COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR ENVIRONMENT & SUSTAINABLE DEVELOPMENT

PRACTICES AND CHALLENGES OF DISASTER RISK MANAGEMENT IN URBAN AREA; THE CASE OF ADDIS ABABA CITY, ETHIOPIA

BY

MELIS NIGATU TAREKEGEN

JUNE, 2020

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CENTER FOR ENVIRONMENT AND DEVELOPMENT

Declaration

This is my original work and has not been presented for MA/MSC degree in any other university and that all the sources and materials used for the thesis have been properly acknowledged.

Declared By: Melis Nigatu

Signature: _____

Date: _____

Place: Addis Ababa University College of Development Studies, Center for Environment and Sustainable Development

Supervisor's approval

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge as an advisor.

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PRACTICES AND CHALLENGES OF DISASTER RISK MANAGEMENT IN URBAN AREA; THE CASE OF ADDIS ABABA CITY, ETHIOPIA

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External Examiner Signature Date

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Chair person, Department of CoDS Signature Date

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Melis Nigatu

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List of Acronyms

ASEAN- Association of Southeast Asian Nations

CCA- Climate Change Adaptation

COP- Conference of the Parties

DPPC- Disaster prevention and preparedness Commission

DRM- Disaster Risk Management

DRMFSS- Disaster Risk Management and Food Security Sector

DRR- Disaster Risk Reduction

FDRMC- Fire and Disaster Risk Management Commission

GTP- Growth Transformation Plan

HFA- Hygo-framework For Action

IPCC- Intergovernmental Panel on Climate Change

ISDR- International Strategy for Disaster Reduction

NDRMC- National Disaster Risk

NUA- New Urban Agenda

SDGs- Sustainable Development Goals

SFDRR- Sendai Framework for Disaster Risk Reduction

UNDESA- United Nations Department of Economic and Social Affairs

UNDP- United Nation Development Program

ABSTRACT

The risk of disasters in urban areas due to natural and man-made hazards is increasing in frequency and intensity nationwide. It is now widely recognized that extreme weather events that all become a regular part of life in the future. Bearing this in mind, the main purpose of this study was investigating the practice and challenge of Disaster Risk Management in Addis Ababa city. To this end, the pre-disaster, during disaster and post disaster practice of three DRM institutions were compared. There collaborative traditions and challenges were also investigated. The study employed descriptive research design. Questionnaire, interview and document analysis research methods were employed to collect data. Purposive sampling techniques were employed to select questioner respondents and key informant. Data analysis included explanatory, simple descriptive statistics and comparative (one-way between-groups ANOVA) techniques to analyze the qualitative and quantitative data, respectively. The result of the study showed that the significance values of pre-disaster and during disaster practices are better practice in the institution but there is a difference among their on post disaster. Based on the result of this study, the following issues are recommended: fire and disaster risk management commission fire code should be ratified. Most importantly, Institutional collaboration must be in place so as to serve Addis Ababa City to reduce the impact of disaster.

Key words: Disaster, Risk, management, pre-disaster, during disaster, post disaster,
collaboration,challenge

Chapter One: Introduction

1.1. Backgrounds of the Study

Disaster risk management is a structured approach to manage uncertainty and potential adverse impacts from a natural hazard event, through a process of risk assessment and the development of strategies and specific actions to control and reduce risks. It is systematic, institutionalized, and covers both strategic and operational issues related to reducing vulnerability and exposure to hazards while increasing coping and response capacity. Risk management is about dealing with uncertainty. It is important, therefore, to emphasize the need for institutionalized approach so that the process of disaster risk management can be continuous, dynamic and responsive. It mainly focused on prevenet and reduces or transfers of the impacts of manmade or natural hazards. It also includes the three pre disaster phase. Then it comprises all measures and preparations done ahead of a hazardous event (or disaster). Disaster risk Management (UNDP, 2016).

Though some efforts are made, the disastrous impact of climate change on urban livelihoods and natural biodiversity systems has long been observed worldwide. Shaped by the type of hazards and degree of exposure, extensive disaster risk derived by urbanization, environmental degradation, socio-economic inequality, and poor urban governance is witnessed to accumulate larger losses in mortality, economic and physical damage (Shaw et al., 2010).

Moreover, Lack of transparency, weaknesses of urban governance, and limitations of financial and human capacities may cause socio-economic assessment biases. But DRM Investments and financial losses in the context of risk governance; humanitarian action organizational learning, identification of the DRR community based early warning systems, and GIS risk mapping mechanisms for vulnerable populations are support to the notion of building urban resilience to secure risk aware spatial planning policies for the built environment and critical infrastructure, adding a new dimension in the contexts of socio-ecological reconstruction or, and civil society cultural vitality(Etinay et al. , 2018).

The need to integrate efforts towards sustainable development goals, climate change adaptation and disaster risk management has been recognized. And to do this, the term resilience is important. Resilience is the "ability of a system, community, or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of hazards promptly and efficiently by preserving and restoring essential basic structures". And building or reinforcing resilience implies the development of unified tools supporting greater coherence and coordination among different approaches. Addressing disaster risks in the context of resilience encourages urban planners to look at the many impacts of disasters and build long term capacity of communities to both adapt and cope with uncertain risks. The goal is for communities to prepare for an earthquake as much as they prepare for a drought or flooding (World Vision, 2015).

Gearing Sustainable Development Goals (SDGs) into practice is essentially dependent, among others, on the planning and coordination of disaster risk management at various levels of administration. Therefore, the management cycle as well as the top-down and bottom-up approaches have been established over the years and integrated into the Disaster Risk Management (DRM) area (Coetzee &Niekerk, 2012).

According to(Jembru ,2019) institutional collaboration is now increasingly both necessary and desirable as a strategy for addressing many of society's most complex public challenges. In addition, it is essential organizational building block that supports a growing array of activities seeking to mobilize and impact on diverse stakeholders in achieving a mix of public and private goals. Basically, one of the purposes of institutional collaboration is to appeal a wide range of sectors from different areas.

Since most of Ethiopian population are highly dependent on crop farming which is vulnerable to weather variability (Molla et al., 2019), sectors collaborative works are important to alleviate the population vulnerability to climate change impacts. In other words, institutional collaborations are crucial to take jointly preventive and alleviative actions for potential disasters.

Moreover, the goal of integrated disaster risk management is to promote an overall improvement in the quality of safety and security in a region, city or community at disaster risk. Integrating disaster risk management in to urban management promote the adaptation of a DRM approach to urban management in order to protect urban development from the impacts of natural hazards

and prevent future urban development from creating new risks or exacerbating risk(Center for Advanced Development Program, 2013).

The world is experiencing more frequent, deadly and costly disasters. Disasters are increasingly uncertain and complex due to rapid environmental and socio-economic changes occurring at multiple scales. The social and economic cost of natural disasters has increased in recent years due to population growth, change in land use partners, migration and unplanned urbanization, environmental degradation and globe climate change (World Bank, 2005). Numbers of people that live in areas with insufficient infrastructure, service accessibility and high risk of environmental hazard (Krishnan, 2017).

In general, disasters both natural and human-made causes, like droughts and famine, wars and civil strafes, floods, diseases outbreaks and traffic incident (car, train and plane crashes) have occurred in Ethiopia and caused many injuries, deaths and large property losses. Despite the fact that disaster is common phenomenon both in rural and urban areas across the country, in the academic research little attention is given to urban environs. In this study due consideration is given to Addis Ababa city DRM to fill the gap.

1.2. Statement of the problem

The number and scale of disasters triggered by natural hazards are increasing (UNISDR, 2016). The world increase in the frequency and severity of disasters and the indicators was 240 million people on average were affected by natural disasters in the globe each year between 2000 and 2005. During each of these years the disasters claimed an average of 80,000 lives and caused damage of an estimated US$ 80 billion (FAOUN, 2008).

The severity and prevalence of disaster is more worsen in developing countries than developed nations. Ethiopia is, amongst the developing countries, the most vulnerable to natural and manmade disasters. Among others, drought induced famine, flood, landslide, crop-pests, and infrequent earthquake and wars are the major triggering events that have, over the past many years, been causing incalculable suffering to communities and millions of dollar worth of property destructions (Mulugeta, 2010).

To alleviate the aforementioned disasters, over the last three decades, Ethiopia learned the hardest way to transform its disaster management from a mere apparatus of response and recovery to preparedness, mitigation and development. Resources and technical (technological) capacities aside, Ethiopia now possesses a wealth of (drought) disaster management experiences (Mulugeta, 2009). For many years, great emphasis was given to post disaster response, recovery and rehabilitation rather than on pre-disaster preparedness and prevention measures. This has invariably caused immense losses of lives and dislocation. Although the system of disaster management in Ethiopia seems to benefit from the recent paradigm shift in the field and lessons learned from several decades of experience, there are still salient problems that EDM has to reckon with. Recent times have witnessed that active partnership and collaborative relationship among actors in disaster management community appears to be lacking (Mulugeta, 2010).

Moreover, almost all actors in the disaster management community have invariably been preoccupied with and investing more heavily in draught disaster than any other hazard in history and pay little or no attention to other hazards(namely, crop pests, flood, disease epidemics, earthquake, war, civil conflicts and traffic accidents) to which citizens are vulnerable.

In addition, there has been little research, and even probably less has been written, on urban disaster management except water pollution. For instance, though Addis Ababa is a home to 25%

of the urban population in Ethiopia and is one of the fastest growing cities in Africa and highly vulnerable to different hazard like flooding, urban fire and earthquake etc., the researches done in the area are focused on water pollution only. For instance, ERA (1997) on the chemical in oxygen demand, Biological oxygen only Demand , and dissolved oxygen on Big Akaki, Little Akaki and Kebena rivers, Adane Bekele (1999) on Surface water and ground water pollution problems in the upper Awash river basin, (Tamiru Alemayehu, 2001) on The impact of uncontrolled waste disposal on surface water in Addis Ababa , (Hamre and Eyasu , 2017) on contamination of rivers and reservoirs in and around Addis Ababa city and actions to combat it, Getachew Gebre (2009) on Water pollution and its socio-economic implications: the case of Addis Ababa and Abebe Amare (2019) on Corporate environmental responsibility in Ethiopia: a case study of the Akaki river basin, are some to be mentioned. Mulugeta's (2009) finding also supported the above idea in the following way

> Almost all actors in the disaster management community have invariably been preoccupied with and investing heavily in drought disaster. In other words, actors in the realm of disaster management in Ethiopia pay little or no attention to other hazards (namely crop pests, flood, diseases epidemics, war, civil conflicts and traffic accidents) to which citizens are vulnerable. More generally, there has been little research, and even probably less has been written, on the problematic of the disaster management system in Ethiopia (p.62). The climate of Addis Ababa is forecasted to have an increase in precipitation variability and temperature. This will likely induce a wide range of hazards in the city including flooding and landslide inanition to drought and fires which have been the most common hazards in rural and urban. Addis Ababa has currently faces potential shocks and stresses related to its unprecedented rapid urbanization including urban flooding, fire, earthquakes, landslide and social vulnerability (World Bank, 2015).

Therefore, in the city which is exposed to numerous disasters, focusing on only limited aspects (water pollution and drought disasters) do not bring a significant solution to alleviate the encountered problems of the city. Hence, identifying the existing disasters in the city and examining the integration of directly involved institution in DRM is emphasized in this study. Because. "Integrated disaster risk management not only requires rigorous and multi-factor risk assessment, but it also calls for producers and institutions credibly reduce the risk. Experience

shows that knowledge, regulations, codes and other policy measures are of little use without effective implementation (Amendola et al., 2008).

Moreover, it is also claimed that the disaster risk of a city comes from the failure of its government. Because, risk reduction, disaster preparedness and resilience of a city primarily depend on the role and efficiency of the city government (Ethinay and Egbu, 2018). Therefore, in this study, the existing DRM practice and integration of institutions which are engaged in disaster reduction were investigated to fill gap.

1.3. Objective

1.3.1. General Objective

The main objective of the study was to assess the existing practices and challenges of disaster risk management of Addis Ababa city.

1.3.2. Specific Objectives

The specific objectives of the study were intended to:

- Investigate the DRM practice of Addis Ababa city at pre-disaster, during disaster and post-disaster phases
- Examine the practices of institutional collaboration at pre-disaster, during disaster and post disaster phases of DRM in Addis Ababa
- Asses the major challenges faced institutions in the practice of DRM and institutional collaboration in Addis Ababa?

1.4. Research Questions

1. What seems the existing practice of Addis Ababa city DRM at pre-disaster, during disaster and post-disaster phase?
2. How institutional collaborations are manifested at a pre-disaster, during disaster and post-disaster phases of DRM in Addis Ababa?
3. What the major challenges faced institutions in the practice of DRM and institutional collaboration in Addis Ababa?

1.5. Significance of the study

One of the characterizing features of the Ethiopian disaster management system was its due emphasis on post-disaster activities. Despite the prevalence of those worst disasters, the Ethiopian governments devoted their time and resources on relief and response, let alone the realization of the principles of the early warning system (Birtukan, 2014). As (Jembru, 2019) asserted in Ethiopia pre-disaster, during –disaster and post-disasters require a system of holistic view in concern and decision making of sectors. As evidence in the area indicated, Addis Ababa is exposed to natural and manmade hazards. These result different disasters like flood, fire and car accidents to mention some among others. The city has set, disaster risk management policy though its effectiveness to reduce disaster in question. Disaster is increasing in alarming rate and affects social, economic and environmental arena of the city. As Jembru mentioned, the complexity of challenges that disasters pose on the society calls for collaborations. Living in disaster free city is the wish of any society. To this end, a trough understanding of the problems and seeking plausible solutions are unquestionably imperative. Hence, this study is supposed to have the following contributions,

- ✓ It may help institutions which are engaged in DRM to be aware of the benefits of institutional collaboration and to take appropriate actions against the problems.
- ✓ The findings of the research could also give the complete pictures of DRM existing in the city to the concerned bodies so that they can take measures based on evidences.
- ✓ Besides, the study is hoped to serve as a stepping stone for other research works in the area.

1.6. Scope of the Study

Due to time and cost limitations the study is conducted in Addis Ababa city three selected institutions only. The study also basically focused on the selected institutions practices at pre-disaster, during disaster and post-disaster risk management, their collaborations and faced challenges only.

1.7. Definition of keywords/phrases

- **Disaster** - "A serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community/society to cope using its own resources" (Holloway, 2003).
- **Disaster management** - "The organization, management of resources and responsibilities for dealing with all aspects of emergencies (including disaster prevention and mitigation), but especially disaster preparedness, response and rehabilitation/recovery" (Holloway, 2003).
- **Disaster risk management** - "refers to integrated, multispectral and multidisciplinary administrative, organizational, and operational planning processes and capacities aimed at lessening the impacts of natural hazards and related environmental, technological and biological disasters" (NDMC, 2006/2007).
- **Disaster Risk Reduction** - "The systematic development and application of policies, strategies, and practices to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) adverse impact of hazards, within the broad context of sustainable development" (United Nations International Strategy for Disaster Reduction, 2002).
- **Emergency Management** - "The discipline dealing with risk and risk avoidance" (Haddow et al., 2006).
- **Vulnerability** - "A set of conditions and processes resulting from physical, social, economic and environmental factors, which increase the susceptibility of a community to the impact of hazards" (United Nations International Strategy for Disaster Reduction, 2002).
- **Risk** - "The probability of harmful consequences, or expected loss (of lives, people, property, livelihoods, economic activity disrupted or environmentally damaged) resulting from interactions between natural or human induced hazards and vulnerable/capable conditions. Conventionally, risk is expressed by the equation=Hazards x Vulnerability/Capacity" (United Nations International Strategy for Disaster Reduction, 2002).

- **Prevention** - "Activities to provide outright avoidance of the adverse impact of hazards and related environmental, technological and biological disasters" (United Nations International Strategy for Disaster Reduction, 2002).
- **Mitigation** - "Structural and non-structural measures undertaken to limit the adverse impact of hazards, environmental degradation and technological hazards" (United Nations International Strategy for Disaster Reduction, 2002).
- **Preparedness** - "Activities and measures taken in advance to ensure effective response to impact of disasters, including the issuance of timely and effective early warnings and the temporary removal of people and property from a threatened location" (United Nations International Strategy for Disaster Reduction, 2002).
- **Hazard** is a phenomenon, condition, situation, event, human activity or substance that has the potential to cause injury to life or health, damage to property or the environment, or disruption of livelihoods and social services.
- **Early warning system** is a socio-technical system designed to generate and circulate meaningful warning information in a timely manner to enable a target system take a proactive response to a hazardous threat in order to avoid disaster or reduce its impacts.
- **Recovery** refers to the decisions and actions taken to restore and or improve the pre-disaster functioning and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.
- **Resilience** is the ability of a community or system to resist, absorb, or recover from the effects of hazards in a timely and efficient manner, preserving or restoring its essential basic structures, functions and identity. It is the ability of the community to bounce back to normal functioning after suffering a distress from a hazard event.

Chapter Two; Literature Review

2.1. The Concept of Disaster Risk Management

The field of disaster risk management is relatively new and takes a structured approach to managing uncertainty related to the threat of natural and man-made disasters. Disaster risk management consists primarily of risk assessment and the development of strategies to mitigate disaster risk (Dyke et al., 2011).

According to Mulugeta, (2008) disaster management is a public policy issue involving administrative decisions, programs, and strategies oriented towards curtailing the impact of hazards and/or preventing their occurrences by controlling vulnerability, ensuring the readiness of a community to take precautionary measures and establish an administrative apparatus that can effectively react to disasters as they occur with the required speed of response.

Although DRM includes disaster preparedness and response activates, it is about much more than managing disasters (UNISDR, 2015). DRM programmers should not be standalone but instead be integrated within development planning and practice, since disasters are an indicator of failed or skewed development, of unsustainable economic and social process, and of ill-adapted societies (UNISDR, 2015).

From the above three quotations, it is possible to conclude that disaster risk management is an act of organizing approach to manage the threat of natural and man-made disasters and minimizing hazards by preventing their occurrences. Moreover, DRM is an integrated within development planning and practice beyond managing disasters.

Disaster can be natural or man-made. Natural disasters are a worsening problem in many of the world's largest cities. Since an increasing majority of the world's population will soon live in cities, and mostly in large cities the trend towards increasing urban hazard poses serious societal challenges for the future (Mitchell, 1999). Population and assets, in African cities, small and large, are among the most vulnerable to disaster risk globally. Climate change and demographic shifts add urgency and uncertainty (Adelekan et al., 2015).

In general, disaster risk management ultimately aims to decrease risk by reducing exposure to hazard, lessen vulnerabilities and increase capacity to build resilience to disaster. To this end, different counties establish disaster risk management institutions for the purpose of preventing natural and manmade disasters. Ethiopia also have national disaster risk management commission to reduce disaster across the country. Likewise, Addis Ababa has its own disaster risk management.

2.1.2. Components of DRM

According to (Zimmerman, 1985); Abraham, 2001); Sims and Vogelmann, 2002) cited in Jemberu, (2019) different scholars recognized six major pillars of DRM. These are: prevention, mitigation, preparedness, response recovery and rehabilitation. These pillars are also categorized under three phases. These include, pre-disaster phase, disaster phase and post-disaster phase.

2.1.2.1. Pre-disaster Phase

Pre-disaster phase of DRM means a period before the occurrence of a disaster. DRM activities implemented during this period include: prevention, mitigation and preparedness activities in order to eliminate or lessen the adverse impacts of hazards and related disasters (Jemeberu, 2019).

The prevention, mitigation and preparedness activities with a focus on incorporating DRM elements into development strategies, policies and programmes, building the capacity for all actors to discharge their roles, building adequate physical and financial reserves, and ensuring the tools for response are in place including contingency planning and a holistic information system that encompasses early warning, risk assessment, livelihood analysis and monitoring systems (Woldemariam, 2013).

To sum up, pre-disaster phase has three consecutive activities that show preparedness. Since the concept of prevention is the total avoidance of adverse impacts of hazards and related disasters, the activities performed at this stage is done with the intention to completely avoid potential adverse impacts through action taken in advance. On the other hand, mitigation is the action of

lessening/ limitation of the adverse impacts of hazards and potential disasters. The adverse impacts of hazards often cannot be prevented fully but their scale and severity can be substantially minimized by various strategies and actions. Preparedness assumes that community and property are vulnerable to hazards, and that preparedness will always be necessary to address the occurrences of hazardous events. Therefore, managerial and technical steps taken to minimize losses just before, during, and after a disaster come within the envelope of preparedness (Mulugeta, 2010).

2.1.1.2. Disaster Phase

This phase exercises the infrastructure and systems of response with a focus on communities and weredas as the first line of detection and response. (Woldemariam, 2013)
Emergency response is preparedness in action whereby actions are taken during and immediately after the impact of disaster that ensure the affected communities are evacuated from disaster zone. DRM activities implemented during this period include disseminating early warning, evacuation of at risk people, conducting search and rescue operation, providing emergency relief supplies, conducting damage and loss assessment. It is the period that emergency response is given to the affected communities in the form of emergency medical assistance, food, shelter, clothing, provision and allocation of crucial food and non-food items, goods and services aimed at saving lives, reducing health impacts, ensuring public safety and protecting livelihoods of the affected population in the event of a disaster (Jemberu,2019).

2.1.1.3. Post-Disaster Phase

Post disaster phase means a period after the occurrence of a disaster. Response is preparedness in action, whereby actions are taken during and immediately after the impact of disaster that ensure the affected communities are evacuated from disaster zone, and are provided with emergency medical assistance, food, shelter, clothing, etc. Search and rescue operations, concerted and coordinated actions taken to alleviate the suffering of the victims and speed of responses along the lines expected are indeed the acid tests of the administrative machinery put in place during and immediately after disaster. Recovery spans from activities pertaining to damage assessment and debris clearance to actions undertaken to support victims to get back to normal life and reintegrating them to regular community functions. Attempts to restore normalcy also includes

provision of temporary employment and regaining of lost livelihoods, psychosocial rehabilitation of traumatized community, replacement of buildings, and infrastructure and lifeline facilities (Mulugeta,2010).

This phase manages the transition into development programmes and begins with a damage assessment as the basis joint early recovery programming. These activities aim to quickly move to stabilization and the promotion of resilience building activities. Resilience is the ability to withstand threats or to adapt to new strategies in the face of shocks and crises, in ways that preserve the integrity of individuals, households and communities (while not deepening their vulnerability) with a focus on merging humanitarian and development programming to better address overlapping risks and stresses. It is an emerging concept that complements DRR (DRM SPIF, 2014).

From these three phases of DRM components, one can easily learn that to protect disaster before happening, to minimize the risks while it happens and to resilience after happening, different multi-sectors approaches are employed systematically. Well-designed polices has played a significant role to the feasibility of the approaches. In the next topic global and Ethiopian DRM polices are highlighted.

2.1.2. Reviewing Disaster Risk Management Policies

2.1.2.1. Global DRM policy

Disaster risk management policies and practices should be based on understanding of disaster risk across all dimensions of vulnerability, capacity, people and exposed asset, hazard and environmental characteristics. Such knowledge can be utilized for risk assessments before the disaster, for prevention and mitigation and the development and implementation of adequate preparedness and effective response to disasters.

To strengthen DRR efforts within the regional/ cross-border, Indonesia plays an active role through the association of southeast Asian Nations ASEAN) and is committed to managing DRR together. Furthermore, Indonesia also has laws and policies on disaster management that have incorporated many aspects emphasized by the ASEAN agreement on disaster emergency response and actively participates in the ASEAN committee on Disaster management.

DRR polices professional human resources, adequate budgets, and multi-threat risk assessments and integrated planning, secure culture has been built on individual residents living in disaster-prone areas, and risk assessment through districts is comprehensive and updated regularly (Surinato et al., 2019).

In Malawi disaster risk management is a developmental issue aimed at reducing social, economic and environmental disaster losses in order to achieve socio-economic growth in the country. Due to the crosscutting nature of disaster risk management function, the NDRM policy is linked to the Social, infrastructure, environmental and natural resources policies.

In Ethiopia the new 2013 policy provides for compressive framework of disaster risk management (DRM) measures, and is an amendment of the 1993 National policy on disaster prevention and management. It includes general directions and major implementation strategies including on decentralized DRM system, early warning and risk assessment, information management, capacity building, and on integration of disaster risk reduction in to development plans.

2.1.2.2. Ethiopian Disaster Risk Management policy

According to (Mulugeta, 2010) of all the hazardous events, drought has, over many centuries, triggered famines that caused human losses of catastrophic proportions in Ethiopia. The genesis of EDM systems should, therefore, be associated with the 19973/74 famine and the establishment of Relief and Rehabilitation Commission (RRC). On August 29, the defunct Emperor issued Order No. 93/1974 to establish a government agency (RRC) whose immediate responsibilities included mobilizing relief resources from domestic and international sources and providing the same to areas affected by drought.

In Ethiopia almost all actors in the disaster management community have invariably been preoccupied with and investing more heavily in drought disaster than any other hazard in history and pay little or no attention to other hazards (namely, flood, disease epidemics, earthquake, fire, war, conflicts and traffic accidents) to which citizens are vulnerable. Thus, due mainly to the magnitude of losses caused by disaster, the threats could find substantive solutions through public policies. As a result, disaster management is very prominently in public policy and administration. Furthermore, the private sector and nongovernmental organizations, bilateral and

multilateral organizations also played a very important part in disaster management (Abebe, 2010).

As Mulugeta stated, two phenomenal events which were occurred in 1990 and 1993 optimized the beginning of the transformation of EDM. First of all, the former government of Ethiopia (People's Democratic republic of Ethiopia (PDRE) called a national conference in 1988 that drew its participants from major national decision makers, national and international experts, and distinguished researchers. The eventual outcome of the conference was solid and prolific recommendations that culminated in a comprehensive National Prevention and Preparedness (NPP) Strategy in March 1990. The latter articulated strategies and plans geared towards avoiding, preventing, providing effective response, and recovery plans to deal with drought and other disasters that Ethiopia has been experiencing frequently.

Second, in October 1993, the Transitional Government of Ethiopia (TGE) enacted a Disaster Prevention and Management policy signifying a second phenomenal event that added substantial value to the reformation of EDM towards mitigation/prevention and preparedness. The policy underscored the importance of integrated actions to mitigate and/or prevent the root causes of drought disaster to which Ethiopians have repeatedly been vulnerable (TGE, 1993). After having recognized the ineffectiveness of the past DM system in factoring disaster prevention and preparedness into long term development effort, the policy set out objectives that emphasized prevention and preparedness plans, mapped out actions that should be taken in mobilizing resources in times of normalcy, and underscored efforts that would enhance community capabilities and resilience when the disasters occur (TGE, 1993) cited in (Mulugeta, 2010).
To sum up the history of the genesis of Ethiopian Disaster Management system, it is associated with the 1973/74 famine and the establishment of Relief and Rehabilitation Commission (RRC), during the period from 1974 to 1989. During this period of time, the disaster management machinery in Ethiopia heavily invested in response and recovery, rather than in preparedness and prevention. Due to these limitations in 1995 RRC was renamed as Disaster Prevention and Preparedness Commission (DPPC) by proclamation No. 10/1995. After went through gradual changes, now it is organized under the name of National Disaster Risk Management Commission. The commission is responsible for coordinating disaster response, risk management, preventive measures and recovery programs in the country (Jemberu, 2019).

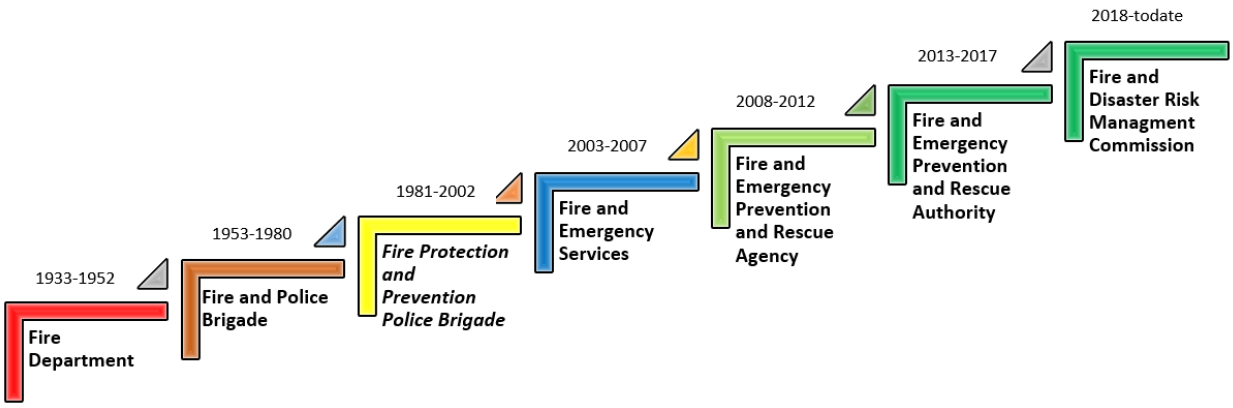
2.1.3. Disaster Risk Management Institution in Addis Ababa

Since Addis Ababa is the capital city of Ethiopia, both governmental and non-governmental institutions which are working on DRM are found in it. Of these various institutions, FDRMC of AA, NDRMC and ERCS of Addis Ababa city are the focus of this study.

2.1.3.1. Addis Ababa Fire and Disaster Risk Management Commission

The current FDRMC is passed through in different stages with a continuous shifting of naming and responsibility. As indicated in figure 5, from 1933-2018 it shifted its name seven times. Then Fire Department of 1933, organized in Brigade since 1953 to 2001. In 2002 it expanded its responsibility by adding emergency prevention and rescue agency. Then, in 2012 its hierarchy had been upgraded to authority before it organized as commission in 2018 In addition to its naming shift, its responsibility also raised from time to time.

Figure 1 Evolution of the institutional arrangement of Disaster Management for Addis Ababa City



Source: FDRMC

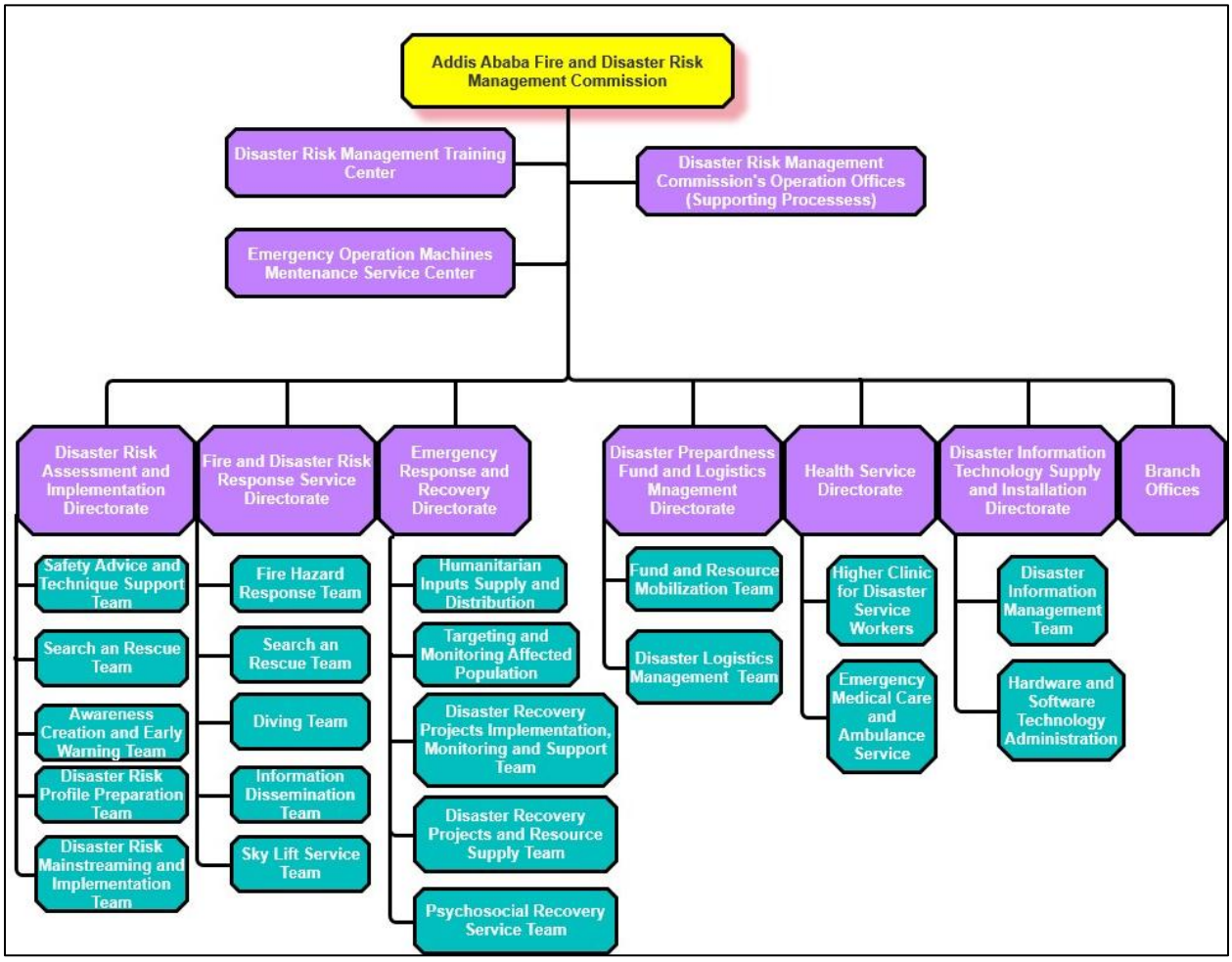
Figure: 5 shows that historical development of institutional arrangement in FDRMC in Addis Ababa

2.1.3.2. Current Institutional Arrangement of Fire and DRM for Addis Ababa City

Addis Ababa Fire and Disaster Risk Management Commission are now expanding service. For the time being there are 9 branches and 1 Disaster Risk Management training institute. This makes the community can get the service easily when compare as before. Now a day this full fills different technological disaster prevention machines and fire trucks, Rescue cars and also disaster risk management trained human resource.

In General, the new arrangement of the institution is important to overcome the disaster that upon in Addis Ababa if it apply effectively. This institution is now participating to prevent Covid 19 in Addis Ababa in Disaster preparedness funds and logistics Management Directorate. This directorate gives for the community food and non-food items for the community. Show in figure

Figure 2 Current Institutional Arrangement of Fire and DRM for Addis Ababa City



Source: FDRMC, (2018)

2.1.3.3. National Disaster Risk Management Commission of Ethiopia

NDRMC was established in 2015 by transforming the DRMFSS to a full-fledged commission. This has significantly strengthened its legal and operational framework for a comprehensive and integrated national DRM system at national and local levels. It is guided by 2013 National policy and strategy on Disaster Risk Management and by the 2014 strategic program and investment framework. It changed the institutional landscape for DRM in Ethiopia and crated as an autonomous federal government office which is accountable to the minister of peace.

The commission is responsible for coordinating disaster response, risk management, preventive measures and recovery programs in the county. Overall, it has a vision of reducing disaster risks and potential damages caused by a disaster through establishing a comprehensive and coordinating DRM system in the context of sustainable development (proclamation No. 363/2015).

2.1.3.4. *Ethiopian Red Cross Society*

Established in 1935 ERCS is the oldest National Society in Africa recognized by the League of Red Cross/Red Crescent Societies (now International Federation) as the 48th member of the organization. An independent auxiliary to the Government of Ethiopia, providing a full complement of humanitarian services including disaster relief, first-aid training, basic health care, blood donation services, health and hygiene promotion, HIV and AIDS support, and water and sanitation. The ERCS is delivering services to vulnerable people through country-wide network of branches and volunteers. The ERCS has 11 regional offices, 27 zone branches, 50 woreda (district) branches, 46 sub-branches, 2,600 Red Cross Committees (grassroots units) and 73,000 volunteers.

2.1.4. History of Disaster in Ethiopia

Whilst a wide range of natural hazards are present in Ethiopia, including drought, floods, landslides, pests, earthquakes, and urban and forest fires, by far the most common natural hazards in Ethiopia are droughts and floods. Most of Ethiopia is made up of arid, semi-arid or dry sub-humid areas, all of which are vulnerable to these hazards. Over the last twenty years Ethiopia has experienced many localized droughts and seven major droughts, four of which

resulted in famines. In 2008, more than six million Ethiopians required emergency food assistance due to drought. An International Food Policy Research Institute (IFPRI) research brief in 2008 concluded that the regions of Ethiopia most vulnerable to the impact of climate change (and hence drought and flooding) were Afar and Somali, both regions with low levels of rural service provision and infrastructure development, where pastoralism predominates (Powrie et al., 2012).

Flash floods and seasonal river floods are becoming increasingly common in Ethiopia, due largely to deforestation, land degradation, increasing climate variability, and settlement patterns. There have been six major floods during the past two decades that have resulted in significant loss of life and property. Whilst large-scale flooding is limited to the lowland areas of the country, flash floods can occur in most parts of the country (especially when rains fall after prolonged dry spells or droughts). Heavy rainfall in the highlands can cause flooding of settlements in a number of river basins, particularly the Awash River Basin in the Rift Valley. Flooding in urban areas, especially in Addis Ababa, occurs annually. (Powrie et al., 2012).

Drought affected nearly all sectors in Ethiopia; agriculture (loss of crops and livestock), water resources (increase in evaporation and decline in availability of fresh water which results in water stress), inadequate water for industry, reduced electricity production [from hydropower], etc. Although it has not been assessed and documented properly, the impact on ecosystems is significant (loss of wet lands and lakes, loss of forest and soil cover, increased soil erosion and land degradation, etc.). The social and economic impacts (increased human and livestock disease, migration, and conflict over water, and the decline in the National Gross Domestic Product (GDP)) are hugely important. Perhaps nowhere else is the change in weather (drought) and climate regimes more noticeable than in water sector (Kundzewicz et al., 2007 in Gutierrez et al., 2014), which in turn affects all other sectors significantly, and this is as a result of the meteorological drought (VanDijketal.,2013), Mera, G.A. (2018).

Dire Dewa flood affects more than 117,000 people (i.e., one-third of the town population) and officially resulted in the loss of 256 human lives and 244 missing. It caused also the worst property damages to housing and infrastructures in the town history with an estimated total damage of 10 million USD (Alemu 2009).

Disaster lurks just beneath the country's thin decorative veneer of modernism. On 11 March 2017, a part of the Qoshe landfill collapsed, burying houses and killing at least 115 people. Houses, schools, and recreational sites which were located just meters away from Qoshe, with no minimum safe distance between them and the waste site were instantly crushed, with still unaccounted people buried under the mountain of garbage. Now, five months after the disaster, the site remains a highly conflictual zone. Police actively patrol for anyone suspected of wanting to defame the image of the new Ethiopia. Waste pickers are suspicious of strangers and fear undercover government officials who seek to enforce fines on them, or worse, evict them from their homes (New internationalist, 2017).

Generally, based on last experience natural and manmade disasters in Ethiopia affect human lives, infrastructures and environment.

2.2. Building urban resilience

The disastrous impact of climate change on urban livelihoods and natural biodiversity systems has long been observed worldwide. Shaped by the type hazards and degree of exposure, extensive disaster risk affected by urbanization, environmental degradation, socio-economic inequality, and poor urban governance is witnessed to accumulate larger losses in mortality, economic and physical damage (Shaw et al., 2010).

The Rapid rise of resilience in the disaster risk management (DRM) policy landscape is marked in the Hygo-framework for action 2005-2015 (HFA) whose subtitle "Building the resilience of Nation and communities to disasters, looks to place the concept at the core of DRM aspirations. Focused to the ability of withstand stress and bounce back (UNISDR, 2005) and (Matyas et al., 2015).

The year 2015 also witnessed the adoption of the sustainable development goals and the Paris climate change agreement (COP21), followed with 2016 New Urban Agenda (NUA) Quito declaration on sustainable cities and human settlements for all. That would require joined-up monitoring mechanisms for indicators to achieve progress on the reporting process, and enable a track on building resilience (ODI, 2016).

Moor 2001 pointed out that cities, as the most complex of human creation, are at great risk both from a wide range of hazards and from their own multiple vulnerabilities. As the noted points, of urban vulnerability are everywhere from infrastructure systems and building to telecommunication, transport, energy and resource supply lines. And reduction of vulnerability at the city scale is not simply a matter of stronger structures. Urban risk reduction mechanisms include police and fire forces, planning and building inspection departments, health services, families, schools and the media.

A resilient city is a sustainable network of physical systems and human communities. Physical systems are the constructed and natural environmental components of the city. They include its built roads, buildings, infrastructure, communications and energy facilities as well as its waterways, soils, topography, geology and other natural systems. In sum, the physical systems act as the body of the city, its bones, arteries and muscles.

During disaster, the physical systems must be able to survive and function under extreme stresses. If enough of them suffer breakdowns that cannot be repaired, losses escalate and recovery slows. A city without resilient physical systems will be extremely vulnerable to disasters (David &Godschalk, 2003).

Ethiopian cities are already struggling with access to jobs, infrastructure, services, and housing, rapid urbanization will lead to greater concentration of people, assets, and infrastructure, thus increasing exposure to shocks and stresses. Limited capacity for land-use planning, coordination of services and mobilization of financing for infrastructure pose major constraints to healthy urbanization and will compound Ethiopia's continued exposure to shocks and stresses. Together these risks increase cities vulnerability to disasters such as floods, fire and earthquakes, with potentially devastating effects on Ethiopia's economic performance and its poverty. Ethiopia has developed a commendable national disaster risk management (DRM) system with effective early warning and response mechanisms. Urban areas however have not benefited from this national system, as the focuses have been largely on rural food security and drought mitigation (World Bank, 2017).

The Ethiopian cities prosperity initiative 2014, which builds on the GTP, focuses on inclusive and safer cities development as a key strategic pillar. Complementing Ethiopia's urban development policies, the government has developed policies to systematically manage its disaster risks, thereby also enhancing urban resilience.

Effective and comprehensive knowledge on disaster risks can enable greater resilience to disaster stresses and enable development opportunities (Bean, 2014).

2.2.1. Building Safer Cities

Disaster impacts are increasing in severity. Annual direct losses for weather related events have increased from $ 3.9 million in the 1950s to $63 million in the 1990s. Moreover, a number of ongoing trends have the potential to cause even more severe and broader disaster impacts than ever before. These include increased environmental degradation, the impact of climate change, population growth in cities in globalization in developing countries, disaster can cause major setbacks to economic and social development, inflict massive causalities, and cause the diversion of funds from development to emergency relief and recovery. By applying innovative approaches to disaster risk reduction and by empowering people through effective disaster reduction strategies, communities and government will be more resilient when disaster strikes and better able to protect their lives, homes, livelihoods and assets.

Vulnerability to disaster impacts is one of the most underestimated issues in urban development. By 2050, the world population is expected to grow by 3 million people. Most of this growth will take place in developing countries and within these countries in cities and town more than doubling urban population. Large numbers of people will be concentrated in megacities and on fragile lands, making reduction of vulnerability to disasters in metropolitan areas a critical challenge facing development (Kreimer et al., 2003).

2.3. Urban Area and Urban Hazards

A city or urban area is a set of infrastructure, other structures, and buildings that create an environment to serve a population living within a relatively small and confined geographic area. The lives and livelihoods of the population are supported by interrelated systems around which the urban area and society function. Capital stock makes up much of the infrastructure that includes business fixed capital machinery and equipment, structural capital (plant, infrastructure, overheads, offices, and social physical capital), and residential capital (dwellings). A disaster can directly affect people and capital stock and as a consequence, the systematic functioning of both urban hazard. An urban hazard is a risk that threatens a city, its population, and related socioeconomic activities. If a risk threatens a capital or large city the risk may resonate beyond the area of impact.

2.4. Challenge of Disaster Risk Management

Disaster is a major threat that could jeopardize the development of economic, social and physical elements of a nation as well as the well-being of its people. The damage as well as loss of property and life caused by the disaster is overwhelming and least desired by any country. Only by having a good and well-coordinated disaster management plan, such as reducing the risk of disasters, a recovery plan and a highly prepared response team including the community, can reduce damages and loss of life, while enabling the country to move forward and achieve a high-income developed country status. Nevertheless, policy implementation, particularly in disaster management, not only requires coordination, corporation and commitment between related agencies, but most importantly the community is the first responder when disaster strikes. According to (Chong and Kamarudin, 2017) there are three common challenge of DRM this are:

1. Un-proportionate disaster management planning between top-down and bottom-up approaches,
2. Lack of coordination in the entire disaster management cycle and greater focus on the disaster emergency response stage, and

3. Lack of planning of a long-term recovery (post-disaster) process, which results in low level community and stakeholder resilience.

2.4.1. Challenges of institutional integration in to DRM

Governance challenges and historical burden have resulted in overlapping policy process, as both a policy incorporate the other field, and creates a threat of parallel national-level structures, thereby increasing potential inefficiencies in governance and policy implementation. The importance of developing a horizontal integration implementation of the disaster risk reduction (DRR) and climate change adaptation (CCA) policies strategy before policy formulation process to avoid the potential of inefficiencies became evident.

One major challenge in the mainstreaming of disaster risk management is lack of effective and appropriate institutional and legal framework. Furthermore there are also another challenges this are weak coordination, cooperation and linkages among the sectors related to DRR, lacks of skills in loss assessment and post disaster needs, lack of strategic research agenda, absence of consensus regarding terminology, and limited coordination between stakeholders (UNDP,2016).

Different documents indicated that DRM in Ethiopia is not practiced in terms of its intended way because of weak institutional collaboration (Jemberu et al., 2019).Emphasized that even though different sectors are responsible for DRM in Ethiopia In addition to this, considering DRM as single sector task is another weakness of institutional collaboration.

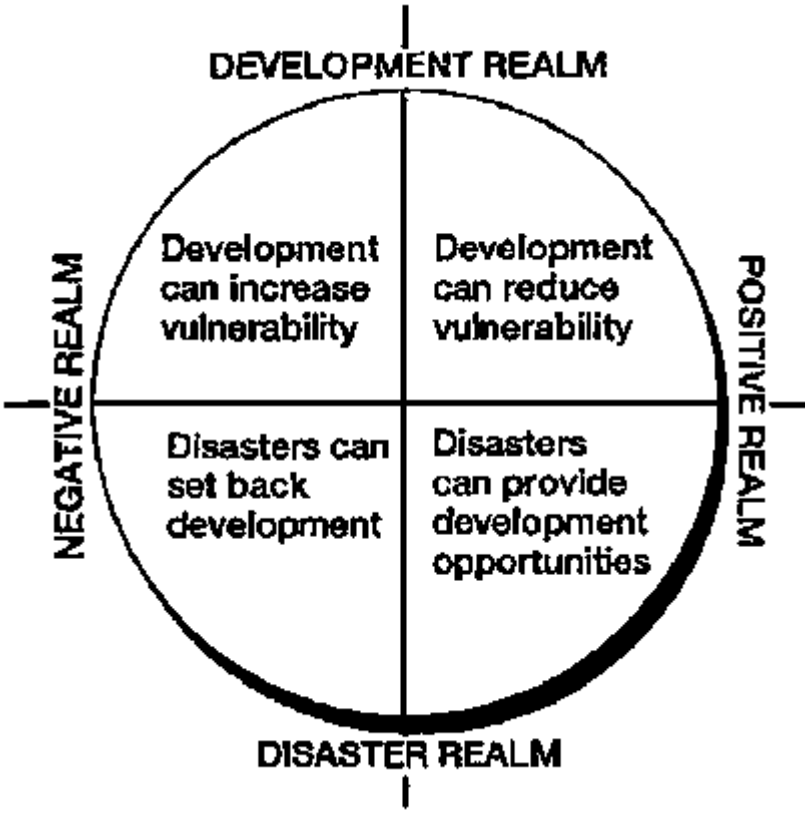
2.5. Relationship between Disaster and Development

A disaster may wipe out years of development programming, slow the course of improvement in developing world countries that already are behind, and may waste precious resources. Generally, the cause and effect relationship between disaster and social and economic development has been ignored. Ministries of planning and finance and other development planners did not concern themselves with disasters. Development planners hoped that disaster would not occur and, if they did occur, they felt that disasters were handled most effectively by relief from donor countries and relief organizations. Development programs were not assessed in the context of disasters. The effect of the disaster on the development program and whether the development programs increased the likelihood of disaster or increased the potential damaging effect of a catastrophic event (actualization of hazard) were not considered.

According to Stephenson & Dufrane, (2002) there is a relationship between disasters and development indicates four basic themes. These basic themes include:

1. Disasters set back development programming, destroying years of development initiatives— Infrastructure improvement (e.g., transport and utility systems) is destroyed by a flood.
2. Rebuilding after a disaster provides significant opportunities to initiate development programs—A self-help housing program to rebuild housing destroyed by an earthquake teaches new skills, strengthens community pride and leadership, and retains development dollars that otherwise would be exported to large construction companies
3. Development programs can increase an area's susceptibility to disasters—a major increase in livestock development leads to overgrazing, which contributes to desertification and increases vulnerability to famine.
4. Development programs can be designed to decrease the susceptibility to disasters and their negative consequences—Housing projects constructed under building codes designed to withstand high winds result in less destruction during the next tropical storm.

Figure 3 four realms of disaster and development



Source: UNDP-DHA (1994)

Development requires institutional and structural transformations of societies to speed up economic growth, reduce levels of inequality, and eradicate absolute poverty. Over time, the effects of disasters can decrease a countries long term potential for sustained development, causing governments to modify their economic development priorities and programs.

2.6. Environment and Disaster Risk

Just s disasters are understood to turn back the development clock through loss of infrastructure, livelihoods and psychological stress, climate change is frequently cited as one of the most serious environmental problems confronting human development (Echeverri et al., 2000). In the context of the contemporary failure to address poverty adequately (Norgaard, 1994) climate change is also seen as an additional obstacle to the achievement of sustainable development in the next century. The impacts of climate change on development are expected to manifest

primarily through impacts on natural resource, on which the poor depend heavily, and on human health. Temporal and spatial changes in rainfall patterns and shifts in temperatures compound existing crisis facing the water and agriculture sectors due to growing populations (Molden and Fraitre, 2004). Four main issue characterize the relationship between climate change and development: A/ the role of industrialization in causing climate change and the differential responsibility of developed countries and developing countries; B/ the inequitable impact of climate change on developing countries; C/ the significant role of development issues in influencing climate change policy and political negotiations. D/ the way in which climate change interacts with other forces affecting development such as globalization.

2.6.1. Linking climate change and disaster risk

Climate change and disaster risk have clear consequences for development, which can follow a path that would minimize impacts, although often this is not the case. In addition, climate change and disaster risk are related. While the media frequently portrayers metrological hazards as direct ramifications of climate change, scientists are reluctant to attribute any particular proportion of increased hazardous to climate change (Adger and Brooks, 2003). Ambiguity and incompleteness of data on disaster occurrence and impact provide further scope for media and political manipulation or misinterpretation of disaster risk. Climate change affects disaster risk in two ways: short –term climate variability and its extremes influence the range and frequency of shocks the society absorbs or adjusts to, whereas long- term variability can lead to changes in the productive base of society, particularly in natural resource dependent economics (Parry and Carter, 1985). In reality, signals of change and variability have been considered impossible to distinguish from one another (Downing et al., 1998). Recent studies on the European heat wave of 2003 have provided some insights in to distinguishing between the two signals (Stott et al., 2004), and these may lead to better understanding of how climate change affects variability. While events such as the heat wave represent anomalies within existing climate averages, these new research techniques may allow for the making of estimates of when such extreme events are expected.

The most effective way of addressing the risks posed by climate change and disasters is to lessen the underlying factors causing vulnerability to these phenomena. While it has been noted that current responses to disasters will no longer be sufficient in a changed climate, where dynamics

and mean climate have shifted (Sperling and Szekely, 2005), it must also be underlined that these current responses to disasters are not sufficient, as there are considerable losses that have short and long-term effects (Shipper and Pelling,2011).

2.7. Conceptual framework of Disaster Risk Management

The purpose of this chapter is to give the study a conceptual basis by discussing some basic concepts and reviewing related studies.

The purpose of Disaster Risk Management is to reduce the underlying factors of risk and to prepare for and initiate an immediate response should disaster hit. The Disaster Risk Management Framework (DRMF), illustrated in Figure 1, considers conceptually, DRM as a continuum, and thus as an ongoing process of interrelated actions, which are initiated before, during or after disaster situations. The framework is aiming, in particularly, at countries and regions, which face recurrent exposure to natural hazards. DRM actions are aimed at strengthening the capacities and resilience of households and communities to protect their lives and livelihoods, through measures to avoid (prevention) or limit (mitigation) adverse effects of hazards and to provide timely and reliable hazard forecasts. During emergency response, communities and relief agencies focus on saving lives and property. In post-disaster situations, the focus is on recovery and rehabilitation, including, however, the concept of "building back better". This implies to initiate DRR activities also during recovery and rehabilitation. The paradigm shift to conceptualize DRM as continuum (and no more in phases) reflects the reality, that the transition between pre- during and post disaster situations is fluid, in particularly in countries, which are regularly exposed to hazards. The elements of the framework- further elaborated in figure 1 - include both structural (physical and technical) and non-structural (diagnostic, policy and institutional) measures (Baas, S., Ramamasy, S., Dey de Pryck, J., & Battista, F. (2008, 7).

Figure 4 Conceptual framework in DRM

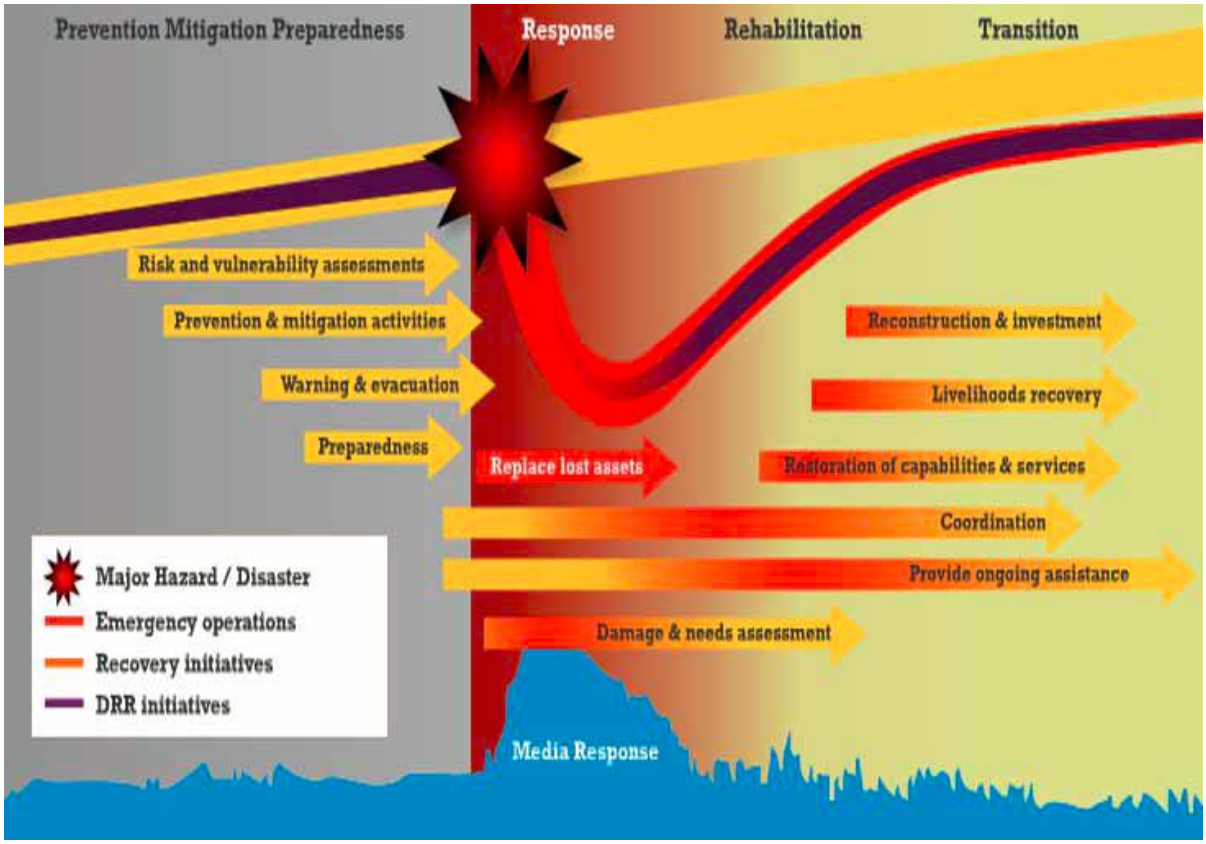


Figure 5 Disaster risk management framework Source:

Food and agriculture organization of the United Nations (Baas et al., 2008)

The value of this framework is its ability to promote a holistic approach to DRM and demonstrate the relationships between hazard risks/disasters and development. For instance, the activities on mitigation and prevention comprise the development portion, while relief and recovery comprise the humanitarian assistance portion, with preparedness linking both types of efforts.

Furthermore, the framework provides the basis to address public commitment and institutional systems, including organizational capacities, policy, legislation and community action, as well as environmental management, land-use, urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments. The framework also provides the space to positively value and constructively include communities' and households' traditional coping strategies, recognizing the importance of their ownership of the DRM process, thus diminishing the (passive) dependency typically generated by relief offered by outsiders. (Baas et al., 2008). Each of them was discussed under the components of DRM.

CHAPTER THREE; Research Design and Methodology

3.1. Introduction

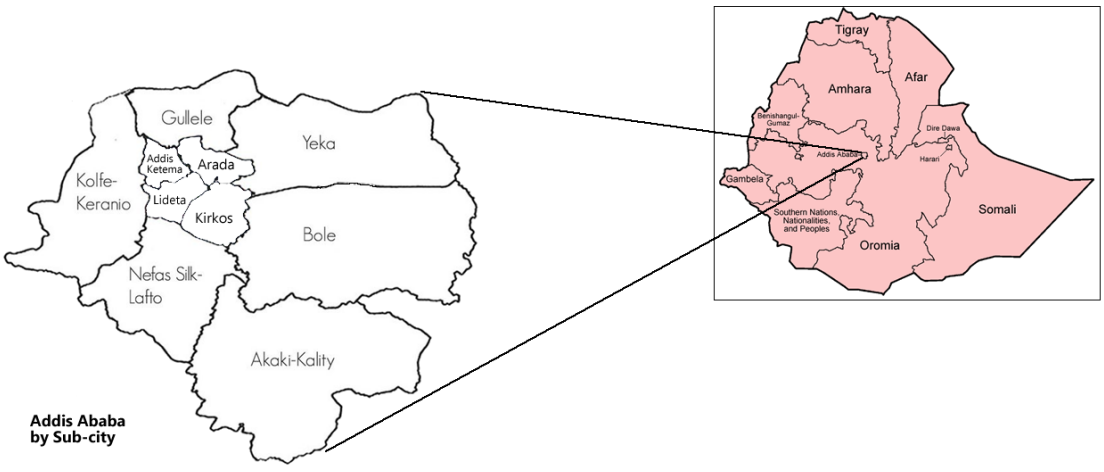
The previous chapter reviews the literature and main concept related to practice and challenge of disaster risk management and provides conceptual framework for the study.

In this chapter, the study area and research methodology used to conduct the study are discussed. Research design, population of the study, sampling technique and sample size used; sources of data and methods of data collection, methods and tools of data analysis are discussed in depth.

3.2. Study area

The study area selected for this research is Addis Ababa city. Addis Ababa is the capital and largest city of Ethiopia. Addis Ababa lies at an altitude of 2300 m above sea level and is a grassland biome, located at 9°1′48″ N and 38°44′24″ E (Abebe, 2019). According to world urbanization prospects (UNP) census, the city has population of 4,793,699 inhabitants. As a chartered city, Addis Ababa also serves as the capital city of the Oromia regional state. Addis Ababa is one of the fast expanding in the country (Tamiru, 2001). It is also the biggest city in the nation in terms of population.

Figure 6 Administrative map of Addis Ababa



Source: Addis Ababa City Government, (2017)

Due to irregular pace of expansion and an alarming increment of population, the city faces potential shocks and stress that could hinder it from achieving its development goals. This includes flooding, urban fire and earthquake from shocks and unprecedented urban growth, water scarcity, unemployment and social vulnerability from stress. (Global practice on social, urban, rural and resilience, 2015) though urban disaster risk management institutions are situated in the city, they didn't prevent the city dwellers from disasters because of the following main reasons. Firstly, most of the institutions concern is rural area. Secondly, some of them like, (Addis Ababa Fire and Disaster Risk Management Commission, National Disaster Risk Management Commission and Red Cross) are working in Addis Ababa, they lack collaboration.

Addis is expanding in a sprawling manner, with growth in urban extent outpacing population growth. The result of this growth is an estimated 46% of vacant or underutilized land. At the same time, the city center has extremely high density (up to 30,000 people per km), concentrating around 30% of the population on 8% of the land, generally with poor living conditions.

3.3. Study Design

A research design is a plan or blueprint of how you intended to undertake the research (Mouton, 1996). The study employed descriptive research design because it would helpful to obtain information about the practices and challenges of DRM in Addis Ababa. The descriptive research, aims to present a complete description of a subject within its context on real events which are not possible to control, contemporary and complex social phenomenon whose boundary is not well identified (Kothari, 2004). And it used comparative descriptive research design.

3.3.1. Types and source of data

The data inputs for the study were collected from both primary and secondary sources in Addis Ababa. Primary data were collected using semi-structured key informant interview and close ended likert scale questionnaires. Secondary data were collected both from published and unpublished sources including books, magazines, journal articles, internet archives, project reports, documents and thesis, that were pertinent to the topic under discussion.

3.3.2. **Population**

As source of population this study involved three institutions workers namely, National Disaster risk Management Commission, Fire and Disaster Risk Management Commission of Addis Ababa and Ethiopian Red Cross Society of Addis Ababa.

3.4. **Sample size and sampling techniques**

3.4.1. **Sample Size**

An appropriate sample size for a given study depends on various factors including research type, availability of resources, and time. The sample size of the study was determined using Yamane formula (Yamane, 1967). According to this formula the sample size is determined by $\frac{N}{1+N*e2}$

Where n= the sample size

N= Number of population

e= the error of 5 percentage points

The total numbers of key informant interviewees were four, one and one from Fire and Disaster Risk Management Commission, National Disaster Risk Management Commission and Ethiopian Red Cross Society respectively. These key informants were selected based on their position in the institutions (all are higher officials) and their knowledgably pertinent to the issue under investigation. The total sampling units involved in responding the structured questionnaire were 113, 31 and 31 from FDRMC, NDRMC and ERCS, respectively.

Table 1 population and sample size determination

Site	No of employees in the institution	Sample size proportion
National Disaster risk management commission	56	31
Fire and disaster risk management commission	198	113
Ethiopian Red Cross society	56	31
Total	310	175

3.4.2. **Sampling Techniques**

The study involved non-probability sampling techniques. Non-probability sampling technique is used to identify the most relevant targets to select some group of samples that represent the whole population and to spot the most constructive and likely sources of information to the study (Kothari, 2004). Therefore, the study involved purposive sampling technique. Purposive sampling was employed to select key informants and structured questionnaire. The key informants from the three institutions were selected on the basis of both their professional expertise and their general knowledge and experiences about disasters recurrently happened in Addis Ababa.

On the other hand purposive sampling was employed to select those involved in answering the structured questionnaire. The total sampling units involved in responding the structured questionnaire were 175. Of this, as shown in the above table (1), (31,113 and 31) were selected from National Disaster Risk Management Commission, Fire and Disaster Risk Management Commission, and Ethiopian Red Cross Society of Addis Ababa, respectively.

3.5. **Data collection Tools**

The use of multiple data sources helps to triangulate the data (Daymon and Holloway, 2002; Ritchie et al., 2005). Thus, the methods of primary data collection employed in this study were key informant interview, document review and structured questionnaire.

3.5.1. **Key Informant Interview (KII)**

Checklists were prepared and used for key informant interview. Key informant interview involved higher officials of Addis Ababa Fire and Disaster Risk Management Commission (AAFDRMC), National Disaster Risk Management Commission (NDRMC) and Ethiopian Red Cross Society (ERCS). Data gathered with this instrument include: knowledge and exposures about the existing practices of disaster risk management, institutional collaboration and challenges.

3.5.2. **Document Review**

Document analysis is a systematic method for finding, selecting, appraising, evaluating, and synthesizing secondary data, though frequently used in combination with other qualitative research methods; it has also been used as a stand-alone method in the areas of specifically

historical and cross-cultural studies (Bowen, 2009). Accordingly, the method was employed to systematically select, evaluate and synthesize various secondary sources of data (printed, electronic, published or unpublished resources). From the studied institutions so as to complement, supplement, or triangulate the aforementioned primary sources of data especially, their policies related to disaster risk management.

3.5.3. **Questionnaire**

Questionnaire was another instrument used to collect the quantitative data. Data collected with this method included: demographic characteristics of the sample respondents, current practice of disaster risk management, the nature of collaborations among the institutions and the challenges they faced. Hence, the preparation of the questionnaire included: the respondents profile in the first part, the practices and institutional collaborations in the second part and finally the challenges they faced.

3.6. **Methods of data Analysis**

The study employed both qualitative and quantitative data analysis techniques. To analyze quantitative data, collected through structured questionnaire have been coded and entered into SPSS version IBM 21 software. To analyze this quantitative data, descriptive statistics such as frequency, mean, percentage, correlation and regression were primarily utilized. To analyze the qualitative data obtained through key informant interview and document review, thematic and content analysis techniques were used. Tables and figures were also employed to widely present information as needed.

CHAPTER FOUR

4. Data presentation, Analysis and interpretation

In this chapter three institutions, current practice, institutional integration and challenge of disaster risk management in Addis Ababa was analyzed. The institutions are both from governmental and non-governmental sectors situated in Addis Ababa city. The total sampling units involved in responding the structured questionnaire were 175 from the three institutions. Of these sampling unites 171 questionnaires (59, 56 and 56) were collected from Fire and Disaster Risk management Commission, Red Cross and National Disaster Risk Management Commission respectively.

4.1. Response Rate

Table 2 Response rate

Item	Response rate	
	No	Percent
Sample size	175	100
Collected	171	97
Remain uncollected	4	3

Source: Owen construction from survey questionnaires, 2020 n=175

From the above table, out of 175 distributed questioner 171(97.7%) were collected while 4(2.2%) of the questioner remain uncollected due to different reasons. Therefore, the analyses were made based on the response obtained from 171 questionnaires.

4.2. Demographic character of the Respondents

The following section contains statically analysis pertaining to personal details of the respondents relating to age, gender, education and work experience and further correlate it with other variables. Thereafter, each of the biographical variables of the sample is dedicated in table and discussed.

Table 3 Demographic character of the Respondents

		Institution					
		Fire and disaster risk management commission		Red Cross		National disaster risk management commission	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Sex	Male	46	78.0%	47	83.9%	44	78.6%
	Female	13	22.0%	9	16.1%	12	21.4%
	Total	59	100%	56	100%	56	100%
Age	20-30	36	61.0%	26	46.4%	28	50.0%
	31-40	16	27.1%	23	41.1%	25	44.6%
	41-50	5	8.5%	5	8.9%	3	5.4%
	above 50	2	3.4%	2	3.6%	0	0.0%
	Total	59	100%	56	100%	56	100%
Educational level	Preparatory school and below	1	1.7%	0	0.0%	0	0.0%
	Diploma	28	47.5%	4	7.1%	5	8.9%
	Bachelor degree	25	42.4%	46	82.1%	44	78.6%
	Master	4	6.8%	6	10.7%	6	10.7%
	PhD	1	1.7%	0	0.0%	1	1.8%
	Total	59	100%	56	100%	56	100%
work experience	1-5 years	33	55.9%	34	60.7%	31	55.4%
	6-10 years	14	23.7%	12	21.4%	16	28.6%
	11-15 years	12	20.3%	10	17.9%	9	16.1%
	Total	59	100%	56	100%	56	100%

Source: Owen computation

Among the total sample respondents, 80.15% (137) were males whereas the remaining 19.88% (34) were females. Age of the sample respondents ranged from 19 to above 50 with an average of 33.33 years. As table 4.2 shows majority of the sample unit respondents 67.3% (115) have got degree, 21.6% (37) diploma, and 9.4 (16) MA/MSc, 1.2 (2) PhD whereas the remaining 0.6% (1) were preparatory school and below.

The work experiences of the sample respondent units were also varied. As large as 57.31% (98) of the sample respondent units were served from 1-5 years, 24.56% (42) were served from 6-10 years and the remaining 18.13% (31) were served from 11-15 years (Table 3).

4.3. **Current existing pre-disaster, during and Post DRM practice in Addis Ababa**

Disaster risk management actions in the pre-disaster phase are aimed at strengthening the capacities and resilience of households and communities to protect their lives and livelihoods, through measures to avoid (prevention) or limit (mitigations) adverse effects of hazards and to provide timely and reliable hazard forecasts. In the response phase, communities and relief agencies focus on saving lives and property. In the post- disaster phase, the focus is on recovery and rehabilitation (Baas, et al. 2008). In light of this there are different objectives of current existing pre, during and post disaster risk management institution in Addis Ababa. These objectives are summarized below.

4.3.1. **Pre- disaster phase Disaster risk management practice**

"The trend is for the risk become urban". Thus, public policies and disaster response measures are increasingly being tested beyond their capacities, with tragic consequences (Mitchell, 1999). In response to this development, it is essential to determine what kind of pre-disaster initiatives can help to mitigate disaster risk, especially in urban, low-income and informal settlements.

Creating public awareness is one crucial aspect of pre-disaster risk management activity among others. The sample respondents were asked to rate their knowledge about the existence of public awareness strategy and implementation of the city. Accordingly, 53.23% (91) of respondents reported they have knowledge about the existence of public awareness activities in the city while 21% (36) said they have no knowledge about it. The remaining 25.7 (44) respondents remained neutral. Thus, more than half of the respondents (53.23%) indicated the existence of public awareness activities performed by the institutions in the city (table 4).

Table 4 Urban public awareness strategies for DRM exist and implemented

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	12	7.0	7.0	7.0
	Disagree	24	14.0	14.0	21.1
	Neutral	44	25.7	25.7	46.8
	Agree	64	37.4	37.4	84.2
	Strongly agree	27	15.8	15.8	100.0
	Total	171	100.0	100.0	

Information gathered from key informant interviews also showed the presence of public awareness activities among institutions. For example respondents from RCS responded as the institution used an influential and figured individual to create awareness to the public on different mass Medias. In addition, if a natural disaster is forecasted the institution echoed it to the community to create awareness. As An Initiative of National Disaster Management Authority and India Gandhi National Open University (2012) asserted, "A massive awareness campaign is necessary to support the community in preparation of disaster management plans".

This finding in lined with (Mulugeta's, 2008) finding.

> It is needless to say that the manner and contexts in which institutions are set up, techniques, such as an early warning system, is put in place and personnel are trained and community are alerted abundantly showed that Ethiopian disaster management is invariably unresponsive to other hazards other than drought .

Though evidences showed that institutions gave attention for pre-disaster RM, As clearly observed in the following table, there is no significant difference among them (Table 5).

Table: 5 both between-groups and within-groups sums of squares, degrees of freedom, mean Square, frequency and significance level.

Table 5 Pre-disaster Risk Management practices of the three institutions

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
urban disaster recommendation assigned and resourced	Between Groups	.096	2	.048	.035	.966
	Within Groups	233.880	168	1.392		
	Total	233.977	170			
All organization personnel maintaining preparedness are equipped for effective disaster response	Between Groups	8.057	2	4.029	2.286	.105
	Within Groups	296.025	168	1.762		
	Total	304.082	170			
Procedures are in place during hazard events	Between Groups	.780	2	.390	.248	.781
	Within Groups	263.934	168	1.571		
	Total	264.713	170			
Urban early warning system are in place for all major hazard	Between Groups	1.509	2	.755	.392	.676
	Within Groups	323.204	168	1.924		
	Total	324.713	170			
Regular exercises conduct evacuation defining drill	Between Groups	.595	2	.298	.162	.851
	Within Groups	309.416	168	1.842		
	Total	310.012	170			
Awareness campaign on DM and preparedness for community	Between Groups	2.975	2	1.488	.995	.372
	Within Groups	251.071	168	1.494		
	Total	254.047	170			
Urban public awareness strategies for DRM exist and implemented	Between Groups	.617	2	.309	.241	.786
	Within Groups	214.728	168	1.278		
	Total	215.345	170			
organizational preparedness to respond manmade disaster	Between Groups	.031	2	.015	.010	.990
	Within Groups	254.016	168	1.512		
	Total	254.047	170			

As it is clearly observed in the table, ANOVA significant table presented above showed that these institutions namely Fire and disaster risk management commission, Red Cross, National disaster risk management commission were found to have similar pre-disaster management or there is no significant difference between these institutions ($p>0.05$).

In general, based on the aforementioned evidences it is possible to conclude that the three institutions pre-disaster RM practice found in an encouraging conditions. The prevalence of disaster, especially, in urban areas might contribute to this radical change as it has been shown in the following information.

> The number of extreme natural events is increasing as a result of climate change. This is a particular threat for agglomerations, which are also exposed to technological disasters. There is also a link between development level and disaster risk vulnerability to extreme natural events, as well as to technology-related and man-made risks, increases the disaster risk. The subject of disaster risk management is already being taken very seriously by many particularly vulnerable countries. Efforts are being made to develop risk management structures that strength resilience to risks ((DRM).

The Government of Ethiopia has endorsed a comprehensive DRM policy, based on lessons learned from previous experience. These include the necessity of a multi-hazard approach grounded in a deep understanding of specific disaster risk, and its link to development and vulnerability; emphasis on prevention, mitigation, preparedness and post-disaster modalities and capacities; de-centralization of resources and structures; a clear determination of DRM responsibilities, supported by the capacity for legal enforcement and a high degree of accountability (DRM and FSS Ministry of Agriculture)**.**

4.3.2. **During Emergency phase disaster risk management practice**

Emergency response is preparedness in action whereby actions are taken during and immediately after the impact of disaster that ensure the affected communities are evacuated from disaster zone. DRM activities implemented during this period include disseminating early warning, evacuation of at risk people, conducting search and rescue operation, providing emergency relief supplies, conducting damage and loss assessment. It is the period that emergency response is given to the affected communities in the form of emergency medical assistance, food, shelter, clothing, provision and allocation of crucial food and non-food items, goods and services aimed

at saving lives, reducing health impacts, ensuring public safety and protecting livelihoods of the affected Population in the event of a disaster (Abrahams, 2001 cited in Jemberu, 2019).
The sample respondents were asked the availability of sufficient number of ambulance and fire track during crisis. Accordingly, 52.7% (90) of the respondent replied there were enough ambulance and fire track. 26.3% (45) of the respondents replied as there were no sufficient ambulances and fire tracks to give services during crisis while 18.7 % (32) of the respondents remained abstained. Thus, more than half of the sample respondents (52.7%) indicated that there are sufficient number of ambulances and fire tracks for while disaster responses.

Table 6 enough ambulance and fire truck to respond mass causality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	15	8.8	8.8	8.8
	Disagree	30	17.5	17.5	26.3
	Neutral	32	18.7	18.7	45.0
	Agree	54	31.6	31.6	76.6
	Strongly agree	36	21.1	21.1	97.7
	6	4	2.3	2.3	100.0
	Total	171	100.0	100.0	

According to key informant interview there are two type of during disaster services. 24 hour ambulance services with no fee and immediate use donations after the crisis.

Table 7 During Risk Management practices of the three institutions

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
Enough ambulance and fire truck to respond mass causality	Between Groups	.223	2	.112	.065	.937
	Within Groups	288.198	168	1.715		
	Total	288.421	170			
DRM organization addressed adequately DM challenge in urban community	Between Groups	2.535	2	1.268	.893	.411
	Within Groups	238.412	168	1.419		
	Total	240.947	170			
Response and support agencies contact detail document available	Between Groups	.948	2	.474	.279	.757
	Within Groups	285.473	168	1.699		
	Total	286.421	170			
Alarm system in place to initiate emergency response	Between Groups	5.915	2	2.957	1.781	.172
	Within Groups	279.044	168	1.661		
	Total	284.959	170			
procedures in place for responding to d/f types of disaster	Between Groups	.552	2	.276	.201	.818
	Within Groups	230.185	168	1.370		
	Total	230.737	170			

The tabulated figure did not show significance difference among institutions in during disaster RM practices because all figures listed under column Sig. (.937,.411, .757, .172, .818) are greater than .05 at the significant level of P<.05.

4.3.3. **Post Disaster phase disaster risk management activities**

Post disaster RM practices encompass two main actions. Namely, response and recovery.

Response is preparedness in action, whereby actions are taken during and immediately after the impact of disaster that ensure the affected communities are evacuated from disaster zone, and are provided with emergency medical assistance, food, shelter, clothing. Search and rescue operations, concerted and coordinated actions taken to alleviate the suffering of the victims and speed of responses along the lines expected are indeed the acid tests of the administrative machinery put in place during and immediately after disaster while recovery spans from activities pertaining to damage assessment and debris clearance to actions undertaken to support victims to get back to normal life and reintegrating them to regular community functions. Attempts to restore normalcy also includes provision of temporary employment and regaining of

lost livelihoods, psychosocial rehabilitation of traumatized community, replacement of buildings and infrastructure and lifeline facilities **(**Mulugeta, 2009**)** .

The sample respondents were requested to level to which extent instruments, standards and processes for damage assessment and need of food, shelter, water, medicine etc. were established and equipped. Accordingly, 40.3% (69) of the respondents reported as they were established and equipped. 36.3% (62) respondents replayed as instruments and standards of damage assessment and need of food, shelter and water were not established and equipped while the remaining 22.8% (39) respondents remained not decided. Though majority of the respondent (40.3%) replayed positively, almost a close figure of respondents (36.5) replayed oppositely. This might showed the existences of limitation in post-disaster RM practice among the three institutions (Table 8).

Table 8 instrument, standard for impact damage assessment and food are established

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	27	15.8	15.8	15.8
	Disagree	35	20.5	20.5	36.3
	Neutral	39	22.8	22.8	59.1
	Agree	45	26.3	26.3	85.4
	Strongly agree	24	14.0	14.0	99.4
	6	1	.6	.6	100.0
	Total	171	100.0	100.0	

Data gathered from key informant interview revealed the imbalance treatment between urban and rural areas. Their focus inclined to rural area.

The analysis of variance (ANOVA) of the three institutions showed significant difference among them at the significant level of P<*.05.* In the tabulated Sig. column figures are <.05 at the significance level of P<.05.

To sum up, though the three institutions are engaged in the activities focus on provision of recovery and rehabilitation support to the affected communities and areas in order not only to restore social services, infrastructure and economic activities in the city, they did not participate in the same way.

Table 9 Post Disaster Risk Management practices of the three institutions

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
legislation & capacities in place to minimize adverse environmental consequence	Between Groups	85.945	5	17.189	14.856	.000
	Within Groups	190.909	165	1.157		
	Total	276.854	170			
Sector wise recovery framework developed	Between Groups	52.502	5	10.500	6.746	.000
	Within Groups	256.843	165	1.557		
	Total	309.345	170			
urban DRR incorporated in to livelihood restoration to build resilience to future hazards	Between Groups	102.777	5	20.555	20.193	.000
	Within Groups	167.960	165	1.018		
	Total	270.737	170			
Guidelines and codes developed for building back better	Between Groups	96.044	5	19.209	11.478	.000
	Within Groups	276.143	165	1.674		
	Total	372.187	170			
urban risk transfer mechanism in place	Between Groups	90.879	5	18.176	17.224	.000
	Within Groups	174.115	165	1.055		
	Total	264.994	170			
Specialized teams for recovery operations available	Between Groups	80.811	5	16.162	11.157	.000
	Within Groups	239.025	165	1.449		
	Total	319.836	170			
instrument, standard for impact damage assessment and food are established	Between Groups	108.073	5	21.615	19.315	.000
	Within Groups	184.641	165	1.119		
	Total	292.713	170			
Arrangement for repair of infrastructure and services in place	Between Groups	118.337	5	23.667	18.376	.000
	Within Groups	212.517	165	1.288		
	Total	330.854	170			

4.4. **Role/ contribution of institutional integration of DRM for disaster reduction**

Literature in the field indicated that risk reduction measures need to be specific to the risk profile of a particular location or community. Dialogue between experts from different disciplines and a high level of community involvement is required, in order to tackle both the hazards that can lead to disaster and the underlying factors which make some people more disaster-vulnerable. Communities cannot bring about structural changes by themselves and often require the cooperation of and support from local and national authorities. Central government needs to ensure adequate resource flows to enable local action. Cooperation also needs to be ensured between stakeholders at different levels from local to national and beyond. This includes coordination of DRR priorities and approaches between different departments of government, and with non-state actors. National and regional platforms for DRR are important for such collaboration and exchange. (VOICE, 2013)

Different types of organization or institution have different ways of working, and may not share all the same interests. The terminology they use may be very different and there will be inequalities in the resources they can contribute to joint work. Time and lots of dialogue is needed to understand each other's ideas, objectives and ways of working. However, the prospect of safeguarding lives and assets by concerted action on disaster risk reduction can be a powerful motivation. Public, private and third sector actors should be prepared to push themselves beyond their comfort zone. NGO participation in innovative partnership approaches is best supported by predictable funding frameworks that accommodate the level of effort, flexibility and time needed for multi-stakeholder work (VOICE, 2013).

Table 10 Role of institutional collaboration in disaster risk Management practices of the three institutions

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Communication network with other organization	Between Groups	3.486	2	1.743	.897	.410
	Within Groups	326.514	168	1.944		
	Total	330.000	170			
Integrate S.D policies reverse loss of Enviro. Source	Between Groups	5.568	2	2.784	1.909	.151
	Within Groups	245.005	168	1.458		
	Total	250.573	170			
Research institute work together with dep. And common UDRM issues	Between Groups	.353	2	.177	.094	.910
	Within Groups	315.273	168	1.877		
	Total	315.626	170			
Mechanism to guide monitor& integrate DRM action with various sector in place	Between Groups	.538	2	.269	.155	.857
	Within Groups	291.755	168	1.737		
	Total	292.292	170			
institutional mechanism for coordination of DRM activities across in Orgz .in place	Between Groups	5.022	2	2.511	1.398	.250
	Within Groups	301.656	168	1.796		
	Total	306.678	170			
risk reduction measure take local level urban equipped to integrate DR local planning	Between Groups	2.812	2	1.406	.782	.459
	Within Groups	302.041	168	1.798		
	Total	304.854	170			

4.5. **Challenges of Disaster Risk Reduction in Addis Ababa City**

According to Global Facility for Disaster Reduction and Recovery (AGFDRR) report on the Status of Disaster Risk Reduction in Sub-Saharan Africa (2010), Almost all countries in Sub-Saharan Africa are exposed to one or multiple natural hazards Floods usually affect large river basins such as the Congo, Niger, Nile, and Zambezi basins, but flash floods can impact any region after extreme rainfall. Droughts occur predominately in semi-arid and sub humid areas of the Sahelian countries, the Horn of Africa, and Southern Africa. The risk of landslide is high in countries with hilly terrain, high levels of rainfall, soil erosion and deforestation due to unsustainable land management. Addis Ababa city is not exceptional for these disasters. Therefore, the challenges that faced the institutions are discussed hereunder.

The sample respondents were requested to respond their experience whether the traffic jam constrained performing their duties or not. Accordingly, 66.1% (113) of the respondents reported the traffic jam became obstacle to perform their duties, 15.2% (26) replayed it doesn't affect them from performing their duties while the remaining 16.4% (28) responded neutral. Thus, more than half of the respondent (66.1%) responded as the traffic jam affects them to perform their duties. Main challenges faced in Addis Ababa city are:-

- There is lack of or weak enforcement of strategic and regulatory frameworks such as Fire code and building codes.
- Addis Ababa city still doesn't have legally binding fire codes for important assets of the city such as Industrial Parks, Hotels, gas stations, super markets and malls, cinema and theater halls, industries, etc. For example, out of 3469 institutes only 105 of them are certified.
- Absence of policy and strategy that supports disaster risk reduction in the city
- Absence of comprehensive disaster risk reduction plan in the city
- Absence of disaster risk profile, risk assessment and vulnerability studies for cities in Ethiopia including Addis Ababa.
- Lack of scientific damage and loss assessment is affecting recovery strategies.

Table 11 traffic jam constraint from performing the duties of institutions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	11	6.4	6.4	6.4
	Disagree	15	8.8	8.8	15.2
	Neutral	28	16.4	16.4	31.6
	Agree	51	29.8	29.8	61.4
	Strongly agree	62	36.3	36.3	97.7
	6	4	2.3	2.3	100.0
	Total	171	100.0	100.0	

The first common challenge was the insufficient levels of implementation for each monitored activity. For example, although DRM plans or risk sensitive building codes exist they are not enforced because of a lack of organizations management's capacity.

Key informants were asked to mention what challenges are common in their institutions regarding to DRM. One of the common challenge raised by all respondents was insufficient levels of implementation of policies set to each phases of DRM components. For example, although DRM policy based plan exists in each institution they are not implemented because of lack of capacity or preparedness. Risk information acquired through assessment or from weather forecast of metrology agency is often not translated into practice partly because of financial constraint.

The other challenge mentioned by key informants was inconsistency of people awareness creating campaign. The awareness raising campaigns are disaster based seasonal event so that they may not bring any real change in people's behavior and actions. As a document review indicated:

> One of the biggest challenges is to bring greater coherence into the whole DRM information systems which is now characterized by a number of information based projects rather than a unified system. Risk Assessment, monitoring and early warning products (WDRP, LIAS, and the EWS) are not fully harmonized within one system which reduces efficiency, can lead to duplication and risks slowing response. For example, Risk Assessment tools are not used for guiding early warning which is a lost opportunity (DRM and FSS Ministry of Agriculture)**.**

Table 12 challenges of DRM practices between three institutions

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Legal framework conducive to performance of UDP activities	Between Groups	6.159	2	3.079	1.806	.168
	Within Groups	286.473	168	1.705		
	Total	292.632	170			
physical environment conducive for saving life during emergency	Between Groups	.670	2	.335	.186	.830
	Within Groups	302.570	168	1.801		
	Total	303.240	170			
Are socio-cultural norm in society conducive to performance of disaster prevention & protection activities	Between Groups	.723	2	.362	.236	.790
	Within Groups	257.464	168	1.533		
	Total	258.187	170			
is political climate conducive for emergency worker to perform their work	Between Groups	1.237	2	.618	.374	.688
	Within Groups	277.500	168	1.652		
	Total	278.737	170			
is traffic jam constraint for performing the duties of your institution	Between Groups	11.050	2	5.525	3.693	.027
	Within Groups	251.371	168	1.496		
	Total	262.421	170			
pedestrian and cycling path contributing for urban disaster mitigation during disaster	Between Groups	3.953	2	1.977	1.160	.316
	Within Groups	286.269	168	1.704		
	Total	290.222	170			
written urban disaster prevention and emergency preparedness policy in your organization	Between Groups	9.577	2	4.788	2.462	.088
	Within Groups	326.716	168	1.945		
	Total	336.292	170			

4.5.1. **Correlation result of pre, during and post disaster phase**

Table 13 correlation of pre, during and post disaster management

		Pre-Disaster	During-Disaster	Post-Disaster
Pre-Disaster	Pearson Correlation	1	.752**	.733**
	Sig. (2-tailed)		.000	.000
	N	171	171	171
During-Disaster	Pearson Correlation	.752**	1	.802**
	Sig. (2-tailed)	.000		.000
	N	171	171	171
Post-Disaster	Pearson Correlation	.733**	.802**	1
	Sig. (2-tailed)	.000	.000	
	N	171	171	171

**. Correlation is significant at the 0.01 level (2-tailed).

The above correlation table shows that pre disaster is strongly and positively correlated with both during and post disaster with a correlation coefficient r=.752 and r= .733 respectively and statically significant ($p < 0.01$). This implies that disaster management institution in Addis Ababa are working on urban DM is most probably the same but they have a difference in implementation of policy.

4.5.2. **Addis Ababa city DRM institution practice and management on urban flooding**

Flooding has many different definitions among which Sinafikish (2013), flood is used in a broader sense to cover several river activities that causes damage that is inundation of flood plains and adjacent terraces, bank cutting, river channel shifting, and debris torrents during normally high discharge.

Mulugeta (2016) indicated that the major causes of flooding especially in an urban environment are those drainage areas, constrictions, obstruction (bridges and culverts) debris contamination soil saturation, velocity, topography, ground cover and size are the major ones. Topographical factors are key for the genesis and evolution of the quasistationary convective systems (or in simplified terms slow moving rainfall cells that release large amounts of water over a relatively

small area) that are often the causes of flash floods. From the hydrological point of view, on the other hand, factors that have a decisive influence on the occurrence of flash floods, apart from the intensity and duration of the rainfall, are the topography, soil conditions, and coverage of the terrain.

Disadvantageous topographical conditions such as high-exposure (steeply sloping) highland terrains, narrow valleys or ravines hasten the runoff and increase the likelihood of urban flood occurrence across the world. Saturated soil or shallow watertight geological layers increase surface runoff. Terrain coverage can have a similar effect. According to WMO (2007), urbanization processes and affiliated construction with watertight materials are thought to make runoff 2 to 6 times greater in comparison to terrains with natural coverage (fields, meadows, forests). In summary there are various factors contributing to urban flood risk, some being influenced by human intervention and others are entirely independent from human action.

The harsh adverse impacts of flooding usually calls for managing flood disaster through appropriate systems and strategies is necessarily required especially to predict and evaluate possible flood that may occur in a particular area. This, in turn, helps to reduce the potential damage caused by flooding hazards. It is always argued that to find out possible solutions to flooding problems, an understanding of the long-term factors that contribute to increase flooding are important including unplanned urbanization, soil erosion and deforestation. Then to mitigate flooding hazards, it is important to adopt watershed-based management practices In addition to this, to mitigate flooding propensity, both the government and people have to adopt watershed-scale best management practices which includes floodplain zoning, planned urbanization, restoration of abundant channels, dredging of rivers and streams, increased elevations of roads and village platforms, building of efficient storm sewer systems, establishment of buffer zones along rivers, conservation tillage, controlled runoff near construction sites, adjustment of life-style and crop patterns, good governance, and improvement in flood warning/preparedness systems (Khalequzzaman, 2006; Mulugeta, 2018; Santosa, 2006; Sinafikish, 2013 and Selamawit, 2018).

Disaster risk management institution in Addis Ababa are working together to reduce the impact of flood hazard they mainly focused on pre-disaster, during and post disaster phase. On pre-disaster includes different activities by this institution this are: - Awareness creation about flood

hazard, drainage cleaning and establishing early warning systems. On the other hand they also participate on emergency and after the disaster occur like preparing ambulances and fire truck to mobilize for response to mass casualty which may occur at any time, preparing alarm system in place to alert concerned officials to initiate emergency response and further evacuation as needed to minimize the impact of the disaster. In post disaster there are also different activities Instruments, standards and processes for impact/damage/loss assessment, and needs for food, shelter, water, medicines, hospitalization etc are implemented, repair/reconstruction of infrastructure, mainly recovery and rehabilitation are implemented on this phase.

Generally, this disaster prevention is mainly lead by Addis Ababa fire and disaster risk management commission but the else to institution also participate in different ways.

Chapter five

5. Conclusion and Recommendation

This chapter attempts to highlight and summarize the significant contributions of this study. The chapter begins with a conclusion where research questions are answered, then ends with recommendation and suggestion for future research.

5.1. Conclusion

Based on specific objectives stated so far the researcher draws the following conclusions from major findings summarized above.

The risk of disasters in urban areas due to natural and man-made hazards is increasing in frequency and intensity nationwide. It is now widely recognized that extreme weather events that all become a regular part of life in the future. Bearing this in mind, the main purpose of this study was investigating the practice and challenge of Disaster Risk Management in Addis Ababa city. To this end, the pre-disaster, during disaster and post disaster practice of three DRM institutions were compared. There collaborative traditions and challenges were also investigated. The study employed comparative descriptive research design. Questionnaire, interview and document analysis research methods were employed to collect data. Simple random sampling and purposive sampling techniques were employed to select questioner respondents and key informants, respectively. Data analysis included explanatory, simple descriptive statistics and comparative (one-way between-groups ANOVA) techniques to analyze the qualitative and quantitative data, respectively.

The finding of the study showed that both government and non-government DRM institutions are working together in pre, during and post disaster phases. As research findings showed in previously the two institutions (National Disaster Risk Management Commission and Red Cross Society) focus were rural areas and drought born disaster management only. This study proved that these institutions are widening their scopes and focuses. The data showed that they are working in Addis Ababa giving attention for both natural and man-made disaster management

collaborating with fire and disaster risk management commission. Even though the three institutions are working together in pre-disaster, during disaster and post disaster phases, the result of the study showed that the significance values of pre-disaster and during disaster practices indicates no significant difference in their pre-disaster and during disaster practices among the three institutions. But in post disaster risk management practice, there is a significant difference which means the three institutions being compared are significantly different among each other. This showed that their collaborations varies in each phases.

The finding of the study also showed that Urban Disaster Risk Management in Addis Ababa is exposed to the following challenges: Insufficient levels of implementation of policies set to each phases of DRM components, lack of codes appropriate implementation, inconsistency of people awareness creating campaign, faller of long-term recovery (post –disaster phase) planning, and poor collaboration habits of the institutions are some among others.

Nowadays, Disaster Risk Management is widely perceived as a development pattern that improves the quality of life while protecting and enhancing the natural environment from disaster. So establishing strong Disaster Risk Management institution in urban area is one of the basic components of sustainable development which integrates the economic, social and environmental needs of a city. So give attention to disaster risk reduction, DRM institutional collaboration is very improper to create resilient city.

5.2. **Recommendations**

Based on the findings and conclusions drawn, the institutions researchers recommend the following possible suggestions so to address the gaps observed and maximize strengths indicated in the study.

- Urban Disaster risk management institution collaboration on disaster phase have great role to reduce and prevent human life loss. Due to these effective linkages of measures and policies within those institutional systems, spatial considerations, communication and information systems warnings and assessment systems, codes and standards should form part of effective disaster risk management
- Adequate institutional capacities, as well as capacity and plans in place to address the consequences of urban disasters should be built.
- Municipal disaster management policy should focus more on proactive measures that should address all phases of the disaster management cycle.
- The municipal of Addis Ababa should recruit knowledgeable personnel in disaster management to work with city administrators.
- Addis Ababa Disaster Risk Management institutions should be adequately funded
- The city disaster reduction policy shall be linked with relevant development plans
- On the basis of National DRM policy and strategy, Addis Ababa city administration should to develop policy which recognizes the existing disasters risks of the city.
- For fire and disaster risk management commission fire code should be ratified

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Annexes

School of Graduate Studies

College of Development Studies

Center for Environment and Development

Questionnaires for DRM Specialist

Dear respondents,

This questionnaire is designed to study **"Practices and Challenges of Disaster Risk Management in Urban Area, the case of Addis Ababa"** as requirement for the MA thesis in Environment and Sustainable Development field of specialization. The purpose of the questionnaire is to collect that data helps to know the Practices and Challenges of Disaster Risk Management in Urban Area in operated the city and draw a lessons and also forward remedy or solution where gap is observed. Dears, the result of this study will help different stakeholders and policy makers to make appropriate measures towards the better understanding for the design and development of future projects and intervention in the area of urban disaster preparedness, disaster risk mitigation and emergency management. It is purely for academic purpose; results and any other details will not be used for un-intended purpose. Thus, kindly allocated a few minutes to be frank and complete in concentration. The responses that you will make are summarized in a collective manner and will be kept confidential and anonymous **General instruction for the interviewer/enumerator**

⇒ Please put the **(√)** in the space provided for some of the close-ended questions.
⇒ Write down the response for open-ended questions whenever the respondent provides and necessary;

⇒ Please rate the importance of the listed objectives (1) is least important through (5) is the most important to your decision in investing here. **Strongly agree (5), Agree (4), Neutral (3), Disagree (2), Strongly disagree (1)**

Part 1: Personal information (please encircle it)

No	Question	Response
1	Sex	1. Male 2. Female
2	Age	1. 20-30 2. 31-40 3. 41-50 4. More than 50
3	Educational Level	1. Preparatory school & below 2. Diploma 3. Bachelor degree 4. Master 5. Higher
4	How long have you been employee of this organization?	

Part 2: **<u>Assessing current existing pre, during and post disaster risk management practice</u>**

Please rate the importance of the listed objectives (1) is least important through (5) is the most important to your decision in investing here. **Strongly agree (5), Agree (4), Neutral (3), Disagree (2), strongly disagree (1)**

No	Questioner items	**5**	**4**	**3**	**2**	**1**
	Pre-disaster					
2.1.1	An independent assessment of urban disaster preparedness capacities and mechanisms has been undertaken and the responsibility for the implementation of its recommendations has been assigned and resourced					
2.1.2	Urban disaster preparedness plans and contingency plans are in place at all administrative levels, and regular training drills and rehearsals are held to test and develop disaster response programmes.					
2.1.3	All organizations, personnel and volunteers responsible for maintaining preparedness are equipped and trained for effective disaster preparedness and response					
2.1.4	Financial reserves and contingency mechanisms are in place to support effective response and recovery.					
2.1.5	Procedures are in place to document experience during hazard events and disasters and to undertake post-event reviews					
2.1.6	Urban early warning systems are in place for all major hazards.					
2.1.7	Regular mock and evacuation exercise conducted and local people informed; role of NGOs and local leaders in evacuation defined in drilling					
2.1.8	Does your institution carried out awareness campaign on disaster mitigation and preparedness for stake holders and community					
2.1.9	Urban Public awareness strategies for DRM exist and are implemented with vulnerable communities.					
2.10	Guidelines/laws for zoning regulation e.g. building codes are available and enforced					
2.11	Do you think your role in urban disaster or emergency management before and after the disaster is important?					
2.12	Addis Ababa Municipality is prepared for mass casualty disaster or emergency management at any time a disaster strikes					

2.13	Organizational preparedness to respond Man-made Disaster like urban fire/chemical leak/accident(rail/road/air/boat)/stampede/hijack/others					
	During Emergency					
2.2.1	Does the organization have enough ambulances and fire truck to mobilize for response to mass casualty which may occur at any time					
2.2.2	Does DRM organization addressed adequately disaster or emergency management challenges in urban community					
2.2.3	Response and support agencies' contact details documented, updated, and available					
2.2.4	Reliable alarm system in place to alert concerned officials to initiate emergency response and further evacuation as needed					
2.2.5	Are there procedures in place for responding to different types of crises?					
2.2.6	Well defined standards for the provision of relief in place					
2.2.7	Appropriate urban DRM laws, acts, policies, strategies, frameworks are in place and enforced during emergency					
2.2.8	Is their urban Standardized reporting formats and analysis methods in place					
	Post Disaster					
2.3.1	Are sufficient legislation and capacities in place to minimize adverse environmental consequence of post –disaster recovery					
2.3.2	Sector-wise recovery framework developed					
2.3.3	Urban DRR incorporated in to livelihood restoration/ development programme to build resilience to future hazards					
2.3.4	Guidelines and codes developed for "building back better"					
2.3.5	DRR incorporated into livelihood restoration/development program to build resilience to future hazards					
2.3.6	Urban Risk transfer mechanisms in place e.g. conditional transfers, industries/ merchant insurance.					
2.3.7	Specialized teams for recovery operations available					
2.3.8	Instruments, standards and processes for impact/damage/loss assessment, and needs for food, shelter, water, medicines, hospitalization etc. established					
2.3.9	Arrangements for repair/reconstruction of infrastructure (e.g. roads, bridges wells, schools and other key buildings) and services (e.g. health, education, and provision of inputs) in place					

Part 3: <u>role/contribution of institutional integration of DRM for disaster reduction</u>

Please rate the importance of the listed objectives (1) is least important through (5) is the most important to your decision in investing here. **Strongly agree (5), Agree (4), Neutral (3), Disagree (2), strongly disagree (1)**

No	Questioner items	5	4	3	2	1
3.1	Does your institution have a communication network with other organizations like red cross, FDRMC, and NDRMC in the city					
3.2	Integrate the principles of sustainable development in to city policies and programmes and reverse the loss of environmental resources					
3.3	Research institutes work together with department and community on urban disaster risk management issues					
3.4	Mechanisms to guide, monitor and integrate DRM actions within various sectors are in place					
3.5	Institutional mechanisms for the coordination of DRM activities across organization are in place					
3.6	Is the target group satisfied with the quality of disaster prevention and emergency management services delivered					
3.7	Are measures in place to strengthen regulation and enforcement and investments in the management of critical ecosystems for the protection and resilience of local populations particularly in high risk areas					
3.8	Considering that the most tangible risk reduction measures are taken at the local level, local authorities in urban are well equipped to integrate disaster risk in local planning and to implement risk reduction measures					
3.9	Do you think there is a need to impart formal training in Disaster Management to the Community, to make them more aware as what to do before/during/after a disaster?					

Part 4: **<u>challenges faced in DRM practices</u>**

Please rate the importance of the listed objectives (1) is least important through (5) is the most important to your decision in investing here. **Strongly agree (5), Agree (4), Neutral (3), Disagree (2), strongly disagree (1)**

No	Questioner items	5	4	3	2	1
4.1	Is the legal framework conducive to performance of urban disaster prevention activities					
4.2	Is the physical environment(climate, infrastructure) conducive for saving life during emergency					
4.3	Are socio-cultural norms and values among the target group and in society conducive to the performance of disaster prevention and protection activities					
4.4	Is the political climate conducive for emergency worker to perform their work					
4.5.	Is Traffic jam constraints for performing the duties of your institution					
4.6	Do pedestrian and cycling paths really contribute as one of the urban disaster mitigation and recovery facilities during disaster?					
4.7	Guideline/ laws for zoning regulation e.g. building codes are available and enforced					
4.8	Do you have a written urban disaster prevention and emergency preparedness policy in your organization?					

Key informant Interview

- **current existing pre-disaster, during disaster and post DRM practice**
  1. According to your experience, how preparedness for hazards in urban settings can be improved?
  2. Which are the International policies that are considered in disaster risk reduction management in Addis Ababa?
  3. Do you think that Addis Ababa is one of the most Disasters prone in Ethiopia? If you say yes which disaster is the most common?
  4. What should be the level of preparedness of Fire and Emergency Services if different disaster upon on the same time?
  5. What should be the level of preparedness for 'on-site' first aid, carriage in ambulance and pre-hospital preparedness?
  6. How do you explain about the complexity and emerging nature of disaster risks in Addis Ababa from historical to changing perspective?
  7. Does your institution have adequate skill and capacity to support in the planning, responding and decision making process of DRM in Addis Ababa?
  8. Do you think that disaster management policies and regulation can reduce current upcoming of disaster in your organization?

- **To Describe role/contribution of institutional integration of DRM for disaster reduction in the study area**

1. To what extent does collaboration exist between Ministries, the Departments of Government and the NGOS involved in disaster risk reduction?
2. Any reference for role of different stakeholders and partnerships between them for disaster risk reduction?
3. Does DRR practices and principles been integrated in sector policies and programme?
4. Do you think disaster prevention and emergency preparedness plan be integrated in to the city long –term development plan? How?
5. What should be Organizational structure for Disaster Risk Management in Addis Ababa
6. Did your organization involve preventing Biological hazard, like COVID 19? How please justify

- **To identify major challenges faced in DRM practices**

1. What are the practical challenges and barriers for implementing the existing policies in urban settings?
2. What are the challenges of managing disaster in urban and risk management related legislations, regulatory frameworks and their enforcement practice in Addis Ababa, what methods to be used for DR control in your opinion?
3. What are the main policies that are followed in context of Addis Ababa for Urban Hazard risk reduction? Are the existing policies sufficient for Addis Ababa?
4. What are the major challenges that your institution faces in the process of institutional collaboration for DRM in Addis Ababa?
5. What are the causes for the challenges? Is there any institution that have perspective differences/ counteract with your objective of collaborately manage environmental related disaster risks? With whom? Why?
6. What seems like the process of problem solving approach when challenges have been arose?
7. What solutions have been taken to solve the barriers as per your institution & to foster institutional collaboration for DRM in Addis Ababa in the long run?
8. What are the main obstacles or problems your city has encountered for DRM

List of contacted key informant interviewee at NDRMC, FDRMC, Red Cross and Labor Social Affairs

Sex	Ac. level	Educational Background	Experience	Position in the institution	Code
M	BA	Management	12	Disaster prevention team leader	Interviewee-1
M	BA	Management	12	Disaster logistics team leader	Interviewee-2
M	BA	Public Health officer	8	Team leader	Interviewee-3
M	Diploma	Management	12	Shift Manager	Interviewee-4
M	BSC			Team leader	Interviewee-5
M	MSC	Management	3	Head Program Division	Interviewee-6
M	MSC	Disaster Risk Management	5	Disaster & Response monitoring team leader	Interviewee-7