small particles of solid matter or droplets of liquid) by our industries and vehicular traffic. All these calamities have negatively impacted the environmental sustainability of an area. The ripple effects we are experiencing today are a result of anthropological activities such as urbanization which is a case under study and is witnessed in many urban areas. The environment is no longer sustaining itself because the rate of land destruction is outweighing the measures being put in place to restore normalcy in the environment.

Another serious problem which was documented by the researcher is related to sewage treatment and disposal of waste materials. Hardly, the Chitungwiza municipality is facing some challenges in waste collection and treatment of sewage. This has caused people to create their own dumping sites. Singh (2004) proffered that, the Untreated and partially treated water and wastes ultimately contaminate rivers, lakes and reservoirs causing manifolds of pollution problems. Also the rapid urbanization of Chitungwiza has also enhanced the solid waste problem in the area. Several examples to substantiate the above were documented by Munowenyu (2000), in the United States (US) 655 billion liters of sewage and industrial effluent are discharged into its waters each day. In Swaziland, Lake Zurich, Geneva and Constance have become dark and smelly from sewage and industrial wastes. Obviously this means that aquatic life is endangered and so are some recreational activities such as fishing.

4.1.5. Urban Development Within Wetlands

Urban development on wetlands is a growing phenomenon in most urban areas and Chitungwiza cannot be spared in this issue. As chronicled in this research, Chitungwiza has got a lot of

wetlands sites which are shown on fig 5 in literature review section. It's hardly to find a wetland in Chitungwiza as the municipality pushed by housing crisis in the area to unleash residential stands on wetlands. It is quite shocking that, some local authorities are still not environmental sensitive, as this is evidenced by increased housing developments on wetlands. As documented earlier in literature review, wetlands serve a regulatory role by preventing flooding by holding water like a sponge. With a large number of wetlands which were in Chitungwiza, the city was not supposed to continue facing water blues if the wetlands were properly preserved. UNEP (2006) advocated for the preservation of wetlands as many animals and birds that live in other habitat use wetlands for migration and reproduction. Environmentally wetlands forms an important part of an ecosystem therefore deserves the right to be conserved and protected from vagaries of urban development such as residential and commercial development on wetlands.

4.1.6. Sand abstraction or Sand mining

Massive construction of new buildings in Chitungwiza and the area surrounding, extensions and renovations has been taking place in areas surrounding the city. Trucks among many others carrying loads of sand have become a common sight on Chitungwiza streets as they huff and puff their way to residential areas. This has been exacerbated since the dollarization of the economy in 2009. It is quite shocking that, this harmful activity of sand abstraction has been commercialized in Chitungwiza and many urban areas in the country. This massive construction has seen open pits and holes littered almost everywhere, a clear testimony of the negative impacts of sand mining on the environment. While sand mining has become big business in Chitungwiza and the greater Harare and other surrounding places due to infrastructural development going on, its effects on the crust of mother earth leave a lot to be desired. Also to be blamed is the mining

procedures. Improper mining procedures have left scars within and areas surrounding Chitungwiza environs and many sand extractors have not been moved as they continue looking for new land to dig as shown by the image below:

Fig.9. Urban land degradation by commercial sand mining



Photo was taken on 12/04/15

This sand extraction or mining is an illegal activity which attracts heavy fine if legal procedures are followed. Environmental Management Agency(EMA) through its Environmental Impact Assessment(EIA) and Ecosystem Protection regulation ,2007 published in statutory instrument 7

of 2007 says in section 3(1) no person shall excavate , remove, possess or license the removal of clay or sand deposit for commercial purpose without a license issued by the agency. Again section 3(2) of the statutory states that, any person who wishes to extract, excavate, possess or license the removal of sand or clay shall apply to the agency and inform EMA and the application shall be accompanied by an application fee. This illegal sand abstraction has caused severe land degradation and negatively impacted environmental sustainability.

4.2. Impact of the Activities on the Environment

This section seeks to address the second objective of the study which sought to find out the impact of the activities on the environment. It is undoubtedly that the activities highlighted in the first objective negatively impacted the environment. Activities such as land clearing, agriculture within wetlands, effluent discharge, and commercial sand extraction has caused more harm than good.

4.2.1 Land degradation

Land clearing in Chitungwiza was cited as one of the major cause of environmental degradation in Chitungwiza. Vast tracts of dense forest which were in and around Chitungwiza have been reduced by massive deforestation activities which took in place in the area. Land was not cleared only for housing construction but also wood became their source of fuel followed massive power cuts by Zimbabwe Electricity Supply Authority(ZESA).Vegetation helps to strike an ecosystem balance, with what is happened in Chitungwiza, its it will take another decade for the ecosystem to replace it self and to serve a regulatory role. The natural processes of the environment have been disturbed by this massive deforestation.

This deforestation has also affected air quality in Chitungwiza with large accumulation of toxic gases such carbon monoxide, sulphur dioxide and increasing volumes of carbon dioxide which has got a negative impact on human health. Massive erosion has left the land bare and fertile topsoil removed, which negatively affect agriculture productivity and affects soil quality. The view above was further upheld by Munowenyu (2000) who stated that if processes of erosion continue unabated, land will be reduced to a fine dust bowls which could lead to the

turning of land into a desert. In addition, Krausman et al (2000) puts it, 139 amphibians species, 149 mammals endangered by land clearing.

The destruction of habitat is another negative impact to the environment that is caused by urbanization. The conversion of a natural area to an urban area for more people means the destruction of whatever was there previously (www.infoaction.org). When wetlands for example, are paved over, an ecosystem is lost, and any species dependent on that ecosystem dies. A less drastic example is that of erosion valleys tend to contain fertile topsoil, which tends to get washed away if the valley is urbanized. Therefore with urbanization comes the need for more land and the natural environment is usually sacrificed to make way for more infrastructure (www.infoaction.org). A case of Indonesia can be used to substantiate the impact of urbanization where they resorted to the burning down of wetlands to pave way for land. This urbanization has an adverse impact on the maintenance of the natural habitats.

4.2.2. Land, Air and Water Pollution

Poor sewage and refuse disposal in areas inhabited by urban dwellers has been cited by many residents as another cause of environmental degradation in Chitungwiza and its periphery. Due to increased population followed that the sewerage no longer succumbs to increased sewage and this caused these sewerage pipes to burst into sources of water and rivers. It is of paramount significance to note that aquatic life is part of an ecosystem and environment at large and deserves a special protection. Like a human body, the environment is a system with components working together, aquatic life forms one of the environmental systems. Pollution of land and water by discharged effluent had left the environment in a quandary state in

Chitungwiza. This was further exacerbated by the construction of latrines in those areas which are not yet serviced.

Air pollution has been cited as one of the major problems of urbanization. The air quality between rural areas and the urban areas is significant. Factories and automobiles are part and parcel of urbanization. Harmful emission of gases and smoke from factories and vehicles causes air pollution (www.infoaction.org). On human health, harmful particles in the air resulted in many allergies and respiratory problems. Munowenyu (2000) added that, large scale developments in such activities as manufacturing, agriculture, transport, and recreation, people all over the globe have accidentally or on purpose harmed and thus endangered the environment by making water dirty in such a way that it becomes useless and even harmful to all living things including human beings themselves and make unwanted change in the quality of air.

Water pollution was cited by many respondents in Chitungwiza. Water pollution is mainly caused by runoff of water on bare ground and discharge of effluent, non biodegradable waste which is discharged in major rivers and water sources. All cities have more pollutants and convection currents serves as magnets for raindrop formation. Once the water falls, instead of being absorbed by the soil, it is instead channeled into run off systems, picking up ground pollutants along the way. This pollution is added to that brought about by industrial waste and sewage disposal which is often untreated, especially in cities (www.infoaction.org).

Madondo (2013) added that many towns and cities do not have adequate waste disposal facilities and waste collection trucks which resulted in the accumulation of heaps of waste in urban areas. Large amounts of waste accumulate and when left uncollected for a long time can cause diseases and pollution of the environment. He further went on to say problems of waste

management are experienced by cities in Zimbabwe such as Harare, Bulawayo, and Gweru to mention a few.

4.2.3 Disappearance of Wetlands

Chitungwiza used to have many wetland sites which were supposed to be preserved and protected. Because of urbanization, it's now hardly to find a wetland in Chitungwiza as the municipality pushed by housing crisis in the area to unleash residential stands on wetlands. The municipality was supposed to embark on a thorough research on how they can preserve wetlands and take advantage of wetlands. Environmentally, wetlands serve a regulatory role of preventing flooding and form a natural habitat for birds and other animals.

4.3. Mitigating Environmental Degradation in Urban Areas

This section is addressing the second objective that reads, to establish ways of mitigating environmental degradation in urban areas and also to answer the research question that is asking some of the mitigatory measures of environmental degradation in urban areas.

4.3.1 Stakeholder Participation

From the interviews conducted with relevant urban and environmental stakeholders such as local authority and EMA, the researcher noted that, all the stakeholders agreed on the same objective that is of stakeholder participation on developmental issues in urban areas. The local authorities advocated for the following of developmental procedures outlined in their statutes such as RTCP Act, RDC Act, and UC Act. Also general development control conditions enshrined in the Environmental Management Act (Chapter 20:17) must be adhered to when carrying out land development in Chitungwiza as some of the developments causes irreparable damage. The significance of stakeholder participation in decision making will go along way in circumventing environmental vagaries caused by doldrums of urbanization.

Local authorities in Chitungwiza have highlighted some of the processes to be followed when a permit for a certain development is to be issued. During the planning stage , the department of Physical planning consult various stakeholders chiefly the Environmental Management Agency(EMA) who will pass comments on environmental perspectives or implications of the development, then the surveyor general who is responsible for pegging on the environment, from the surveyor general it then passed to the Provincial Roads Engineer , Zimbabwe National Water Authority(ZINWA), Zimbabwe Electricity Transmission and

DistributionCompany(ZETDC), secretary for lands , the local authority and Agritex for their input prior to issuance of a permit to engage in urban development within an area. This multi stakeholder consultation process enables the department to get expert input before permitting any urban development projects.

After consulting and issuing a permit, all urban development's projects will be further subjected to an EIA. The local authority as a government department will attach conditions to subdivision permits so that they cannot start any development or transfer properties to anyone before carrying out an EIA which will then give guidelines on how the proposed development can be sustainable. Below is an extract of some of the conditions which will be attached to all urban development permits:

Part iii General Development Control Conditions

i) No buildings shall be constructed than in accordance with and to the specification of building plans so approved by the local authority.

ii)The implementation of this project shall be subjected to the recommendations set out in a prospectus prepared by the applicant at its costs and dully approved by the director General of the Environmental Management Agency, pursuant to sections 97, 99 and 100 of the Environmental Management Act(Chapter 20:17)

Again the Plot or lot shall not be occupied until:

iii) Buildings based on plans submitted to and approved by the local authority have been constructed and completed there on.

iv) A reticulated water supply has been connected to the satisfaction and approval of the local authority.

v) Individual septic tanks and soak ways are provided to the satisfaction and approval of the local authority.

vi) The proposed development shall blend in with the natural environment and materials that are in harmony with the surrounding natural environment shall be used. In addition no trees shall be cut except for those cut to pave way for the construction of building approved by the local authority.

The above procedures augment the significance of stakeholder participation in ensuring environmental management in urban areas and prevent further urban degradation. However, as noble as it is, it's quite shocking that the good laws enshrined in a number of statutes are not effectuated or implemented causing them to gather a momentum of dust from shelves. If the above procedures are correctly followed or put into practice shall yield results of environmental management which paves way for sustainability.

However, most of the layout plans in Chitungwiza are not approved and are not following statutory requirements of subjecting the projects to a detailed environmental Impact Assessment (EIAs) to ascertain the potential effect of the development on the environment .also of late there has been a shift in practice with recent layouts now being subjected to full EIA. This has resulted in minimal environmental damage as regulations and guidelines will be followed.

4.3.2 Raids by Local Authority and EMA

Manyame Rural District Council is also engaging in periodic raids for sand poachers who are abstracting sand in the peri urban of Chitungwiza. This has greatly reduced the rate of environmental damage. The raids and Blitz exercises are meant to punish perpetrators who will

be found degrading the environment. It has been a “cat and mouse game” in Chitungwiza stakeholders being the cat chasing sand abstraction perpetrators. However the poachers have devised strategies of dodging the law enforcers by carrying out the poaching during the night hence going unpunished

4.3.3 Conservational strategies

The city of Chitungwiza has embarked on a number of conservational strategies such afforestation and reforestations measures. Residents are participating in afforestation activities which are a long-term measure in conserving the environment. Afforestation and deforestation activities are noble practices and help to ensure environmental sustainability. These activities must be done on a large scale so as to counteract the rate at which the vegetation is destroyed. There is a mismatch between the rate at which the land is cleared and the time it takes to replace itself, which then compromise the ability to meet the demands of future generation.

4.4. Challenges Hindering efforts to Ensure Environmental Sustainability

This section seeks to address the last objective of study which sought to ascertain the challenges hindering efforts to ensure environmental sustainability. From several interviews conducted with various authorities in Chitungwiza, it is shown that there are several stakeholders lined up to protect the environment. Important stakeholders in urban environmental management are the local authorities, Environmental Management Agency (EMA), church organizations, Community Based Organizations' (CBO), and the Civil Society Organizations (CSOs). These stakeholders can be categorized into two namely the public and the private sector. However, a lot of challenges are being faced by these stakeholders in their efforts to ensure environmental sustainability in Chitungwiza

The public sector comprises the general government sector plus all public corporations, for instance local authorities, Environmental Agencies, and ZINWA. The public sector is responsible for implementing natural resource management and environmental protection legislation, and for providing professional judgment on the environmental impacts of developmental projects on behalf of the public, synergies with other sectors, governments, private and civil organizations to encourage sustainable natural resource management behaviors

4.4.1. Lack of Policy Implementation by Local Authorities

Local authorities are guided by various legislations in day to day operations. They play a very significant role in management of the environment within their jurisdiction. The roles of these local authorities are enshrined in the following legislation. Rural District Councils Act of 1996, section 88 and 89 of this Act empowers rural local authorities to make by laws that protect any

water source from pollution, management of sewer disposal, refuse removal and protection of vegetation among a wide range of other duties. According the communal lands Act of 1996, rural local authorities play a huge role in the management of communally owned resources with the aid of traditional leaders. From this view, the local authorities are greatly supported by various legislations in their day to day operations. If the environmental principles enshrined in various legislations are effectuated, it will achieve the goal of environmental sustainability.

Town planners are guided by the Regional, Town and Country Planning (RTCP) Act chapter 29:12 revised 1996, and its preamble was quoted: *In this case local authorities (section 26 of the Act) are empowered to control development as well as permit what is environmentally friendly. All developments which are detrimental to the environment will not be permitted.* The preamble is clear and loud on the roles of town planners in environmental, management as well as developments which are taking place in urban areas. In an interview conducted with various local authorities, they cited a problem of lack of enforcement of environmental regulations which had led to irreparable damage to the environment in urban areas.

In addition the Urban Councils Act chapter 29:15 revised 1996; section 198 of this Act clearly outlines the roles of urban local authorities such as Chitungwiza. Among these powers as listed in the second schedule are (I) Conservation of natural resources or gifts of nature, (ii) Protecting against clearance of land, forests or tree protection. The third schedule of the same Act also empowers local authorities to make by laws so as to control their areas of jurisdiction. By laws which can have a direct impact on management of the environment is (I) Part 1X: Sewerage, effluent and the removal of refuse and vegetation. This provision enables local authorities to

regulate the discharge directly or indirectly of sewer or other effluent into any water sources. (ii) The same part also makes the local authorities responsible for refuse collection with residential areas, commercial areas and even industries as well as within streets. The challenge is on implementation of these policies. If all these provisions are executed properly, urban areas could be centers of environmental sustainability. However, most local authorities have fallen prey in terms of executing their mandate and safe guarding the environment from onslaught by the ever increasing urban population. It now seems as planning systems are now informed by the informal activities in urban areas instead of controlling activities that deter or retards the attainment of environmental sustainability.

In addition, the preamble of the RTCP Act states that: *An Act to provide for the planning of regions, districts and local areas with the object of conserving and improving the physical environment and in particular promoting health, safety, order, amenity, convenience, and general welfare, as well as efficiency and economy in the process of development and the improvement of communications, to authorize the making of regional plans, master plans and local plans, whether urban or rural, to provide for the protection of urban and rural amenities and the preservation of buildings and trees and generally to regulate the appearance of the town scape and landscape, to provide for the control over development, including use of and buildings, to regulate the subdivision and the consolidation of peaces of land, and to provide for matters incidental to or connected with the foregoing.* From the quoted preamble above, it can be noted that, the planning bible is well acquainted to cover and provide for the safeguarding of the environment. Besides, the RTCP Act, other legislations used in urban development such as RDC Act, Urban Councils Act, Communal Lands Act, and EM Act all adequately provide for the

proper management of the environment. However, the enforcement part of the Acts is the missing link in the whole equation. In Chitungwiza for instance, the four planning personnel is expected to cover the whole of Chitungwiza which has a population of 356 840 people (GoZ Census report 2013:137) for both planning and environmental management matters. In the end, only hot spots will be dealt with leaving the other areas unattended.

The researcher noted that, EMA has got noble policies but enforcement is problematic. Several examples to substantiate this were given by various stakeholders during group discussions with residents in Chitungwiza. EMA Act does not cover all wetlands requiring protection especially those not included under the Ramsar International Convention on the protection of wetlands. This leaves room for the abuse of unlisted wetlands as occurred in the construction of the Chinese shopping complex (Longcheng Plaza) recently and the expanding housing project in the wetland running from the National Sports Stadium through working town industrial site to Rugare and Westwood locations in Harare, also the construction of United Family International Church (UFIC) led by Pastor Emmanuel Makandiwa in wetlands in Chitungwiza. Though EMA makes it mandatory for every local authority to prepare Local Environmental Action Plan (LEAP) and Environmental Management Plans (EMPs) that contain strategies and measures for management, protection, restoration and rehabilitation of the environment, the enforcement of such drafting of plans and their implementation at local government level is poor. For example, while Harare has EMPs covering even waste management, its implementations almost non-existent. Chitungwiza lacks similar plans and especially pertaining to management of all types of wastes, yet EM Act and its enforcing agency exists.

Further, while the Act provides for the formulation of environmental management standards for instance, prohibiting discharge of wastes (section 70), minimization of waste through treatment, reclamation and recycling in section 70(3), classification of hazardous waste in section 72(1-2) and prohibition against littering covered in section 83 (1-4), enforcement is also a cause for concern. In this case the researcher concluded that both the Act and Implementing agency are weakened by the expression or wording framing its mandate is a source of weakness, that is, the use of the words "may serve an order...." In section 115(1) can imply that it is not mandatory for the agency staff to serve written orders.

4.4.2. Inadequate resources

Most local authorities are faced with resource challenges which deter the proper effectuation of policies in urban areas. The resource could be financial or physical resource. This caused them to have shortage of many power and necessary resources which enhances environmental systems. The municipality of Chitungwiza has fallen short in many fronts, citing resource shortage as a big challenge in implementing environmental measures and the provision of services such as waste and refuses collection. Chitungwiza municipality has fallen short in trying to cope with rapid urban growth. Ideally, each and every urban node should have a functional sewer treatment plant (sewage ponds). For Chitungwiza, Imbgwa farm was selected for such purposes. However, since 2009, the ponds have not been functioning implying that raw sewer has been discharged into Nyatsime River. Refuse collection should ideally also be increased in line with increasing urban development but for Chitungwiza it is not existent leading to the dumping of waste anywhere and anyhow.

Also budgetary constraints make it difficult for the local authorities' environmental agencies to enforce the Act and ensure compliance. The mother body, the Ministry of Environment lacks adequate funding to support EM agency work, to effectively administer, implement, monitor and evaluate progress of the EM act and agency. Provincial, District and other local authorities do not have adequate resources or capacity, the data or tools to pursue integrated environmental management and look comprehensively at environmental impacts and risks to ecology and humans at large. In addition, they also lack the capacity to manage air quality, hazardous wastes and pollution and to become environmental educators, with fines on perpetrators, they lack capacity to build a comprehensive law enforcement section and carry out any enforcement or policy in the country.

4.4.3. Weaknesses of the Environmental Management Agency (EMA) in Environmental management

The environmental management Act chapter 20:27 clearly outlines the manner in which certain activities and functions are undertaken. The environmental management Agency was established through an Act of Parliament following realization that unchecked environmental degradation was taking place in the country. The environmental management Act chapter 20:27 “ provides for the sustainable management of natural resources and protection of the environment , the prevention of pollution and environmental degradation, the preparation of a national environmental plan and other plans for the management and protection of the environment, the establishment of an environmental agency and an environmental fund , incorporates internationally declared environmental protection frameworks, for instance EMA act and Agency in line with the 1971 internationally declared Ramsar Convention on the Protection of wetlands to which Zimbabwe

became a signatory in 2011, take seriously the protection of designated wetlands , that is Mona valevlei, Cleveland Dam, Mana pools, Lake Chivero, Manyame, Chinhoyi caves, Victoria falls National Park, driefontein grasslands, it also adopts the provisions of the Bamako convention , which bans the trans boundary movement of wastes within African countries, also to amend references to intensive conservation areas and committees and associated matters in various Acts: to repeal the Natural resources Act(Chapter 20:13), the Atmospheric Pollution Prevention Act(chapter 20:03), the Hazardous Substances and Articles Act(Chapter 15:05) and the Noxious weeds Act (chapter 19:07) and tom provide for matters connected with or incidental to the foregoing.

Environmental management Agency is mandated by the environmental management Act (chapter 20:27) to coordinate all conservation and environmental matters. The Act is enshrined in the Zimbabwean constitution that is every Zimbabwean has a right to a clean, safe environment that is not harmful to health. It has the role of ensuring the sustainable use of natural resources. Problems of deforestation and overgrazing, soil erosion and siltation of dams and rivers, and water pollution are all issues of concern in rural and urban areas. It is also a policing organization, making sure that individuals, organizations and companies do not engage in activities that have deleterious impacts on the environment. Any transgressor is fined on the basis of the Polluter Pays Principle. EMA is carrying out a number of environmental protection and rehabilitation activities in Chitungwiza that include:

- Reforestation programmes being carried out together with the forestry commission with the aim of promoting the establishment of woodlands and conserving indigenous wood resources,

- Gully reclamation activities,
- Awareness campaigns including dissemination of information on protection and sustainable utilization of natural resources through schools and farmer extension services and ,
- Awareness campaigns on environmental degradation.

The researcher participated in various environmental awareness activities conducted by EMA in Chitungwiza and observed that the agency is more into waste management campaign than in preventing forests and vegetation degradation. As a common adage, *“Prevention is better than cure.”* EMA is failing to prevent land degradation but rather focusing on correction measures which are also too costly. Waste management has become one of the environmental challenges in Chitungwiza .Thousands of tons of solid wastes are generated daily in the country and estimates show that in the year 2011 urban centre’s of Zimbabwe generated 1,65 million tons of waste (the Herald of 11 February 2015). The waste management that the city is faced with requires stakeholder’s participation and Community Based Organizations have come on board as a key stakeholder.

The environmental management agency has registered over seventy such groups countrywide and such groups are still welcome to registered with the agency (the herald of 11 February 2015).waste management in the local Environment Action Plans (LEAP) programme was identified as a challenge to all urban areas. The problem of waste management has significantly affected the country and the authorities responsible cannot manage it alone hence the engagement of communities in waste management. However, despite the problem of waste management in

Chitungwiza, the agency capacitates CBOs through training, provision of protective clothing during clean up campaign, equipment and Environmental Management Plan (EMP) development.

4. 4. 4. Ignorance of Law by Residents

Also, from an interview with the Acting Provincial Planning Officer (PPO) of Mashonaland East Province, ignorance of the law was also cited as cited as a weakness by residents itself. The farming, communal and urban settlers expressed ignorance of the polluter pays principle. Furthermore, the implementing institutions lacked resources in terms of transport to disseminate, inspect, and enforce the polluter pays principle as law. Only government departments, local authorities, parastatals, and industry expressed knowledge of EM Act whist urban settlers and communal people had no knowledge of EM Act on polluter pay principle.

4. 4. 5. Lack of Effective Stakeholder Participation in Decision Making

Lack of effective stakeholder participation is also a challenge being faced by many organizations.EMA is lacking meaningful and effective stakeholder participation in the implementation of environmental programs. The capacity, the conditions and the willingness to explore new participatory approaches are all missing and hence there is no assistance available to bring community groups equally into the debate. There is not an adequate flow of information to inform interested parties about relevant issues such as the local authorities, the community and the private sector. The farming and communal settlers indicated that environmental laws in the pre colonial period were more of traditional methods of natural resource conservation, where the custodians of environmental laws were the chiefs. These laws were territorial in nature and were

enforced in the designated areas over which the chief had control. These included mandatory restoration of sacred places such as ponds, wetlands, and protected tree species and animals. Traditional chiefs felt that EMA surpassed and violated their role as chiefs and custodians of the natural resources within their jurisdiction. They advocated for the full control and monitoring of natural resources within their jurisdiction with technical advice and support from relevant institutions. Effective decision making requires effective stakeholder consultations. Stakeholders such as churches, Community Based Organizations, the Civil Society Organizations and the Private sector must be involved in environmental decision making.

The lack of political will by the local leadership (chiefs, councilors, members of parliament, government ministers) compounds above problems, especially in areas of enforcement of conservation works and pollution control. Some political representatives were reluctant to enforce unpopular regulations for fear of destroying their political base, for example gold panning is an environmental damaging activity and yet it was allowed to continue to operate. Furthermore, EM Act (chapter 20:27) empowered local authorities to control conservation of natural resources using their bylaws, but these regulations have been formulated long back and is not reflecting current environmental issues taking place in urban areas.

4. 4.6. Incompetence's by other Stakeholders in Environmental Management

ZINWA prescribes conditions for proper use of surface and underground water sources. Environment is not only restricted to green issues but also water resources is a crucial part of the environment. In this case of Chitungwiza , when the layout for Murisa Rural service centre , ZINWA officials categorically stated that NO development should take place within 200 m high

flood levels of Duri River which passes through the city of Chitungwiza. The buffer has been respected by formally planned settlements. However, land barons have now encroached into the open land and established houses thereby endangering the environment around Duri. The major shortcoming of ZINWA is that it is rarely on the ground. It never moves around the water bodies to ensure that they are not being abused by warrant land barons. It is recommended that EMA and ZINWA officials regularly patrol the environmentally fragile areas so that they are not abused by land developers.

4.4.7. Politicization of urban management systems

In a group discussion conducted by the researcher as a tool to obtain data, residents cited politics as a major threat to environmental management. Politics has been overriding urban management systems in Chitungwiza. The quest for environmental sustainability by relevant stakeholders has been looked downwards by politicians. Whilst planning policies prohibits any development on wetland and fragile areas, politicians with their bigger muscle used political power to authorize development on fragile lands. A case in Chitungwiza can be used to substantiate this, Chitungwiza local authorities stopped development on wetlands but some politicians have authorized some residents to continue invading wetlands which was not in line with local authorities planning standards.

4.4.8 Conclusion

From the results of the survey conducted by the researcher, it can be concluded that urbanization of Chitungwiza negatively impacted environmental sustainability. Activities highlighted in this chapter have greatly impacted the environment reducing its ability to cater for the future

generation (sustainable development). This was also exacerbated by challenges such as shortage of resources, lack of stakeholder participation and politicization of urban managementsystemsbedeviling activities meant to achieve environmental sustainability. Furthermore stakeholders in environmental management agency are facing numerous challenges in trying to protect the environment. Environmental sustainability will be a fallacy of composition if appropriate measures and policies are not put in place in Chitungwiza.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

This chapter rounds off the study by giving a conclusion on the impacts of urbanization on environmental sustainability in Chitungwiza. Particular reference was made to the study findings in chapter 4 and literature review in chapter 2. The researcher synthesized research findings and what has been reviewed by various authors.

5.1 Conclusion and key lessons Learnt

It is undoubtedly that urbanization has negatively impacted the environment thereby preventing its quest of being sustainable. Activities explored by the researcher such as commercial sand extraction, free and open effluent and waste discharge, agriculture within fragile areas such wetlands as well as land clearing for urban expansion were seen as the activities on the forefront of causing environmental degradation in Chitungwiza which was a result of uncontrolled expansion of Chitungwiza appropriately termed as urbanization. The encroachment of villages such as Mayambara, Chitsvatsva, Kuora, and Murisa has seen the massive clearing of forests and displacement of sacred shrines in the area caused the researcher to conclude that urbanization negatively impacted the environment.

The scrambling and partition of Seke villages by land barons and the municipality have compounded environmental problems of urbanization in Chitungwiza and left the environment in a state of disarray. It is clearly evidenced by the disappearance of wetlands, pollution of rivers such as Nyatsime, open pits or environmental scars left after sand mining and disturbed air quality are loud and clear signs of environmental degradation in Chitungwiza. The problems have been explored in this research. From the above, one does not need a rocket scientist to tell

that the environmental has been degraded with much reflection on the ground .The change in the quality of air, foul smell of water, polluted water and destruction of habitat are also evidences of environmental destruction.

Environmental sustainability as expounded by various authorities, the ability to cater for the present generation without compromising the ability of the future generation to benefit, cannot be easily achieved in Chitungwiza; it requires strong and effective measures to be in place. As observed by the researcher, Chitungwiza is facing numerous challenges in environmental management which led to the researcher to conclude that environmental sustainability in Chitungwiza will be a fallacy or utopian idea. Challenges highlighted in this research such as lack of policy implementation, lack of coordination among stakeholders, shortage of resources, shortage of skilled man power and politicization of urban management systems will deter the quest for achieving environmental sustainability by environmental stakeholders such as the local authorities, the private sector, civil society, private sector and other public institutions.

Also the researcher noted that Chitungwiza does not have sound environmental conservational practices, raids by the local authority and the municipality police are not effective as sand extractors' decided to dodge the raids and do their activities in a free police environment that is during the night. Conducting raids is not a sustainable measure, the local authority are treating the symptoms of a disease rather than its root cause. There is a need for local authority to establish the root cause and treat the root cause. Increased urban population caused by rural to urban migration and natural increase must be controlled by having long-term strategy such as growth point strategy in Zimbabwe. This will control rural to urban migration.

Also the environmental mother body, that is the ministry of environment, water and climate change must help in capacitating its agencies such as EMA .EMA has been viewed as “toothless bull dog” because of numerous challenges it is facing causing them not to implement environmental policies and activities which are gathering a momentum of dust from shelves.

5.2. Recommendations

Data obtained by questionnaire revealed that Chitungwiza has been shortcoming in regular refuse collection within residential areas. It has fueled rampant littering and wanton waste dumping anywhere and anyhow where anyone sees it fit “use and throw syndrome”. In this regard it is recommended that all residents should be issued with refuse collection bins and the municipality should collect the refuse for recycling so that the environment is spared from further harm.

EMA is generally absent on ground. It has got only less than five officers per district. Consequently, it will have insufficient check on the goings on the ground. Accordingly, it has to employ as many officers to control environmental degradation. In addition, EMA does not have arresting powers making it a “toothless dog”, if possible it should be given arresting powers so that perpetrators are brought to book instantly and stern or stiffer measures against the offenders must be taken rather than clandestinely authorizing the offenders by charging little fines.

EMA treats local authorities as clients. In this case, there is a master and servant client’s relationship. Local authorities are charged fines if found wanting, penalty fines to be given to sand abstractors without permits. At the end there is no symbiotic linkage between EMA and

local authorities. It is recommended that EMA and local authorities should be partners in environmental management rather than being a master and client.

The integrated environmental management approach as a matter of policy is a principle that guides the Environmental Management Act and the Environmental Management Agency. In practice, there is greater need for integration of the environment and conservation values and concerns into the development process. By laws of local authorities and municipalities should be reviewed and aligned to the environmental management Act. The Environmental Management Act should incorporate penalties that are deterrent enough to deter environment abuse. Emphasis should be on using environmentally friendly technologies and processes, incentives such as tax rebates and compliance with the international standards organization certification standards' and procedures.

There is need to establish a fully-fledged environmental management court and its policy force to deal specifically with environmental issues. Sustainable development must take into account social, political, economic, and ecological factors of living and non living resource bases and long-term as well as short term advantages and disadvantages of alternative action. As a strategy of development, it should seek to meet the needs of the environment, communities and other stakeholders (Sprung, 2006). Intergraded environmental management approach include long-term strategic visions and link different policies at different administrative levels to ensure coherency, there is need to harmonize the various acts in order to deal with overlaps between and among, the Forestry Commission Act, Environmental management Act, National parks and

wildlife Management Act, mines and minerals act enforced by line ministries and departments and environmental management agency.

There is need for a strong stakeholder participation in environmental management. A lot of stakeholders are promising to work with agencies such as EMA and the local authorities. The private sector and Non Governmental Organizations are ready to kick start the ball in managing the environment. The private sector comprises private corporations and non profit institutions whose role in environmental resource management is that of recovery natural resources. Such private sector recovery groups include those companies into mining (sand and gold), forestry and fishery must be integrated in environmental management systems. Environmental managers from the private sector must collaborate with other stakeholders in a dynamic social and political environment. In Chitungwiza many private companies such as delta have started working hand in glove with EMA in cleaning up campaigns as well as afforestation measures.

Industries are on the forefront of causing pollution, so the integration of these private sectors in environment management helps to achieve environmental sustainability by adhering to both local and international legislations such as the Kyoto declaration. It's important for the government to make it a mandatory requirement for each and every company in Zimbabwe to have a functional environment department. This helps to ensure the protection of the environment and achieve sustainability in the long run. Also some of these companies must donate clean up materials as well as availing funds for programs meant to protect the environment and to engage in conservational practices such as afforestation and afforestation activities, denouncing development on wetlands and educating the public on the importance of environmental management.

Civil society organizations (CSO) comprises of voluntary organized associations, which represent a wide range of interests and ties with community based organizations, indigenous people's organizations and Non Governmental Organizations (NGOs). Their influence in decisions and implementation of resources management plans, public participation activities as a way to invoke a sense of social responsibility over natural resources must not be looked downwards. In Chitungwiza, SNV is a local based NGO that have also embarked on urban waste and sanitation hygiene and sewage facilities to the generality of the people. However, it is unfortunate that Chitungwiza municipality does not have an enabling environment by not have functional sewer ponds and causing it to discharge sewer directly into water bodies such as Nyatsime River.

The efforts of NGOs have been overshadowed by the ills of having non functional sewer ponds, for instance in 2012, the municipality was fined \$US 15000 by EMA for discharging sewer directly into the environment (Chitungwiza Municipality Report, 2009).The researcher is strongly recommending the need for creating or leveling the plain field for both local and international Non governmental organizations which are into environmental management.

Churches have been forthcoming in environmental management by assisting the local authority in waste management. In Chitungwiza, churches have periodically carried out clean-up campaign exercises mostly at shopping centers as Chikwanha, Taita and Makoni whilst spreading the word of God. The Seventh Day Adventist Church has gone on further to donate bins for ease of waste collection. The main constraint facing churches and other civil organizations is that they have

acute financial shortages hence their efforts are once in a while clean up campaigns which do little to address the issues of waste management. There is a strong need to support the activities of church organizations, they have been playing a very good role to ensure clean and sustainable environmental activities despite the challenges they are facing today. The municipality must compliment church activities to ensure environmental sustainability.

5.3. Areas of Further Research

As far as urbanization and environmental sustainability is concerned, one can engage in a quantitative or scientific study of impacts of urbanization on environmental sustainability so as to prove the impacts of urbanization scientifically. Also among the strategies employed by the local authorities and environmental agency one can do an assessment of the measures being employed by authorities as way of achieving environmental sustainability in Chitungwiza.

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ANNEXURE 1

List of Key Informants

Name and Post in the organization	Institution
Mr. Mudiwa(environmental officer)	Environmental Management Agency(EMA)
Mr. Maoneni(Provincial planning Officer)	Mashonaland East Province
Mr. Munjangu(Planning Officer)	Manyame Rural District Officer
Mrs. Chikwanha(environmental coordinator)	Chitungwiza Residents Trust
Chief Seke(village headman)	Seke Communal Area
Chitungwiza residents'	

ANNEX URE 2

Guideline questions for Interviews with officials of Environmental Management Agency (EMA)

Questions

1. Name of the respondent and position of responsibility?
2. What role does your organization play in environmental management?
3. How do you view the current urbanization of Chitungwiza from environmental perspective?
4. What are some of the activities done in urban areas that degrade the environment?
5. What are the effects of urban development to the environment?
6. What are some of the mitigatory measures being put in place by your organization to curb problems of environmental degradation in urban areas?
7. What are the challenges are you facing as an organization in trying to reduce environmental degradation in urban areas?
8. Which stakeholders do you work with in managing the environment and what are their roles?
9. Do you think environmental sustainability is achievable with the current urbanization in Chitungwiza?
10. What are some of the policy recommendations and strategies that can be employed in order to achieve environmental sustainability?
11. Do you have any other comments?

With much compliments!

ANNEX URE 3

Guideline questions for Interviews with the Provincial Planning Officer for Mashonaland East province

Questions

1. Name of the respondent and position of responsibility?
2. What role does local authority play in environment management?
3. What are the activities that degrade the environment in urban areas?
4. How does the local authority grapples the issue of rapid urban development?
5. Why are local authority systems now encroaching into rural areas as part of urban development?
6. To what extend does the planning legislations cover issues of environmental management?
7. What are the measures that are being put in place to ensure environmental sustainability in urban areas?
8. What are the policy recommendations and strategies that can be employed to ensure that the environment is not degraded by urban activities?
9. Do you have any other comments?

With much compliments

ANNEXURE 4

Guideline questions for Interviews with Chitungwiza Residents Trust

Questions

1. Name of the respondent and position of responsibility?
2. What role does your organization play in environmental management?
3. How do residents view issues of urban development in environmental management?
4. To what extent do residents participate in environmental issues in Chitungwiza?
5. What are the obstacles faced by residents in trying to participate in environmental issues?
6. Do residents are aware of environmental protection?
7. What needs to be done to ensure that residents fully participate in environmental issues?
8. What policy measures and strategies would you recommend to ensure environmental sustainability?
9. Do you have any other comments?

With much compliments

ANNEXURE 5

Guideline questions for Interviews with chief Seke of Seke District

Questions

1. Name of the respondent and position of responsibility?
2. Give a brief history of Seke communal lands particularly villages like Mayambara, Kuora, Chirasavana and Chitsvatsva?
3. How do you view the present physical status of the environment in your area as compared to the past?
4. Are there any changes in the physical environment?
5. What are the main causes of these changes to the environment?
6. What are the causes of environmental degradation in your area in your area pertaining to urban development?
7. What measures are being taken by the community in your area to ensure that the environment is protected?
8. What are the problems you are encountering in trying to protect the environment?
9. Are there any stakeholders you are working with in trying to manage the environment?

With much compliments

ANNEX URE 6

Guideline questions for Interviews with the Chitungwiza municipality

Questions

1. Name of the respondent and position of responsibility?
2. What role does local authority play in environment management?
3. What are the activities that degrade the environment in urban areas?
4. How does the local authority grapples the issue of rapid urban development?
5. Why are local authority systems now encroaching into rural areas as part of urban development?
6. To what extend does the planning legislations cover issues of environmental management?
7. What are the measures that are being put in place to ensure environmental sustainability in urban areas?
8. What are the policy recommendations and strategies that can be employed to ensure that the environment is not degraded by urban activities?
9. Do you have any other comments?

With much compliments

ANNEX URE 7

A Questionnaire Design for Chitungwiza and Seke residents

Name of respondent:.....

Occupation:.....

Residential Area.....

Date:.....

Questions:

1. Describe the general nature of the physical environment which surrounds Chitungwiza

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2. Are there any changes made to the physical environment in Chitungwiza?

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3. What are the causes of environmental degradation taking place in this area?

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4. What is your main source of fuel?

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5. What are you doing in trying to prevent environmental degradation?

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6. What is being done by Environmental Management Agency (EMA) in trying to prevent environmental degradation?

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7. Are there any stakeholders you are working with in environmental management in this area?

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8. What are the problems you are facing in trying to protect the environment?

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9. Do u fully participating in environmental issues?

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10. What do you think needs to be done to ensure that the community fully participates in environmental issues?

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