

PLANNING AND ANALYSIS OF EARTHQUAKE DISASTER RELIEF WORK IN ETHIOPIA

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ABSTRACT— This paper addresses dynamic planning and analysis of earthquake disaster relief work by analysis the disaster throughout the technical and procedural method. And combine this analysis as continues assessment for better input to investigating planning disaster for discontinuous economic growth. This implemented, considering the vulnerability and hazard analysis as a procedural analysis disaster to estimating acceptance risk leveling of effect arising out of disaster occurring, analysis socioeconomic, generating set-ups and procedures. Consensually planning earthquake disaster of relief work through the phases; gathering information, plan development, and investigation, and approve the plan and ongoing applying for organizational and the phases; agent- specifically strategies planning and all- hazard strategies planning for the community to perform the acceptable plan as condense the potential economic loss and giving ordinary relief work. Get considering this, the responsible government sectors collaborating with an analyst's, earthquake engineers and geologist can manage before, during and after the response of earthquake disaster exists to establish continuous conjugated of urban together with rural areas sustainability urbanization.

Keywords— Analysis, Disaster, Earthquake, Planning, Seismic, Sustainability urbanization

INTRODUCTION

It has no controversy the world people like to have the city more urbane, which make them feel have the benefit of their interest and their life easy in cities developed. Urban disaster problems faced a more complex situation because of these all responsible people have to critically consider to overcome this complexity. Even if it is difficult to provide supreme mitigation, since some natural factors, like earthquakes, global climate change, floods, other natural disasters happened more frequently. On the other hand, although the city population and density grew rapidly, urban disaster risks were also growing at the back of urban development as population projection shows in figure 1. For an instant, Addis Ababa is the capital and the largest city of Ethiopia. It is home to 25% of the urban population in the country. This city is urbanizing and growing in an accelerated way, and it is considered the growth engine for Ethiopia [1]. Ethiopia is one of the world's fastest-growing economies, [2] but is affected by droughts, floods, landslides, epidemics, pests, earthquakes and forest fires [3], due to its geographical characteristics.

The East African Rift System, where Ethiopia is located, is the most seismically active region of Sub Saharan Africa and damaging earthquakes with magnitudes greater than 6.0M have been recorded in this region [4]. Even if Addis Ababa is not in rift valley, where the occurrences of earthquake wave high the city is located in the seismic region of the Country which can be affected in two way when earthquake exist on rift valley zone in addition to the seismic zone itself, since the city is located between 70 up to 100km far from the rift valley zones [1]. That other earthquake of such relatively small similar magnitude and distance(in 1977, 1984 and 1985) were felt in high- rise buildings on the upper floor [5]. For example, in 100 years of its history, Addis Abeba has also seen a number of earthquakes, most of which are: the eruption of 6.8 in 1906 at an epicenter far from 100 km South of Addis, a huge wave of 6.6 happened in 1961 at a considerable

distance of 200 km(Karakore earthquake), an earthquake of scale 4.0 occurred in July 1997 at a considerable distance of 22 km southwest of the town.

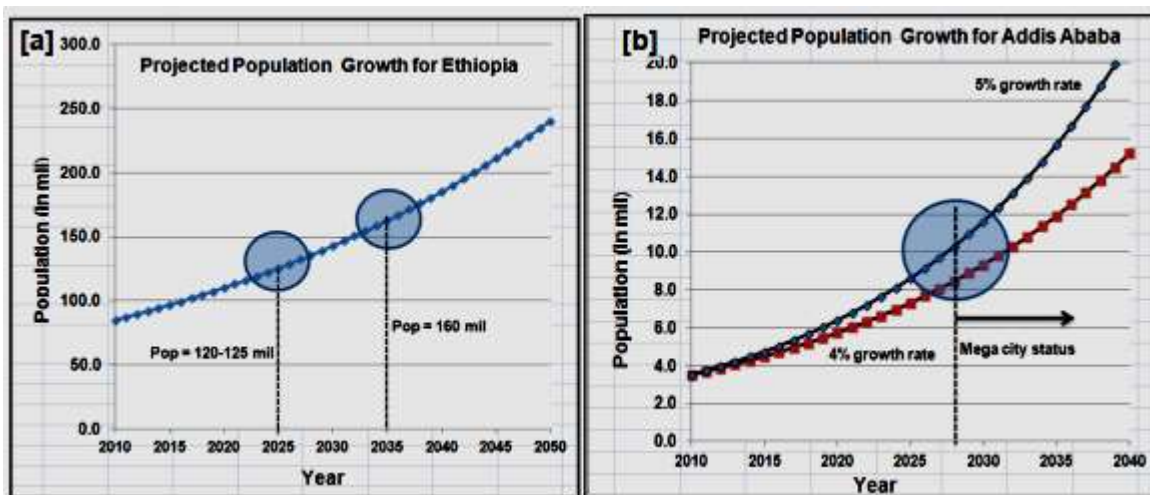


Figure 1: Population projection. a)Ethiopia b) Addis Ababa [6].

In this case, while the earth-shaking happened there are a lot of economic and human life losses exist. In the past decade, most of the industrial, business, private apartments and other constructions as well as different structural works are done and still rapidly continued in the cities, but the qualities and the materials they use for those constructions are not good enough and they are not considered the ground shaking impact relatively higher-risk areas.

Taking into account this, pre-reduce earthquake risk factors are effective carry out in addition hazard analysis and risk management loss predict. After taking this approach further into the evaluation and to use the advancement of disaster response work societies by governments, academics, and potential investors to provide a good base for recovery efforts to improve the capacity of these communities to recover from the effects of earthquakes. The aim of this paper is to grant brief planning and analysis on how can reliefs the earthquake disaster in Ethiopia.

Background of Earthquake and Urban disaster

Earthquake disaster

This is a firm earthquake that mostly will instantaneously damage lifeline infrastructure and services such as those for communications systems, electricity and water supplies, schools and hospitals and so on in a stable and wonderful city today. In addition, higher level risks earthquakes, such as fires, floods, landslides, diseases, etc, will also certainly inflame the financial losses of disaster. In regions where the population is increasing and the country, economy, industry, science, and technology are developing, seismic damage is even more severe. Massive destruction imperiling the lives and property of people [7]. Notwithstanding, earthquakes disaster occurs in Ethiopia is very rarely however it can be strong and cause heavy damages since the government and the responsible committee gives less attention to such type of disaster instead they focus mostly on drought disaster and to make the city more urbanization. Measured against the size of the country, the earthquake active on the seismic zone and main Rift Valley Ethiopia tells as to how it is dangerous for the country urbanization. Figure 1 describes the seismic zone of Ethiopia considering earthquake map in a different region.

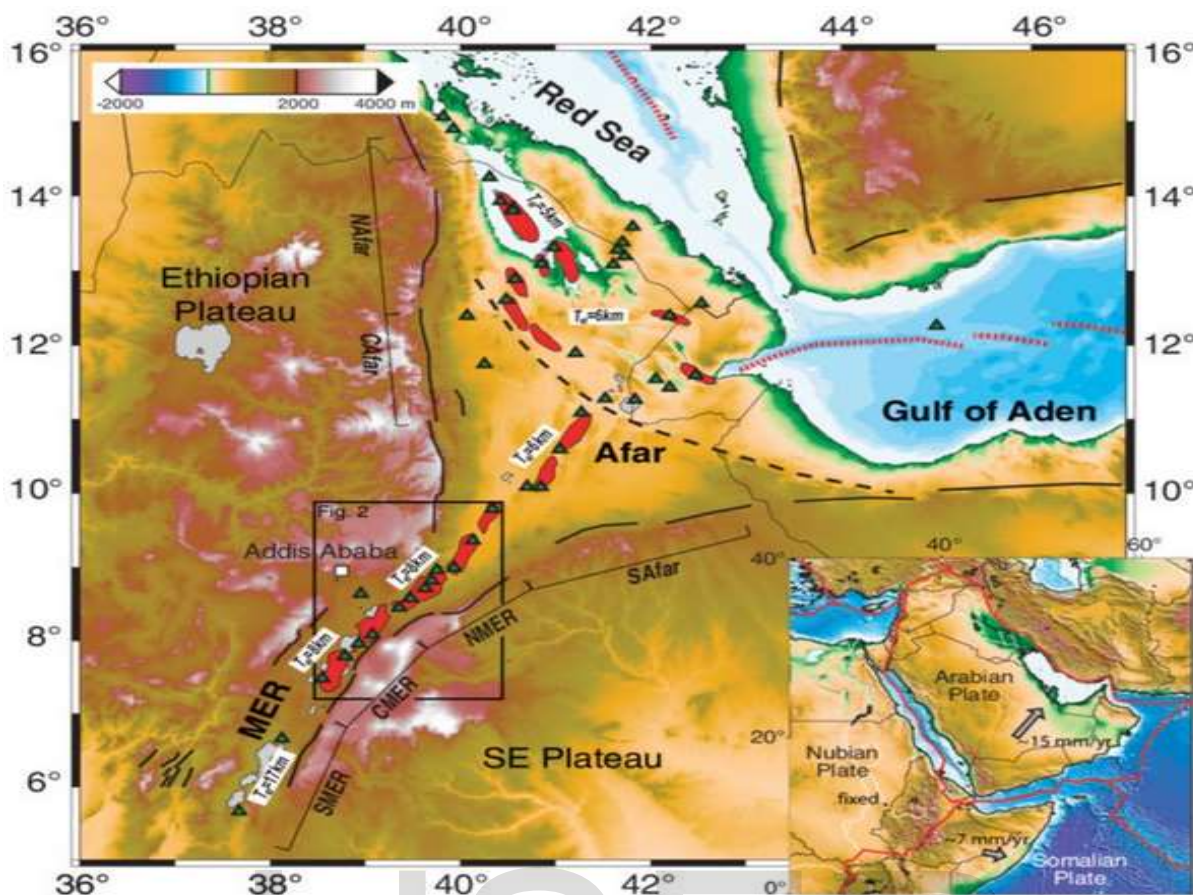


Figure 2: The seismic zone of Ethiopia by mapping the earthquakes.

Source: earthquake report. Com <https://earthquake-report.com/2018/03/24/moderate-earthquake-ethiopia-march-24-2018/>

According to the Databases and several researchers investigated for a different location, 70 people were died by direct consequences of earthquakes. This is listed in table 1 below.

Table 1: Summary of the earthquake in the regions and impact from 1979-2011 [6].

Earthquake	Intensity	Year	STRUCTURAL DAMAGE
Akaki 8.85N 38.7E	Magnitude 4.1 Intensity VII near the epicenter	28 Jul 1979	<ul style="list-style-type: none"> No damage to the then Aba Samuel HEP station a few kilometers away. Cracks in poorly built masonry structures.
8.9N 39.9E	5.1	7 Feb 1981	<ul style="list-style-type: none"> Cracks in masonry buildings in Awara Melka town, north of the Fentale volcanic center.
7.03N 38.6E	5.1	1983	<ul style="list-style-type: none"> Rock slides and damage and destruction of masonry buildings in Wendogenet, east of Lake Awassa. Well-built single-story building cracked at the Forestry Institute. Large boulders dislodged, plaster fell off walls, electric poles thrown down.
Awassa	5.3	1983	<ul style="list-style-type: none"> Damage to steel frames in Awassa. Damage to Western Abo Church in Wondo Genet (1983 earthquake, masonry building with irregular vertical and horizontal stiffness. Damage seems to occur where there is stiffness discontinuity).
11.37N 38.7E Near Lake Hayk.		10Apr, 1984	<ul style="list-style-type: none"> High-rise buildings shook. Mortgage Bank Building in Kazanchis.
8.95N 39.95E		1984	<ul style="list-style-type: none"> Concrete building in Piazza shaken
8.3N 38.52E Oitu Bay	5.1	1985	<ul style="list-style-type: none"> Strongly felt in Lake Langano camp, central MER. Cracks in buildings in resort area hotels.

(Langano)			
9.47N 39.61E Langano	4.8 105 Km away	Oct 1985	<ul style="list-style-type: none"> • Panic in high-rise buildings in Addis Ababa.
	5.6	Oct 1987	<ul style="list-style-type: none"> • Rockslides, many buildings cracked, a tree uprooted, general panic in Arba Minch. • Widespread Panic, inhabitants fled home, the wall moved strongly in Jimma. • Felt in Dodola 330 Kms away.
	5.4	Oct 28, 1987	<ul style="list-style-type: none"> • Already weakened blocked building collapsed, strongly felt – Arba Minch. • Panic – No damage in Jimma. • Students knocked against one another in the classroom, the poorly built house collapsed in Sawla.
Hamer and Gofa Earthquake Swarm	5.3 – 6.2	Oct 7 – 28, 1987	<ul style="list-style-type: none"> • Details are given separately for Awassa, Jima, and Arba Minch.
	5.3	Oct 7, 1987	<ul style="list-style-type: none"> • Light-sleepers is woken. No structural damage in Awassa. • Poorly built structures cracked, many wake up, birds shaken-off trees.
8.9N 40E	4.9	1989	<ul style="list-style-type: none"> • Cracks in buildings in the town of Metehara, northern MER. • Felt like passing truck by many, shaking beds.
Dobi Graben [Afar]		1989	<ul style="list-style-type: none"> • Several bridges damaged.
Mekelle	5.3	Apr 13, 1989	<ul style="list-style-type: none"> • Felt by many causing some panic.
Dichotto	5.8	Aug 20, 1989	<ul style="list-style-type: none"> • Dining people thrown-off table, masonry house collapsed, landslides killed 4 people and 300 cattle, 6 bridges destroyed in Dichotto.
Soddo 6.84N 37.88E	5.0	1989 June 8, 1989	<ul style="list-style-type: none"> • Widespread Panic, broken windows and some injured in Soddo.
8.1N 38.7E	5.1	1990	<ul style="list-style-type: none"> • Minor damage in towns at the western escarpment, i.e., at Silti and Butajira, West of Zway town.
8.3N 39.3E Nazareth	5.0	1993	<ul style="list-style-type: none"> • The collapse of several adobe buildings in Nazareth town northern MER. • Felt as far as Debre Zeit and Addis Ababa.
7.2N 38.4W	5.0	1995	<ul style="list-style-type: none"> • Cracks in flour factory building at Awassa town.
Mekelle	5.2	Aug 10, 2002	<ul style="list-style-type: none"> • Buildings shook in the city of Mekelle.
Afar Triangle		Sept 26, 2005	<ul style="list-style-type: none"> • Fumes as hot as 400 of shoot up from some of them; the sound of bubbling magma and the smell of sulfur rise from others. The larger crevices are dozens of meters deep and several hundred meters long. Traces of recent volcanic eruptions are also visible. This was followed by a week-long series of earthquakes. During the months that followed, hundreds of further crevices opened up in the ground, spreading across an area of 345 square miles.
Ankober	5.0	Sep 19, 2009	<ul style="list-style-type: none"> • Earthquake strikes near Ankober Town and was widely felt in Addis especially by residents who live on multistory buildings.
Hosanna	5.3	2010 Dec 20, 2010	<ul style="list-style-type: none"> • Damage sustained by reinforced concrete frame dormitory building at Jimma University with in-filled walls at where as many as 26 students were injured. Structural damage to slab and column joint. Damage to many building in Hosanna.
Ethio-Somali Border	6.1	March 3, 2011	<ul style="list-style-type: none"> • Buildings shook in Dire Dawa, Jijiga, and Somalian towns.
Agosto/ Yirga Alem	5.0	March 9, 2011	<ul style="list-style-type: none"> • Damage to unreinforced cinder-block clad timber building. 100 houses were destroyed and 2 people were injured in this earthquake.

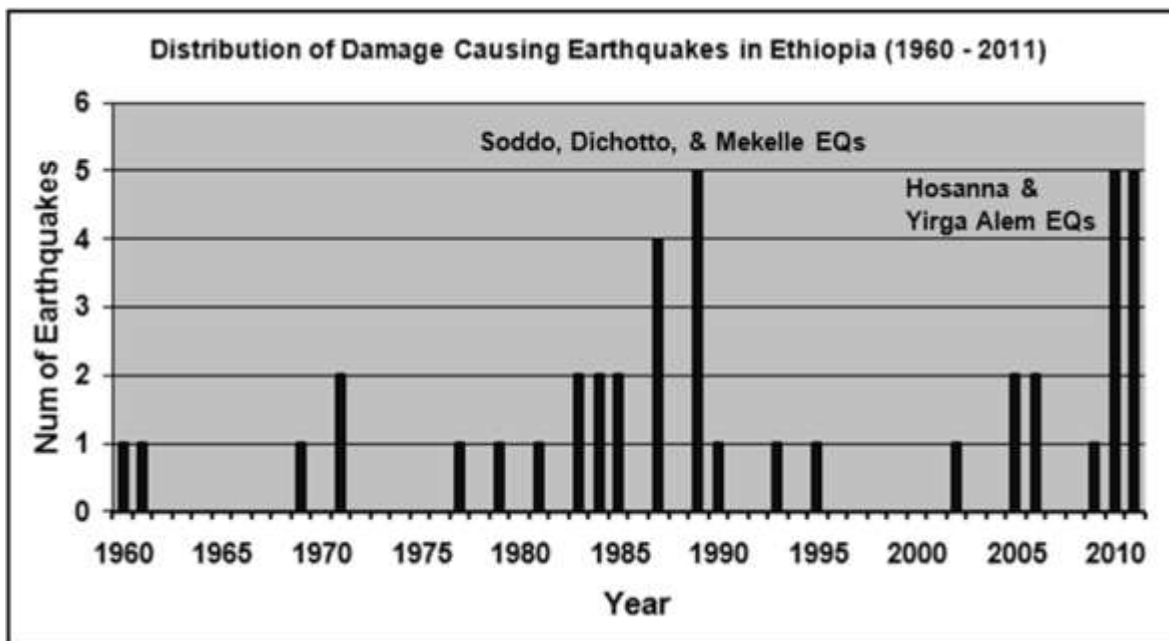


Figure 3: Distribution of damage causing earthquakes between 1960 – 2011. [6]

In the distribution most recorded more than 200 earthquakes with greater than 4.5 in 10 days is on its own result at Dabbahu. And on this distribution, the magnitude represented 4.9 and more disaster on infrastructure and/or life.

During the past years, earthquakes in Ethiopia identified occurs seven times resulted in disasters on human life and reason for more than US Dollar 7 million in economic damage[8]. However, now a day the big crack unusual and ever seen before is happening in Ethiopia, which leads to splitting the country into two countries as shown in figure 4 and 5. Since Ethiopia is one of especially area of the tectonic zone when such unfamiliar disaster of earthquake occurs the country can be easily attacked due to no caretaking account for such an event by government and other responsible sectors.



Figure 4: Big crack in East Africa.



Figure 3: Big crack in Ethiopia

Urban disaster

Urban disaster refers to the harmful events that city as a disaster body, caused by natural, man-made, or both of the reasons that damaged to urban ecological environment, materials, construction, and development of the humanities especially brought harm to life and property. The city is a compositely artificial ecosystem by the natural, social and economic. The intensive population and property, various types of production and living facilities are associated with each other, which make the city extremely fragile when face to disasters [9]. Since Urban square measure as are known as facing seismic vulnerability. The capital Addis Ababa is found on the brink of the western fringe of the Ethiopian vale. Despite solely facing moderate seismicity, the urban public there's a lot of liable to disasters thanks to weak infrastructure and lack of preparation [8]. Population and economic process have junction rectifier to exaggerated urbanization, and additional individuals live getting ready to active rift margins within the sub-Saharan Africa region but there's very little awareness or preparation with regard to potential earthquakes hazards. Poor building structures in seismic zones and low-risk perception and/or absence of alert systems build the urban public a lot of prone to disasters [10, 11]. Take into account this, all of the disasters occurred in the city are belonged to urban disasters.

DEVELOPING OF EARTHQUAKE RELIEF WORK

Around the world, the amount and intensity of natural disaster will increase each year [12]. Since Several disasters are continued by increasing the problems, which can destroy all the economic, industrials, constructions and other sectors of technology done for several decades used for the human safety and interest developing disaster relief work during as the result of the disasters and before disaster should be widely mentioned. Because the potency of disaster relief operations is incredibly hooked into the standard of the preparation, therefore, a well-prepared set up means that associates in nursing redoubled risk of saving lives, whereas additionally creating additional economical use of resources.

Significant Earthquake Disaster Relief Work

As both an essential part of community safety in urban and rural areas, the training on disaster relief is directly related to the safety and security of life and property of people and to environmentally sustainable economic and social development. Even at this level, clothing, diet, water and shelter, and infrastructure standards have been encountered The awareness of security measures has also been further enhanced towards a higher level [7]. Ethiopia is currently in a bridging period of economic, social and political development.

And since the financial pressure to further eliminate the earthquake is already increasing, the economic outlook remains acute. Environmentally sustainable urbanization strategies and the gratitude of public security to relieve one of the natural catastrophes of earthquakes with ongoing social and economic development That One of the two main planning and analysis should be assessed for the future is totally comfortable in years ahead with a significant amount of earthquake relief work. As well as, the making duties by engineers and technicians, the synthetic capacities of seismic prevention and relief in Ethiopia, especially Earthquake engineering and Geologist.

Analysis of the Earthquake Disaster

In the risk management applying to control and reduce the earthquake disaster within the specific disaster, exposure and vulnerability there was advance as in disaster management and when a disaster occurs and restoration [13]. And casualties with the community the analysis of the disaster ought to be thought-about as turning purpose. Since, vulnerability and hazard of the two main analysis, occur in the disaster of Earthquake and along with analysis of protecting capabilities, that are essentially taken collectively together with risk analysis, socioeconomic analysis, prioritization of measures, establishing acceptable risk levels, developing situations and measures in creating attainable this interlinkage. Risk analysis will show whether or not reconstruction and term structural are helpful and necessary once a short amount of emergency aid. The results give a basis for the choice of whether or not support ought to be continuing, and that measures (reconstruction, term structural), so as to cut back vulnerability regarding of disaster risk management a part of disaster management, that specialize in the earlier risk analysis happen to prevention and preparedness of the extreme event, and with reference to them throughout and once of the disaster solely through risk analysis [14]. Figure 5 describing the general phase of Disaster management the significant disaster impact on every nature.

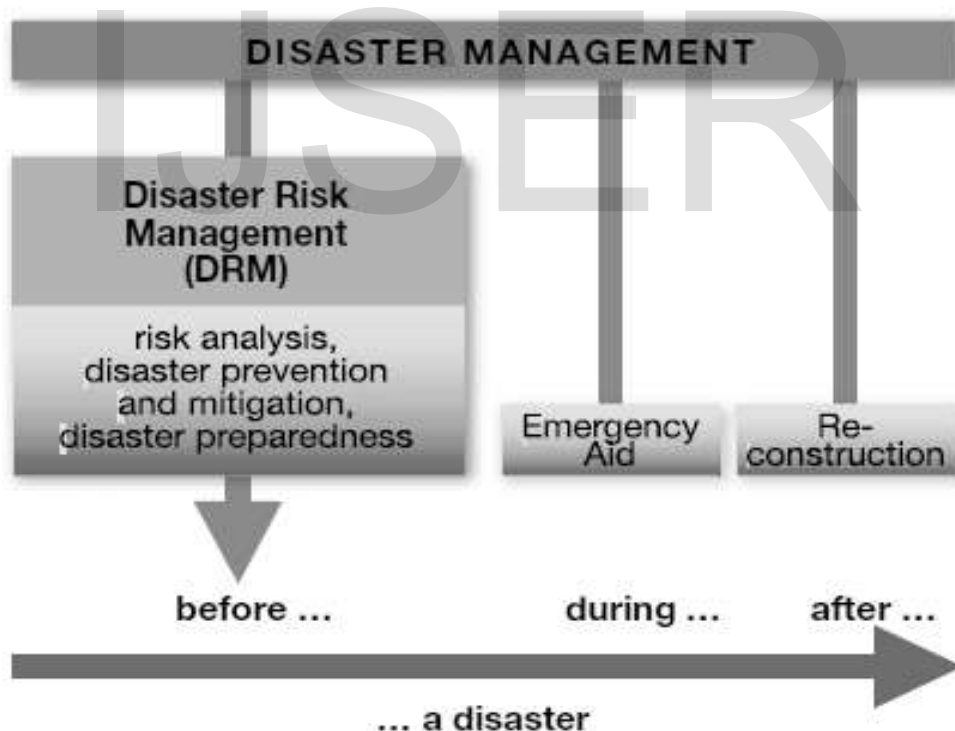


Figure 5: Disaster management inform of disaster risk management.

And intend on the reduction risk investigating intentions of we have to consider recognized and be in touch with nature of disaster and capacities, analyzing and assessing risks associated with those factors; addressing the foundation causes of risks, building risk reduction into property development, upkeep opportunities, disaster recovery and promoting a security culture to be infused into disaster management policy and coming up with output of monitoring risk [15]. During this context, from those countries cause by this disaster the Federal Democratic Republic of Ethiopia is one amongst the foremost disaster-prone countries in Africa [16]. Even though the country is more disaster area the Ethiopia government, national

earthquake resistant rules exist since 1992, but area unit usually not enforced, deed community's vulnerable lead to devoid of careful management, disaster impacts can undermine socio-economic gains. Prior to 2008' numerous barriers stood within the approach of Ethiopia's ability to cope with disasters [16]. These enclosed low levels of knowledge on the vulnerabilities, historical impacts, associate degreed cope mechanisms used coping with disasters; the management of disasters on a reactive basis once hazards were disasters; low levels of coordination and consequently poor designing capacities; an inability of authorities to pursue totally different approaches or to form decentralized designing a reality; the weakness of native designing and budgeting mechanisms and therefore the inability to integrate disaster risk management adequately in spite of high vulnerability to climate variability and disasters. The subsequent analysis appearance at the mechanisms that were in applies. The next discussion views these objectives at intervals the framework of emergency designing measures for hazard hindrance or mitigation, state for hazards, responses to things of emergency and relief or recovery from such things.

Moreover within the thought, nature and manmade because the reason for disasters, increasing attention is being paid to analyzing the role of societies, their mode of production and living, and their development model as doable causes, and integration the results of this analysis into the varied protecting methods. And Earthquake disaster analysis may be a basic instrument of disaster risk management that is employed to review the factors of disaster risk and provides the premise for coming up risk due to earthquake disaster by considering the different methods to control factors and reduced [14]. This instrument may be technical, which is that the technique provides the degree of the danger and procedural that risk analysis, socioeconomic analytic thinking, establishing acceptable risk levels, developing set-up and measures.

Technically method of earthquake disaster analysis

In this analysis methods to reduce the risk of earthquake disaster applying together with the previous analysis done on the assessment of influenced hazard factor by treating the specific earthquake region. this can be implemented by micro-zonation on against to the affected region to estimating the range and size of disaster due to the earthquake and identify the unstable parameter of specified population and infrastructural well designed relating to reducing this unreal surrounding harm region and to varied earthquake supply mechanisms that area unit appropriate to the aim. [17]. Any further adjustments are probably made at sites of interest by surface conditions, topography and soil structure. This seismic zoning mapping basis was actually able for Ethiopia on the basis of earthquake data and the implementation of attenuation relations expressing tectonics and seismic in regions Geological similarity to Ethiopia, [4, 5] Seismic micro-zonation maps provide information on the magnitude, intensity, and acceleration of earthquake return periods. After emanating from the source, waves traveling along different paths are modified according to path parameters like Geometric spread, inhomogeneity, absorption, etc. An earthquake at its source is affected by source stress, rapture propagation pattern, etc.

In regions with low to moderate seismicity, this method records an earthquake sample that is disturbing. In addition, it should be difficult to obtain coincidental records at the soft ground stations and at the onerous rock reference points. The analyzed average accelerations between more spectral amplification and a site response analysis can be calculated the victimization equivalent of horizontal waves speed in the micro-zonation analysis [5].

Other technical of neo deterministic hazard analysis to determine the range and size of disaster for the analysis of earthquake disaster as a system of applying reduction solution with original siting response assumption and considering synthetic statics on the build disaster concerns regions. In this method generated ground motion parameters processed as supporting for a seismic wave with another potential seismic source to collect data for procedural modeling methods as input. This methods could be an applied math approach which might reason an outsized variety of earthquakes potentialities, additionally associated with some careful uncertainty and care information. The strategy numbers modeling formulating into validation methods to use as information regarding the placement of earthquake disaster by getting into the magnitude information. Also, it is supported by ground motion modeling in each location to considering the region of affairs disaster and begins within the convenience of data on earthquake source and regional structural modeling seen in figure 6 below.

In practical, the ground motion of earthquake as a line in an earthquake area and therefore operating for the medium as realistic artificial seismogram at a totally different area, and thus avoid the improper scale amount applied periods to approximate the ground motion reduction relationships [16].

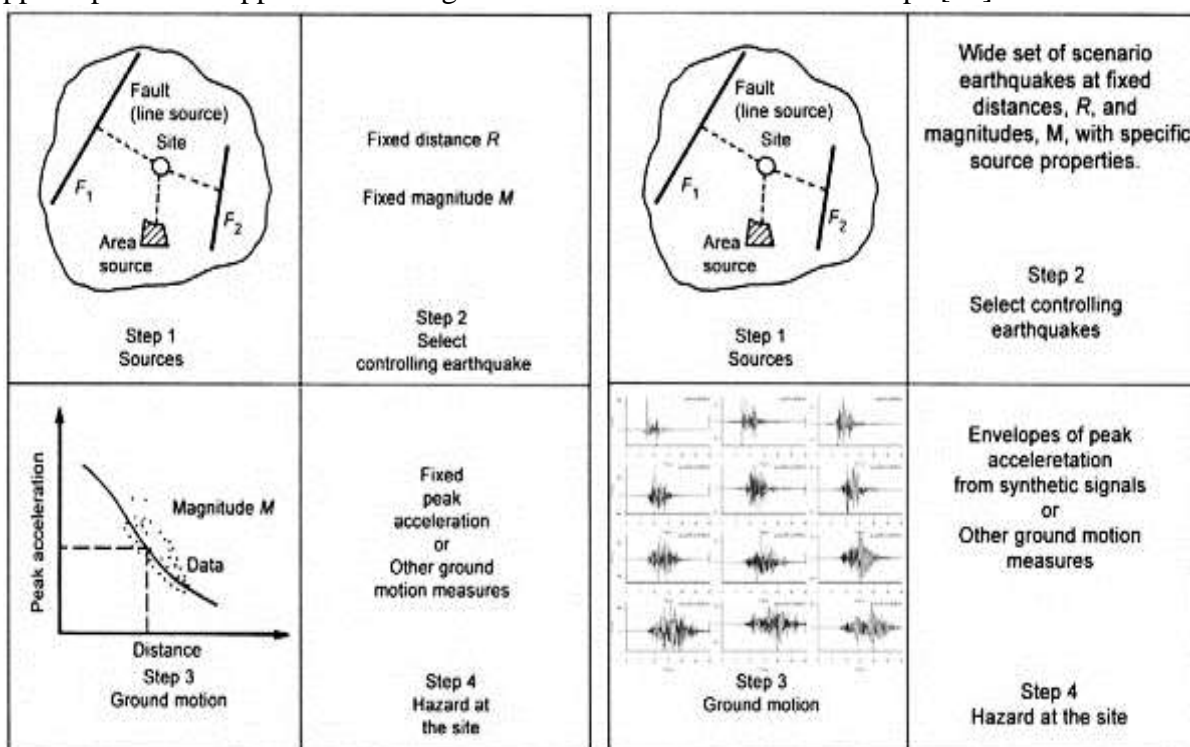


Figure 6: the stage of a) settled seismic hazard analysis, b) modern settled hazard analysis.

Procedural method of earthquake disaster analysis

On this methodology of earthquake disaster analysis the resources needed for an analysis rely upon true and enough data with accurate investigation input as information for documenting as a disaster to the future occurrences. To be ready to estimating acceptance risk level, analysis, and socio-economic value edges analysis of the characteristics and to estimating the accidental disaster with potential loss first, considering the way of team population of the base probability that keep the community from the event into the investigation of studies with analyze the impact of event in disaster region. But to elaborate the studies the vulnerable population around the disaster area should be part of the analysis subsequently to take in consideration the hazard analysis, however, if not this analysis not part of disaster assessment however the analysis is taking place in the vulnerability analysis with the skilled manpower [18]. This ends up in the procedure conferred in figure 7 below.

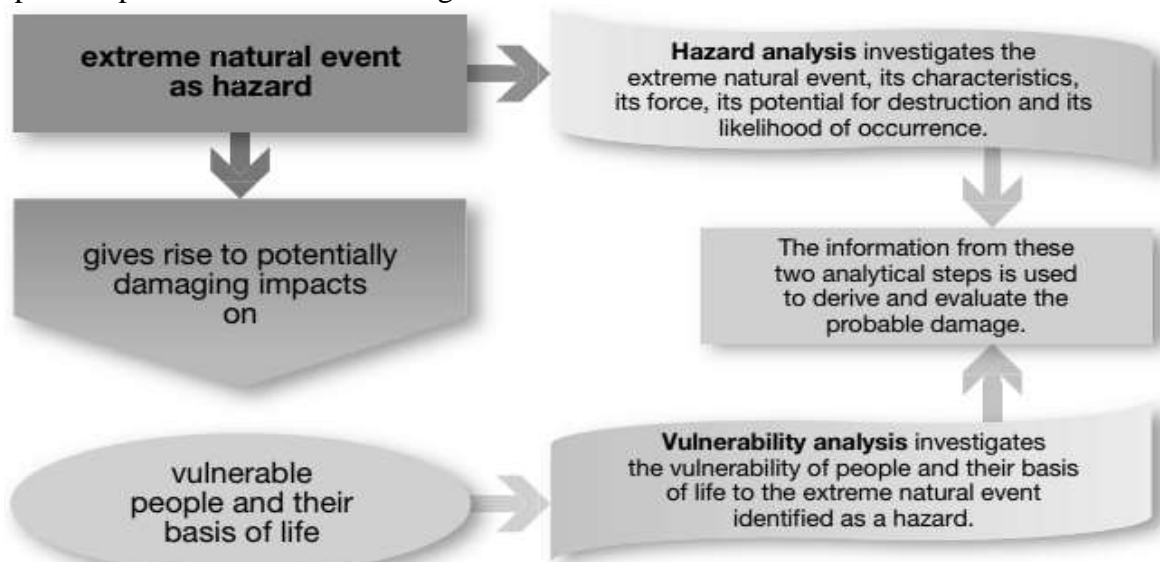


Figure 7: an assessment impact on risk analysis.

This two main disaster analysis consists of hazard analysis and vulnerability analysis, in conjunction with analysis of protection capabilities. This conjointly takes into consideration data from previous emergency aid measures, which is collected continuously by active methods from the two main analysis of the risk. To consider a risk analysis and decide the ways and techniques to be utilized in this, bound conditions should be met and also the following criteria should be taken into consideration political, economic, organization and location statement of problems for the analysis^[18].

After taking account those conditions and criteria the method of analysis can be implemented as in the following procedural stages of Hazard analysis, vulnerability analysis and the combination of two analysis stage [18]:

Vulnerability analysis: this analysis is the initial effort in the earthquake disaster analysis and risk management to identify the vulnerable from different perspective of affected by the disaster; community depending upon their age, gender, cultural, ethical structure, socioeconomic, size and density from rural around the agriculture water area and urban around factory, structural building ; location based on the infrastructure and sufficient facility (transportations, water, hospital emergency center and others) in urban area and ; from place where early warning and emergency system available, as well as the earthquake disaster, preventing and protection given for self-protection from disaster. This all identification and determination of vulnerable for the vulnerability analysis to manage the disaster risk in the time zone of earthquake occur should consider the influence factor of vulnerable and their consequences in the disaster such as physical vulnerable, social, economic and environmental factors.

Take in account this developing the vulnerability analysis using different factors as identification to estimating the vulnerability quality and selection in the bases of influenced factors of vulnerable and analysis of self-defense capabilities: identification of indicators to point out or live capability for the region. The methods and measures area unit known and investigated the analysis depending on the main strategies of disaster managing: announcing warning as traditional or controlling system, plan and funds for protection and reduction of disaster, construct well standard construction and maintains in their service life, take insurance policy and prediction of degree of risk in the time zone of earthquake disaster at varied level and the subsequent indicator gives the output data as the result of this strategies for the next analysis taken to plan and mitigating the earthquake disaster.

Hazard analysis: in this type of analysis, the vulnerability analysis of input data investigated used to identify the type hazard happened in the disaster area, which is taking place sudden or gradual event to develop on the categories of hazard identified and the analysis might have been continuous. For this paper, the sudden disaster type of earthquake is considered and to analysis procedural method with technical instrument methods is desires in order to recognize and categorization of the hazard level in the place of disaster happened. The analysis methodology will be considered in the hazard analysis after collecting data from technical instrument methods and identify the influenced factors like environmental action of structural building, bridge, dams, and others for disaster risk in the time zone of earthquake happened to give the incidence range and size.

Combination of two analysis stage: The risk is known here because of the mean of the loss of human life or harm to things, infrastructure and also the surroundings. Determinative the disaster risk as results of the danger analysis is analytically supported documenting and the hazard analysis together with vulnerability community in order to identify the general risk disaster of earthquake region on population, infrastructure, economic, political, properties and others were taken into consideration at their own specific vulnerability.

In general, this procedural disaster analysis ways are concerned with the analysis, socioeconomic analysis, developing set-ups and measures, estimating acceptance risk level of damages, loss, and consequence arising out of disaster occurring. However, to try the estimate of risk chance and magnitude of injury and loss ought to combine with those technical analysis ways delineated higher than and also the output result will use as input for designing earthquake disaster relief work.

In the earthquake disaster analysis the aim is to give spot of the way hazard potential in the vulnerability community in the region of disaster exists in order to analysis and estimating to plan for the relief work of disaster on each damaged population, properties, political, economic, infrastructural within investigating the weakness and gap occur in the existing management of analysis and expressing accurate measurement

on those gap to confirm and enhance the feasibility, impact and potency of protecting measures by functioning from the chance of change social agreements on ways and measures to scale back disaster risks and to require account in planning earthquake disaster and recovery work by giving the suitable input permanently output product.

Planning of Earthquake Disaster Relief Work

Once the analysis disaster investigated within the technical and procedural methods the estimate of risk chance and magnitude of injury and loss ought to combine with those technical analysis ways delineated higher than and also the output result will use as input for planning earthquake disaster relief work. This input from the analysis can be step up the planning procedural to have successful result using that step by step procedural method to develop relief work for an organization (i.e. institutes, private office, and government office) and Communities.

Disaster planning for an organization

The following disaster planning procedure is proposed to help the organization of Ethiopia for their plan before, during and after an earthquake disaster occur, which is divided into three phases; gathering information, plan development and investigation, and approve the plan and ongoing applying, which is described details as the following [19, 20].

Phase I: Gathering information

Task 1- organized the project top committee

This task would be done by the chief manager of the organization; institute, government office and private office within cooperating within the project coordinator or project manager. In this step, the project coordinator should be generally considered, the most acceptable organization for the unit should be determined(e.g., single arrangement at school level or individual plans at unit level), the team and sub-teams should be identified and convened as acceptable(for example, the laptop support staff should be in the team if the arrangement involves the recovery of digital knowledge), at the level of the organization set: scope — the world designated by emergency preparedness structures and objectives— what is being worked towards and also the course of action the unit intends to follow and Assumptions — what is being taken without consideration or accepted as true without proof of what is a sound assumption, draft the project plan and arrangement together with the project arrangement and schedule.

Task 2- Assign and organize a committee of planning

This committee assigns the administrative as a representative for all disaster region of organization required implementation of project plan within key manager of the committee member in order to operate and processing plan in addition to outline and applying setup of plan.

Task 3- Apply the disaster assessing

The selected committee together with planning participant try to see the impact and their consequence of disaster to analysis the potential possibility of all disaster using a risk analysis and economic impact with technical, community and natural in the environmental condition of disaster. And in this process the difficult for the participant to control and reduce the risk in order to combine together necessary records with protection evaluation of vital documentation, however for the solution the committee should look at the analysis with considering the financial to minimizing potential risk.

Task 4- Establish a review for process and operation of onsite and offsite

The critical desires of every department inside the organization in their evaluation should perform the operation, skilled key person for data analysis process system and service, Essential information and policy records within procedures for; reviewing present records(system instructions, reported methodologies, etc.) that mostly require protection, reviewing or organizing the present offsite storage facility, reviewing the disaster recovery and offsite storage policy or producing a unit leader approval present.

Thus, in this process with operation and analysis in order to identify the sector and organization will

operate in the time zone of earthquake disaster as the most system and for the critical system, the organization investigate instrument and well-organized procedure operation with computer center for data planning, harmed organization and other main necessity. After the critical desires investigated, it will be documented as functional documentation for every sector. Once the first functions are known, the operations and processes ought to be grade so as of priority: Essential, necessary and non-essential.

Phase II: plan development and investigation

Task 5- developing a relief plan

In the planning process of the earthquake disaster, the critical practices should consider are an investigation and giving an evaluation in order to research all necessary aspect for all organization the most practical alternatives for the process just in case of a disaster ought to be researched and evaluated. It's necessary to contemplate all aspects of the organization computer and paper base data, customer services and user operation, and other processing operations To illustrate how an organization might prefer to organize its disaster recovery plan and develop the action plan using the measure mentioned as an evaluation of the plan objective, plan assumption, plan to raise criteria, responsibilities, and authority, contingency operating procedures, contingency operations resource plan, parameters and procedures, procedures for convalescent lost or damaged information, testing, and coaching, and plan maintenance

Task 6- Test plan

To implant the initial test as one of the plan for earthquake disaster relief work first of all the procedural test should justified by applying full interpretation relief plan as parallel test and checklist to be performed by conducting a structured walk-through check throughout developing take a look at strategy and plans, conduct tests, modify the plan as necessary. The take a look at can provide extra info relating to any more steps that will have to be compelled to finalized the procedure with avoiding ineffective procedure and adding different application to change the avoidance or update the plan to adjust all issues in the process of test, which is initially investigated in testing plan to have effective time with reduction of economic and general operation commotion of the organization.

Phase III: approve the plan and ongoing applying

After the relief work has been written and tested for the disaster plan, the plan should be approved by management. It is the final responsibility of prime management that the organization has documented and tested the plan.

Management is accountable for establishing policies, procedures, and responsibilities for comprehensive contingency designing. Also to reviewing and approving the contingency and arrange annually, documenting such reviews in writing. And if an organization, from a serviced office, obtains science-based discipline, management should also. Take a decision on its service company adequacy plans. Ensure that its contingency plans for the arrangement of its service office. The organization's disaster planning relief works generally involve the storage or backup off-site. In addition, the organization should develop written, comprehensive disaster plans that address all essential business operations and functions. The arrangement to adopt documented and tested procedures that, if followed, can ensure that the in-progress process convinces of important resources and operational continuity. The possibility of an organization's disaster is incredibly assured. Insurance alone is not sufficient to make adjustments.

Disaster planning for communities

The planning disaster relief work in the situation of communities is stated as the inclination to response, lead, training, and exercise support, and technical and financial help to strengthen citizens, communities, and state, local and social group governments skilled emergency employees as they arrange oneself for disaster, mitigate the results of disaster, answer community wants when a disaster, and launch effective recovery efforts to be able to reduce the immediate mortality and morbidity with a much better ready, well-equipped service within the preparation includes early warning systems illustrate on Fig 6 below. This planning has three major phases; preparing plan, training to the plan and exercising the plan using *agent-specific strategies planning* that can be provided for the communities solely plan for threats possibly to occur in their region, Since several disasters cause similar issues and similar tasks and *all-*

hazard strategies planning involves planning for the common issues and tasks that arise within the majority of disasters [18].

The following aspects are factors should be considered during planning disaster of a community for successful output before, during, and after the earthquake occurs.

- Escape routes
- Family communications
- Utility shut-off and safety
- Insurance and very important records
- Special wants
- Safety Skills

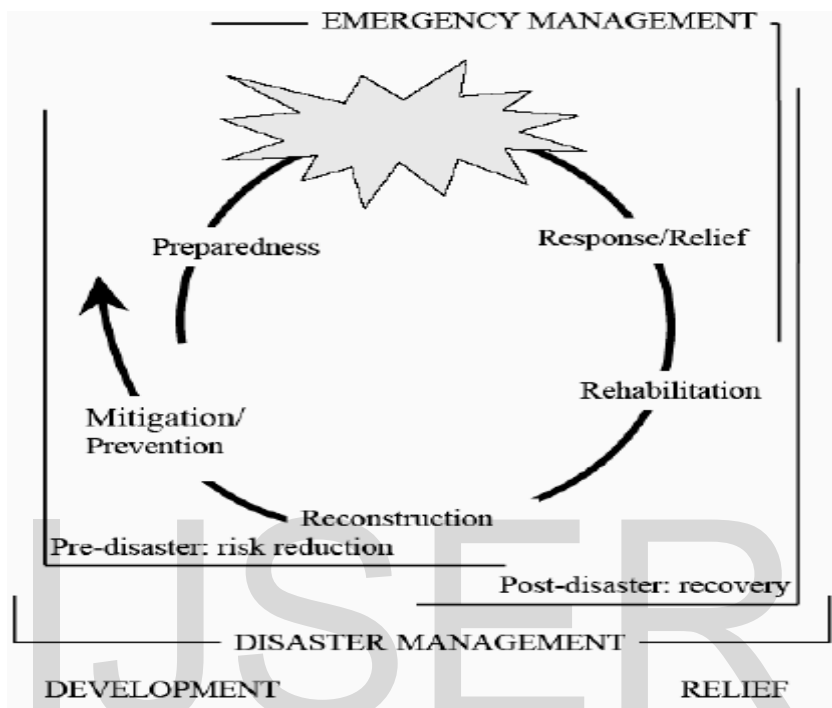


Figure 8: phase of disaster planning management of communities.

The overall goals of the earthquake disaster relief work in Ethiopia is that, to reduce the loss of economic, political, industrial, infrastructural and environmental in the whole area of earthquake region using planning and analysis to preventing and mitigating the ability of earthquake disaster for bringing the continuous economic growth without collapsing of sustainability of urbanization in the country to reach the level of developing countries on the same period of continuous.

GENERAL CONCLUSIONS

This paper has provided the planning and analysis of earthquake relief work in Ethiopia, to reduce the loss of economic, political, industrial, infrastructural and environmental in the whole area of earthquake region using analysis of earthquake disaster: technical and procedural, which considered and recognized be in touch with capacities, analyzing and assessing risks associated to spot participative potential hazards and vulnerabilities of population teams, and planning disaster establish well organized approved plan in view of Ethiopia financial capacity to preventing and mitigating the ability of earthquake disaster for bringing the continuous economic growth without collapsing of sustainability of urbanization in the country to reach the level of developing countries on the same period of continuous.

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