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KENTLEŞME VE ÇEVRE SORUNLARI DALI

URBANIZATION, ENVIRONMENTAL DEGRADATION AND URBAN DISASTER RISKS: CURRENT SITUATIONAL ANALYSIS IN THE FOUR CITIES OF MALAWI (BLANTYRE, ZOMBA, LILONGWE AND MZUZU)

MASTER THESIS

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MASTER THESIS

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KOCAELI, 2019

DECLARATION

I, **Yohane V.A Phiri**, declare that this dissertation is my own original work and that it has not been presented for any other awards, in part or wholly, at Kocaeli University or any other university. This thesis is a result of my own research work, and where other sources were used, they have been duly acknowledged.

Name of Candidate : Yohane Vincent Abero Phiri

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Signature : _____

Date : Kocaeli, 2019

DEDICATION

To my Mum and Dad, **Lebetina** and **Rodrick V.A Phiri**, whose contribution to my education is simply ineffable, my children **Yohane Phiri Jnr**. and **Godwill Trust Phiri** for being such a wonderful boys during my studies and my wife **Bridget Luya Phiri** for enduring throughout the period I was away for studies and overwhelming role she assumed raising our children in my absence.

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LIST OF ACRONYMS AND ABBREVIATIONS

ATR	**:** Access to Resources Model
BCC	**:** Blantyre City Council
DODMA	**:** Department of Disaster Management affairs of Malawi
DRMP	**:** Disaster Risk Management Plan
DRR	**:** Disaster Risk Reduction
DRRM	**:** Disaster Risk Reduction and Management
EAD	**:** Environmental Affairs Department (Malawi)
GoM	**:** Government of Malawi
LCC	**:** Lilongwe City Council
MCC	**:** Mzuzu City Council
NDRM	**:** National Disaster Risk Management Policy
NSO	**:** National Statistical Office (Malawi)
OPC	**:** Office of the President and Cabinet
PAR	**:** Pressure and Release Model
SDGs	**:** Sustainable Development Goals
ZCC	**:** Zomba City Councils

Abstract

The aim of this master thesis was to establish the causality and provide the necessary disaster risk reduction and preparedness course of action, thus to eliminate or reduce the impact of the reoccurrence of both natural and anthropogenic disasters in the four cities of Malawi. Interviews conducted with disaster victims, government officials responsible for the environmental and disaster management sectors and the four city councils officials, clearly demonstrate the urgency required to address the issues arising from the impact of rapid urban population growth in the cities of Malawi. The effects of urbanization on environmental degradation have been established to be detrimental in this paper. There is a drastic quick change in urban densities and illegal settlements which have induced rampant environmental degradation and occurrences of natural and anthropogenic disasters in the cities of Malawi. The results obtained in the survey show that the relationship between urbanization and environmental degradation is critically worse than assumed. The negative externalities arising from the relationship are worsened due to several factors as presented by the interviewees. Non-economic viability of urbanization in a developing country like Malawi, poor mainstreaming of policies by government and other stakeholders towards DRRM, insufficient budgetary support provided by the government towards DRRM activities, exclusion of key stakeholders like city councils in DRRM, poor or un-managed urban planning and land use and non-disaster resilient community characteristics are the major factors worsening the relationship between urban population growth and environmental degradation in relation to occurrence of anthropogenic and natural disasters in Malawian cities.

Keywords : DRRM, Urbanization, Environmental Degradation, Disaster Risk Reduction

Özet (Türkçe)

Bu yüksek lisans tezinin amacı, Malawi kentlerinde afet olaylarının devam etmesinin nedenlerini ortaya koymaktır. Böylece, afet riskini azaltmayı ve afet olaylarına hazırlık sürecini sağlamayı amaçlamaktadır. Özellikle, Malavi'nin dört şehrinde hem doğal hem de antropojenik felaketlerin tekrar oluşmasının etkisini ortadan kaldırmayı veya azaltmayı hedefliyor. Afet oluşum mağdurları, belediye meclisi yetkilileri ve afet yönetimi alanındaki hükümet yetkilileri ile görüşülmüştür. Bu röportajlar, Malawi kentlerinde hızlı kentsel nüfus artışının etkisinden kaynaklanan sorunları ele almak için gereken aciliyeti göstermektedir. Kentleşmenin çevresel bozulma üzerindeki etkileri bu yazıda zararlı olarak belirlenmiştir. Malavi kentlerinde, yaygın çevresel bozulmaya ve doğal ve antropojenik felaketlerin meydana gelmesine neden olan şehir yoğunluklarında ve yasadışı yerleşim yerlerinde çok hızlı bir değişim var. Araştırmada elde edilen sonuçlar, kentleşme ve çevresel bozulma arasındaki ilişkinin, varsayıldığından çok daha kötü olduğunu göstermektedir. Malawi gibi gelişmekte olan bir ülkede kentleşmenin ekonomik olmayan yaşayabilirliği; afet riskinin azaltılması ve yönetimi için hükümetlerin ve diğer paydaşların politikalarının zayıfça yayılması; hükümet tarafından Afet Riskini Azaltma ve Yönetimi faaliyetlerine yönelik yetersiz bütçe desteği; afet Riskini Azaltma Yönetiminde şehir konseyleri gibi kilit paydaşların hariç tutulması; yoksul ve yönetilmeyen kentsel planlama ve arazi kullanımı ve felakete dirençli olmayan toplum özellikleri, afetlerin devam etmesini sağlayan ana etkenlerdir.

Anahtar Kelimeler : Afet Riskinin Azaltılması ve Yönetimi (DRRM), Afet riskinin azaltılması (DRR), Çevresel bozulunma, ve kentleşme

PREFACE

The influx of people migrating from rural to urban areas is not a new phenomenon and neither is it constrained to a precise region of the world. The rapid urbanization trends are evident globally with the African continent, explicitly developing countries, having been singled out as one of the most rapidly urbanizing region in the 21st century. The effects of urbanization on environmental degradation have been established to be detrimental. Often characterized by effects like global warming, ozone depletion, climate change and others. These factors in turn complement to the occurrence of varied natural disasters that have claimed great losses in life and property.

In developing countries like Malawi; the occurrence of natural disasters is rather a common phenomenon. These disasters are often wide spread, occurring throughout the country due wanton environmental degradation. The damage caused by these natural disaster occurrences are often very high attributable to increased disaster risks due to environmental degradation. For the past 10 years rapid urbanization and environmental degradation in the cities of Malawi has been evident. Informal slums and settlements in areas that were naturally drainage sections has been rapidly growing. The wanton cutting down of trees in these areas has resulted in the siltation of rivers and rapid flow of rivers downstream characteristically resulting in the occurrence of floods nearly annually.

To determine if indeed the occurrence of these natural disasters in the cities of Malawi is a result of rapid urbanization, the causality between rapid urbanization and environmental degradation in relation to urban disaster risk occurrence had to be

established. This paper, therefore, aimed at establishing the causality and provide the necessary disaster risk reduction and preparedness course of action, thus to eliminate or reducing the impact of the reoccurrence of natural disasters. Objectively, in addition to the current major post disaster management activities being implemented; environmental conservation for sustainability is seen lacking specifically in the cities of Malawi. Thus, apart from management of the disaster effects in the cities of Malawi; the current multi reoccurrence of disasters is a clear evidence that the cause of the disasters is rather not being addressed. Environmental conservation coupled with urban planning and viable DRRM are likely the only sustainable methodologies to curb the current annual reoccurrence of natural disasters in the cities of Malawi.

Rapid urbanization at the expenses of poor economic growth has been attributed to excessive environmental degradation in turn frequency in occurrence of natural disasters in the cities of Malawi. Does the government of Malawi know that these floods, landslides and various other disasters in the cities of Malawi are outcomes of rapid urbanization and environmental degradation? Are there pre and post disaster risk reduction measures and /or disaster resilience building activities being employed or which have been employed to date?

Using a descriptive cross sectional study methodology, this thesis was conducted to give out answers to the questions such above. Both qualitative and quantitative data was used to come up with this write up. Data was gathered through structured question and interviews. Interviews were held with individuals directly responsible for the areas in need to answer the thesis questions from various departments in Malawian. Randomly,

participants were selected from the areas affected by the natural disaster in the four cities of Malawi over the period 2016-2018 and purposively selected from various stakeholders in departments of the Government of Malawi at the core of Disaster Risk Reduction and Occurrence Management (DRRM).

The results obtained in this paper clearly demonstrate that continued migration of people from rural to urban areas in Malawi has resulted in exorbitant levels of rapid urbanization. The only problem is that the process of urbanization of our cities in Malawi, being a developing nation, is rather not correlational to industrial development and economic growth of the country. This is unlike, the urbanization that occurred in the developed countries; which was rather induced by industrial development and the cities were characterized with economic development. The urbanization in Malawian cities is rather at an alarming rate and detrimentally leading to environment degradation. Day by day due to the ever increasing environmental degradation, the risk of occurrence of natural and anthropogenic disaster is consequently worsening. The efficiency of the management of DRR programs and post disaster management activities is not clear vindicated. Most of the programs implemented rather address the post disaster effects, completely disregarding the causes of the disasters in the cities of Malawi. This is evident in the recent 2018 and 2019 rainy season disasters and hence the sustainable way to address the problem is objectively through a combination environmental conservation and urban planning.

To over emphasize the need for viable DRRM programs and activities will rather be a misguided presentation. The findings in this thesis are considered significant as by

establishing the current situational analysis of the effects of urbanization on environmental degradation and reoccurrence of natural disaster in the cities of Malawi; the paper lays out a foundation for development of informed DRRM programs and activities. Furthermore, it also establishes whether the current disaster risk reduction (DRR) and preparedness methodologies are effective, precisely on post disaster exposure activities being implemented in Malawi. The thesis focuses on answering the question, are the DRRM activities addressing the cause of these disasters or there is more that needs to be done.

To the government of Malawi, the thesis paper will help in re-strategizing the focus of government departments in the field of DRRM to achieve either reduction of total post disaster losses or eliminate the risks associated with disaster occurrences. For academicians, both from Malawi and internationally, the paper provides a foundation for further research in the field of population, urbanization and environmental problems in Malawi. Additionally, using this paper, Malawi may be used as a case study of other developing countries with a similar problems.

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

It is an undeniable fact that currently the world faces a major and historical unprecedented transition from predominantly rural to urban settlements. United Nations World Population Prospectus (UN-WPP 2017; 2014) and World Urbanization Prospectus (UN-WUP, 2014) argue that by 2050 world population and urbanization are to have increased tremendously. The projections are that by the period population shall have increased to 9.6 billion from the current 7.6 million and two-thirds of this population shall be urban based. The prospectuses further outline that Africa and Asia currently house a larger percentage of the projected increases as they are less populated and urbanized. The population growth in the two continents is projected to drastically rise from 40% and 48% to 56% and 64% by 2050 in the two respective continents (UN-WPP, 2017).

Demand for basic needs such as land for shelter, employment, food and many more in the urban settlements presently thrive as a vivid consequence of the rampant shift of rural populations to urban areas. Literature support the vital role urbanization plays towards development, but only appropriately planned and well managed urbanization has the efficacy to enable scaling up of economies in urbanized cities (Kita, 2017). In most African countries urbanization has created high population densities in the cities, which in turn have

led to development of numerous negative externalities specifically the pressure the population exerts on the environment (Gondwe et al., 2011). Rampant environmental degradation, deforestation, waste accumulation, and several other negative externalities are currently the characteristics of most urban populations in the developing countries in Africa.

Urbanized cities in most developing countries in Africa, as highlighted earlier, are characterized by environmental degradation and natural and anthropogenic disaster. Rural-urban migrants often create informal settlements due to prohibitive land markets and high levels of poverty in the cities (Manda, 2014). As most of the migrants cannot afford to pay for the expensive land prices, they occupy informal settlements that are located in areas ignored by the rich for being prone to various disaster hazards such as floods, flash flood and earthquakes. Most of the communities in these informal settlements construct sub-standard houses; often very crowded and occupy areas which were naturally designed as drainage for watersheds or river catchment areas. Coupled with the rate of environmental degradation in these areas, the risks of disaster occurrence triples with time; exposing these rural-urban migrants settling in informal settlements to numerous anthropogenic disasters (Kita, 2017).

Malawi, a small landlocked country in South-Eastern part of Africa shares the characteristics as presented above. With a population of about 18 million people and covering a space of only about 118 000 Km^2, the country remains one of the least developed countries in the world (GSURR Africa, 2016). As of 2015, Malawi was ranked the 18^{th} least developed country in the world with a per capita income of $220 and over 67% of its population lived below the poverty line. Around 90% of Malawi's population is supported

by an agriculture dependent economy (Kayuni and Tambulasi, 2005). The country, therefore, faces numerous challenges ranging from the need to fully develop a market economy, reduce poverty levels, and provision of better social services to mention a few.

Urbanization in Malawi for the past two decades has drastically been on the higher side and it is labeled to be 'one of the fastest urbanizing countries' within the sub-Saharan region. As of 2012 urbanization growth rate was estimated at 4.7% (UN-Habitat 2011a), whilst in 2013 a report submitted to the Ministry of Lands, Housing and Urban Development, pegged the annual urbanization rate at 5.2% (Manda, 2014). According to National Statistical Office (NSO) (2009), data presented in the National Census of Malawi of 2008, urbanization population percentage is predicted to rise as high as 50% by 2050. Such projections, without properly being planned and executed, management of the population flocking into urban areas is likely to lead to increased urban poverty and slums.

Currently, Malawi has been infested with characteristic urban disaster occurrence which were deemed rural based a decade ago. It is argued that the shift in the disaster occurrence in Malawi is due to the ever thrusting urban population percentage which has aggravated the occurrence of environmental degradation (Manda, 2013). Despite the fact that urban population percentage in Malawi is much lower than other countries in the region at 15.7%; it is deemed the highest considering the poor economic status and size factor of the country comparative to Zambia, Mozambique and Tanzania (GUSRR Africa, 2016). NSO (2009) and UN-Habitat Report (2011a) indicate that the non-correlational relationship of the urban population percentage to the country's economic status and development worsens the impact of population growth on the environment. Thus urban

growth in Malawi brings about various environmental problems that consequently result in anthropogenic disaster risks (GUSRR Africa, 2016).

Of special interest, Malawi's urbanization is as a result of rapid migration of individuals from the rural to the urban areas. On average, a large percentage of Malawians farm less than one hectare of land which is insufficient to meet household demands hence hunger reoccurrences. The move to the cities is mostly in search for work with the belief that cities have opportunities for social and economic development (Chikhwenda, 2002). For developing countries like Malawi, the rising levels of urban poverty and insufficient basic infra-structure escalates into numerous problems like shortage of land, housing and congestions, crime, high prevalence of infectious diseases and unemployment (Masys, 2015).These factors in turn put pressure on the allocation and distribution of available natural resources, like land, hence occurrence of numerous environmental problems which consequently lead to occurrence of anthropogenic urban disaster and risks

The global escalation of rapid population growth and urbanization induces wanton environmental degradation and Malawi is no exception. In most developing countries in Africa, environmental degradation is directly linked to over population which is deemed to exert pressure on natural resources specifically land. The outcome from this process eventually leads to deforestation, overgrazing, and overuse of land for subsistence agriculture (Kalipeni, 1992). Manda (2013) denotes that government development strategies specifically in Malawi; favoring large scale agricultural development to support the population also contributes to the burden.

Environmental degradation in Malawi is far more recognized. Over the years there has been wanton and careless destruction of forest and forest reserves for fuelwood and

expansion (UN-Habitat Report 2011a). This has resulted in exposure of the country's soils to forces of erosion. AFIDEP (2012) argues; with a high population growth rate, overpopulation has been singled out as one of the major factors contributing to the current trends in environmental degradation. Rapid population growth and urbanization puts enormous pressure on natural resources such as forests, water and land. Poorer land quality is a characteristic of the already scarce land that has to be divided amongst more people due to overpopulation and hence smaller plots that are poorly managed. Over exploitation of resources is therefore evident in the use of the land, forests, and even fishing stocks in Malawi (Manda & Wanda, 2017).

Between 1990 and 2010, Malawi nearly lost about 17% of its forest cover and continues to be faced with a steady 1% decline annually (AFIDEP, 2012). Agricultural expansion, growth of human settlements, overdependence on wood for cooking and levels of reforestation continue to worrisomely worsen the degradation problem. The projection of a rapid and steady shift of Malawis' population from rural to urban areas, currently pegged at 16%, is deemed to worsen the condition of degradation in the country (UN-WUP, 2014). UN-Habitat Report (2011a) indicates that of the current 16% resident in urban areas; 66% reside in slums. Overexploitation of resources in their vicinity has led to rampant urban environmental degradation and is now deemed uncontrollable. This has characteristically made them highly vulnerable to floods, poor environmental sanitation and lack of basic social services and livelihood opportunities. Environmental degradation therefore is one of the major reasons why there is reduced economic productivity in Malawi in addition to the reoccurrence of anthropogenic rural and urban disasters (Kalipeni, 1992; AFIDEP, 2012).

The continued reoccurrence of natural and anthropogenic disasters in Malawi exerts a massive responsibility on the government and affects development of the nation (Gondwe et al., 2011; Pelling et al., 2004). The disaster reoccurrence pose a significant threat towards established and clearly articulated plans for economic growth and development. The continued rise of monetary values in disaster management expenditure, are a stumbling block to realization of the economic growth and development. Pelling et al. (2014) argues that in most developing countries disaster occurrences have a large impact on the poor thus on their livelihood, cost of building their shuttered communities and infrastructure. Globally, 85% of individuals that are affected by post disaster effects are believed to be those that live in medium or lesser developed section of the world. The factors discussed above therefore make Malawians, particularly the poor, to be at a higher risk to the impact of hazardous occurrences like floods and droughts (UNEP, 2005).

Manda (2017) and Kita (2017) present that rural-urban migrants in Malawi face a higher risk of being victims of natural disaster occurrences. Faced with prohibitive land markets coupled with high levels of poverty; rural-urban migrants form informal settlements that are often designated in areas abandoned by the rich due to the feared risk of occurrence of natural disasters like floods and earthquakes. Often these places are designated drainage areas and, consequently crowding due to overpopulation, the areas are environmentally degraded. Most urban areas and cities in Malawi are classified as at risk to natural disasters attributable to population concentration, development densities, unplanned urbanization and regulatory short falls. Physical aspects such as informal nature of constructions available in the urban areas worsen the risk associated with occurrence of natural disasters (UN Habitat Report, 2011a).

The unprecedented shift of occurrence of disasters from rural to urban areas in Malawi over the past decade needs to be critically looked at. This study, therefore is undertaken covering the four major city councils in Malawi as gazetted by amended Local Government Act of 2010 namely; Lilongwe, Blantyre, Mzuzu and Zomba.

1.2 Problem Statement

There is a continued shift of disasters occurrences and the pressure they exert from rural to urban areas in Malawi. These disasters occurrences vary widely from floods, earthquakes, droughts and landslides. Of recent, the four cities in Malawi; Lilongwe, Blantyre, Mzuzu and Zomba have registered several cases of disaster reoccurrences which consequently have resulted in massive destruction of settlement areas, destruction of property and loss of life. These disaster have been depicted to be typically human induced both within the rural and urban areas. Human induced activities in the form of environmental degradation and rapid exponential urbanization are casual to the occurrence of these anthropogenic disaster.

Arguably, the vulnerability of urban populations to these disasters worsens coupled to several other factors like lack of knowledge, limited resource and access to information and technology, weak infrastructure, poverty and absence of effective disaster risk reduction strategies. Of the above, poverty is singled out to be the outmost cause of rapid and uncontrolled urbanization which consequently leads to wanton environmental degradation. Continued rapid urbanization and environmental degradation have resulted in a drastic changes in the climatic manifestation, hence exacerbating the frequency and

severity of disasters occurrences in the country. Unpredictable weather related disaster occurrences specifically in the urban areas have become order of the day in Malawi.

Dating back the 1970s Malawi has had systems that enable the government to respond to disaster occurrences and post disaster effects such as addressing issues related to loss of property and relocation of victims. The continued reoccurrence of natural disasters in Malawi clearly vindicates an imbalance between the nature/environment and the human population. The shift of disaster occurrences from rural to urban areas indicates worsening of the existent imbalances between humans and Mother Nature amongst urban populations.

Overpopulation due to urbanization in the cities of Malawi worsens the post disaster occurrence effects and hence renders it impossible for government through its disaster management body, Department of Disaster Management Affairs (DoDMA), to effectively and efficiently reach out to all affected. Collaboratively, city councils and DoDMA need to work tirelessly to develop methodologies as to curb the risks to disaster occurrences in urban areas and hence reduce post disaster effects management cost. Without scientifically proven evidence of analysis of the current situation of the relationship of urbanization, environmental degradation and urban disaster occurrences, it is practically difficult to devise such methodologies as aid in the combat of the reoccurrences.

Figure 1 below is a problem analysis diagram summarizing the circle of current situation of the relationship of urbanization, environmental degradation and urban disaster occurrences specifically in the cities of Malawi.

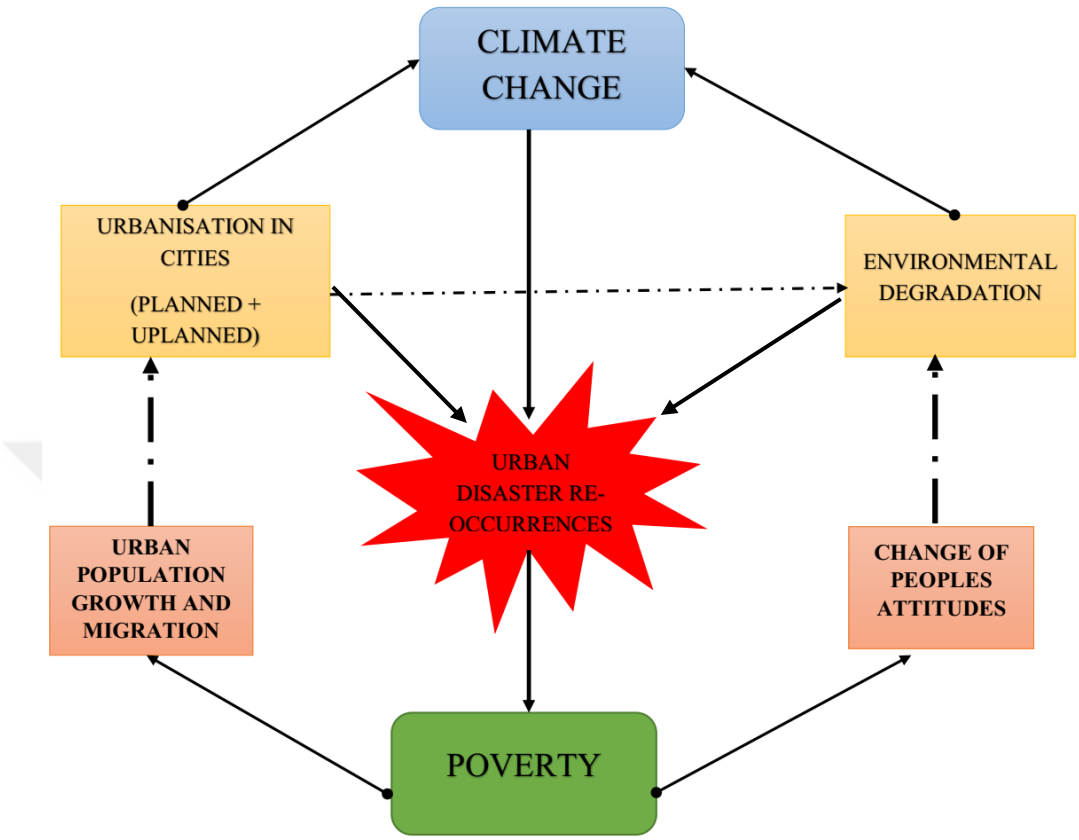

Figure 1: Problem Statement Cycle (The interrelationship of urbanization, environmental degradation and urban disaster re-occurrence)

1.3 Rationale/Justification

The Department of Disaster Management Affairs (DoDMA) in Malawi has the sole responsibility of coordinating programmes related to any form of management for both disaster occurrences and post disaster needs assessment. The continued reoccurrence of urban disasters in the country renders it practically impossible for the department to directly manage all activities related to disaster occurrence countrywide. City councils,

therefore, play a vital role in the management of any disaster occurrence within their vicinity or employment of methodologies aimed at disaster risk reduction.

Currently, DoDMA with various partner local and international organization has diversified its roles not only focusing on management of disaster occurrences but also implementing activities aimed at building community disaster resilience. The later goal; cities are the fulcrum for realization of communities that are well equipped with disaster resilient characteristics.

This paper, discusses the current relationship of urbanization, urban environment degradation and urban disaster occurrences. Specifically, it analyses the risks of occurrence of urban disaster and efficiency of disaster management, disaster risk reduction and post disaster management activities in the four cities of Malawi. This makes the paper justifiably vital as it forms a cornerstone for DoDMA and city councils to establish methodologies aimed at revitalizing disaster occurrences and risk management based on scientific evidence presented in this paper. Further, the paper provides a basis for policy development for city councils and all other stakeholders with intent to work with the Government of Malawi (GoM), and/or directly with city councils.

For both national and international academicians, the paper provides a foundation for further research in the field of population, urbanization and environmental problems in Malawi. Additionally, Malawi shares a lot of similarities with other countries within her region and other developing countries in Africa and the world at large; thence the paper may be used as a case study in developing countries with a similar problems.

1.4 Research Objectives

The main objective of this thesis is to establish urban population percentage growth and its effects on environmental degradation in the four cities of Malawi. Additionally, it is aimed at assessing disaster occurrences management and, disaster risk reduction preparedness in the four cities of Malawi.

Specifically, the thesis will critically focus on:

a. To establish urban population growth trends in the four cities.
b. To evaluate the impact of urban population growth on environmental degradation within Malawian cities.
c. To analyze the risk of occurrence of natural and anthropogenic urban disasters in the cities of Malawi.
d. To establish the extent of effectiveness of community disaster resilience characteristics and post disaster management programs in Malawian cities.

1.5 Research Questions

The paper answers the question, ‘what is the current relationship of urbanization, and urban environmental degradation in relation to the continue reoccurrence of urban disaster within residential areas in the four cities of Malawi

With specificity the thesis generates answers to the questions;

a) What is the current urban population growth percentage in the cities of Malawi and to what extent does it impact the rate of environmental degradation in the cities?
b) Are urban area dwellers in Malawi at risk of natural or anthropogenic urban disaster occurrences? Why?
c) Are the disaster risk reduction and preparedness programs employed now effective enough in the cities of Malawi?

CHAPTER TWO

2. LITERATURE REVIEW

The review of the literature in this paper is done in line with the objectives articulated earlier. It is covered in five sections focusing on literature on urbanization, environmental degradation, disaster risks and disaster occurrences and management. An analytical view of work by various authors is presented in relation to the authors objectives in this study.

2.1 Urban Population Percentage Growth in Malawi

As global urbanization and population growth continues to grow every day, neither is the trend restricted to a particular region of the world. An additional one billion people was globally added within the past 12 years, making global population average 7.5 billion people as of 2017 (UN World Population Prospectus 2017). Projections indicate that by 2100, the population will have reached 11.2 billion and worsen the already widespread urbanization population percentage from 54% to 66% by 2050 (UN World Population Prospectus, 2017; UN World Urban Prospectus, 2014). Wang et al. (2012) argues that despite characteristic differences in the population growth trends globally, a majority of countries share the discussed trends and are evidenced to rapidly urbanize.

Manda (2013) defines urbanization as the migration of individuals from rural areas to an urban society, which induces a process of clusters of population and developed economic activities. Several factors induce the process of migration of which two of the

dominant have been identified as poverty and overpopulation in the rural areas specifically in the developing world like Malawi (World Bank Africa, 2015). As Chikwenda (2002) puts it, Malawi's continued rapid urbanization population percentage is indeed mainly due to the above mentioned factors. Rapid urbanization is casually due to loss of agricultural land in the rural areas of Malawi, attributable to ever thrusting population growth in such areas. The migration is induced as a belief amongst individuals that cities have the necessities for achieving a socially and economically stable life.

Population census and data on urbanization in Malawi is officially produced by The National Statistical Office (NSO). The constitutional mandate is that the body carry's out such population censuses in every ten years. The most recent population census results released in 2008 pegged Malawi's population at approximately 14 million, though several recent approximations; ten years later peg the population at roughly over 18 million (NSO, 2009; GoM Population Data Fact Sheet, 2012; UN Population Funds, 2018). This indicates that from 2008 population census to date, Malawi has added approximately 33% to its total population with the trend continuing to rapidly shift upwards (Rapid, 2017; NSO, 2010); and as of the period between 2008 and 2012 over 84% of the population in Malawi was rural based estimated at 12.5 million (GoM Population Data Fact Sheet, 2012).

Clearly, the information presented by different authors above proves the conceptual framework suggested that rural-urban migration in Malawi is mainly due to depletion of agricultural resources in the rural areas (Chikwenda (2002). Over the recent years, Malawi has been faced with characteristically very rapid urbanization trends. Population in the cities continue to grow at an alarming rate beyond the holding capacities and economic

abilities of the cities. NSO (2009) support that urbanization has been rampant dating back 1966 as **Table 1** below demonstrates. Projection in 2010 by NSO further indicate that the rapid urbanization in Malawi is highly very likely to continue. The projections clearly illustrate the continued urban population growth specifically in the cities where the study of this paper focuses. Currently urban population percentage is at 15.3%, as the **Table 1** below demonstrates, pegging the total urban population at approximately 1.9 million. Though available data shows that this growth is likely to continue steadily in all the four cities of Malawi and that by 2023 total urban population will be approximately 3.5 million (NSO, 2010).

Table 1: Urbanization in Malawi by Year

Years	National Pop.	Urban Pop.	Urban Pop. %
1967	**4039583**	**260,000**	**6.0**
1977	**5547460**	**555,000**	**8.0**
1987	**7988507**	**857, 391**	**10.7**
1998	**9933868**	**1,435,436**	**14.4**
2008	**13,029,498**	**1,881,010**	**15.3**

Source: National Statistical Office of Malawi 1998, 2008,

Kalipeni (1992) argues that urbanization is an important element as far socio-economic development is concerned. Potts (1986) suggest that the low level of urbanization in Malawi between earlier 1900 and 1960 was a result of a low level of national investments that would attract migrants, both national and international. Historically, the relationship between urbanization and socio-economic development has been established to be positively correlational in most of the developed countries in the west (Thuku et al., 2013). The question to be answered for a developing country with only

about 118 000 Km^2 of space is; does the continued rapid urban growth in Malawi signify betterment of socio-economic and environmental status of the country?

An analysis of the above data on urban population percentage in Malawi brings out two vital elements to be discussed. Firstly, it is the interesting phenomena that close to 80% of urban population in Malawi resides in the four cities Lilongwe, Blantyre, Zomba and Mzuzu (NSO, 2009). This is to say that only four out of the 28 districts Malawi has, as of 2008, were sharing bout 12% of total national urban population and the rest approximately 3.3%. NSO (1994) denotes that just 20years back in 1987, these four regions (now cities) were only sharing 2.6% of the total national urban population. It further indicates that such a rapid persistent urbanization growth has remained constantly increasing dating the 1970s soon after independence of the country. The second factor is the constant high figure of population growth in areas defined as urban in Malawi pegged at 5.2% as compared to the national population growth at 2.8% (NSO, 2010). Data presented by NSO (2009) clearly denotes that dating back 1966, Malawi's urban population growth has always exceed national population growth. An urban population growth rate over 5% denotes that the likelihood of urban population doubling in 20 years was very high.

Lilongwe, Mzuzu, Blantyre and Zomba still cover the same space as it was in the 1940s. Does the rapid urban population growth have an impact on the functionality of these cities? What are the economic, socio and environmental capabilities that the cities have to effectively and efficiently hold such a rapid urban population growth in a developing country like Malawi?

2.2 Malawi's' Urban Environmental Degradation Trends

Economic development of the future depends on the efficient and sustainable use of the natural resources available in a country (The World Bank-Malawi Report, 1992). It is unfortunate though that globally, day by day forests continue to vanish and reports of complex environmental issues alongside their effects on human beings and how they relate to the ecosystem increase (Kendall, 2012). These environmental concerns concurrently continued to receive global attention in need of a swift action.

Despite the fact that Malawi is one of the poorest countries in the Africa continent with an average of a per capita income of $220; environmental issues, degradation inclusive, are far more recognized (Kayuni and Tambulasi, 2005). It is argued by various authors that the current macro-economic performances and achievements have largely been to the some extend on the expense of natural resources throughout Malawi (GUSRR Africa, 2016; AFIDEP, 2012; Chikwenda 2002; Kalipeni, 1992). Such activities have in turn led to the massive depletion of soils, forest and other vital natural resources in the country. AFIDEP (2012) argues that if the economic losses arising from soil erosion, deforestation and other vital natural resources were considered as environmental assets when analyzing the depreciation of the country, the GDP of Malawi would grow minimally by 1.9% annually between 1988 and 1990. Kalipeni (1992) argues that government development policies like these, favoring large scale farming coupled with a population of over 84% being rural based and dependent on agricultural activities for survival, contribute to the burden described.

Environmental degradation in Malawi is considered very rapid and at a critical point. Continued expansion of most parts of the country has led to the wanton and careless destruction of forest and forest reserves for fuelwood and shelter. Dibie (2014) argues that it is undeniable that human activities are the cause of the wanton environmental degradation and continue to worsen conditions of occurrence of several consequences of environmental degradation such climate change impact. Therefore, the likelihood of occurrence a global environmental crisis seems to be looming in the horizons (Sing, 2008). The continued unlimited consumption, economic growth, population explosion and exorbitant urbanization, increases the chances of occurrences of an ecological crisis in a developing country like Malawi and at large globally.

Environmental degradation in recently urbanizing regions like Malawi is similar to the cause of the phenomenon in the already urbanized and developed regions of the world. As in the developed countries and the middle income countries, Malawi's urban environmental degradation is attributable to the rapid growth of urban poor (Parker et al., 1995). White (2013) puts it that often urban poor individuals will have moved from economically non-viable farming communities to huge informal squatter settlements in the cities. In Malawi it is argued that the squatter communities when in the cities often settle in areas that are unsuitable for settlement and slowly the pressure they exert on the environment results into the complete modification of over 80% of the earths land surface leaving it completely degraded and vulnerable (Manda and Wanda, 2017; Kita, 2017; Manda, 2014; Manda 2013).

With the continued worry of the loss of global usable earths land surface, now approximated at about 40%, and fear of the worst early stages of the sixth earths mass

extinction event in its 4.5million years in history (White, 2013); the question remains what is being done to reduce the continued wanton environmental degradation? Kalipeni (1992) and Kayuni and Tambulasi (2005) highlight that environmental resources depletion and degradation in Malawi is rather not a rare issue as it has attracted a lot of debates in the interest of establishing what really causes it. The higher population growth rates have resulted in the overpopulation and rapid urbanization, hence being singled out as a vital factor casual of environmental degradation. Additionally, the condition of environmental degradation continues to worsen attributable to poor choices of agricultural farming methods that eventually lead to loss of forests, wildlife and soil erosion (Cohen, 2006).

Furthermore, in addition to the effect of overpopulation and rampant urbanization on environmental degradation, Malawi being an agricultural depend country, relies on agricultural land for the generation of about 40% of its domestic output (Kita, 2017; Manda 2013; Gondwe et.al 2011). Additionally, 90% of the export earnings are also centrally based on agriculture and thus conclusively agricultural land is central to the economic development of Malawi. Gondwe et al. (2011) argues that overpopulation and continued use of poor framing methods have in turn worsened degradation of the environment and arable land continues to grow less and soils becoming less fertile. AFIDEP (2012) puts it that massive degradation of the environment in Malawi due to the earlier mentioned factors has led to massive deforestation which in turn has worsened recorded level of soil erosion. The level of environmental degradation has triggered several sequential consequences like continuous flooding of rivers ending up in occurrences of several recorded natural disaster in both rural and urban settlement areas

in Malawi (Kita, 2017). The migration of rural populations to urban areas in Malawi has put pressure on the few resources in the cities and evidently wanton deforestation and environmental degradation resulting in cumulative occurrence of natural disasters like floods, mud slides, and many more (Kita, 2017; Manda, 2014; AFIDEP, 2012; The World Bank-Malawi Report, 1992).

2.3 Impact of Urbanization in Malawi

The continued growth of urban population percentage in Malawi brings about several consequences, both positives and negatives. Manda (2013) and Gondwe et al. (2011) denote that due to the economic incapability of a country like Malawi, the negative consequences of urbanization have rather been deemed higher as compared to the positives. There is no development of industrialization in the cities of Malawi and most developing countries within the region as compared to the urbanization that had taken place around the 1950-70s in the developed world (Satterthwaite, 2007; Panda, 2004). The shift of rural population to urban areas in Malawi increases the demand for basic needs such as land for settlement, employment, and food once the migrants find their way into the cities (Kita, 2017; Kayuni & Tambulasi, 2005). Gondwe et al. (2011) explains that the pressure the populations exert is rather considered beyond the social, economic and environmental capabilities of the cities in Malawi. The higher population densities in non-economically, non-socially and non-environmentally capable societies in the cities create numerous negative externalities specifically on the environment (Vanwey et al., 2005; Peng et al., 2009). Malawian urban areas continue to display characteristic environmental

degradation due to wanton deforestation, poor waste management, cultivation along river banks and many more factors (Manda & Wanda, 2017; Kita, 2017, Gondwe et al. 2011; Kalipeni 1992).

The interaction between the environment and humans discussed above has always been studied and scientist have tried to find ways to explore and understand population dynamics and their influence on the environment (de Sherbinin et al., 2007). De Sherbinin et al (2007) and Moran and Ostrom (2005) argue that ecological footprints are shaped more importantly by the two factors population and consumption. It is logically evident that increased population growth induces increased need for higher consumption rates; in turn making environmental human relationship vital element of discussion. Of recent the discussion of wide alteration of natural lands to croplands, pastures, urban areas reservoirs and several other anthropogenic sceneries is clearly visible in the developing world manifesting the nature of human influence on the environment (Boone & Fragkias, 2013; Peng et al., 2009; Vanwey et al., 2005). This is because most of the developed world countries lost their natural covers earlier in the 1900 as they became urbanized. Martine et al. (2008) argues that the global urban population is currently pegged at 50% and yet the global urban spaces only covers less than 3% of the earth's surface; this therefore entails a sour relationship between humans and the environment. It is not surprising therefore to observe continued environmental degradation in the urban areas in most parts of the developing world and evidence of climate change effects like occurrence of natural disasters.

In Malawi, Kita (2017) argues that the continued worsening condition of environmental degradation is attributable to the rapid urbanization taking place in the

cities of Malawi. High level of environmental degradation are evident in the cities and have led to reoccurrence of anthropogenic disaster. Gondwe et al. (2011) and Manda and Wanda (2017) agree by highlighting that rural-urban migrants often create informal settlements due to the experience of prohibitive land markets and high levels of poverty when in the cities of Malawi. The occupation of such informal settlements, often located in areas ignored by the rich for being disaster prone, increases their vulnerability to several dangers like disasters. Of interest is the impact the communities have once in the urban areas. Since the community settlements in such informal areas are crowded and located in areas naturally designed as a drainage from watershed and river catchment areas; the rate of environmental degradation becomes disastrous (Kita, 2017).

Social, Urban, Rural and Resilience Global Practice, World Bank; also known as GUSRR (2016) explains that urbanization in the developing countries like Malawi is a burden not solely because of issues surrounding the living environmental of the rural-urban migrants in the cities. It argues that the lack of economic stability to support the rampant urbanization being experienced makes it non-environmentally friendly as the crowd of rural-urban migrants once in the cities engage in various unsustainable environmental activities for their survival. Such a chain of activities in turn puts pressure on the allocation and distribution of available natural resources like land hence occurrence of numerous environmental problems which consequently lead to occurrence of anthropogenic urban disaster and risks (Chikwenda, 2002). Realistically Douglas et al. (2005) argues that urban population percentage in the developing word is far much lower compared to the developed world. The only challenge is that developing countries lack the economic stamina to support their population. GUSRR (2016) gives an example that

despite Malawi's urban population rising swiftly from 3.7% in the 1950's to 15.4% by 2016, the percentage is considered much lower just within its region compared to neighboring countries like Zambia, Mozambique and Tanzania. The lack of a positive correlation between urbanization and economic development stands to be the causal factor in the occurrence of rampant environmental degradation resulting in several consequences like disaster occurrences.

Douglas (2005) highlights that rural-urban migrants in most developing countries constitute the urban poor. It is important to note that globally these urban poor create a larger contribution to the current trends of environmental degradation globally. Chen et al. (2014) notes that most of the rural-urban migrants moved from the rural areas after worsening levels of environmental degradation; consequently resulting in reduced agricultural yields due to the climate change impact. It is arguably correct to say that the recent environmental degradation occurring in the cities has been triggered by the rural-urban migrants. Worsening condition of global climate change impact are therefore totally a result of the rapid urbanization being experienced globally (Moran & Ostrom, 2005); developing countries being at a high risk as they are recently urbanizing at the expense of weak economies.

Boone and Fragkias (2013) in their book argue confidently that linking the process of urbanization in the developing world and globally to sustainable growth and development, remains a big challenge for both now and the future. The social, economic, and physical/environmental change impact of urbanization on the environment makes it one of the worst visible forces of human activities today.

2.4 Urban Disaster Risks and Occurrence in Cities of Malawi

Earlier a critical focus on the relationship that exist between Mother Nature and anthropogenic activities and their impact has been discussed. One important outcome from the relationship between nature and human activities is the occurrence of both natural and anthropogenic disasters. According to Kreimer et al. (2003) one of the most commonly underestimated issues in urban development is disaster impact vulnerability. As UN-World Population Prospectus (2017) and UN-World Urban Prospectus (2014) indicate, by 2050 world population will have increased with an additional 3 billion individuals and over 60% of the total world population, then, expected to be urban based. Despite a global trend predicted as above, over half of the projected urban population growth is deemed to take place in the developing countries, in Africa and Asia.

The impact of urbanization on the environment is widely classified to have social, economic and environmental problems; collectively the outcome from such an impact has a greater influence on the occurrence of natural and anthropogenic disasters; climate change effects inclusive (Brecht et al., 2013). It is clearly established by so many authors that increased urbanization in the cities of the world, specifically the developing, increases the vulnerability to the occurrence of various forms of disasters (Brecht et al., 2013; Boone & Fragkias, 2013; de Sherbinin, 2007; Satterthwaite, 2007; Kreimer et al., 2003). The increase in number of rural-urban migrants settling on fragile lands makes the reduction of vulnerability to occurrence of both natural and anthropogenic disaster in cities and urban area in the developing countries a critical environmental challenge to be addressed. Brecht et al. (2013) specifically argues that despite availability of several factors that cause

urban disaster occurrences urbanization play a major role in inducing a larger percentage of the urban disasters that have occurred in the developing countries. Thus, Urbanization induces poverty, scatter settlements and urban population density. These factors in turn result in the occurrence of wanton environmental degradation consequently increasing the vulnerability to the occurrence of natural disasters.

Malawi has a total of about 29 districts and each has an area classified as urban, but the major ones are the four cities Lilongwe, Blantyre, Mzuzu and Zomba. Of recent occurrence of urban disasters have been wide spread specifically in the four cities mentioned above (DoDMA, 2017). Kita (2017) and Manda and Wanda (2017) indicate that of recent urban areas are at a higher risk of impact to the occurrence of natural disaster like flash floods, floods, windstorms, and landslides. It is obvious that the shift of disasters from the rural areas around the 1980s to urban areas over the past decade is a clear indication of worsening of environmental degradation. Kita (2017) in a study conducted in Mzuzu city argues that the rapid urbanization experienced has induced continued reoccurrence of disasters; specifically as most of the settlers in the city are urban poor and occupy inform settlements. UN-Habitat Report (2011a) argues that between 2011 and 2016, Malawi had 68% of urban land space occupied by urban poor and with informal structures for their daily life. The structures were all built in an area exposing them to occurrence of natural disasters, thus in addition to the fact that they were substandard and located in environmentally degraded areas (Ubale et al., 2013, Colenbrader, 2016). In addition to the challenges above, urban areas in Malawi lack the economic and social capacity to enhance development of disaster resilient appropriate infrastructures;

worsening the vulnerability of urban poor areas to occurrence of flash floods, floods and landslides (Amoako, 2016; Ubale, et al., 2013).

Disasters in most urban areas of the developing world are an undeniable reality of current city life, despite the perception that urban areas are in control of the non-threatening physical environment (Pelling et al., 2003). Population pressure in cities in Malawi and most developing countries results in the development of seemingly well furbished infrastructure, in environmentally degraded areas and prone to disasters, which rather haven't incorporated any safety measures worsening the vulnerability of the communities. Ryner (2002) argues that environmental degradation resulting from the rapid transformation and exploitation of the natural environment has resulted in deforestation and accumulation of garbage as landfills in the cities. In developing countries like Malawi, low income settlement urban areas occupied by the urban poor are characterized with poor waste management, blockage of drainage systems thence worsening the vulnerability of urban disasters amongst these areas (Manda and Wanda, 2017; Chardon, 2002). Climate change effect impacts arising from the effect of wanton environmental degradation due to urbanization also affect the urban poor as frequency of urban disasters has continued to worsen yearly in Malawi and the other developing countries (IPCC, 2001).

Over half of the 29 districts in Malawi were severely hit by floods and landslides, leaving a total destruction of agricultural livelihood of the people in 2015 (World Bank, 2016). Additionally, approximately over 1.5 million individuals were estimated to have no food and 336 000 displaced with nowhere to live. Following the 2015 disaster occurrences over 6.5 million people were affected by famine throughout the country in

2016 and United Nations OCHA Report (2017) indicated a continued occurrence of floods and several other disaster in Malawi. The report projected that the effects of 2017 national disasters would be 836 000 individuals in need of support in the 2018 national calendar.

An interesting phenomenon in the flood occurrences in Malawi is the drastic change in disaster occurrence zones. Historically floods were deemed localized in the rural areas but of recent flash floods, landslides and other natural disaster occurrence are spread across urban areas in the country. Davies (2018) reports of wide spread occurrence of floods, flash floods, landslides and strong winds and rains in the urban areas of Malawi and largely within the four cities Lilongwe, Blantyre, Mzuzu and Zomba. As far as several factors are casual to increased incidence of disaster occurrences, the relationship between urbanization and the rate of environmental degradation remains vital to the increased vulnerability of urban communities specifically those that are based in urban poor areas of the cities (Kita, 2017).

2.5 Urban Disaster Risk Reduction, Preparedness and Disaster Management in Malawi

It is clearly evident from the literature discussed earlier that currently all the countries in the world are vulnerable to climate change and instability of weather patterns due to rampant environmental degradation fundamentally arising from excessive rural-urban migrations. Wamsler (2004) argues that the poorest countries and the poorest people within them remain the most vulnerable to the occurrence of urban disasters and continue to be the most exposed with least means to adapt to such occurrence. Globally, the harsh

effects of urban disasters occurrences affect nearly one billion individuals living in urban poor areas (UN-HABITAT, 2011b). Wamsler (2007) argues that when disasters occur in the cities amongst the urban poor settlements in developing countries the effects are far much worse than in other environments, and the poor communities in these cities remain the greatest at risk. Day in and out more small scale and large scale disaster reoccurrences in urban areas erode and destroy years of effort of development (Sanderson, 2000). Pelling et al. (2004) puts it that the occurrence of several natural disasters in urban areas of the world is due to the recent rampant urbanization coupled with other factors. It is argued that urbanization has a two way effect relationship with disaster effects. Thus urbanization affects disaster overwhelmingly as disaster could affect it. It is unfortunate though that despite the continued reoccurrence of urban disasters, both planned and unplanned urban growth continue without incorporating the concept of disaster risk reduction.

A disaster is basically defined as unprecedented disruption of functioning of society with wide spread losses; economically, materially and environmentally exceeding the capability of the affected society in question. UNISDR (2009) defines disaster risk reduction (DRR) as an idea and practice of reducing disaster risk by employing systematic efforts that enables clear analysis and management of casual factors of disasters. Thus several methodologies can be employed to achieve this including reducing exposure to hazards, reducing vulnerability of both individuals and property, good land and environmental practices and advanced preparedness for adverse effects. Batuk et al. (2008) argues that achieving DRR is a role that needs to establish a crucial understanding that negative effects of disasters on people, the environment and the economy are aggravated by human actions.

In Malawi, management of all issues regarding occurrence of disaster is constitutionally mandated in the hands of the Department of Disasters Management Affairs (DODMA) with support of various governmental and non-governmental organization. The promotion of DRR in Malawi is rather a new phenomenon DODMA emphasized in the National Disaster Management Policy of 2015 (GoM, 2015). Previously, the department had been very active in the management of disaster occurrence and most of roles were to mobilize resources to govern issues relating post disaster occurrence management. Though such was the case, several organizations such UNDP, World Bank and Red Cross Society embarked on activities to promote DRR and resilience of communities in Malawi (UNDP, 2008). Without government support though, the roles the non-governmental organization played in promoting disaster resilience; had not been very effective and efficient.

Kita (2017) argues that DRR in the cities of Malawi has not been fostered as required fundamentally due to several factors, specifically ineffective mainstreaming of urban development activities and DRR activities. As Bull-Kamanga et al. (2003) explains, the distance between urban specialist and disaster specialist in the developing world makes adopting DRR methodologies nearly impossible and most of the times unsuccessful. Often it is difficult for institutions responsible for disaster response like DODMA in Malawi to make changes and adopt DRR partly because disaster reduction measures require collective understanding with other departments and engagement of the urban poor being affected. In the cities of Malawi, this means city councils, local NGOs and community based organizations have to be engaged in urban development and DRR programs. Without the 2015 National Disaster Risk Management Policy, Malawi had had no

framework to initiate such required mainstreaming on DRR between DODMA and City Councils (GOM, 2015). Clearly, this translates that DRR is a new phenomenon that requires to be quickly incorporated into Malawi's urban development policy considering the continued reoccurrence and frequency of urban disasters in the four cities of Malawi.

Manda (2014) in a study titled 'Where there is no local government addressing disaster risk reduction in a small town in Malawi' conducted in one of the most tourist attracting urban area in Malawi, argues that the continued reoccurrence of disasters in the urban areas of Malawi is a result of non-commitment of local government to adopt DRR methodologies as required. Most urban areas in the developing world, occupied by the urban poor, where disaster occurrence are frequent-Malawi inclusive-have rarely underwent rigorous systematic vulnerability and loss assessment (Manda and Wanda, 2017). There has been continued neglect of urban poor communities by both the state and local government. In Malawi, this is attributable to insufficient resources by the local city councils to enforce DRR programs within their jurisdiction and partly as highlighted earlier that DODMA's focus had been management of post disasters outcomes. This paper discusses in detail, the concept of DRR and management as administered by city councils after 2015 national disaster management policy based on the data collected.

CHAPTER THREE

3. CONCEPTUAL FRAMEWORK AND RESEARCH METHODOLOGY

The presentation in this chapter discusses the concept developed specifically for realization of the objectives of this research. The discussed conceptual framework contains independent, dependent, intervening and moderating variables, specifically developed to explain the objectives of this research. Further the chapter discusses the research design and methodologies employed throughout the research execution. It describes the methodology adopted in coming up with the sampling frame, sample size, sampling techniques for data collection and data collection techniques used.

3.1 Conceptual Framework

The continued reoccurrence of natural and anthropogenic disasters and their geographical concentrations are key to several past and existing discussions on the scope of vulnerability and public policies required to tackle them. Several thoughts have been brought forward as to why natural and anthropogenic disasters occurred and continue to occur. Traditional thought in most parts of the developing world, have classified natural hazards perceiving them as an act of the gods. Of recent, debates surrounding both natural and anthropogenic disasters are centered on the arguments that their occurrences are socially constructed within a complicated interactions of natural forces and many other political, economic and social conditions in the society. These are discussed within the

concepts of vulnerability to disasters as a consequence of the socially constructed factors posing as unresolved development challenge.

For decades now various models have been used in disaster management by researchers, governments and various agencies. Indeed, such a variety of models are classified to have been effective in some parts of the world. Despite the achievements of such models, disasters remain to be a fundamental challenge standing on the way to global sustainable development. Disaster management still remains one of the fundamental factors that has negatively influenced disaster prevention and effectively managing them when they occur.

Two of the most recent and commonly used models in disaster management (prevention and occurrence management) by governments and various agencies include Pressure and Release (PAR) and Access to Resources (ATR) models (Wisner et al. 2004). PAR methodology provides a structural framework which enables clear assessment of the progression of vulnerability of communities and establish their risk to disaster occurrences. Thus, it helps in the process of extracting out the root cause, the various pressure that result in translation of the root causes to become effective hazards and unsafe condition.

The ATR model rather promotes individuals understanding of how to make informed choices based on their capacity to acquire desired resources in a situation of disaster occurrence. It is rather a vibrant model critically looking at individuals capacities in the likelihood of occurrence of disaster, thus both prior to and after. It singles out the underlying forces of decision making, choices, budgets and abilities of affected population during disaster occurrences.

Reference to these two models (PAR and ATR), being the most recent and very popular in use in achieving disaster risk reduction and management, the conceptual framework in this research is based on them. It is used to establish the relationship of urbanization and environmental degradation, and how the two relate to reoccurrence of urban disaster occurrences in Malawian cities.

Figure 2 below is a diagrammatic presentation of the developed conceptual framework showing the interlinkage of the variables in the framework

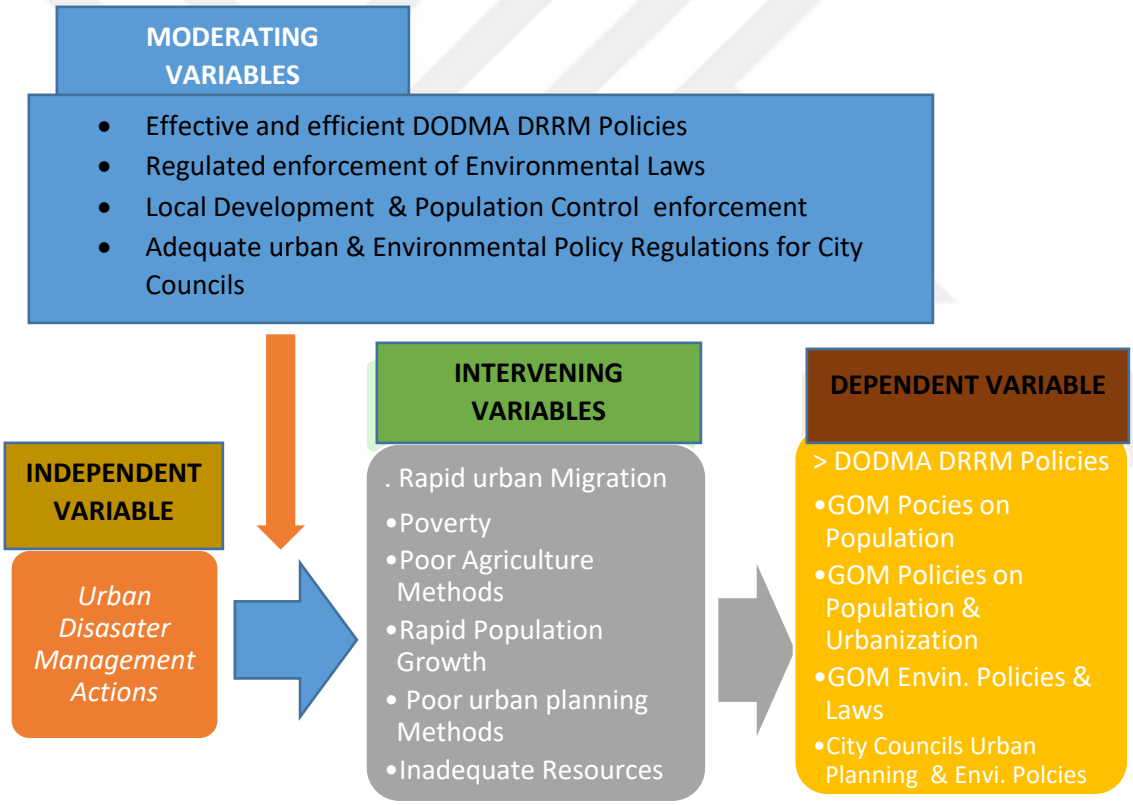

Figure 2: Conceptual Framework of the Research

3.2 Research Design and Methodology

3.2.1 Research Design

The study in this thesis was done in Malawi, specifically within the four cities the country has: Lilongwe the capital, Blantyre the commercial, Mzuzu and Zomba. The targeted participants included DODMA, The Environmental Affairs Department (EAD), City Councils and at large victims of urban disasters occurrences in the cities of Malawi between 2016 and 2018. Establishing the current situation analysis of the relationship that exists between urbanization and environmental degradation in reference to the occurrence of urban disaster in the cities of Malawi, the researcher employs various methodologies as to come up with appropriate data to explain the above relationship.

Both probability and convenience sampling techniques were employed during sample selection of the study.

3.2.1.1 Sampling Frame

The **Table 2** below summarizes the sampling frame used in this study and characteristically only mentions the general areas of sampling used.

Table 2: Sampling Frame in the study

SAMPLING UNITS	POPULATION
Disaster Victims in Four Regions	505,837
City Councils in Four Regions	32
DODMA	4
Environmental Affairs Department	4
TOTAL	**505,877**

3.2.1.2 Sample Size

The sample size used was estimated as the **Table 3** below shows and as summarized.

Table 3: Sample Size used in the study

SAMPLING UNITS	RESPONDENTS
Disaster Victims in Four Regions	400
City Councils in Four Regions	12
DODMA	2
Environmental Affairs Department	2
TOTAL	**416**

The elements from disaster victim's areas in the four regions were calculated by stratifying the areas in the four cities and then later grouped based on when was the last time they experienced any urban disaster occurrence. The total population in areas affected between 2016 and 2018 was computed into the formula to come up with a total

estimated sample size to the nearest 100 and later each region was assigned equal number of participants in the study. Thus;

i. An estimated sample size of all the areas affected by urban disaster occurrences between 2016 and 2018 was computed at 400 in all four cities
ii. Each region was assigned a sample size of 100 individuals, thus Lilongwe, Blantyre, Mzuzu and Zomba each had 100 participants in the study.

3.2.1.3 Sampling techniques

The study employed basically two major techniques throughout the process of sampling to estimate the sample size. The first sampling technique employed was random probability stratified sampling technique. This technique involves splitting heterogeneous population into homogenous groups and later make precise estimates from the groups. The second methodology employed was non-probability convenient sampling method. This employs a technique where members were selected based on the purpose of the study.

a) Stratified Sample Size Calculation

Malawi is gazetted to have four city councils as per the 2010 Local Government Act namely: Blantyre City Council (BCC), Zomba City Council (ZCC), Lilongwe City Council (LCC) and Mzuzu City Council (MCC). This research was conducted in all the four cities of Malawi and samples were collected from each of the region in the study. **Table 4** below illustrates how the population was stratified and then samples used in the study were selected.

Table 4: Victims stratified sampling done for the sample size used

Region	Total Zones in A city**	Areas Selected*	Population Size**	Sample Size***
CENTRAL Lilongwe	57	Mtandire	26,001	21
		Biwi	20,487	15
		Chipasula	29,390	17
		Kaliyeka	44,965	19
		Kawale	40,867	13
		Mchesi	20,487	15
SOUTHERN Blantyre	26	Ndirande	113386	35
		Soche	14,610	21
		Michiru	48,375	23
		Chilobwe	44,819	21
NORTHERN Mzuzu	16	Mchengautuwa	21894	14
		Masasa	676	14
		Chibanja	9,911	14
		Chibavi	3,607	14
		Salisbury	3,721	14
		Zolozolo	7,556	14
		Chiputula	24029	16
EASTERN Zomba	14	Sadzi	9,222	32
		Likangala	9131	32
		Chinamwali	12,703	36
TOTALS			**505,837**	**400**

*Areas were selected based on data of urban disaster occurrences between 2016 and 2018

** Population of areas (city wards) 2008 Census Information by NSO (NSO Preliminary Report, 2008)

*** Randomly selected interviewed victims in each area selected

b) Convenient Sampling Technique

This is also referred to as non-random judgmental sampling technique and uses purposive sampling methodology. The technique was used to include the participation of key stakeholders when we tackle issue of urban disaster risk reduction and management. These main stakeholders include:

i. Department of Disaster Management Affairs (DODMA); this department used to be in the office of Vice President later transferred to the Office of the President and Cabinet (OPC) and now is under Ministry of Internal Affairs and Home Security. The department is mandated to be the overseer of management of all disaster risk reduction and management activities. It is the first to react to the management of disaster occurrences and design post disaster management activities with partner organization in Malawi. The department contributed two (2) participants for the study.

ii. Environmental Affair Department (EAD); this department is under the Ministry of Energy, Mining and Natural Resources and since its establishment it is mandated to ensure continued promotion, coordination, monitoring and overseeing compliance with environmental and natural resources programmes, policies and legislation as to achieve reduction of poverty and sustainable developement. It is a vital stakeholder in this study as we establish the current situation of the impact of urbanization on environmental degradation. There were two (2) participant from this department.

iii. City Councils; The Local Government Act of 2010 gives the four city councils in Malawi the mandate to operate independently with by-laws governing every sector of the cities to ensure alignment to the national local government development policies and realization of SDGs. Since the recurrent occurrence of disasters affect the cities, it makes the city councils a vital stakeholder in the study. We critically look at the policies and operations of the city councils in addressing the factors that influences urban disaster management actions. The

city councils provided 3 members each, totaling a number of 12 members from the city councils considered in study.

3.2.1.4 Data Collection Methods

The data used in the write up of this research was collected using questionnaire and structured interviews. The questionnaires were administered to the interviewees that were selected to have been affected by the disaster occurrences between 2016 and 2018. Face to face interviews were conducted with all personnel from DODMA, EAD and City Councils. In all the questionnaires, a section on community disaster resilience was included as to establish whether our cities have the capacity to be resilient to urban disaster occurrences.

The questions (for both victims and structured interviews) were designed and aligned to enable the researcher answer the research questions as highlighted in section 1.4 of this paper.

3.2.2 Methodology

To ensure that the study generates exact results to the questions being asked, a specific procedure as outlined below was prepared and followed with diligence by all members involved throughout the study.

3.2.2.1 Collection of Data

In summary, the study was conducted throughout the whole country of Malawi but in the specific four city councils; Lilongwe, Blantyre, Mzuzu and Zomba. Interviews were scheduled with appropriate officers in the city assembly offices and those within the government departments of DODMA and EAD.

Data collection from the disaster victims in all the areas was done through printed out questionnaires administered by research assistants/data enumerators. For structured interviews done, electronic copies of the questionnaire were sent after initial planning of the meeting date.

a) Data collection from disaster victims in selected areas

The total sample size used in the study was 400 and this comprised of participant from all the four cities considered in the study. Each city was allocated a total sample size of 100 participants randomly chosen from the areas selected. **Table 5** below shows the distribution of the sample size used based on gender in all the four cities the study was conducted.

Table 5: Sample Size Distribution by Gender

City	Area	Male	Female	Total
Lilongwe	Mtandire	13	8	**21**
	Biwi	9	6	**15**
	Chipasula	9	8	**17**
	Kaliyeka	8	11	**19**
	Kawale	6	7	**13**
	Mchesi	5	10	**15**
Blantyre	Ndirande	20	15	**35**
	Soche	15	6	**21**
	Michiru	14	9	**23**
	Chilobwe	16	5	**21**
Mzuzu	Mchengautuwa	10	4	**14**
	Masasa	10	4	**14**
	Chibanja	14	0	**14**
	Chibavi	4	10	**14**
	Salisbury	5	9	**14**
	Zolozolo	12	2	**14**
	Chiputula	13	3	**16**
Zomba	Sadzi	21	11	**32**
	Likangala	13	19	**32**
	Chinamwali	19	17	**36**
TOTALS		**236**	**164**	**400**

The sample size comprised of a majority of individuals aged between 26 and 50 years totaling 48.3% of the study sample, followed by 23.5% of individuals aged between 51 to75 years old. The youth below 25 years and the old aged above 75 years, contributed 19.8% and 8.5% respectively.

b). Socioeconomic and Demographic Characteristics of Respondents

The data collected was grouped according to the areas in the four cities where the data was obtained. **Table 5** in section 3.2.2.1 (a) above demonstrates the distribution of the respondent's cities/region by area of origin. The distribution of the data collected showed that a large percentage of the respondents were those that are aged 26-50 and were married at 120. This was followed by a number of respondents that were married and aged 51-75 totaling 63.

In the introductory part of this paper it was presented that, disaster prone areas in Malawi are often occupied by rural-urban migrants that are poor. The victim's respondents interviewed based on their income and education level demonstrates that a large percentage of the disaster victims interviewed were earning an average amount of income per month and had at least attended secondary school. The result were also characterized by a group of respondents that had attended secondary school but still earning an income they had described as very low monthly. Of the 400 respondents interviewed only 26 had indicated to have attended tertiary level education and 4 declared to have stable income labelled as high in the questionnaire.

Another important finding in the questionnaire was on the occupational status of the respondents, thus the disaster victims in the four regions of Malawi. It was found out that of the 400 respondents in all the four regions a total of 216 were casually employed and the highest number of casual employees were from the southern region, Blantyre City Council.

c) Data collection from selected organizations

Prior to the day of the structured interview, the author prearranged a date to meet with the interviewees and discuss on the most comfortable date to carry out the interview. A soft copy of the questionnaire was sent to the interviewee for their preparation prior to the meeting day.

The questionnaires were printed and one on one interviews were conducted lasting a maximum of an hour. The structured interviews were done with individuals from DODMA, EAD and the City Councils. DODMA and EAD each contributed 2 members for the structured interview and the four city councils contributed 3 members each for the study, giving a total of 12 members.

3.2.2.2 Data Analysis

The data collected was qualitative, and upon completion it was entered into SPSS software to generate easily understandable graphs, bar charts and tables as used in this study. These were used to enable the author interpret the data in alignment to the objectives of the study.

In some cases, excel was used to analyze the data where SPSS was deemed not appropriate by the author to analyze the intended data.

3.3 Limitations

The shortcomings listed below might have had a vital influence on the methodology and conclusion of the study, but the researcher ensured that these were addressed before or during the study period. Notably the limitations in the study were:

i. The misconception of the purpose of the study which would lead interviewees to provide false information specifically on the side of disaster victims.

ii. Likelihood of personnel earlier scheduled to take part in the study to be changed.

iii. Misunderstanding that would arise between the data enumerators/research assistants and the interviewees during data collection as the questions had to be translated in vernacular language for the respondents to give their responses.

iv. The organizations asked to provide individuals to be interviewed in the study ended up cancelling some meetings and this resulted in a reduced sample size as compared to the earlier planned.

CHAPTER FOUR

4. DATA ANALYSIS AND FINDINGS

The following chapter discusses the findings obtained from the data collected. The raw data was analyzed using data analysis packages, excel and statistical package for social scientist (SPSS) software's to extract out the clear picture represented by the data on ground. The analysis of the findings in this chapter will be used to reach meaningful conclusions and come up with constructive recommendations.

4.1 Analysis of Data and Findings

4.1.1 Community Respondents Characteristics

a) General household characteristics

To establish the impact of the disaster occurrences on the victims, the questionnaires had four questions asking the respondents to share their experiences on how long they had lived in the areas affected, thus when they were affected by the disaster occurrences, how many people were affected in their household, and finally describe the severity of the disaster occurrences they had experienced. Below, are figures describing the findings from the questions above based on the answers the respondents gave during the survey.

Figure 3 below is a presentation of the outcome of the survey when the respondents were asked to describe the period they had lived in the area they were staying. The data is grouped based on the region of origin of the respondents. The figure below demonstrates that 190 individuals of the respondents that were interviewed in all the four regions had been resident in the areas for a period of 5-10 years. The four regions in general had over three quarters of the sampled size living in the areas selected for this study for a period between 6 and 17 years and above.

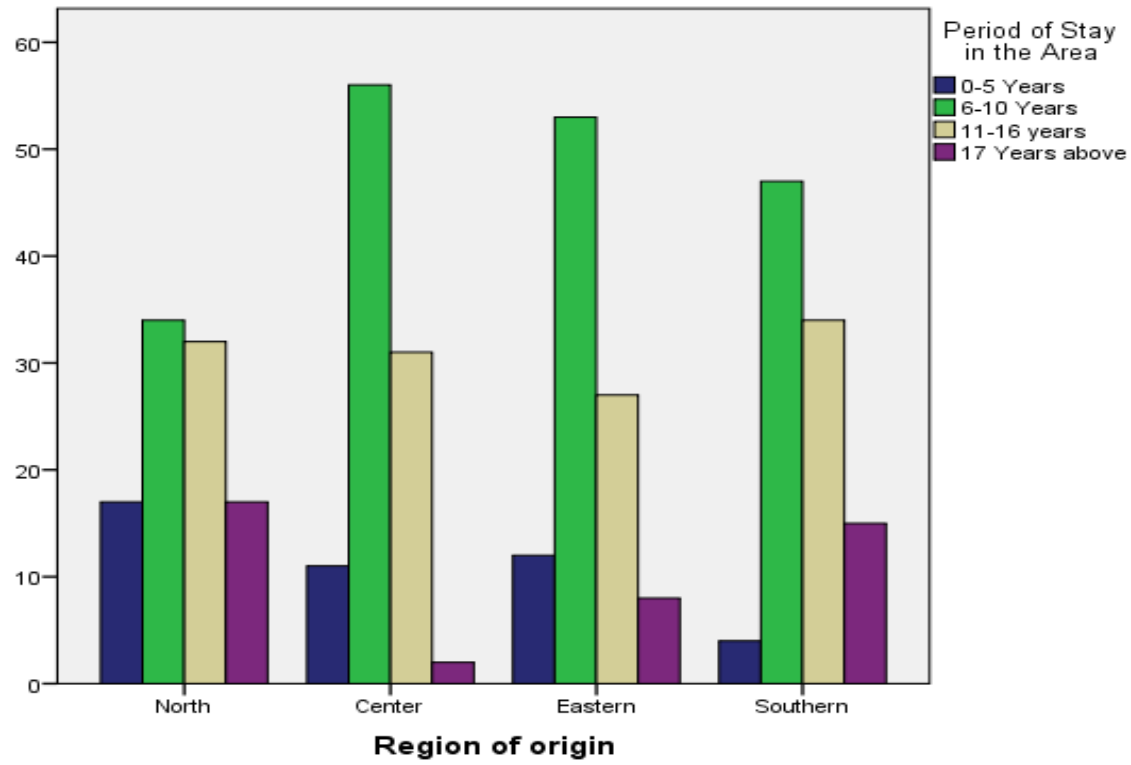

Figure 3: Respondents period of stay in the areas affected by disaster occurrences

The second question asked to the respondents in relation to their areas of residences was a description on the period they had been affected by disaster occurrence between 2016 and 2018. It has to be clarified here that during the data collection exercise,

the enumerators were asked to specify that they were interested in a period of agricultural/farming calendars 2016, 2017 and 2018, thus the period spanning between late 2016 and early 2018.

The results obtained signified that of the 236 male participants from the four city councils considered in the study, 82 (34.75%) were affected in early 2017, 97 (41.1%) in late 2017 and 57 (24.15%) in early 2018. Similarly, of the total 164 female respondents interviewed 46 (28.05%) were affected by the disaster occurrences in early 2017, 67 (40.85%) around late 2017 and 51 (31.1%) early 2018. In summary, late 2017 had registered the highest number of disaster victims in all the four regions at 164 followed by the period around early 2018 which registered 108 respondents in the study.

The questionnaires also established the number of individuals that had been affected by the occurrence of the disasters in the period between 2016 and 2018. Malawi, as a country, traditionally still practices at large extended family type of living. The findings in this study also considered this factor and hence large family numbers in some of the figures presented. **Table 6** below illustrates the information on how many family members had been affected during the disaster occurrences as indicated by the respondents in each of the regions the study was carried out. The findings in the study showed that a large proportion indicate that 6-10 people had been affected during their experience of a disaster occurrence between 2016 and 2018.

Table 6: Disaster victim's affected number of household members

REGION	NO OF PEOPLE AFFECTED PER HOUSEHOLD			TOTAL
	0-5 People	6-10 People	11 People Above	
North	14	62	24	100
Center	30	54	16	100
Eastern	34	45	21	100
Southern	15	41	44	100
TOTAL	***93***	***202***	***105***	***400***

The questionnaires further aimed to establish the extent of the impact of the disasters in the affected areas specifically focusing on the affected households. 69.5% of the total respondents interviewed in all the areas affected indicated that experience of the disaster occurrences on them had a severe impact. In most of the areas the respondents indicated to have lost property and including their homes which made it very difficult for them to restart a living. Living in conditions of urban poor, the respondents described of their vulnerability to occurrence of post disaster infections due to lack of proper public health services in areas affected by the disasters. The **Figure 4** below is a bar graph illustrating the findings on how severe the impact of the disaster occurrences were in all the areas selected for the study in the four cities.

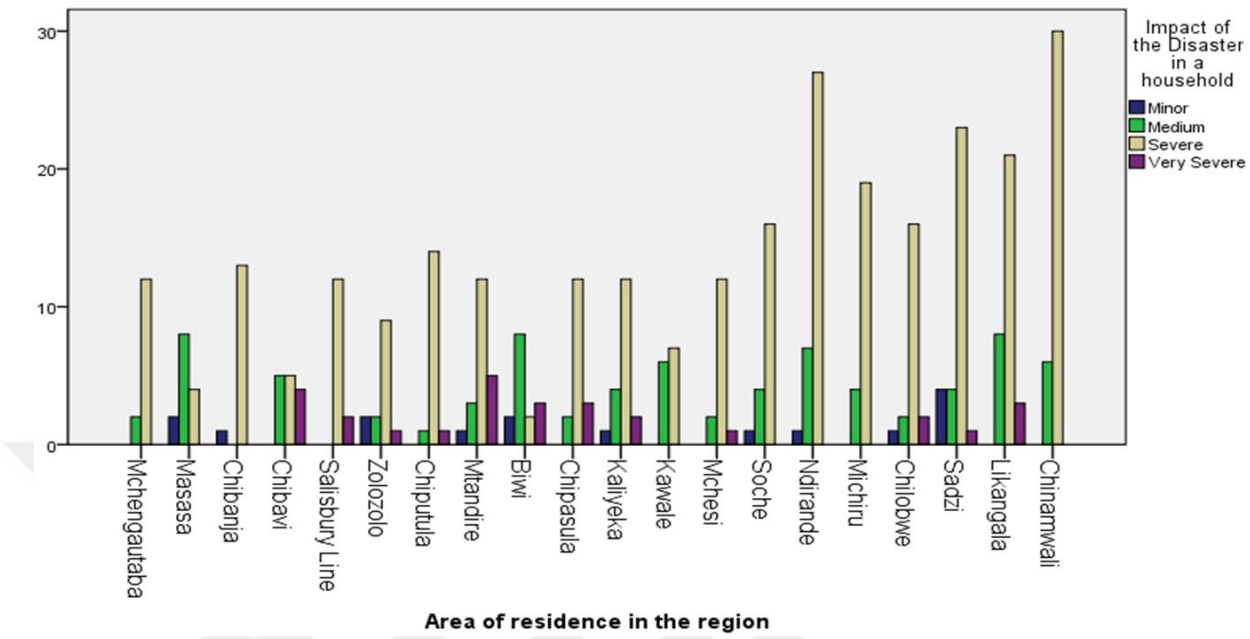

Figure 4: Distribution of the severity of disasters occurrences in the areas affected

b) General population characteristics and the environment

This section aimed at finding out the effect of the population size on the environment amongst the victims of disaster occurrences in reference to the areas they were interviewed from during the survey. Several question were asked to the respondents involved in the survey regarding their area of residence's population size over the years they had been living there. The **Table 7** below illustrates the findings from the previously discussed questions regarding population size in the areas the study was carried out. The findings in this section were that three quarters of the sampled population raised a concern that population sizes were large and continued growing day by day in their areas. Thus a majority despite living in the areas for a period of no more than 16 years were able to notice the differences in population sizes and how the populations' size was growing.

We also asked the respondents to explain the impact of the population size in their area, thus the effect population growth has on the change of their living environment. An option of major impacts of rapid population growth in an area namely: degradation, pollution and resource scarcity were given answers to the questions. The respondents were also asked on whether rapid urbanization growth in their areas had an impact on the occurrence of disasters in their areas. **Figure 5** is a bar chat that demonstrates the relationship of the findings for the impact of urbanization in the respondent's communities and whether urbanization is casual to the disaster occurrences in their areas. The results from the respondents signified that 158 individuals of the total sample interviewed agreed to the fact that rapid urbanization was likely casual to the disaster occurrence experienced in their settlement areas. This was in addition to the fact that they perceived urbanization being casual of rampant degradation, pollution and increased scarcity of basic resources in their residence areas.

Table 7: Comparative population sizes and growth rate among the disaster victims

Population Size	**Population Growth Rate in Areas**				
Distribution/Area	Slowly	Medium	Rapid	Very Rapidly	**TOTAL**
Very Large	1	10	**67**	**174**	***252***
Large	2	5	**41**	**79**	***127***
Medium	0	1	5	11	***17***
Small	0	0	0	4	***4***
TOTAL	***3***	***16***	***113***	***268***	***400***

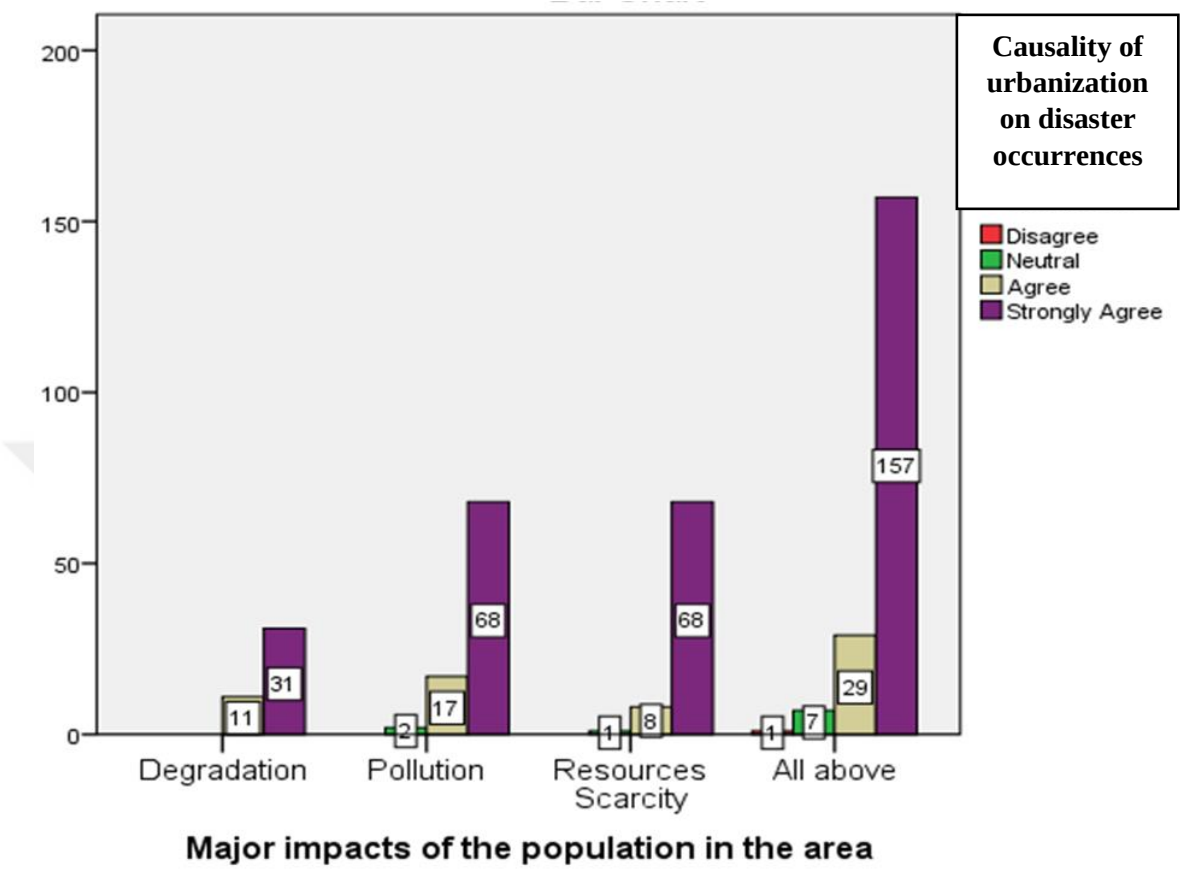

Figure 5 : Impact of urbanization in relation to occurrence of urban disasters in areas of the respondents

This section of the questionnaire further established that a large percentage of the community members interviewed agreed that rapid urbanization in their resident areas had impact on continued environmental degradation and would be deemed casual to the occurrences of disasters occurrences. 43.25% respondents indicated that rapid urbanization had an impact on the continued environmental degradation in their areas. This number also indicated that there were measures employed to address the environmental degradation issues but often this came after the occurrence of the disasters.

A large percentage of the sampled population also indicated that the measures being employed by the government and other partner organizations in addressing the environmental degradation were rather ineffective and inefficient. A total of 280 individuals strongly disagreed to the opinion that the environmental degradation programs being carried in their areas were effective and efficient enough. At least 102 individuals merely disagreed to the previously highlighted question. This indicates that a total of over 95.5% of the individuals interviewed think that the programs aimed at addressing environmental degradation in the four cities of Malawi were not yet deemed effective and efficient despite availability of such programs. **Table 8** below is an illustration of what peoples thoughts were when asked if the programs addressing environmental degradation were effective and efficient in their areas of origin.

Table 8: Environmental Degradation Programs and their efficiency in Malawi.

REGION OF ORIGIN	Measure of Effectiveness and Efficiency-(Impact urbanization on Environmental Degradation)				TOTAL
	Strongly Disagree	Disagree	Neutral	Agree	
North	75	25	0	0	100
Center	60	40	0	0	100
Eastern	70	13	10	7	100
Southern	75	24	1	0	100
TOTAL	**280**	**102**	**11**	**7**	**400**

4.1.2 Urban Communities Disaster Resilience Characteristics for the Disaster Victims

In this section the aim was at establishing the disaster victims' communities' resilience characteristics. A Community Disaster Resilience Toolkit developed by GOAL in 2015 was adopted to establish if our communities are resilient to the occurrence of any type of disaster occurrences. The toolkit divides the measure of community disaster resilience into five different areas namely: governance, risk reduction, knowledge and education, risk management and vulnerability reduction and disaster preparedness and response. **Appendix I** clearly describes the criteria assessment of community disaster resilience used in coming up with the findings discussed in this section.

a) Governance

This section had five questions all aimed at establishing five sections in governance of disaster occurrences. The five questions looked at the issues dealing with policy and political commitment, right to awareness and advocacy, integration of disaster reduction with development policies, access to partnerships and inclusion of the vulnerable communities in disaster risk reduction programs.

Since most of the areas sampled for the study were those that were affected between 2016 and 2018 and that had a frequent reoccurrence of disaster, the aim of first question on policy was to establish if the leadership of their areas was committed to effective and accountable leadership on Disaster Risk Reduction and Management (DRRM) issues. The question were directed on finding out the perception of the communities on leadership

engagement in relation to decision making on disaster management actions, emergence preparedness, risk reduction and reducing vulnerability.

Of the 400 participants in the study, a total of 72.3% respondent from all the regions indicated that there was completely no commitment by the community leaders to address disaster resilience issues in their communities. This signifies they disagreed to the existence of any form of effort the community leader's provide in ensuring that affected communities were safe from disaster occurrences and their impacts. 26.25% respondents indicated that there was very limited commitment on build community resilience by the community leaders and considered it negligible. This signifies that local communities in the affected areas represented lack of commitment, effectiveness and accountability of their leadership on all issues surrounding DRRM.

One vital element in DRRM is the need to ensure that the community is aware of its legal right and obligation of the government to provide them with protection. We asked the communities sampled and interviewed in this study on whether they had knowledge of their leadership legal mandate to protect them. Out of the 59% males involved in the study, a total of 60.2% indicated that they were not aware that it is the legal mandate of the government and their leadership to protect them. Additionally, 94 of the total 164 women interviewed shared a similar view of the previous description. 20% of the individuals in the study indicated that they had limited knowledge of the legal mandate government and stakeholders have in protecting them.

It was also found out the communities in poor urban area in Malawi continue to suffer the impact of disaster occurrence due to the negligence on the side of their leaders to integrate development and DRRM. It was found out that despite several available policies

and plans to realize development and manage disaster risks, the leadership's lack of commitment and limited awareness of the legal mandate by the communities rendered the plans futile. The interviewed communities were asked of existence of any programs that aim at reducing poverty and improve their quality of life through development projects that took place in their areas. 364 individuals in the study of 400 from different occupational status and from different regions indicated that DRRM and development plans were non-integral in all the four Malawian cities.

The achievement of a community that is resilient to disaster occurrences depends on the provision availability of support from relevant stakeholders and local non-governmental organizations (NGOs). If communities have better access to available funds or support on DRRM activities and plans, it will be easier to build up a community that is resilient. The interviewed individuals in this study clearly indicated that without clearly defined leadership and commitment, most of the partnership on DRRM are rather unstable. Out of the sampled and interviewed 400 individuals from all the four regions, 89.5% respondents clearly denoted that partnerships on DRRM specifically from stakeholders and local NGOs were really very unstable. For instance some of the respondents indicated that most of the NGOS that came after the disaster occurrences between 2016 and 2018 were available for only few weeks and closed their programs.

The interviewed sample further indicated development projects in the cities of Malawi only take place amongst the communities living in developed areas of the cities ignoring the poor urban vulnerable to disaster occurrences. Out of the total population sampled and interviewed in the study, 294 individuals from all the four regions indicated that participation and inclusion of vulnerable minorities in DRRM activities is typically

negligible. **Figure 6** below clearly illustrates the results obtained when the participants in the study were asked if they considered DRRM activities and plans to be inclusive of them, the vulnerable minorities in the cities of Malawi by region of origin.

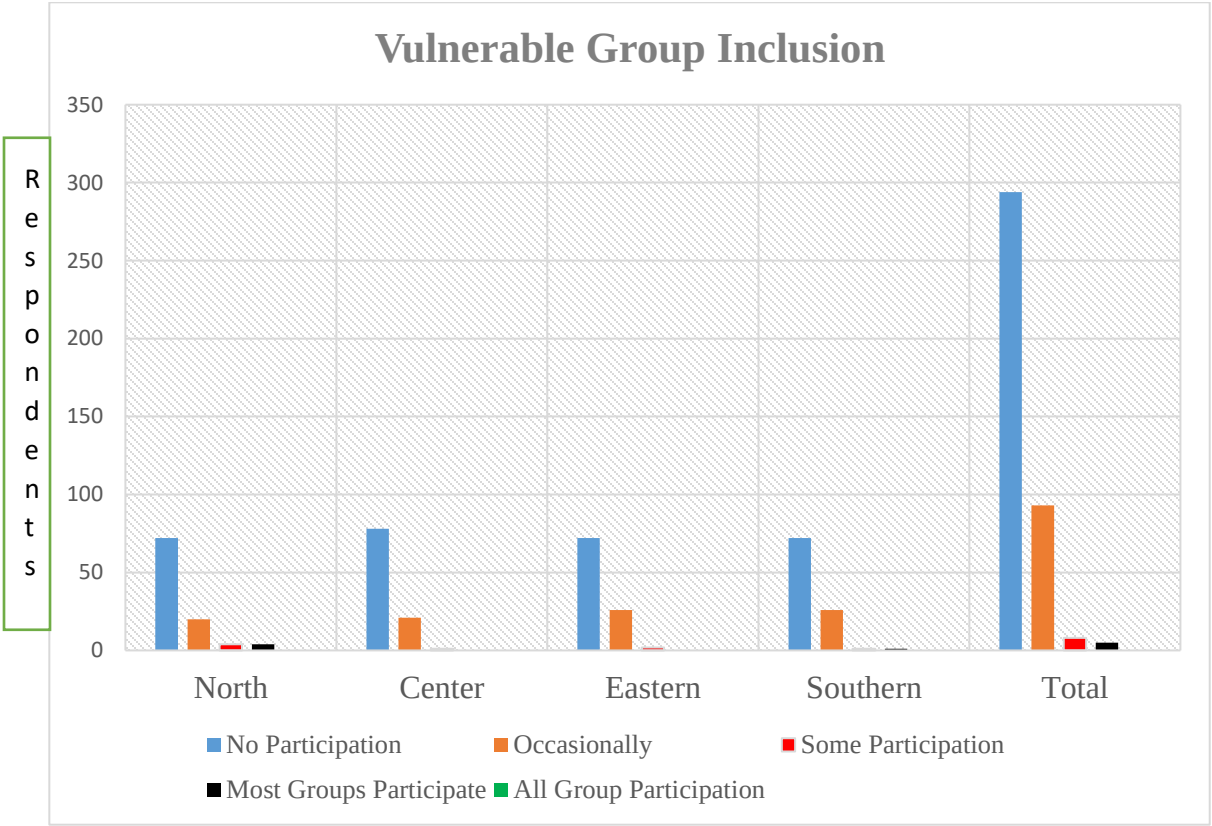

Figure 6: Disaster victim's thoughts on their inclusion in DRRM plans and activities by region of origin

b) Disaster Risk Reduction (DRR)

UNISDR (2009) defines DRR as a conceptual and practical art of reducing disaster risks with the aid of organized efforts aimed at clearly analysis and management of factors that are casual to disasters. Thus DRR, focus on the reduction to exposure to hazards, reducing vulnerability of the individuals and their properties and environmental conservation and management for sustainability and preparedness. A community's disaster

risk is calculated as the multiplication of a disaster risk hazards and its vulnerability over the community's capacity to assess the hazards they are exposed to and employed corrective action.

In this section the respondents were asked of the community's capabilities to conduct risk assessments and employ local and scientific methods in disaster risk reduction and management (DRRM) activities. Thus we established if the communities had ever carried out a vulnerability and risk reduction assessment and use their local and scientific methods and knowledge to address the hazards and risk identified in their assessment

Table 9: Respondent presentation of vulnerability/risk assessments done for DRRM

Region of origin	Availability of Vulnerability/Capacity Assessment	
	Never	Outdated
North	73	27
Center	84	16
Eastern	87	13
Southern	91	7
Total	**335**	**63**

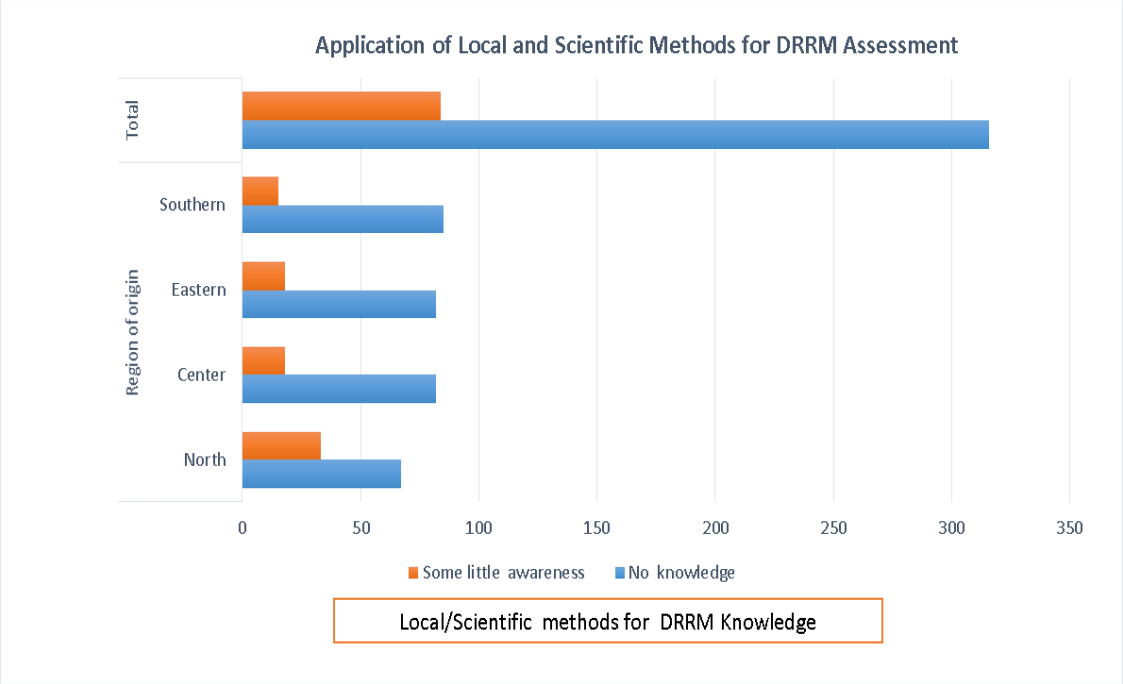

Figure 7: Respondents presentation of use of local/scientific assessment methods for DRRM

The **Table 9** above clearly indicates that of the 400 respondents interviewed, 83.75% expressed that they had never been involved in any form of community vulnerability and had no knowledge of such an activity taking place within their residential areas. Similarly, **Figure 7,** denotes that close to three quarters of the interviewed sample expressed total ignorance of existence of any local/scientific methods employed by their communities in vulnerability and risk reduction assessment.

c) Knowledge and Education

This section aimed at understanding the disaster victim's knowledge when it comes to issues dealing with DRRM. The aim was to understand the respondents knowledge in disaster occurrence, risk and hazards causal of disasters, and reduction and management of

disaster occurrences. The respondent's knowledge on DRRM, education and training on DRRM and cultural attitudes embracing DRRM were the three main sections covering this part.

On respondent's knowledgeability about DRRM issues the questionnaire aimed at establishing whether within the communities there open debates are resulting in agreements, specifically focusing on their vulnerability to disaster risk and hazards. Of the total 400 respondents interviewed, 29.5% totally denied knowledgeability of any open debates aimed at resolving disaster problems they had been facing, 44.3% indicated that they were some infrequently (nearly negligible) occurring community open debates, and 20.5% agreed to have been involved in community debates aimed at addressing issues related to their vulnerability to disasters. It must be indicated that nearly all the respondents that indicated to have witnessed or be involved in a community open debate described that these meeting were only occurring after a disaster occurrence and often focused on how to help those that had been badly affected by the occurrence.

One of the most important tools in achieving community resilience is through ensuring that information of vulnerability and DRR is well disseminated throughout the community. There should be channels that should aim at continued education and training of individuals in communities on how to embrace vulnerability reduction and DRRM ideologies. 314 individuals of the 400, representing a 78.5% of the sample interviewed, indicated that some form of education and training had been observed, but this was mainly after the disaster occurrences. 6.3% of the sample interviewed totally expressed ignorance of any form of education and training programs occurring and 13% indicated to have been involved in education and training programs.

Cultural attitudes such as religious views and expectations also play a vital a role ensuring a community is resilient. Unfortunately, in Malawi and specifically the respondents in this survey, religion and other cultural beliefs do embrace the idea of building resilience. The cultural belief's like *"Ana Mchuma (children is wealth)"* have propagated continue worsening of environmental degradation. It is no surprising that a total of 339 respondents in the study, representing 84.8% of total sample, indicated that cultural beliefs have no role or rather play a very weak role in embracing DRRM ideas for disaster resilience.

d) Risk Management and Vulnerability Reduction

The section aimed at establishing the resilience characteristics directly related to disaster occurrences thus environmental degradation, urban planning, infrastructure protection systems, hazard resistant livelihoods and community social protection systems.

Sustainable environmental management is a cornerstone for realization of disaster resilience. Do our communities in the areas affected by disaster occurrences adopt such environmental sustainable methodologies? Do environmental practices in these affected communities aim at reducing the risk and hazardous condition to disaster occurrence? Environmentally sustainable resident areas not only modify the frequency of hazardous occurrence but also acts as natural barriers with the ability to modify the effect the natural disasters. 97.5 % of the respondents involved in the study indicated that in their communities there were neither any projects nor activities that would be described as promoting environmental sustainability activities.

Secondly, the respondents were asked to give out there view on adoption of hazard resistant livelihoods in their communities. This proved to be a difficult question as most of the affected individuals were in structures that in themselves were already unsafe. In addition to this most of the infrastructure was located in areas that were naturally drainage areas worsening their vulnerability. It is not surprising, therefore, to see that a cross tabulation of results between hazard resistant livelihoods response and infrastructure protection responses clearly denotes that a large percentage of individuals were practicing a non-hazard resistant lifestyle and it was in poorly built infrastructure without any form of protection. The **table 10** below clearly presents the information.

Table 10: Disaster resilience characteristics of communities in Malawi.

Hazard Resistant Livelihood Practices	**Protection of Infrastructure in communities**				**Total**
	No Hazard Mitigation	Some Hazard Mitigation	Fairly Hazard Mitigation Applied	Majorly Hazard Mitigation Applied	
Non Hazards Resistant	209	104	15	0	**328**
Minimally hazard resistant	37	22	8	5	**72**
Total	**246**	**126**	**23**	**5**	**400**

Risk management and vulnerability reduction only work when building community disaster resilience if the communities under consideration have an easily accessible fund in case of an occurrence. Every community through its leadership has to have policies aimed at providing the members in the community support. This support may be in the form of direct aid given for DRR or indirectly through programs that reduce vulnerability. Thus the section aimed at establishing the availability of both formal and informal social schemes

provided by the government and other stakeholders in the field, for disaster reduction and recovery. Of the 400 respondents interviewed, 307 indicated that none of their communities had any social funds/schemes neither for disaster reduction nor recovery purposes.

The respondents were also asked to account for their responsibility by adopting land use planning and management activities as a tool for achieving DRRM and vulnerability reduction. Adoption of land use planning for individuals living in the urban-rural setting solely depends on their income capacity. The Table 12 below clearly displays the results obtained when we asked the 400 respondents on whether they adopt land use planning and management as a tool for DRRM and vulnerability reduction. As the **Table 11** below demonstrates, the income level of the respondents had an influence on their choice of not using land use planning and management in DRRM. The respondents also indicated that rather they had no choice as such living areas are what they are capable of managing based on their income.

Table 11: Income, DRRM and Vulnerability Reduction Adoption.

	Land Use Planning and Management Adoption			
Income Level	No committal	Doesn't Consider	Considers-Short term	**Total**
Low	105	38	1	144
Average	178	54	0	232
High	21	3	0	24
Total	**304**	**95**	**1**	**400**

e) Disaster Preparedness and Response

Organization of a community plays an important role in determining their resilience to vulnerability and occurrence of disasters. This section wanted to capture the level of preparedness and response the respondent's communities had. The first question was aimed at establishing the capacities in preparedness and response to DRR and vulnerability reduction of the respondents in the survey. Of the total 400 respondents involved in the survey 41.3% (165 persons) highlighted that the capacity and preparedness by their communities was totally very weak. 48.3% (195 persons) describe the response capacity as a typically just weak. This clearly shows that a total of 90.1% (360 persons) of the total sample used in the survey indicated that their community's capacity to DRRM and vulnerability reduction was in general weak.

As an indication of a weak capacity of DRRM and Vulnerability reduction, a cross tabulation of the results obtained when we asked the respondents of availability of early warning systems and any contingency planning activities availability in case of disaster occurrence were as **Figure 8** below displays.

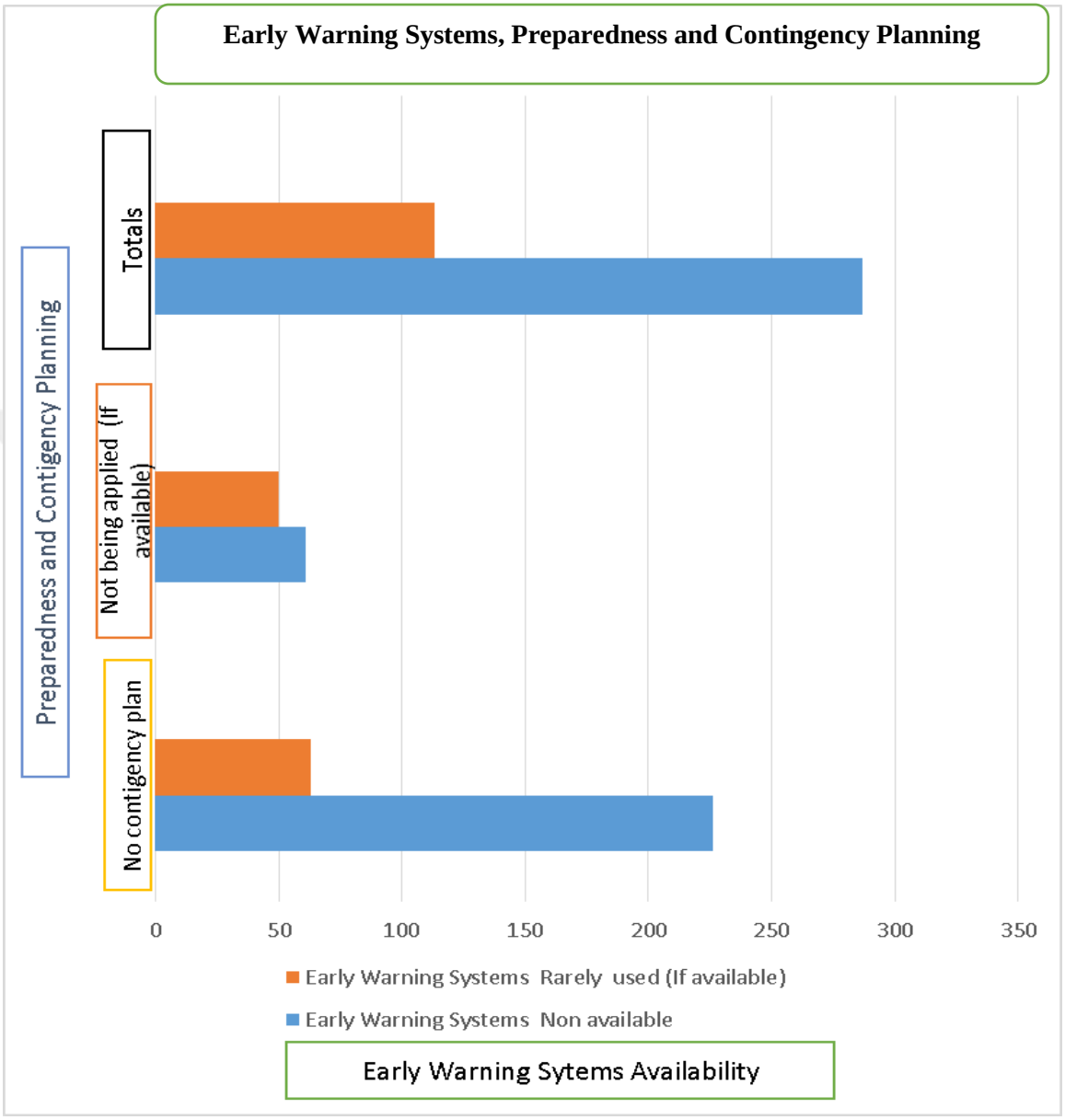

Figure 8: Availability of preparedness activities and contingency planning in the communities.

The respondents were further asked to elaborate on the availability of temporary infrastructure in case of occurrence of any form of disasters. Of the 400 respondents interviewed 304 (representing 76% share) indicated that there were no available infrastructure that can be clearly pointed out to be used for emergency situations. Despite a

total of 80.8% (323 persons) indicating that it was in their desire to take up active roles in ensuring that emergence response and recovery activities reach every member of their society; poor community organization for disaster preparedness and response has rendered it impossible to realize communities which are resilient to occurrence of natural and anthropogenic disasters.

4.1.3 City Councils Officials Characteristics

The findings to follow are based on one to one interviews that were conducted with up to twelve officials that work with the four city councils; Lilongwe, Blantyre, Zomba and Mzuzu. The city council officials were purposively selected as a group of necessary stakeholders in the study, since the continued reoccurrence of disasters heavily manifests their impact in these cities. Cities in Malawi are characterized vulnerable to occurrence of disaster, and the officials were asked to comment on what their thoughts were on several issues affecting the cities including disaster resilience characteristics of the communities within them.

a) Individual characteristics of the officials

As highlighted above, there were 12 city officials and each of the four cities contributed 3 individuals that got involved in the study. Of the 12, 8 were males and 4 were women with the northern city of Mzuzu contributing a female respondent, 1 was from southern city of Blantyre and 2 were from eastern city of Zomba.

The individuals interviewed were either within a field that dealt with the issues regarding urban development and sustainability or city environmental issues.7 of the total respondents were environmental officers within the city councils, 3 were members of a district disaster management team and 2 were urban/physical planners working with city councils. All the 12 officials interviewed indicated that they had either been involved or heard of issues regarding DRRM and environmental conservation and management for sustainability. A total of 7 officers indicated to have worked on projects that aimed at addressing issues related to both DRRM and environmental conservation in the cities, 4 highlighted that they had never been involved on project on DRRM but rather actively participated in projects involving environmental conservation and 1 (one) individual had said he was mostly involved in projects on DRRM due to his involvement in the districts DRRM committee.

b) Cities urbanization and environmental characteristics

The section aimed to establish what the officials thought, in their own professional opinion or based on facts on the ground, were the trends on urbanization and its impact in relation to environmental and occurrence of disasters in the cities.

When asked what the urbanization trends in the cities of Malawi were, all the respondents clearly indicated that urban population growth in their cities was at an alarming stage. Furthermore, all the respondents expressed concern on the non-correlational relationship between urbanization in the cities of Malawi and environmental conservation and economic viability. The respondents expressed the concern that urbanization has had a lot of negative impact on the economic viability of the cities. These are expressed through

huge budgets that are needed to address daily arising concerns affecting environmental conditions and other pertinent issues of the cities. Most of the city officials indicated environmental degradation, land degradation, and environmental pollution as the major reasons why urbanization in Malawian cities is considered not viable in addition to the economic pressure it has on the cities operations.

When asked to comment if urbanization is causal of the continued occurrence of disasters in the cities of Malawi, all the officials totally agreed that urbanization could be a causal factor for occurrence of the disaster incidents. Most of them though were quick to say that disaster occurrences are an outcome of amalgamation of several factors. Most of the officials cited that failure of urban planning policy, poor environmental conservation policies, economic instability, insufficient resources and failure of enforcement of land and urban administration policies coupled to the rapid urbanization has worsened the condition of vulnerability of urban communities to disaster occurrence. 80% of the officials clearly mentioned five areas as examples that had been affected by rampant urbanization and disaster reoccurrence in their cities of residence.

c) urban resident communities disaster resilience characteristics

Similar to the question asked to the disaster victim's on urban community's disaster resilience characteristics, the city officials were asked open ended questions to give more details on what they thought on disaster resilience characteristics of their communities. The section covered a total of vital areas when determining a community disaster resilience characteristics namely: governance, risk management, resident's knowledge and education

on DRRM, risk management and vulnerability reduction and preparedness and response characteristics of the urban residents.

i. Disaster Risk Reduction and Management Governance

This section had five question related to governance characteristics and the first question covered a discussion on leadership commitment to ensure that their communities were resilient to disaster occurrences. All (100% representation) the city officials as those in leadership positions for the communities, agreed that there was indeed lack of commitment, effectiveness and accountability of them as leaders in issues regarding DRRM for realization of disaster resilience. They cited several issues contributing to the failure, majorly, insufficiency of resources in the city councils as compared to the needs on the ground.

Contrary to what the disaster victims indicated that they were not aware of the legal rights to protection by the government, 100% of the city officials indicated the individuals were rather aware of their legal rights. They indicated that rapid urbanization has resulted in influx of settlements in areas that are disaster prone. *'This does not mean the settlers in such areas aren't aware of the legal right to protection, but rather due to poverty induced overcrowding in cities; individuals have resorted to settling in areas vulnerable to disaster occurrences. We must understand the communities have a role to play in achieving disaster resilience characteristics. And this has to be by compliance to legal rule of law of administration of cities,' said one of the officials from urban planning section in one of the four cities".*

The **Table 12** below illustrates a cross tabulation of whether the city officials thought urban community residents in their cities had unified development goals and within them, embedded were DRRM strategies to realize resilient communities. As the table shows, most of the city officials indicated that the communities likely had available common community goals but were not being applied and indeed DRRM goals were rarely integrated into the development goals. The 9 officials indicated that often these community goals and integrated DRRM goals were only observed in case of a disaster occurrence.

Table 12: Development Goals and DRRM integration by City Councils

Common Community Development Goals	**Integration with Development Planning**		Total
	Non Integral	Rarely Integral	
Not Applicable (If available)	1	2	**3**
Available (Not applicable)	5	4	**9**
Total	**6**	**6**	**12**

83% (10 persons) of the officials when asked if communities had access to social funding and partnership aimed at DRRM and vulnerability reduction, they clearly indicated that such programs were available but unfortunately most of them were not sustainable. Thus such programs were often available on offer by non-governmental organizations or other stakeholders and would only last after until the end of post disaster management activities. 100% of the city officials expressed a concern that most of the programs run in the communities regarding DRRM, often did not include the vulnerable groups within the communities. 80% of the officials explained that this was due to the fact that government development policies for years has budgeted for DRRM activities in rural areas than urban

centers where disasters were not yet frequent. The officials further highlighted of several projects by World Bank, Red Cross Society and many other stakeholders which are carried out in the rural townships of Malawi despite the fact the urban areas are being faced with a similar challenges.

ii. Risk management characteristics

In this section, the city officials were asked to give comments on risk assessment characteristics of the urban communities that were often vulnerable to disaster occurrences. The first question aimed at establishing if the city officials, as the leadership, had played a role in a step that would encourage the conduct of risk assessments amongst the urban communities. Did the official's apart from initiating conduct of disaster risk assessment ensure continuity of such an activity? Were the outcome of the risk assessments done communicated to the rest of the community members, and did they devise remedial actions to the identified risks?

Of the 12 officials interviewed, a total of 10 indicated that neither did they get involved in any disaster risk assessment activities with the communities nor aware of any community that had done disaster risk assessments. 2 of the officials indicated that, they were aware of outdated desk preliminary risk assessments used in the proposed urban planning development activities years back before the current rampant urbanization. The city officials further explained that since most of the urban communities that are vulnerable to occurrence of urban disasters are the urban poor, it was practically impossible for them to adopt any local/scientist methods in urban disaster risk awareness. 100% of the officials agreed to the fact that rampant urbanization has rendered the resources in the city councils

insufficient to carter for all the challenges induced by it, thus waste accumulation, environmental degradation, infrastructure services, land degradation, and water and sanitation services.

iii. Urban residents knowledge and education on DRRM

The city officials in this section were asked to clarify the stand of urban resident's knowledgeability on DRRM activities. They were asked to comment on the three questions relating to public awareness on DRRM issues, dissemination of DRRM knowledge, and cultural attitudes and values on disaster recovery.

On public awareness the city officials were asked if they knew of any projects that encourage open public debate on disaster issues and eventually result in solutions to the major challenges faced by the urban communities. 9 of the 12 interviewed officials clearly expressed no knowledge of such projects current being employed. Of the 12; 3 said there were some infrequent debates or discussion in areas that had previously been affected by disaster occurrences. And only one official described that he was knowledgeable of recently implemented activities by an NGO aimed at encouragement of public debate amongst communities affected by disaster in Mzuzu City. The official further expressed that it was vital to clarify that the project had only commenced in 2 of 10 frequently affected areas in Mzuzu city.

When asked if dissemination of information on DRRM was sufficient in the cities of Malawi, the officials indicated that inability of city councils to raise enough funds for operations and insufficient funds for operation from local government had crippled most projects aimed at increased dissemination of information on DRRM; worse still other

projects aimed at environmental, waste management and water and sanitation have been completely crippled due to the insufficiency of funds. It wasn't surprising that 100% (12 officials interviewed) indicated that communities were rather not active in dissemination of DRRM information. Additionally, the officials highlighted that high population densities and uncontrolled urbanization and environmental degradation is a clearly evidence that Malawian cities residents do not embrace any form of cultural attitudes and values towards disaster recovery characteristics. Evidently, all the officials indicated that cultural attitudes and values rather play a weak or no role in embracing the buildup of disaster resilience.

iv. Communities risk management and vulnerability reduction

Environmental sustainability management, hazard resistant livelihood, social protection, protection to infrastructure, and land use planning practices are critical components to realization of a community that is resilient to disaster occurrences. The purpose of this section was to learn from the city officials on how the urban communities in the cities of Malawi were fairing on the above mentioned components.

On environmental sustainability management and hazard resistant livelihood of urban community residents in Malawian cities, all the officials indicated that these were a major challenge to be realized towards disaster resilient characteristic of the communities. All the officials clearly indicated that communities in urban areas in Malawi, specifically those that live in poor regions of the cities, clearly have zero practice attitude for environmental sustainability and hazard resistant livelihood. Further this was attributed to the economic status of the communities in most of the urban communities in the cities, coupled to the financial and resources incapability the four city councils have in Malawi.

On availability of social funds for recovery programs to the communities, the officials denoted that as of now these were available during disaster occurrences. They explained that the funds for disaster management were allocated to DODMA, and city councils would be allocated a partial some in case they had areas affected by disaster. Additionally, the officials were quick to say they were aware of projects that had been carried out soon after disaster occurrences and offered social recovery support to selected few heavily impacted individuals in some parts of the their cities.

Figure 9 below demonstrates the responses of the city officials when we asked them if any of the communities in their cities practiced methods related to mitigation of disaster risks through land use planning and infrastructure protection. The figure clearly denotes that this was not the situation on the ground as most of the officials indicated communities were not considering adoption of land use planning and protection of their infrastructure. When asked why this was the scenario, the officials presented two main reasons for the situation. Firstly, urban residents' poverty forces them to leave in areas prone to occurrence of disasters and failure to erect infrastructures that is appropriate and disaster resilient in such areas. Additionally, the condition worsens due to the high density of residents in the urban communities Secondly, the financial and resources insufficiency affecting the cities has forced the four city councils to fail management of issues regarding land use planning activities for settlers and regulation of infrastructure construction throughout the urban residents.

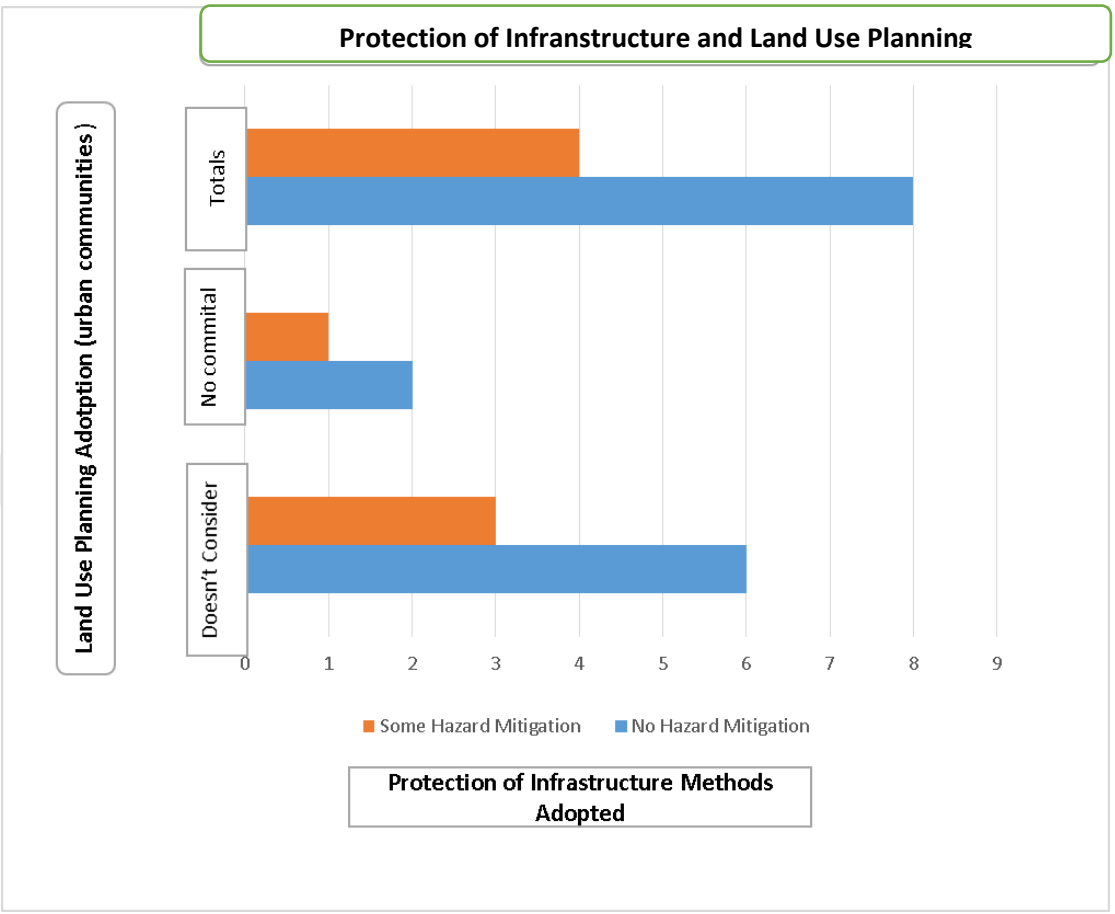

Figure 9: Infrastructure Protection and Land use Planning Adoption for DRRM as viewed by City Officials

v. Preparedness and response characteristic of urban communities

Communities' ability to have organized and coordinated structures demonstrates that the community has the capability to respond to and recover from disaster. This further shows that the community, through set up organization structures in their locality, are able to develop early warning systems that will enable the rest of the members adopt remedial actions discussed through the set up structures. Such communities have also the ability to come up with contingent plans in case of a disaster occurrence.

It wasn't surprising from the findings discussed earlier when 92% (11 officials of 12) said the urban communities, specifically those often affected by recurrence of disasters, shared none of the characteristics describe above. Thus, urban poor communities in the cities of Malawi have no formal structures or organizations that aids them in the design of contingency plans and setting up of early warning systems.

On the issue of disaster response and recovery, 83.3% (10 officials) expressed a concern that most communities are not concerned about disaster response and recovery. They explained that most communities affected by disaster reoccurrences continue to be resident in the same areas yearly. This is often despite support from NGOS and other stakeholders immediately after disaster occurrences. Clearly, this demonstrates the lack of an attitude to adopt methodologies that promotes disaster resilience, response and recovery.

4.1.4 Department of Disaster Affairs Management (DODMA) and Environmental Affairs Characteristics (EAD)

DODMA currently is housed under the Ministry of Home Security and Internal Affairs and the organization is responsible for the handling of all issues related to disaster management activities in Malawi. Annually, the department is allocated with funds to facilitate preparation of emergency response occurrences in case of any disaster occurrence. In this study two senior officials from the department were interviewed to give out their take on current disaster risk and occurrence situation in the urban areas of Malawi, specifically the cities of Blantyre, Lilongwe, Mzuzu and Zomba.

EAD is a department under the Ministry of Natural Resources, Energy, Mining and Environment and its sole responsibility it to mandate the administration and management of compliance with environmental and natural resources programmes, policies, and legislation towards the realization of sustainable development and poverty reduction. Similarly, the department through annual allocation from the mother ministry gets funding to ensure that programs related to environmental and natural resources management are realized throughout the country. The department contributed two of its senior officials who were interviewed and asked to give statistical and experience based response on current environmental situation of urban communities in the four cities of Malawi.

The two departments were purposively selected as they play two vital different roles. DODMA is responsible for the shaping of disaster management policies in Malawi as it currently holds the power to be the overseer of projects related to DRRM in Malawi. EAD is empowered as the overseer of national environmental policies development, legislation and monitoring. Thus the power to administrate major environmental changes occurring in the cities of Malawi and casual to disaster risks and occurrences are in the hands of this organization.

4.1.4.1 EAD Officials

The two senior officials from this department were first of all asked to comment on availability of policies, legislation and their enforcement in the cities of Malawi; Lilongwe, Blantyre, Zomba and Mzuzu. Additionally, they were asked to comment on the

current status of environmental issues in the cities of Malawi in relation to the urbanization trends and disaster resilient characteristics of the cities.

The officials from EAD involved in the study were both responsible for environmental affairs management and partially they had indicated to be involved in policy enforcement that address issue related to disaster management. As highlighted above, the focus was to gain knowledge from the two officials on how their department addresses issues related to environmental degradation, policy administration and climate change.

The officials clearly indicated that Malawi's policy framework is far more developed and what lacks now is execution of the policies available in the different sectors. They further indicated that the major challenge in the execution and development of policies is failure of mainstreaming policies towards common goals by the different departments. Political intervention in the execution of policies was also indicated as a major concern by the officials who said despite the vital support they have got from government in the development of policies, they have recently been faced with a challenge to implement them due to political decisions in projects throughout Malawi.

a. Environmental Issues and Urbanization in the cities of Malawi

In this section the EAD officials were asked several question relating to environmental degradation and urbanization in main four cities of Malawi. The first question aimed at establishing their knowledge on the current urbanization trends in the cities of Malawi. The officials indicated that urbanization growth in Malawi is rather rapid and presents a worrisome trend to be looked into seriously by all relevant stakeholders. They labelled the current trend of urban population growth in Malawian cities as

uneconomically viable and non-environmental. They bemoaned the rapid urbanization growth as one of the factors affecting the operation of implementation of environmental projects in the cities of Malawi. An example is what the officials gave highlighting that vegetation cover in all the cities of Malawi has continued to drastically reduce and this has led to climatic changes that are casual to the occurrence of several anthropogenic disasters that have been experienced.

The officials presented several issues that are evident to them as environmental policies and regulation officers in Malawi. They highlighted further that of recent year's environmental impacts of urbanization include but not limited to; settlements in riverine buffer zone, mushrooming of unplanned settlements, increasing land pressure, poor waste disposal, ground water resources contamination and increased incidences of criminal activities both environmental and human criminal cases. Settlements in riverine buffer zones in the cities of Lilongwe, Blantyre and Mzuzu has been established to be the causal factor to urban disaster reoccurrences. The officials mentioned areas like Mtandire and Chipasula (Area 23) in Lilongwe, Mchengautaba and Zolozolo in Mzuzu and Ndirande and Chilobwe in Blantyre.

Most often due to insufficiency of resources and mainstreaming of projects amongst government departments and local city councils, the measures employed to address the major environmental impacts of urbanization are not effective and efficient. Despite the involvement of other stakeholders in the field, enough has not been done yet. The EAD officials did indicate that there are mainly solutions to the current persistent problems on the environment arising from the current rampant urban population growth. The most vital methodology to be adopted is to ensure that government policies and legislation

implementation is mainstreamed into all government departments, and local city councils that are at the helm of execution of such policies and legislations. Secondly, the EAD officials indicated that city councils need to be sufficiently resourced, supported and empowered with skills. This is to ensure that enforcement of land and physical planning regulations and improvement on implementation of appropriate development control is a guarantee.

b. Urban communities disaster resilience characteristics

Malawian urban communities, specifically those that live in semi-urban or poor regions, were identified as at risk and vulnerable communities to occurrence of urban anthropogenic and natural disasters by the EAD officials. Several factors were represented as to why these urban communities are at a greater risk and vulnerable to the occurrence of disasters. The official indicated that currently our cities have no characteristic quality of disaster resilience because there is no commitment as evidenced by: lack of functional institutional frameworks for DRRM and civic protection, limited budgetary provision for DRRM activities, lack of contingency planning, and general negligence by community leaders on matters of DRRM and civil protection. Furthermore, they indicated that DRRM awareness in both rural and urban areas of Malawi and at large by the Government of Malawi (GoM) is limited to disaster relief, rehabilitation and recovery only. Additionally, poor disaster resilience in Malawi is built on the foundation of poor funding for DRR activities; of recent had focused on rural communities and ignoring the city residents that continue to face the challenge of continued disaster occurrence.

Despite availability of stakeholders involved in the field, the insufficiency of support from such stakeholders and poor mainstreaming of policies has affected execution of several projects aimed at realization of communities that are resilient to disaster occurrence. This is not only amongst the city residents but also the rural communities in Malawi. An example elaborated by the EAD officials was of the rural districts of Malawi Chikwawa, Nsanje and Mphalombe where continued reoccurrence of disasters has been evidenced for the past 2-3 decades annually. Such scenarios leaves a lot to desire on the role of leadership in integrating development goals with DRRM.

4.1.4.2 DODMA Officials

The officials from DODMA gave various comments relating to DRRM policies and integration of policies by DODMA with City councils in Malawi. Further the two senior officials expressed the current holistic view of adoption of DRR as a cole value of the organization. They also gave comments on the characteristics of urban communities as regard to disaster resilience.

In this section the researcher aimed at critically identifying the role of DODMA in the design and implementation of policies related to DRRM. The four sections below discuss the main points the questionnaires covered during the interviews done with the officials.

a. DRRM Policies in Malawi

The two officials indicated that currently Malawi, in 2015, adopted a new policy named National Disaster Risk Management Policy (NDRM).The vision of the new policy is to ensure that Malawi becomes a resilient nation to disasters. Thus the long term plan of the policy is to reduce disaster losses in all the parts they affect; thus loss of lives, social assets, environmental assets and economic losses. Vital to highlight is the fact that despite this being a recent policy, DODMA was established in 1991 and has been carrying out its roles since then. DODMA official indicate that issues regarding DRRM in Malawi is rather a new phenomenon. Earlier disaster management concept in Malawi was solely concerned with the disaster relief, rehabilitation and recovery. Thus the organization, DODMA, was more into management of post disaster effects and less into DRRM.

The new policy however addresses the concept of DRRM through its vision and mission statement and it forms the cornerstone as it is developed with mainstreaming of several other policy on environment, housing, local government and many more. To this reason, when we asked the DODMA officials whether leadership in Malawi through city councils and the government at large is committed and effective to implementation of DRRM, it was observed that DRRM being a new concept commitment was there but slugging. One of the officials indicated that "*There is commitment, of recent, to address urban disaster risk and vulnerability, something which was not the case in the previous years. However, issues of accountability among leaders remain a challenge, particularly in the utilization of resources meant for disaster response."*

b. City Councils as DRRM activities Lead

With continued reoccurrence of urban disasters in the cities of Malawi, city councils need to play an active role in the administration and execution of the newly introduced NDRM policy. Indeed, the new policy integrates several policies within it. The question that remains is whether city councils have been mandated as the lead in addressing issues regarding DRRM. Earlier the city officials had bemoaned the insufficiency of resources and poor policy mainstreaming and implementation as a challenge to realization of cities resilient to disaster occurrence.

Dating 2015, immediately after the NDRM policy launch, several projects in phases have been rolled out by DODMA and partner organizations aimed at allowing city councils throughout Malawi take the lead in DRRM. The DODMA officials cited examples of Mzuzu City, Lucheza and Kasungu Municipality as some of the regions in the pilot of adopting integration of disaster risk management plan (DRMP) in their development goals as city and municipalities'. It was indicated that with support from United Nations Development Programme (UNDP) and World Bank, their aim is to ensure all cities, municipalities' and district councils are mandated to take lead in management of disaster risk, response to disaster occurrence and recovery by ensuring that their local regulations and development goals have DRMP within them.

Though the above is the case, in a period of close two years a majority of plans and projects are in the pipeline pending implementation. One of the major challenges facing DODMA and city councils in Malawi to operationalize DRRM activities deals with limited government budgeting support. City councils bemoan the rapid increased population growth

to render their roles ineffective as resources are insufficient for the challenges in their jurisdiction.

c. Urban Communities Vulnerability to Disaster Occurrence

The DODMA officials were asked to give out their knowledge on issues relating to the vulnerability of urban communities in the cities of Malawi to disaster occurrences. In other words that researcher wanted to establish whether urban community's residents in the cities of Malawi have any form of disaster resilience characteristic.

The DODMA officials highlighted that leadership is rather committed in Malawi to reduce the vulnerability of urban communities to disaster occurrences, though they indicated it is a new phenomenon their organization was working hard to realize. This was rather different from the thoughts of the victimized communities, city councils officials and EAD officials who labelled commitment to DRRM issues as lacking. The three groups labelled commitment to DRRM lacking based on limited budgeting, poor mainstreaming and implementation of policies, and continued reoccurrences of urban natural disaster in the cities of Malawi.

The officials also bemoaned that in Malawi, specifically within cities, the communities are not really aware of the legal responsibility of the role of the government in civic protection. They highlighted though, that people are aware of legal laws that prohibit individuals to settle in disaster prone areas. It is sad though individuals, especially the urban poor, take advantage of lack of enforcement of such regulations and continue to settle in hazard prone areas; thus in the river bank buffer zone areas.

On whether our city councils or the communities have common goals and within them integrated with DRRM principles, the DODMA officials said that the goals are there, though they may not be common. Risk reduction is part of the broader development strategy within the cities, though this may be taken from the perspective of broader development goal than risk reduction, per se. They continued to say that it is the goal of new NDRM policy to ensure that such DRMP are revealed and communicated to the public. Furthermore, they indicated that current vulnerability reduction is rather a difficult task as most vulnerable groups in the urban communities are left out of the discussions of DRRM. There are several vulnerable groups within the city fabric, including the land constrained and poor who occupy hazardous location, women, children, disabled and the elderly. Their participation in DRRM planning is limited.

One other major issue discussed by the officials on urban community residents' resilience to disaster occurrences was on whether vulnerability and capacity assessments (VCAs) had been conducted in our cities in Malawi. The DODMA official clearly indicated though this was the responsibility of city councils, the introduction of the NDRM policy will involve carrying of VCAs to come up with realistic DRMP to be integrated in the development plan of the city councils. The officials indicated of activities aimed at VCA in Blantyre City, Kasungu and Luchenza Municipal Councils and Mangochi Town Council as we interviewed them.

The officials were also asked to comment on what their organization and all relevant stakeholders do or have done to ensure that DRR information and knowledge is transmitted and discussed amongst the urban communities (victims of disaster occurrences). It was learnt that on a small scale DODMA and other stakeholders like UN-Habitat, JICA

and UNDP carried out spatial projects aimed at discussing the occurrence of urban disasters with communities in cities of Malawi in Mzuzu, Zomba and Blantyre. Additionally, the officials expressed progress in DRR information knowledge contributable to the recent projects being carried in the cities and town councils of Malawi to develop DRMP and integrate them with development goals. Now, staff in the four cities are being trained on DRRM and upon enforcement of city DRMP, they will be responsible for coordination of DRRM activities inclusive of occurrences management.

Our urban communities' residents' are currently considered counter-productive to the realization of disaster resilient communities. Most communities in the city that are in areas grouped as the urban poor, have settled in areas prone to occurrence of various forms of disasters and they do want to move as they know that the government will always assist them when they are affected (68% of urban dweller are currently urban poor in slums (UN-Habitat 2011a)). These communities are often considered the group that has induced wanton environmental degradation in the cities of Malawi and consequently reoccurrence of urban disasters. Conclusively, it is not erroneous to say the majority of the urban population are contributing to environmental degradation and harm within the cities. It must be noted that these urban poor communities have taken advantage of the lack of enforcement of law in most of our cities in Malawi. As long as there is no law enforcement, the cities may adopt the environmental management practices on paper but in practice they may not be implemented.

On adoption of hazard livelihood practices by urban communities in quest to realize less vulnerable communities and availability of social protection schemes that aid communities in case of a disaster occurrences, the officials expressed that not everyone

practiced hazard disaster livelihood lifestyle and over 95% of urban residents have no access to social schemes when hit by disaster occurrences. There are several urban communities that adopt practices that are exposing them to disaster risks and increasing their vulnerability. Of recent, disasters in urban areas have become more common, and more severe. Almost every year one or more city is affected by disasters of various types in Malawi. This is due to exposure to disasters through poorly located disaster prone settlements, weak infrastructures in such areas, and poor decision regarding land use planning leading to rampant environmental degradation and hence increased disaster vulnerability.

Our cities in Malawi, due to the factors highlighted above are highly vulnerable to disaster risk occurrence. The DODMA officials pointed out that our cities have no capacity at all to run in case of a large impact from disaster occurrence. Majority of cities have no trained personnel and operating organization in disaster preparedness and response. Operational Early Warning Systems in the cities in case of occurrence of urban disasters are very limited. At the moment the officials were being interviewed they expressed that none of the four cities in Malawi had a contingency plan developed and/or operational and none had infrastructure specifically designed for emergency response to heavy disaster impacts. It was also discovered that cities in Malawi with the help of DODMA play a leading role to response and recovery from disaster occurrence but the major concern is their capacity is lacking.

4.2 Concluding Remarks

The results presented and discussed above show that currently urbanization plays a big role in the operation of the cities of Malawi. Thus urbanization has a role in rampant environmental degradation and continued reoccurrence of urban disasters. Currently, none of our cities have developed contingency plan, urban community members have no access to schemes and education on DRRM and lack of proper mainstreaming of policies and their enforcement all leading to communities that are vulnerable to disaster occurrences.

There is a very thin line that separate the link to the relationship that exists when talking of urbanization, environmental degradation and urban disaster risk in the cities of Malawi.

CHAPTER FIVE

5. KEY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The discussion in the chapter focuses on presentation of the key findings, conclusions and recommendation based on the analysis and discussion of the data in the previous chapter. Conclusions and recommendations are made based on the summary of the findings highlighted above and thus in relation to objectives of the study. The main objective of this study was to establish the current situational analysis of the connection that exists between urbanization and environmental degradation in relation to urban disaster risk and occurrences in the cities of Malawi. The problem statement of the research was the continued reoccurrences of disasters in Malawian cities and the rampant urban population growth evidenced by the increased number of squatters. This is despite several strategies that have been applied addressing issue related to urban population growth, environmental degradation and disaster occurrences. The research shows that there is still need of the stakeholders in DRRM to do something more as to achieve communities disaster resilient characteristics specifically amongst the urban poor residents in the cities of Malawi.

The conclusion made in this paper are clearly aimed at the realization of urban communities that are disaster resilient and leadership which is committed and effective towards DRRM goals.

5.1 Key findings and Discussion

These key findings are discussed and summarized into six different subheadings and majorly address the specific research objective of this paper.

5.1.1 Demographic and Disaster Victims Characteristics in the Cities of Malawi

It is clear from the findings that urban population in Malawian cities continues to grow at a rampant rate. Cities are at the point of experiencing population explosion due to the continued trends of rural-urban migrants. Unfortunately, rural-urban migrants moving to the cities have no adequate education and skills that can enable them join the job industry once in the cities. Coupled to poor educational backgrounds, the rural-urban migrants continue to squeeze themselves on small pieces of land once in the cities. This is evident through the high population densities our cities continue to experience.

Most of the residents in areas that are affected by natural disasters in the cities of Malawi are characterized by communities that lack a stable income and depend on casual work for their survival. Living in areas with high population densities and with poor urban land use planning practices, coupled with unstable incomes, the communities are unable to adopt infrastructure protection systems that can empower adoption of DRRM. This clearly is also evident through the magnitude of impact by the occurrence of disasters when they happen in the cities.

5.1.2 The Link Between Urbanization and Environmental Degradation in Relation to Urban Disaster Risks and Occurrences

As highlighted by the findings, over 93% of respondent from all the sectors considered in the study clearly indicated that urbanization is typically very rampant in Malawian cities. This is blamed on mainly the uncontrolled rural-urban migration being experienced now throughout Malawi. Of the 29 districts Malawi has, urban population percentage is estimated at 16.7% (NSO, 2010), 80% of the total urban percentage is established to be based in the four cities of Malawi; Lilongwe, Blantyre, Mzuzu and Zomba (NSO, 2009). 68% of the 80% city urban residents in Malawi are classified to be based in urban slums conditions and often in higher population densities (UN-Habitat, 2011a). The findings in the study clearly show that most of the areas affected by disaster occurrences in the cities of Malawi are those that are occupied by the urban poor and with characterized with high population densities.

Such communities experience rampant environmental degradation basically for two major reasons. The first being urbanization induces rampant use of available natural resources for survival of the communities and this leads to rapid depletion and degradation of the environment. On the other hand, the continued increased population growth in areas that are accessible to the rural-urban poor has led to the creation of uncontrollable population densities in these communities. Such large densities put extra pressure on land

use and leads to environmental degradation and consequently worsen the impacts of disaster occurrences.

To clearly demonstrate the impact of urbanization on environmental degradation and how it relates to occurrence of natural disaster **Appendix II and III** below are two sets of photographs; the first is of a situation of urban poor settlements in Ndirande, Mchengautuba and Chipasula and the second are google maps photos differentiating population densities in the cities of Lilongwe, Blantyre and Mzuzu between 2003 to 2018.

5.1.3 Urban Community Disaster Resilience Characteristics

Based on the GOAL Toolkit for measurement of disaster resilience of communities and the findings presented in this paper, urban communities in Malawi are classified as the second level group with low disaster resilience. Thus numerically the urban communities' resilience in the cities of Malawi is between 21-40%. The findings demonstrate that the government is aware of the problem of disaster occurrences in the cities. It has developed policies to adopt DRRM and has the capacity to carry out the plans but the interventions remains limited. This is to say the interventions are only one-off meal and short term.

The findings shows that lack of commitment by leadership of the communities, lack of awareness and knowledge of what DRRM is by the communities, and poverty are the three major reasons why most urban poor communities are not resilient to disasters. Poverty induces rapid urbanization, leading to uncontrolled urban environmental degradation and causally increased vulnerability to disaster risks.

5.1.4 DODMA, EAD and City Councils on Urban Policy in DRRM

Drumming up support for DRRM requires leadership that is committed and effective in execution of their outlined policies and regulations. DODMA as the sole body with power to administrate all issues related to DRRM needs to step up and ensure that the concept of DRRM is adopted by all relevant stakeholders in the country within the field of disaster management. Policies and regulations of EAD and city councils on DRRM need to be mainstreamed with all other relevant government policies and regulations to ensure the realization of communities that are resilient to disaster.

The findings in this study are that currently DODMA, EAD and City Councils lack the commitment to mainstream their policies to ensure that projects with a common goal of DRRM are realized. For years DODMA had focused on independently running the issues related to disaster management, leaving out vital organizations like City Councils and EAD which are at the fulcrum of realization of such projects. Additionally, City Councils and EAD need to ensure that their policies align to ensure successful execution of projects addressing issue relating to environmental degradation in the cities of Malawi.

5.1.5 The Role of City Councils on Urban Planning for DRRM

City councils current have a lot of problems relating to their operation in the fight against continued urbanization and several problems arising from the rampant urban population growth. The findings in this study clearly denotes that our cities are not resourced enough to run their mandates of protecting their communities. Characterized by insufficient

resources, insufficient staff and ineffective enforcement of several by-laws; cities no longer take the lead role in ensuring that the urban communities are safe and resilient from disaster occurrences.

Our cities are not able to enforce urban planning land use regulations, and this is why the masses flocking to the cities from rural areas have taken the advantages to settle in areas naturally designed as buffer zones of rivers and in other cases protected areas due to incidence of reoccurrence of disasters. Our City Councils in Malawi are not empowered to take action by the National Local Government Laws on several issues that affect adoption of DRRM goals affecting the cities. Unlawful expansion of settlements in most urban communities administrated by local chiefs are rampant now in the cities of Malawi. Such settlements have led to increased case of poor land use practices, waste accumulation, rampant environmental degradation and hence worsening the occurrence of urban disaster vulnerability. Political interference has been singled out as one major factor affecting the operation of several government departments and city councils in Malawi. The need to gain political favours has been singled out as one of the major factors in addition to the insufficiency of resources and staff affecting enforcement of regulations and laws on urban planning and land use, environmental control and many more. City Council without a capacity to take leading roles in the enforcement and implementation of projects either related to urban planning and environmental management; the dream to have DRRM integrated in development goals is along away to be realized.

5.1.6 Environmental Conservation for Sustainability and DRRM

The findings clearly show that environmental conservation for sustainability is not clearly thought of when all departments responsible for the adoption of DRRM in Malawi were interviewed. EAD indicates that unavailability and insufficiency of budgetary support renders over 70% of its planned activities unsuccessful. Further the department bemoans ineffective mainstreaming and implementation of government policies from various departments aimed at addressing several issues including environmental management. City councils in Malawi complain of the exclusion from involvement in projects run by several stakeholders in realization of environmental conservation and sustainability.

In whatever the situation, environmental conservation for sustainability and quest for realization of communities that are less vulnerable to disaster occurrence and have adopted DRRM, requires multi-sectoral policy and programs integration in a developing country like Malawi. Achieving environmental conservation for sustainability and DRRM requires enormous effort but this has to be work of all the stakeholders affected or with interest in the subject of discussion, thus including the local urban communities at large.

5.2 Conclusions

The conclusions below are directed at the set objectives of the study and their basis is on the findings as discussed in chapter four and earlier in this chapter.

5.2.1 Urban Population Growth Trends in Cities of Malawi

The data analysis and key findings presented in the paper, clearly indicate that urban population trends continue to grow very rapidly in all the four Malawian cities. The stakeholders interviewed in this survey agree that the problem of rampant urban population growth in Malawian cities is rather getting worse day by day. It is rather not erroneous to conclude that with such a trend of urban population growth, urban communities in Malawi are likely to face a situation of population explosion. Evidenced with several challenges highlighted in this paper, the urban population boom needs clearly defined methodologies to address the negative externalities they trigger in the Malawian cities including environmental degradation and disaster occurrences.

5.2.2 Impact Of Urban Population Growth On Environmental Degradation

We can conclude that urbanization in the cities of Malawi is rather the causal factor for the continued reoccurrences of natural disaster on an annual basis in the cities of Malawi. The link between urbanization and environmental degradation is denoted to be worsening every day. The rural-urban migrants once in cities settle in areas that are naturally

prohibitive to for settlements. With high population densities in such areas, environmental degradation is often the ultimate outcome and this has put the residents of such areas vulnerable to disaster occurrences.

The casual relationship between urbanization and environmental degradation has been an outstanding challenge that seems not to be appropriately addressed. Stakeholders have resorted to addressing post disasters impacts management than solving the ultimate cause of the recurrent occurrences of anthropogenic disaster in cities of Malawi, thus addressing the solutions that would render averting the negative externalities that arise from the sour relationship between urbanization and environmental degradation. The impact of urban population growth in Malawi on the environment has continued to worsen due to what is describe the non-economic viability of our cities and the nation at a large to handle the rampant growth of population being experienced.

5.2.3 Urban Risks to Occurrence of both Natural and Anthropogenic Disasters in Malawi Cities

The evidence presented in this study clearly shows that our urban communities, specifically the 68% that resides amongst the urban poor community, are one of the worst vulnerable to occurrence of disaster thus both natural and anthropogenic. Over the years several disaster have continued to occur and have left various forms of impacts on communities in such areas as presented in the data analysis section. For example Mtandire in Lilongwe, Nchengautaba in Mzuzu, Ndirande and Chilobwe in Blantyre and Sadzi in Zomba have been the most expected areas to be hit by several anthropogenic disaster like

flash floods, floods, mudslides and natural whirlwinds. Such urban communities have continued to suffer loss of their property and worst case scenarios their lives. Conclusively the risk to occurrence of both natural and anthropogenic disaster amongst the urban poor is due to three factors namely:

a. The impact of rapid urbanization within their (urban poor residents) living environment.
b. Ineffective, inefficiency and poorly committed leadership of the communities when it comes to dealing with issues on the vulnerability to disaster and DRRM.
c. Poor mainstreaming of policies by government, its departments and relevant stakeholders working in the field of disaster management affairs.

5.2.4 Effectiveness of Urban Community Disaster Resilience and DRRM Programs

The research thesis in totality presents that characteristically the communities in the cities of Malawi are not resilient to disaster and they have not adopted yet DRRM practices. As earlier discussed the vulnerability to disaster is due several factors. The major factor though affecting the communities' attitude towards adoption of DRRM practices is far more complex and though it may be related to the factors that were earlier presented. Poverty of the urban community residents is a major factor that influences the decisions of the residents towards adoption of DRRM practices.

Programs on post disaster management activities in Malawi may be classified as a failure. This is similarly to the situation of DRRM practice adoption by residents in the communities of cities of Malawi. Based on the key findings and data analysis presented earlier in this paper, disaster management policies in Malawi, as operated by DODMA and other relevant stakeholders, has often focused on rehabilitation and recovery rather than embracing the key principal of DRRM. It is until the 2015 NDRM policy when DODMA has joined the roles of independent stakeholders like UNDP, Red Cross, The World Bank and others to enable change of attitude amongst communities through their local councils to start embracing DRRM. It is clearly evident that it would be erroneous to start measuring if disaster management carried out in the country has been effective or not. Despite that not much was done on adoption of vulnerability reduction and DRRM, and hence less effective; on disaster response programs DODMA and stakeholders would be commended for.

5.3 Recommendations

Based on the findings of the study as presented in the previous parts of this research, several recommendations to follow are highlighted. This in the view of the current situational analysis of the relationship between urbanization and environmental degradation and the occurrence of urban disasters in the cities of Malawi; Lilongwe, Blantyre, Mzuzu and Zomba.

(a). One of the major challenges affecting the operation of all environmental and DRRM activities Malawi is related to the fact there are insufficient funds, resources and staff to effectuate most of the planned activities. There is need, therefore, for the

Government of Malawi (GoM) through its relevant departments to adjust budgetary allocation and spending on all activities related to environmental issues and DRRM throughout Malawi.

(b). There is need of mainstreaming policy development and implementation from all government departments working in the field of environmental management, urban planning and DRRM so at to realize common goals through execution of projects in related targeted areas as one team.

(c). There is need of the GoM to revise its existing policies that govern issues related to population growth and urban migration. There should be development policies aimed at generation of new growth centers apart from the four major cities in the quest of reduction of rural urban migration.

(d). Most urban community residents are not aware of major impacts their settlement in densely populated areas causes on the environment and consequently worsening the post disaster occurrence effects. It is requirement that urban community residents need to have the capacity to understand the impact of their actions on the environment and how those actions are causal to the occurrence of urban disaster risk at large. In other words there is need to ensure that public awareness on issues related to urbanization, environmental degradation and urban disaster occurrences has to propagated throughout the cities of Malawi and rural communities inclusive.

(e). City Councils in Malawi, despite availability of several local governments' acts, continue to be faced with challenges in the enforcement of several bylaws and regulations as there are still gaps between the bylaws and government laws. One of the major solutions to deal with the problems arising from continued accumulation

of individuals in already dense and prohibited locations in the cities of Malawi, is to ensure that city councils have all the necessary mandate to manage aspects of city urban land use and planning. If city councils have the total mandate to administrate the land use development and planning, there will be reduced cases of deliberate settlements in areas that already dense and located in areas consider as buffer zones or natural drainage areas.

(f). There is a need to ensure that city councils are mandated with the fulcrum role in the management of disaster risk reduction, response and recovery issues. Thus city councils need to adopt their own city bylaws that govern their responsibility in relation to DRRM. DRRM has to have an independent established department in the various city councils that integrates the concept DRMP into the development goals of our cities, which currently is not the case in Malawi. This department will be responsible for the overseeing of issues to deal with public awareness on DRRM issues, setting up of social funds in case of a disaster occurrence in the communities, emergency infrastructure establishment and response and recovery plans specific for their cities.

(g). There is the urgent need of coordination between the private and public DRR and management stakeholders in city councils and Malawi at large. It is evident that projects on DRRM have been carried out by private stakeholders through NGOs and CSOs with minimal involvement of the GoM and City Council Officials. additionally the focus of most of such projects have focused on rural areas sidelining the city that currently suffer in silence the continued rampant occurrence of both natural and anthropogenic disasters.

(h). DODMA is currently underway with enforcement of the contents of 2015 NDRM Policy, aimed at ensuring that DRRM becomes part and parcel of development goals of all the cities, municipalities, town and district councils. Three years down the line; of four cities councils, several municipalities, town and district councils, less than six of 29 districts in Malawi have successful began the integration of DRRM into their development agendas. There is need for DODMA to speed up endorsement of the needed NDRM policy contents in all the districts of Malawi. This will also help raise awareness on DRRM issues both in the rural and urban areas of the country.

(i). Our cities councils continue to be faced with several environmental issues which have played a major role in worsening the impact of disasters when they occur. Urbanization has led to wanton cutting down of trees, continued accumulation of wastes, contamination of water resources and many more environmental issues. There is need for all city councils in collaboration with EAD to formulate stringent environmental bylaws to help in the reduction of continued rampant environmental pollution. Additionally, Malawi as country needs to develop a national wide applicable environmental conservation plan to address issues related to re-afforestation and related sections.

(j). Our cities experience severe damages when disaster such floods, flash floods, whirlwinds occur. The extensive damages are experienced due to the poor nature of fragmented laws and codes that govern the administration of infrastructure design and construction. There is therefore, a clear need of development of laws and codes

in the management of urban open spaces and specified and regulated construction in such areas to reduce the impact of disaster occurrences.

(k). There is also currently a need for the government of Malawi and its city councils to broaden their exploration of a broad base of partnerships to be involved in addressing environmental and DRRM issues in Malawi. This may be achieved by ensuring that environmental and DRRM issues are integrated in all sectors of development since these topics are already multi-stakeholder in nature.

(l). Lastly, one of the most challenging and vital recommendation is ask the government of Malawi through respective city councils to draft plans for resettlement/relocation of all urban communities that are frequently affected by disaster occurrence. These communities may include those in areas that are densely populated and located in buffer zones or areas prone to disaster occurrences. It must be noted though that this should be a resolution only when all plans related to the cost of relocation and resettlement of the communities are done and perfectly communicated to the relevant stakeholders in discussion. This is to avoid later cases that may arise due to several issues related to the daily living of the communities once relocated.

5.4 Areas for further study

The research has mainly discussed in entirety an analysis of current situation of the relationship between urbanization and environmental degradation in relation to urban disaster risks and occurrences in the four cities of Malawi. The research focused on four main stakeholders in the fields of urbanization, environmental degradation and urban disasters occurrences namely: urban communities, city councils, EAD and DODMA. However, in case of future researcher's interests in a related field, it would be worthwhile to note that disaster occurrences have also spread widely in urbanized town councils of the districts of Malawi like Salima, Dedza, Chikwawa, Nsanje and others. This could also form an important area of research to establish why such occurrence are widely spreading to urbanized areas of district town councils. Another area of research could be to focus on the evaluation of the success of implementation of the NDRM policy in integrating its contents with local community government councils throughout Malawi.

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APPENDICES

I. Assessment Criterion for Community Disaster Resilience Characteristics Used in the Study *(Modified and adopted from a design developed by GOAL Toolkit for Disaster Risk Management 2015)*

A. General Criteria Assessment

ASSESSMENT METHODS FOR DISASTER RESILIENCE PART OF QUESTIONNAIRES

The assessment shall be based on two grading systems of the five thematic areas to a certain the percentages and the level/categories of the thematic areas based on the results obtained. The computation of the data and discussion shall be done as the diagram below denotes. This is as adopted from a disaster resilience toolkit by GOAL. Upon establishing the impact urbanization has on environmental degradation, which shares a causal relationship with the occurrence of natural disasters, the measure of resilience to urban disaster shall be used to ascertain the current situation and relationship of urbanization, environmental degradation and the occurrence of urban disasters.

%	LEVEL	CATEGORY	DESCRIPTION
0-20	1	Minimal Resilience	Little awareness of the issue(s) or motivation to address them. Actions limited to crisis response.
21-40	2	Low Resilience	Awareness of the issue(s) and willingness to address them. Capacity to act (knowledge and skills, human, material and other resources) remains limited. Interventions tend to be one-off, piecemeal and short-term.
41-60	3	Medium Resilience	Development and implementation of solutions. Capacity to act is improved and substantial. Interventions are more numerous and long-term.
61-80	4	Resilient	Coherence and integration. Interventions are extensive, covering all main aspects of the problem, and they are linked within a coherent long-term strategy.
81-100	5	High Resilience	A 'culture of safety' exists among all stakeholders, where DRR is embedded in all relevant policy, planning, practice, attitudes and behaviour.

B. DRRM Governance

THEMATIC AREAS	NO	QUESTIONS	LEVEL	LEVEL TWIG IN QU	DESCRIPTION	%	CATEGORY
GOVERNANCE	1	COMMUNITY LEADERSHIP	1	Strongly Disagree	**Non Commital**	0-20	Minimal Resilience
			2	Disagree	**Limited Commitment**	21-40	Low Resilience
			3	Neutral	**Medium Level**	41-60	Medium Resilience
			4	Agree	**Basically Committed**	61-80	Resilient
			5	Strongly Agree	**Committed**	81-100	High Resilience
	2	RIGHT AWARENESS AND ADVOCANCY	1	Strongly Disagree	**Non Awareness**	0-20	Minimal Resilience
			2	Disagree	**Limited Awareness**	21-40	Low Resilience
			3	Neutral	**Aware/No Action**	41-60	Medium Resilience
			4	Agree	**Good Awareness**	61-80	Resilient
			5	Strongly Agree	**Excellent Awareness**	81-100	High Resilience
	3	INTERGRATION WITH DEVELOPENT PLANNING	1	Strongly Disagree	**Non Integral**	0-20	Minimal Resilience
			2	Disagree	**Rarely Integral**	21-40	Low Resilience
			3	Neutral	**Fairly Integral/Outd**	41-60	Medium Resilience
			4	Agree	**Integral/non applicat**	61-80	Resilient
			5	Strongly Agree	**Regulary Integral**	81-100	High Resilience
	4	ACCESS TO FUNDING AND PATERNERSHIP	1	Strongly Disagree	**No DRR Parternship**	0-20	Minimal Resilience
			2	Disagree	**Unstable Partenersh**	21-40	Low Resilience
			3	Neutral	**Fairly Stable**	41-60	Medium Resilience
			4	Agree	**Stable**	61-80	Resilient
			5	Strongly Agree	**Very Stable**	81-100	High Resilience
	5	VULNERABLE GROUP INCLUSION	1	Strongly Disagree	**No Participation**	0-20	Minimal Resilience
			2	Disagree	**Occasionally**	21-40	Low Resilience
			3	Neutral	**Some Participation**	41-60	Medium Resilience
			4	Agree	**Most Groups Partici**	61-80	Resilient
			5	Strongly Agree	**All Group Participati**	81-100	High Resilience

C. Risk Assessment for DRRM

RISK ASSESSMENT	**6**	HAZARD ASSESSMENT	**1**	Strongly Disagree	**Never**	0-20	Minimal Resilience
			2	Disagree	**Outdated**	21-40	Low Resilience
			3	Neutral	**Partially shared (few)**	41-60	Medium Resilience
			4	Agree	**Mostly shared (Many)**	61-80	Resilient
			5	Strongly Agree	**Done and Working**	81-100	High Resilience
	7	VULNERABILITY/CAPACITY ASSESSMENT	**1**	Strongly Disagree	**Never**	0-20	Minimal Resilience
			2	Disagree	**Outdated**	21-40	Low Resilience
			3	Neutral	**Partially shared (few)**	41-60	Medium Resilience
			4	Agree	**Mostly shared (Many)**	61-80	Resilient
			5	Strongly Agree	**Done and Working**	81-100	High Resilience
	8	LOCAL AND SCIENTIFIC METHODS FOR RISK ASSESSMENT	**1**	Strongly Disagree	**No Local knowledge**	0-20	Minimal Resilience
			2	Disagree	**Some risk awareness**	21-40	Low Resilience
			3	Neutral	**Medium level awareness**	41-60	Medium Resilience
			4	Agree	**High level of awareness**	61-80	Resilient
			5	Strongly Agree	**Better level of awareness**	81-100	High Resilience

D. DRRM Knowledge and Education

KNOWLEDGE AND EDUCATION	**9**	PUBLIC AWARENESS AND KNOWLEDGE	**1**	Strongly Disagree	**Not openly debate**	0-20	Minimal Resilience
			2	Disagree	**Some Infrequent debate**	21-40	Low Resilience
			3	Neutral	**Fair level of debates**	41-60	Medium Resilience
			4	Agree	**Frequently and Participatory**	61-80	Resilient
			5	Strongly Agree	**Costitent and frequent**	81-100	High Resilience
	10	EDUCATION AND TRAINING	**1**	Strongly Disagree	**Minimal**	0-20	Minimal Resilience
			2	Disagree	**Some**	21-40	Low Resilience
			3	Neutral	**Fairly Knowledgeable**	41-60	Medium Resilience
			4	Agree	**Knowledgeable**	61-80	Resilient
			5	Strongly Agree	**Wide Spread Knowledgeability**	81-100	High Resilience
	11	CULTURE, ATTITUDE, MOTIVATION	**1**	Strongly Disagree	**Very Week Role**	0-20	Minimal Resilience
			2	Disagree	**Weak Role**	21-40	Low Resilience
			3	Neutral	**Active Roles**	41-60	Medium Resilience
			4	Agree	**More Active Roles**	61-80	Resilient
			5	Strongly Agree	**Proactive & Effective Roles**	81-100	High Resilience

E. Risk Management and Vulnerability Reduction

RISK MANAGEMENT AND VULNERABILITY REDUTION	12	ENVIRONEMNTAL AND NATURAL RESOURCES MANAGEMENT	1	Strongly Disagree	**No Practices**	0-20	Minimal Resilience
			2	Disagree	**Little Practices**	21-40	Low Resilience
			3	Neutral	**Some Practices**	41-60	Medium Resilience
			4	Agree	**Medium Practices**	61-80	Resilient
			5	Strongly Agree	**Sustainable Practices**	81-100	High Resilience
	13	HAZARD RESISTANT LIVEIHOODS PRACTICES	1	Strongly Disagree	**Non Hazards Resistant**	0-20	Minimal Resilience
			2	Disagree	**Few hazard resistant**	21-40	Low Resilience
			3	Neutral	**Some hazard resistant**	41-60	Medium Resilience
			4	Agree	**Most hazard resistant**	61-80	Resilient
			5	Strongly Agree	**All hazard resistant**	81-100	High Resilience
	14	SOCIAL PROTECTION	1	Strongly Disagree	**No Access to SP (Any)**	0-20	Minimal Resilience
			2	Disagree	**Access to informal SP**	21-40	Low Resilience
			3	Neutral	**Limited Acess to both SP**	41-60	Medium Resilience
			4	Agree	**Access to Formal SP (indirect)**	61-80	Resilient
			5	Strongly Agree	**Acess to effective formal SP (direct)**	81-100	High Resilience
	15	PROTECTION OF INFRASTRUCTURE	1	Strongly Disagree	**No Hazard Mitigation**	0-20	Minimal Resilience
			2	Disagree	**Some Hazard Mitigation**	21-40	Low Resilience
			3	Neutral	**Fairly Hazard Mitigation Applied**	41-60	Medium Resilience
			4	Agree	**Majorly Hazard Mitigation**	61-80	Resilient
			5	Strongly Agree	**Hazard mitigated structures**	81-100	High Resilience
	16	LAND USE PLANNING	1	Strongly Disagree	**No commital**	0-20	Minimal Resilience
			2	Disagree	**Doesn't Consider**	21-40	Low Resilience
			3	Neutral	**Considers-Short term**	41-60	Medium Resilience
			4	Agree	**Considers-Long term**	61-80	Resilient
			5	Strongly Agree	**Effective (Local and International)**	81-100	High Resilience
	17	OPERATION OF SERVICES IN EMERGENCIES	1	Strongly Disagree	**Frequently impacted**	0-20	Minimal Resilience
			2	Disagree	**> 1 month after impact**	21-40	Low Resilience
			3	Neutral	**< 1 month after Impact**	41-60	Medium Resilience
			4	Agree	**<1 week after impact (10year)**	61-80	Resilient
			5	Strongly Agree	**Very rare Impacts**	81-100	High Resilience

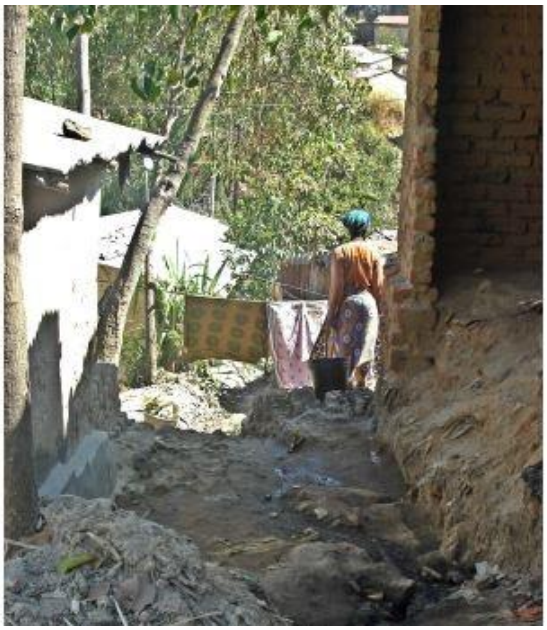
F. Preparedness and Response for DRRM

PREPAREDNESS & RESPONSE	18	ORGANISATIONAL CAPACITIES AND COORDINATION	**1**	Strongly Disagree	**Very Weak**	0-20	Minimal Resilience
			2	Disagree	**Weak**	21-40	Low Resilience
			3	Neutral	**Fair**	41-60	Medium Resilience
			4	Agree	**Good**	61-80	Resilient
			5	Strongly Agree	**Strong**	81-100	High Resilience
	19	EARLY WARNING SYSTEMS	**1**	Strongly Disagree	**Non available**	0-20	Minimal Resilience
			2	Disagree	**Raraely used**	21-40	Low Resilience
			3	Neutral	**Tools availble (Not used)**	41-60	Medium Resilience
			4	Agree	**Effective tools available (not regulary use**	61-80	Resilient
			5	Strongly Agree	**Functional Tools Available**	81-100	High Resilience
	20	PREPAREDNES AND CONTIGENCY PLANNING	**1**	Strongly Disagree	**No contingency plan**	0-20	Minimal Resilience
			2	Disagree	**Not being applied**	21-40	Low Resilience
			3	Neutral	**Occasionally applied**	41-60	Medium Resilience
			4	Agree	**Regulary Applied**	61-80	Resilient
			5	Strongly Agree	**Effective and Regulary**	81-100	High Resilience
	21	EMERGENCY RESOURCES INFRASTRUCTURE	**1**	Strongly Disagree	**Unsafe and Unavailable**	0-20	Minimal Resilience
			2	Disagree	**Small Scale available**	21-40	Low Resilience
			3	Neutral	**Fair Scale available**	41-60	Medium Resilience
			4	Agree	**Structures and Resources available**	61-80	Resilient
			5	Strongly Agree	**Purpose built structures**	81-100	High Resilience
	22	EMERGENCY RESPONSE AND RECOVERY	**1**	Strongly Disagree	**Mainly passive role**	0-20	Minimal Resilience
			2	Disagree	**Do not prioritize need**	21-40	Low Resilience
			3	Neutral	**Usually plays a leading role**	41-60	Medium Resilience
			4	Agree	**Always plays a leading role**	61-80	Resilient
			5	Strongly Agree	**prioritized**	81-100	High Resilience

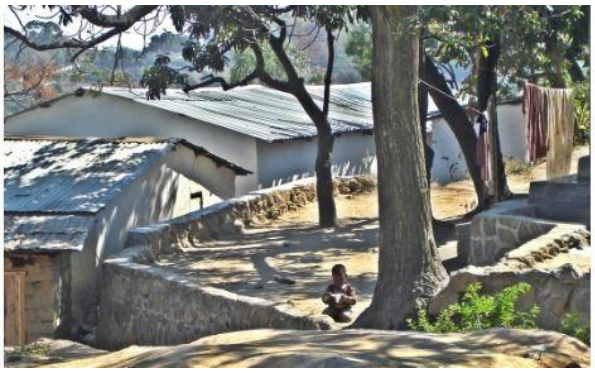
II. Photographical Display of the Current Situation of Impact Of Urbanization in High Density Areas in Malawi Cities

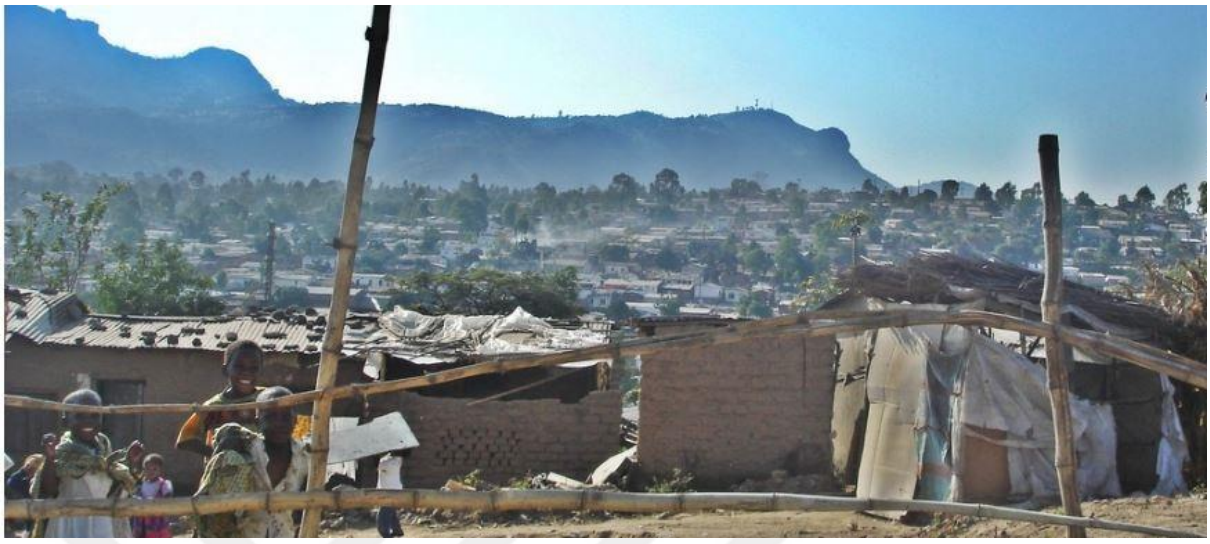
A. Ndirande

1. Conditions of urban settlements



2. Housing conditions





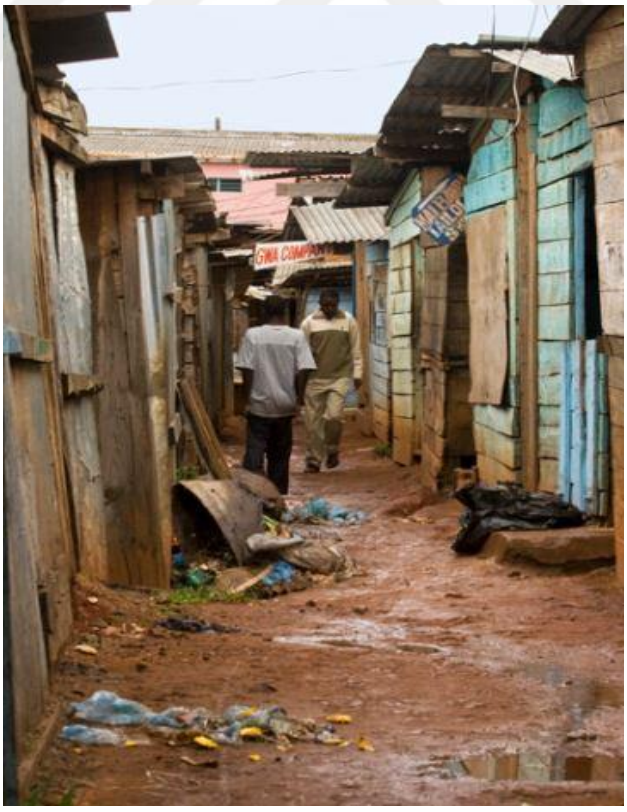
B. Chipasula

1. Housing Conditions

2. Rampant encroachment of drainage areas

In this figure the complete closure of **SIDE A** has led to the propagation of settlements downside **SIDE B**. As the figures show, this has been a natural drainage area system slowly being encroached.

C. Mchengautaba

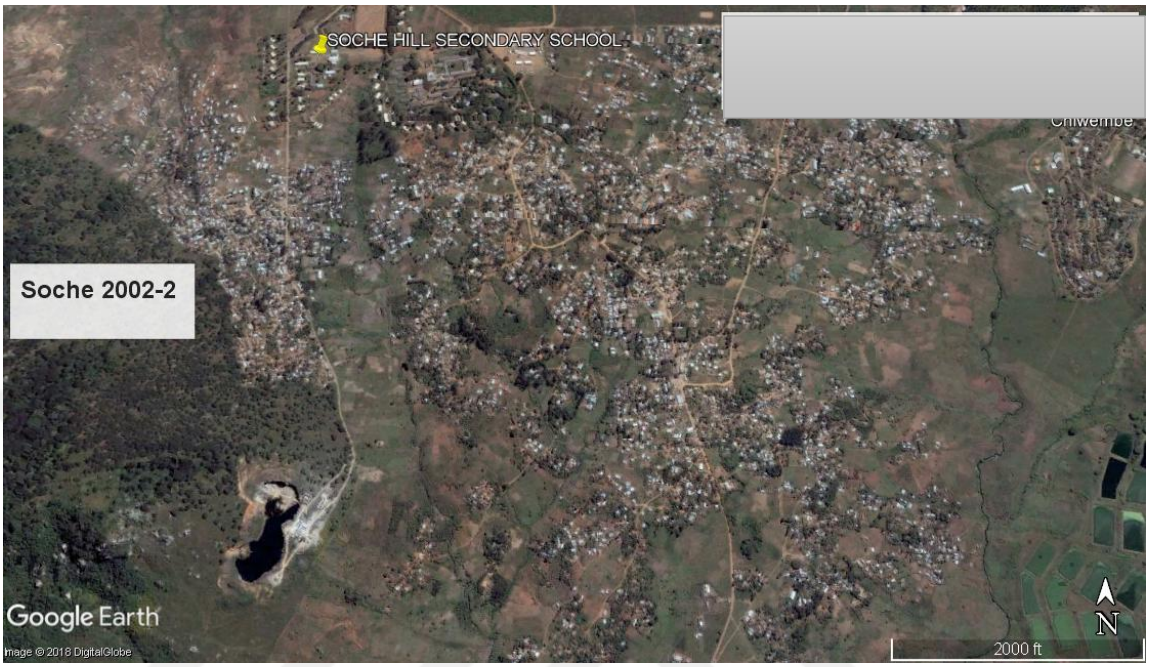


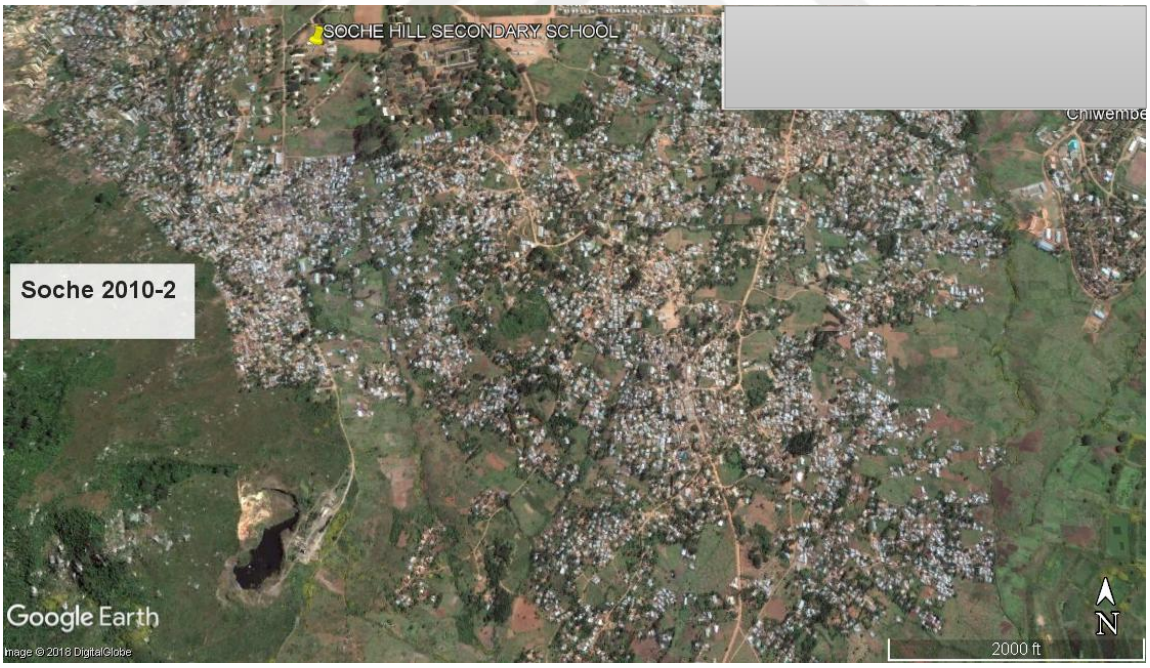
III. Google Photos Showing the Difference In Urban Population Densities Between 2003 and 2018

The google photos below are a demonstration of the increase of population densities in urban residences of Malawi in the four cities of Lilongwe, Blantyre, Mzuzu and Zomba. The areas of photos were randomly selected from the areas sampled in this study.

A. Lilongwe

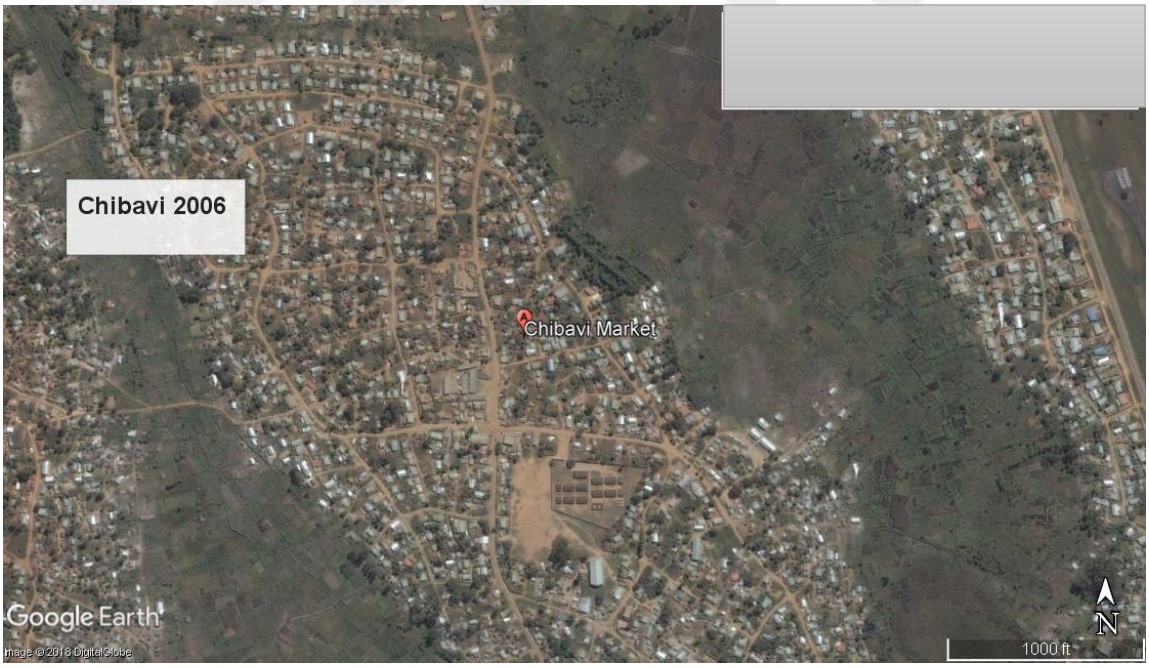
B. Blantyre


SOCHE HILL SECONDARY SCHOOL
Soche 2002-2
Google Earth
Image © 2018 DigitalGlobe
2000 ft
N


SOCHE HILL SECONDARY SCHOOL
Soche 2010-2
Google Earth
Image © 2018 DigitalGlobe
2000 ft
N


SOCHE HILL SECONDARY SCHOOL
Soche 2018-3
Google Earth
image © 2018 DigitalGlobe
2000 ft
N

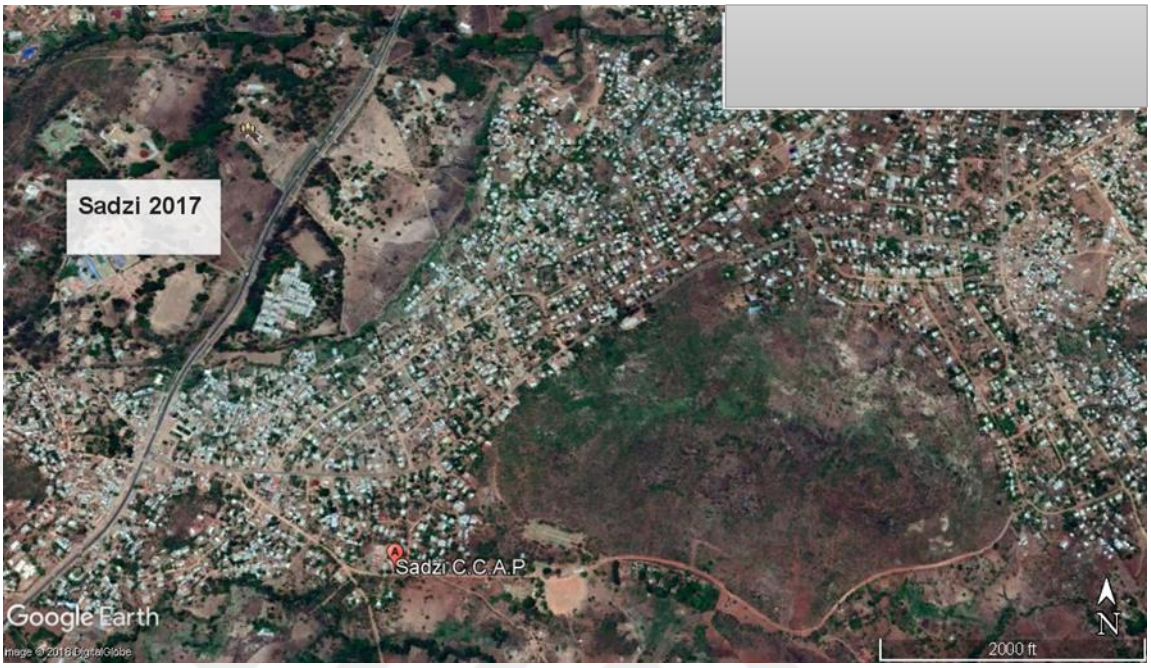
C. Mzuzu


Chibavi 2006
Chibavi Market
Google Earth
image © 2018 DigitalGlobe
1000 ft
N


Chibavi 2017
Chibavi Market
Google Earth
image © 2018 DigitalGlobe
N
1000 ft

D. Zomba


Sadzi 2007
Sadzi C.C.A.P
Google Earth
image © 2018 DigitalGlobe
N
2000 ft


Sadzi 2017
Sadzi C.C.A.P.
Google Earth
2000 ft
N

IV. QUESTIONNAIRES

A. QUESTIONAIRE FOR THE VICTIMS OF 2017/2018 URBAN DISASTERS IN THE CITIES OF MALAWI

I am **Yohane V.A Phiri**, a Master of Science Student in Urbanization and Environmental Problems at Kocaeli University in Turkey and currently conducting a research titled "Urbanization, Environmental Degradation and Urban Disaster Risks: Current Situational Analysis in the Four Cities of Malawi (Blantyre, Zomba, Lilongwe and Mzuzu)". The purpose of this questionnaire is to collect related data to the research topic within your city. Be assured that any data collected will be kept confidential, will be stored and used for academic purposes only. Aggregate results shall be used to write a paper to be presented to the Social Science Institute at Kocaeli University. No names of participants in part/full shall be used in the write up of the paper.

1	**GENERAL INFORMATION**
1.1	Sex: **Male [ ] Female [ ] Other [ ]** …….
1.2	Age: **0-25 years [ ] 26-50 years [ ] 51-75 years [ ] 75 years above [ ]**
1.3	Marital Status: **Never Married [ ] Married [ ] Widowed [ ] Divorced [ ] Separate[ ]**
1.3	Educational Level **None [ ] Primary [ ] Secondary [ ] Tertiary/University [ ]**
1.4	Occupational Status: **Regular Employee [ ] Causal Employee [ ] Employer [ ] Self-Employed [ ] Unpaid Family Worker [ ]**
1.5	Income Level: **Low [ ] Average [ ] High [ ] Very High [ ]**
1.6	Region of Residence: **Northern [ ] Central [ ] Southern [ ] Eastern [ ]**
1.7	Which area do you live? …….
1.8	How long have you been living in this area? **[ ] 0-5 yrs. [ ] 6-10 yrs. [ ] 11-15 yrs. [ ] 16 yrs. and above**
1.9	When were you affected by the disasters that occurred in your area (Date)? **[ ] Early 2017 [ ] Late 2017 [ ] Early 2018**
1.10	How many people were affected in your household? **[ ] 0-5 people [ ] 6-10 people [ ] 11 people above**
1.11	How was the impact of the disaster occurrence on your life (family included)? **[ ] Minor [ ] Medium [ ] Severe [ ] Very Severe**
2	**URBANIZATION AND THE ENVIRONMENT**
2.1	Would you described the size of population that lives within your area? **[ ] Very Large [ ] Large [ ] Medium [ ] Small [ ] Very Small**
2.2	How has the population living in the areas grown over the period? **[ ] Very Slowly [ ] Slowly [ ] Neutral [ ] Rapidly [ ] Very Rapidly**
2.3	What are the major impacts of growth of the population on the environment clearly evident within your community? **1……..2…….3……..**

2.4	Would you agree if it was said that urbanization (population growth) is one of the major reason for increased occurrence natural and anthropogenic urban disasters in the cities of Malawi; your area included? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
2.5	Are there any specific areas apart from your location where you would cite as an example of where there is a clear manifestation of impact of urbanization (population growth) on the environment and disaster occurrences? **1……..2……3…… …….**
2.6	Is one of the impact of population growth environmental degradation which is casual to occurrence of urban disasters? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
2.7	Are there any measures currently being employed either by your community or with partnerships from immediate offices or other partners to address the challenge highlighted above? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
2.8	Would you describe these measures effective and efficient in addressing the issues raised above? (impacts of urbanization and environmental degradation) **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
2.9	Are there any other measures you would suggest as to how the problem above can be managed? **1…….2……..3…… …..**
Please complete the questions below on community disaster resilience	
3	**COMMUNITY DISASTER RESILIENCE CHARACTERISTICS (Governance, Risk Assessment, Knowledge and Education, Risk Management & Vulnerability Reduction, Disaster Preparedness and Response)**
3.1	In your own view can you describe commitment, effectiveness, accountability by community leaders in addressing urban disaster risks and resilience issues? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.2	Do you believe in the Malawian Cities (Yours Specifically) community members know or are they aware of legal obligations the government has towards citizens on DRR, Management and Preparedness? (Examples?) **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.3	Does your city and communities within it have common goals for development? Is reducing risk part of these goals? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.5	Can you name external actors that your community has strong relationships with, whether for funding, resources, coordination, training or activity implementation for DRR? **1……2…….3…… ……**

3.6	Are there communities or groups you describe as vulnerable to occurrence of urban disasters? Are these groups included or do they participate in the plans to address DRR or building community resilience? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.7	Has your city or community carried out participatory vulnerability and capacity assessments (VCA), shared the findings and have human resources capable of conducting and updating these assessments? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.8	Does your city and the community use local knowledge and perceptions of risk as well as other scientific knowledge, data and assessment methods? Any Examples available? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.9	Is there an open debate within your community or city resulting in agreements about problems, solutions and priorities relating to disaster risks? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.11	Do your cities cultural attitudes and values (e.g. expectations of help/self-sufficiency, religious/ideological views) enable it to adapt to and recover from shocks and stresses? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.12	Can you confidently argue that your city and the communities around adopt sustainable environmental management practices that reduce disaster risk and adapt to new risks related to climate change? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.13	Can we confidently argue that the community around the city have a secure supply of food and water and manages an equitable distribution system during disasters? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.14	Does the community employ hazard-resistant livelihoods practices for all sectors? How often is your community affected by disaster occurrences? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.15	Does your city or community have access to social protection schemes to support risk reduction directly, through targeted DRR activities, or indirectly, through socioeconomic development activities that reduce vulnerability? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.16	Are there affordable and flexible community savings and credit schemes, and/or access to micro-finance services, whether formal or informal that are designed for emergency situations? Any examples? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.17	Are household and community or cities asset bases (income, savings and convertible property) sufficiently large and diverse to support disaster coping strategies and are there measures to protect them against disaster? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.18	Are the cities building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**

3.19	Does the community decision-making regarding land use and management take hazard risks and vulnerabilities into account? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.20	Can you argue confidently if the city services have the capacity to continue their operation without interruption during emergencies? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.21	Does the city have a trained and operating organization in disaster preparedness and response? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.22	Is there an operational Early Warning System in the city in case of occurrence of urban disasters? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.23	Does the city use a contingency plan that is widely understood, includes measures to protect vulnerable groups, and was prepared in a participative manner? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.24	Are there emergency infrastructures (purpose built or modified) accessible to community and with adequate facilities for all affected population in an emergency situation? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**
3.25	Does the city take a leading role in response and recovery actions that reach all affected members of community and that are prioritized according to needs in an emergency situation? **[ ] Strongly Disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] Strongly Agree**

B. QUESTIONAIRE FOR CITY ASSEMBLY ENVIRONMENTAL AND DISASTER MANAGEMENT OFFICERS

I am **Yohane V.A Phiri**, a Master of Science Student in Urbanization and Environmental Problems at Kocaeli University in Turkey and currently conducting a research titled "Urbanization, Environmental Degradation and Urban Disaster Risks: Current Situational Analysis in the Four Cities of Malawi (Blantyre, Zomba, Lilongwe and Mzuzu)". The purpose of this questionnaire is to collect related data to the research topic within your city. Be assured that any data collected will be kept confidential, will be stored and used for academic purposes only. Aggregate results shall be used to write a paper to be presented to the Social Science Institute at Kocaeli University. No names of participants in part/full shall be used in the write up of the paper.

1	**GENERAL INFORMATION**
1.1	Sex: Male [ ] Female [ ] Other [ ] …….
1.2	Region of Residence: Northern [ ] Central [ ] Southern [ ] Eastern [ ]
1.3	What is your position at the city assembly?
1.4	Which departments are amalgamated within your position (Is environmental protection and disaster management within?)
1.5	Contact Details: Email* Cell:

2	**URBANIZATION AND THE ENVIRONMENT**
2.1	Would describe the current urbanization rate of your city?
2.2	Do you consider urbanization rate/ trends in our city environmentally and economically viable?
2.3	What are the major impacts of urbanization on the environment that are clearly evident in your community?
2.4	Would you agree if it was said that urbanization is one of the major reason for increased natural and anthropogenic urban disasters?
2.5	Are there any specific areas where you would cite as an example of direct impact of urbanization on the environment and disaster occurrences?
3	**COMMUNITY DISASTER RESILIENCE CHARACTERISTICS (Governance, Risk Assessment, Knowledge and Education, Risk Management & Vulnerability Reduction, Disaster Preparedness and Response)**
3.1	In your own view can you describe commitment, effectiveness, accountability by community leaders in addressing urban disaster risks and resilience issues?
3.2	Do you believe in the Malawian Cities (Yours Specifically) community members know or are they aware of legal obligations the government has towards citizens on DRR, Management and Preparedness? (Examples?)
3.3	Does your city and communities within it have common goals for development? Is reducing risk part of these goals?
3.5	Can you name external actors that your community has strong relationships with, whether for funding, resources, coordination, training or activity implementation for DRR?
3.6	Are there communities or groups you describe as vulnerable to occurrence of urban disasters? Are these groups included or do they participate in the plans to address DRR or building community resilience?
3.7	Has your city or community carried out participatory vulnerability and capacity assessments (VCA), shared the findings and have human resources capable of conducting and updating these assessments?
3.8	Does your city and the community use local knowledge and perceptions of risk as well as other scientific knowledge, data and assessment methods? Any Examples available?

3.9	Is there an open debate within your community or city resulting in agreements about problems, solutions and priorities relating to disaster risks?
3.10	Is there discussion or transmission of DRR knowledge within the city? In what ways?
3.11	Do your cities cultural attitudes and values (e.g. expectations of help/self-sufficiency, religious/ideological views) enable it to adapt to and recover from shocks and stresses?
3.12	Can you confidently argue that your city and the communities around adopt sustainable environmental management practices that reduce disaster risk and adapt to new risks related to climate change?
3.13	Can we confidently argue that the community around the city have a secure supply of food and water and manages an equitable distribution system during disasters?
3.14	Does the community employ hazard-resistant livelihoods practices for all sectors? How often is your community affected by disaster occurrences?
3.15	Does your city or community have access to social protection schemes to support risk reduction directly, through targeted DRR activities, or indirectly, through socioeconomic development activities that reduce vulnerability?
3.16	Are there affordable and flexible community savings and credit schemes, and/or access to micro-finance services, whether formal or informal that are designed for emergency situations? Any examples?
3.17	Are household and community or cities asset bases (income, savings and convertible property) sufficiently large and diverse to support disaster coping strategies and are there measures to protect them against disaster?
3.18	Are the cities building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
3.19	Does the community decision-making regarding land use and management take hazard risks and vulnerabilities into account?
3.20	Can you argue confidently if the city services have the capacity to continue their operation without interruption during emergencies?
3.21	Does the city have a trained and operating organization in disaster preparedness and response?
3.22	Is there an operational Early Warning System in the city in case of occurrence of urban disasters?

3.23	Does the city use a contingency plan that is widely understood, includes measures to protect vulnerable groups, and was prepared in a participative manner?
3.24	Are there emergency infrastructures (purpose built or modified) accessible to community and with adequate facilities for all affected population in an emergency situation?
3.25	Does the city take a leading role in response and recovery actions that reach all affected members of community and that are prioritized according to needs in an emergency situation?

C. QUESTIONAIRE FOR DEPARTMENT OF DISASTER MANAGEMENT AFFAIRS OFFICERS

I am **Yohane V.A Phiri**, a Master of Science Student in Urbanization and Environmental Problems at Kocaeli University in Turkey and currently conducting a research titled "Urbanization, Environmental Degradation and Urban Disaster Risks: Current Situational Analysis in the Four Cities of Malawi (Blantyre, Zomba, Lilongwe and Mzuzu)". The purpose of this questionnaire is to collect related data to the research topic. Be assured that any data collected will be kept confidential, will be stored and used for academic purposes only. Aggregate results shall be used to write a paper to be presented to the Social Science Institute at Kocaeli University. No names of participants in part/full shall be used in the write up of the paper.

1	**GENERAL INFORMATION**
1.1	Sex: Male [ ] Female [ ] Other [ ] …….
1.2	Region of Duty: Northern [ ] Central [ ] Southern [ ] Eastern [ ]
1.3	What is your position at the DoDMA?
1.4	Which departments are amalgamated within your position (Is disaster risk reduction and disaster management within?)
1.5	Contact Details: Email* Cell:
2	**COMMUNITY DISASTER RESILIENCE CHARACTERISTICS (Governance, Risk Assessment, Knowledge and Education, Risk Management & Vulnerability Reduction, Disaster Preparedness and Response)**
2.1	In your own view can you describe commitment, effectiveness, accountability by community leaders in addressing urban disaster risks and resilience issues?
2.2	Do you believe in the Malawian Cities (in general) community members know or are they aware of legal obligations the government has towards citizens on DRR, Management and Preparedness? (Examples?)

2.3	Do our cities and communities within it have common goals for development? Is reducing risk part of these goals?
2.4	Can you name external actors that our cities have strong relationships with, whether for funding, resources, coordination, training or activity implementation for DRR?
2.5	Are there communities or groups you describe as vulnerable to occurrence of urban disasters? Are these groups included or do they participate in the plans to address DRR or building community resilience?
2.6	Has your city or community carried out participatory vulnerability and capacity assessments (VCA), shared the findings and have human resources capable of conducting and updating these assessments?
2.7	Does our cities and the communities use local knowledge and perceptions of risk as well as other scientific knowledge, data and assessment methods? Any Examples available?
2.8	Is there an open debate within our community or cities resulting in agreements about problems, solutions and priorities relating to disaster risks?
2.9	Is there discussion or transmission of DRR knowledge within our cities? In what ways?
2.10	Do our cities cultural attitudes and values (e.g. expectations of help/self-sufficiency, religious/ideological views) enable it to adapt to and recover from shocks and stresses?
2.11	Can you confidently argue that our cities and the communities around adopt sustainable environmental management practices that reduce disaster risk and adapt to new risks related to climate change?
2.12	Can we confidently argue that the community around our cities have a secure supply of food and water and manages an equitable distribution system during disasters?
2.13	Does the community employ hazard-resistant livelihoods practices for all sectors? How often are our communities affected by disaster occurrences?
2.14	Do our cities or communities have access to social protection schemes to support risk reduction directly, through targeted DRR activities, or indirectly, through socioeconomic development activities that reduce vulnerability?

2.15	Are there affordable and flexible community savings and credit schemes, and/or access to micro-finance services, whether formal or informal that are designed for emergency situations? Any examples?
2.16	Are household and communities or cities asset bases (income, savings and convertible property) sufficiently large and diverse to support disaster coping strategies and are there measures to protect them against disaster?
2.17	Are the cities building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
2.18	Does the community decision-making regarding land use and management take hazard risks and vulnerabilities into account?
2.19	Can you argue confidently if the city services have the capacity to continue their operation without interruption during emergencies?
2.20	Do the cities have a trained and operating organization in disaster preparedness and response?
2.21	Are there operational Early Warning Systems in the city in case of occurrence of urban disasters?
2.22	Do the cities use a contingency plan that is widely understood, includes measures to protect vulnerable groups, and was prepared in a participative manner?
2.23	Are there emergency infrastructures (purpose built or modified) accessible to community and with adequate facilities for all affected population in an emergency situation?
2.24	Do the cities take a leading role in response and recovery actions that reach all affected members of community and that are prioritized according to needs in an emergency situation?

D. QUESTIONAIRE FOR THE DEPARTMENT OF ENVIRONEMNTAL AFFAIRS OFFICERS

I am **Yohane V.A Phiri**, a Master of Science Student in Urbanization and Environmental Problems at Kocaeli University in Turkey and currently conducting a research titled "Urbanization, Environmental Degradation and Urban Disaster Risks: Current Situational Analysis in the Four Cities of Malawi (Blantyre, Zomba, Lilongwe and Mzuzu)". The purpose of this questionnaire is to collect related data to the research topic within your city. Be assured that any data collected will be kept confidential, will be stored and used for academic purposes only. Aggregate results shall be used to write a paper to be presented to the Social Science Institute at Kocaeli University. No names of participants in part/full shall be used in the write up of the paper.

1	**GENERAL INFORMATION**
1.1	Sex: Male [ ] Female [ ] Other [ ] …….
1.2	Region of Residence: Northern [ ] Central [ ] Southern [ ] Eastern [ ]
1.3	What is your position at the Department?
1.4	Which departments are amalgamated within your position (Is environmental protection and disaster management within?) [] E [ ] D [ ] E+D
1.5	Contact Details: Email* Cell:
2	**URBANIZATION AND THE ENVIRONMENT**
2.1	Would you describe the current urbanization rate of our cities in Malawi? (whether rapid or not)
2.2	Do you consider urbanization rate/ trends in our city environmentally and economically viable?
2.3	What are the major impacts of urbanization on the environment that are clearly evident in our community?
2.4	Would you agree if it was said that urbanization is one of the major reason for increased natural and anthropogenic urban disasters in Malawian cities?
2.5	Are there any specific areas where you would cite as an example of direct impact of urbanization on the environment and disaster occurrences?
2.6	What is the impact of urbanization on environmental degradation in the specific areas cited above?
2.7	Are there any measures currently being employed either by your office or other partners to address the challenge highlighted above?

2.8	Would you describe these measures effective and efficient in addressing the issues raised above? (impacts of urbanization and environmental degradation)
2.9	Are there any other measures you would suggest as to how the problem above can be managed?
Please complete the questions below on community disaster resilience	
3	**COMMUNITY DISASTER RESILIENCE CHARACTERISTICS (Governance, Risk Assessment, Knowledge and Education, Risk Management & Vulnerability Reduction, Disaster Preparedness and Response)**
3.1	In your own view can you describe commitment, effectiveness, accountability by community leaders in addressing urban disaster risks and resilience issues?
3.2	Do you believe in the Malawian Cities (Yours Specifically) community members know or are they aware of legal obligations the government has towards citizens on DRR, Management and Preparedness? (Examples?)
3.3	Does your city and communities within it have common goals for development? Is reducing risk part of these goals?
3.5	Can you name external actors that your community has strong relationships with, whether for funding, resources, coordination, training or activity implementation for DRR?
3.6	Are there communities or groups you describe as vulnerable to occurrence of urban disasters? Are these groups included or do they participate in the plans to address DRR or building community resilience?
3.7	Has your city or community carried out participatory vulnerability and capacity assessments (VCA), shared the findings and have human resources capable of conducting and updating these assessments?
3.8	Does your city and the community use local knowledge and perceptions of risk as well as other scientific knowledge, data and assessment methods? Any Examples available?
3.9	Is there an open debate within your community or city resulting in agreements about problems, solutions and priorities relating to disaster risks?
3.10	Is there discussion or transmission of DRR knowledge within the city? In what ways?

3.11	Do your cities cultural attitudes and values (e.g. expectations of help/self-sufficiency, religious/ideological views) enable it to adapt to and recover from shocks and stresses?
3.12	Can you confidently argue that your city and the communities around adopt sustainable environmental management practices that reduce disaster risk and adapt to new risks related to climate change?
3.13	Can we confidently argue that the community around the city have a secure supply of food and water and manages an equitable distribution system during disasters?
3.14	Does the community employ hazard-resistant livelihoods practices for all sectors? How often is your community affected by disaster occurrences?
3.15	Does your city or community have access to social protection schemes to support risk reduction directly, through targeted DRR activities, or indirectly, through socioeconomic development activities that reduce vulnerability?
3.16	Are there affordable and flexible community savings and credit schemes, and/or access to micro-finance services, whether formal or informal that are designed for emergency situations? Any examples?
3.17	Are household and community or cities asset bases (income, savings and convertible property) sufficiently large and diverse to support disaster coping strategies and are there measures to protect them against disaster?
3.18	Are the cities building infrastructure and basic services resilient to disaster (including being located in safe areas, using hazard-resistant construction methods and structural mitigation measures)?
3.19	Does the community decision-making regarding land use and management take hazard risks and vulnerabilities into account?
3.20	Can you argue confidently if the city services have the capacity to continue their operation without interruption during emergencies?
3.21	Does the city have a trained and operating organization in disaster preparedness and response?
3.22	Is there an operational Early Warning System in the city in case of occurrence of urban disasters?
3.23	Does the city use a contingency plan that is widely understood, includes measures to protect vulnerable groups, and was prepared in a participative manner?

3.24	Are there emergency infrastructures (purpose built or modified) accessible to community and with adequate facilities for all affected population in an emergency situation?
3.25	Does the city take a leading role in response and recovery actions that reach all affected members of community and that are prioritized according to needs in an emergency situation?