

INTERNATIONAL ENVIRONMENTAL LAW AND THE CHALLENGES OF EARTHQUAKE IN THE WORLD

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1.0 INTRODUCTION:

Earthquake is a geological hazard with adverse effects on the earth environment and the inhabitants – man, animal, plant and the living organisms. Earthquake is as old as the history of creation. The Bible² records the episode of earthquake when the ground clave under the man called **KORAH** and his company and the earth opened her mouth and swallowed them and their houses. Earthquake is one of the re-occurring natural and man-made disasters around the world which constitute a threat to human survival on the planet earth.

Natural or man made disasters such as cyclone, tornado, hurricane, flood, tsunami, earthquake, volcanic eruption, forest fire, chemical spill, climate change have the effect of causing drought, famine, rainfall, variation and shrinkage of fresh water supplies that invariably lead to unimaginable human suffering, mass starvation and unquantifiable humanitarian catastrophe.

The purpose of this article is to sensitise the International community further into the disastrous effect of earthquake with a view of evolving concrete legal instrument to eliminate human activities that can precipitate the occurrence of earthquake. The existing policies or instruments to tackle the aftermath of earthquake are unco-ordinated, personalized and palliative in nature. There is a need for a concerted effort by the International community and regional bodies to confront the environmental challenges of earthquake. This is suggesting that there is a need for institutional mechanism to deal effectively with the outcome of earthquake. “In truth the United Nations lacks any coherent institutional mechanism for dealing effectively with environmental issues. Natural hazards like earthquake, flooding, erosion, tsunamis etc are inimical to global security. “If global security is taken to mean security against those risks that threaten our common survival, the focus of collective legal action may indeed be sharpened considerably”³ Law as an instrument of social engineering and indeed environmental law and actions become imperative in addressing this collosus called earthquake.

2.0 CONCEPTS AND PROCESSES OF EARTHQUAKE

Earthquake in general represent a release of built up stress in the lithosphere⁴ Earthquake can be defined as the shaking of earth cause by waves moving on and below the earth’s surface and causing: surface faulting, tremors vibration, liquefaction, landslides, aftershocks and/or tsunamis.⁵ The lithosphere is one of the inorganic realms of the natural elements of the world. The lithosphere in its broadest aspect consists of the entire solid earth. In recent times however, the term lithosphere has been applied restrictively to the outer layer of rigid brittle rock. In thickness, the lithosphere ranges from 40 to 80 kilometres. The lithosphere has the capability of moving bodily over the soft plastic atmosphere underneath it. The lithosphere does not form a single continuous shell over the entire earth, but is broken into large fragments called lithospheric plates.

² Numbers chapter 16:32 & 33

³ Palmer, G (1992) New ways to International Environmental law. *American Journal of International Law*. Vol 86 No 2 p. 260

⁴ Montgomery, C.W. (1986) “Environmental Geology” MicGraw Higher Education, New York P. 68

⁵ <http://www.unisdr.org/unisdr/framework/html/DEFINITION>. See also European Commission Directorate General Environment Unit D3: Civil protection

The release of built up stress in the atmosphere occur along fault, planar breaks in rock along which there is displacement of one side relative to the other. Sometimes the stress produce new faults or breaks, sometimes it cause slipping along old, existing faults. When movement along faults occurs gradually and relatively smoothly, it is called *Creep*.⁶ Creep sometimes termed *aseismic slip*, meaning fault displacement without significant earthquake activity-can be inconvenient but rarely causes serious damage.

When friction between the rock on either side of a fault prevents the rock from slipping easily or when the rock under stress is not already fractured, some elastic deformation will occur before failure. When at last the stress exceeds the rupture strength of the rock, a sudden movement occurs to release the stress. This is an earthquake, or seismic slip.⁷

Faults come in all sizes, form microscopically small to thousands of kilometers long. Likewise earthquakes come in all sizes, from tremors so small that even sensitive instruments can barely detect them, to massive shocks that can level cities. The amount of damage associated with an earthquake is partly a function of the amount of accumulated energy released as the earthquake occurs.

Natural hazards comprise phenomena such as earthquakes, volcanic activity, landslides, tsunamis, tropical and other severe storms, tornadoes, and high winds, river floods and coastal flooding, wildfires and associated haze, drought sand/dust storm, infestations. Natural disaster is the result of the impact of a natural hazard on a socio-economic system with a given level of vulnerability which prevents the affected society from coping adequately with this impact. The risk of a disaster is the probability of a disaster occurring. The evaluation of a risk includes vulnerability assessment and impact prediction taking into account thresholds that define acceptable risk for a given society. Seismic risk is the possibility of a seismic disaster that has as a result loss of life, loss of property, or loss of function of buildings, structures or utilities because of a complex combination of seismic hazard and vulnerability.

An earthquake's point of initial rupture is called its focus or hypo-centre. The term epicenter refers to the point at ground level directly above the hypocenter.

3.0 MEASUREMENT OF EARTHQUAKE

Earthquake can be measured in terms of its magnitude or intensity. The energy released that caused the ground shaking or ground motion is directly proportional to the magnitude of the earthquake. The magnitude of an earthquake is measured through the *RICHTER* magnitude scale. A Richter magnitude number is assigned to an earthquake on the basis of the amount of the ground displacement or shaking that it produces near the epicenter. The magnitude of an earthquake can also be measured through what is called **MOMENT MAGNITUDE**. Moment magnitude takes into account the area of break on the fault surface, the displaced along the fault during the earthquake, and the strength of the rock.

The size of an earthquake can also be described through the intensity of the earthquake. Intensity is a measure of the earthquake's effect on humans and on surface features. Intensity is somewhat a subjective measure in that it is usually based on human observations by or impression of individuals. Nevertheless, it is a more direct indication of the impact of a particular seismic event on humans in a given place than is magnitude. Even in an uninhabited area, intensities can be estimated if the latter data have been measured.

4.0 EFFECTS OF EARTHQUAKE

Earthquake is one natural disaster that has claimed human lives more than any disaster in any single event. In 342 AD, the earthquake in Turkey claimed the lives of 400,000 people. China has suffered five notable and terrific earthquakes. The first earthquake in China occurred in 1290 and caused the death of 100,000 people. The earthquake of 1556 claimed the lives of 830,000 people, the largest in the history of

⁶ Montgomery, C.W. (1986) "Environmental Geology" op. cit.

⁷ Ibid

earthquakes all over the world. The earthquake of 1976 in China caused the death of 655,000 people. India witness an earthquake in 1737 which caused the death of 300,000 people. Italy and Japan have each experienced five notable earthquakes while the United States of America has experienced historic and notable earthquakes on six different occasions. The first earthquake in the U.S.A occurred in San Francisco in 1906 where it claimed 700 lives. San Francisco witnessed another earthquake in 1871 which claimed the lives of sixty people. California experienced earthquake twice in 1989 and 1994. Washington experienced an earthquake in 2001 and Alaska in 2002 without any loss of life on the two occasions.⁸

The world largest earthquake with an instrumentally documented magnitude occurred on May22, 1960 near Valdivia in Southern Chile. It has been assigned a magnitude of 9.5 by the United States Geological Survey. It is the largest earthquake of the 20th century. Other earthquakes in recorded history may have been larger however, this is the largest earthquake that has occurred since accurate estimates of magnitude became possible in the early 1900s.⁹ The earthquake produced a powerful tsunami that traveled at a speed of about 200 miles per hour across the Pacific Ocean. The wave killed 61 people in Hawaii, 138 in Japan and 32 in the Philippines. The earthquake occurred beneath the Pacific Ocean off the coast of Chile. Ground motion from this earthquake destroyed and damaged many buildings. The Chilean government estimated that about two million people were left homeless. Most of the damage and deaths were caused by a series of tsunamis that were generated by the earthquake. These waves swept over coastal areas moments after the earthquake occurred. They tore buildings from their foundations and drowned many people.

Earthquakes lead to shaking and ground rupture which in turn result in more or less severe damage to buildings and other rigid structures. The severity of the local effects depends on the complex combination of the earthquake magnitude, the distance from the epicenter and the local geological and geomorphological conditions. Ground rupture is a visible breaking and displacement of the Earth's surface along the trace of the fault, which may be of the order of several metres in the case of major earthquakes.

Earthquakes can cause fires by damaging electrical power or gas lines. The 1906 earthquake in San Francisco resulted in the death of people from fire outbreak.

The earthquake that occurred on 22 May, 1960 in Southern Chile produced a powerful tsunami¹⁰ that travelled at a speed of about 200 miles per hour across the Pacific ocean. Large waves produced by an earthquake or a submarine landslide can overrun nearby coastal areas in a matter of minutes. Tsunamis can also travel thousands of kilometers across Open Ocean and wreak destructions on far shores hours after the earthquake that generated them. Ordinarily, it has been observed that earthquakes under magnitude 7.5 on the Richter scale do not cause tsunamis. Most destructive tsunamis are caused by earthquake of magnitude 7.5 or more. Most of the damage and death associated with earthquakes are caused by a series of tsunamis generated by the earthquakes. Coastal areas are swept over moments after the earthquake occurred while many people are drowned.

Earthquakes may cause flooding where dams are damaged. A flood is an overflow of any amount of water that reaches land. Floods occur usually when the volume of water within a body of water, such as a river or lake exceeds the total capacity of the formation and as a result some of the water flows or sits outside of the normal perimeter of the body.

Earthquake can lead to the outbreak of diseases. The 1994 Northridge¹¹ earthquake that occurred on 17 January, 1994 in the North-Central San Fernando valley region of Los Angeles, California, U.S.A. caused the outbreak of *coccidioidomycosis*¹² The disease affected about 203 people out of which three people died.

⁸ Montgomery C.W. Ibid. P. 67

⁹ Geology. Com News Carriers

¹⁰ Tsunamis are long wave length, long period sea waves produced by the sudden or abrupt movement of large volumes of water

¹¹ USGS Response to an Urban Earthquakes – Northridge'94. The earthquakes occurred within a duration of 10-20 seconds in the north central San Fernando valley region of Los Angeles, California, U.S.A.

¹² Valley fever is a respiratory disease caused by inhaling spores of a species of fungus unique to the American Southwest.

Earthquake can cause notable effects such as the disruption of social services and destruction of infrastructural facilities. The Northridges Earthquake of 1994 affected eleven hospitals that suffered structural damage and remained unusable after the earthquake. The hospitals were not able to serve their local neighbourhoods and had to transfer out their in-patients to nearby hospitals. The earthquakes also affected transportation as many roads and rails had to be closed because of structural failure or collapse. Los Angeles International Airport and other airports in the area were shut down. Education was equally affected as some universities were shut down. California State University, Northridge was the only major university near the epicenter. Many campus buildings were heavily damaged and a parking structure collapsed. Los Angeles unified school district closed local schools throughout the area. The University of Southern California suffered some structural damage to several other campus buildings. The United States postal services suspended all mail service throughout Los Angeles area for several days. The Los Angeles public library shut down most of its branches. It should be noted that as it happened in the Northridge, California, the effects of earthquake could be the same or more in other area whenever it occurred.

Earthquakes constitutes a threat to the environment. The earthquake that struck sichvan province n China on May 12, 2008 was China most damaging earthquake since the 1976 Tangshan earthquake disaster. The province is one of the major agricultural production bases of china. The epicenter of the earthquake in Wench van was in a mountainous area, approximately 603,000 people lived in the region and were violently affected by the earthquake. The complex topography of the region adds to the difficulties of rescue and reconstruction. Proper disposal of all the debris from buildings that were destroyed presents a large environmental and health challenge.

The report from State Council Information Office shows that many houses collapsed. Eventually the rubble is probably destined to be dumped into the fields and valleys of rural areas. Some neighbourhood and croplands have become dumping grounds for debris that may constitute health hazards to residents.

5.0 INTERNATIONAL LEGAL RESPONSE TO THE PROBLEM OF EARTHQUAKE

Humanity will continue to live with natural disasters such as cyclones, tornadoes, hurricanes, floods, tsunamis, earthquakes, volcanic eruptions, forest fires, chemical spills and climate change induced calamities. The key question is how to cope with and mitigate their impact on vulnerable populations within the territories of nation states.

The hazards that cause the largest numbers of fatalities in one event are earthquakes. Despite the recent scientific evolution, earthquakes are still the most unpredictable and feared natural disasters.¹³

It is not possible to predict earthquakes. However, their physical consequences are highly predictable once we know which the potential seismogenetic sources that may affect an area and the physical and human characteristics of that same area. Though we can not prevent earthquakes from occurring, their effects can be quite minimized through effective prevention measures and reduction of vulnerability.¹⁴

Legal responses to the problem of earthquake are not designed to prevent the occurrence of earthquake but rather they are geared towards mitigating the effects of earthquakes whenever it occurs.

The United Nations has continued to play a leading role in order to mitigate the effects of natural disasters in the countries of the world. The UN has established a number of agencies to react to the challenges of natural disasters.

The UN through the **UN-HABITAT- Risk and Disaster management Unit (RDMU)** has provided support to national governments, local authorities and communities in strengthening their capacity in

¹³ Fereniki, V (2003) "Earthquakes in Europe (National, International and European policy for the prevention and mitigation of seismic disasters)" European Commission Director- General Environment. Unit D3

¹⁴ Ibid. P. 3.

managing human – made and natural disasters. The unit provides support by sending technical advisory missions to disaster – prone countries. Other areas of support include but not limited to the following:

- a. Developing of techniques and tools for the management of disaster, prevention, mitigation and rehabilitation.
- b. Assessing global and regional demands for support on disaster management and human settlement.
- c. Designing, implementation and back stopping projects at national, regional and global level in collaboration with other countries and external support agencies.

The United Nations office for co-ordination of Humanitarian Affairs (UN-OCHA)¹⁵ is another agency of the UN designed to provide humanitarian support for countries and affected people in a disaster zone. The mission is saddled with the responsibility of mobilizing and co-ordinating the collective efforts of the international community, in particular those of the UN system, to meet in a coherent and timely manner the needs of those exposed to human suffering and material destruction in disasters and emergencies.

The *International search and Rescue Mission (INSARAG)*¹⁶ is an intergovernmental network under the United Nations umbrella, which deals with urban search and rescue (USAR) and related disaster response issues. The purpose of **INSARAG** is to provide platform for the exchange of information, to define standards for international **USAR** assistance and to develop methodology for international co-operation and co-ordination in earthquake response.

The UN has a stand – by team known as the *United Nations Disaster Assessment and Co-ordination (UNDAC)*¹⁷ which is a team comprising of disaster management professionals who are nominated and funded by member governments such as UNDP, UNICEF, WHO etc. The team is normally deployed within hours of request by a disaster – stricken country to carry out rapid assessment of priority needs and to support national Authorities and the United Nations resident Co-ordinator to Co-ordinate International relief on – site.

The *United nations Disaster Relief Co-ordinator office (UNDRO)*¹⁸ was established in 1972 to co-ordinate international relief activities to countries struck by natural or other disasters. The **UNDRO** works in conjunction with the **UNDP** and reports directly to the secretary – general of the UN. The office in collaboration with the UNDP established **SEISMED Project (Co-operative project for seismic Risk reduction in the Mediterranean Region)**. The aim of the project is to establish procedures for the mitigation of earthquake disasters through the appropriate management of earthquake risk.

The International community as part of its response to the scourge of natural disaster declared the year 1990 – 1999 as the *International Decade for Natural Disaster Reduction (IDNDR)* with a view of increasing awareness of the importance of disaster reduction. The outcome of the decade was the shift of emphasis from disaster response to disaster reduction. The secretariat of IDNDR in Geneva launched the *Risk Assessment Tools for Diagnosis of Urban Areas against seismic Disasters (RADIUS)* in 1996 with financial assistance from Japan. The aim is to promote world-wide activities for reduction of seismic disasters in urban areas particularly in developing countries. The **RADIUS** has developed practical tools for seismic risk assessment of urban areas and equally raised public awareness.

The European Union has responded positively to the challenges of natural disaster through series of actions. Earthquakes are a major natural hazard for a large part of the European Union territory, particularly the Mediterranean countries have suffered in the past from very serious seismic disasters.¹⁹ The committee on Energy, Research and technology of the European Parliament in its document **Doc – EN/RR/244/244682 of 31 January, 1994** considers earthquake as a major natural hazard with serious effects. The committee

¹⁵ <http://www.reliefweb.int/ocha/index.html>

¹⁶ <http://www.reliefweb.int/insarg/index.html>

¹⁷ <http://www.reliefweb.int/undac/index.html>

¹⁸ <http://www.virtualref.com/uncrd/index.html>

¹⁹ Fereniki, V. OP.Cit. P.29

therefore encourages co-ordination and co-operation in research and research policy, sees earthquakes disaster prevention in seismic areas as top priority. The committee calls the European Commission to establish international co-operation links, proposes the setting up of a European Earthquake observatory, encourages the completion of the drafting of the European Construction Standards and the promotion of civilian rescue services at European level.

The European Union formulated a design code known as *Eurocodes*. The Eurocodes based on article 100 of the Treaty are to provide a set of rules for the design of buildings and civil engineering works. The Eurocodes are to provide common design criteria and methods to fulfill the specified requirements for mechanical resistance, stability and resistance to fire including aspects of durability and economy. The codes would also facilitate the exchange of construction services between member states. *Eurocode 8* is of the particular significance as it deals with the design of all types of structure to withstand seismic..... loading. It also indicates the design provisions for earthquake resistance of structural construction works.

The 2011 earthquake in *Tohoku* region of Japan which occurred in March 11 was a major earthquake that shook Europe and attracted international response from other countries of the world. The earthquake created extremely destructive tsunami waves of up to 10 metres that struck Japan minutes after the quake, with smaller waves after several hours in many other countries.

The earthquake caused extensive and severe damage in Japan to roads, railways, buildings and caused fires in many areas. The Japanese National Police confirmed 1886 deaths, 1885 injuries and about 2369 people missing.

The UN reported that search and rescue team from 45 countries were offered to Japan on request. The United States moved naval vessels closer to Japan for the purposes of providing aid. The United Kingdom was reported to have sent 70 rescuers including two search dogs, a medical support team and 11 metric tons of specialized rescue equipment. South Korea sent 5 members from her National Rescue Services. The Peoples Republic of China which had suffered a major earthquake just one day prior to Japan's earthquake sent a 15 member rescue team and the sum of US \$167,000. Singapore sent a rescue team while the Vietnamese government offered US \$200,000 to the Japanese people. The response to earthquake from the International Community is a testimony of the calamitous nature of the disaster, hence the need to create awareness on the scourge on how to reduce it or minimize the effects.

International Legal instruments including Human Rights Treaties, contain numerous provisions aimed at protecting and promoting the right of health. The Universal Declarations of Human Rights (1948) affirmed that

“Everyone has the right to a standard of living adequate for the health and well being of himself and of his family including food, clothing, housing and medical care and necessary social services and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control”

In an emergency situation arising from a natural or man – made disaster, the right to health can be used to monitor the humanitarian response by local, regional, national and international actors. Disasters normally are beyond what the affected nation can cope with locally, the international community, must rise up to the challenges of the affected countries.

It must be noted that humanitarian assistance is imperative to alleviate the suffering of the people in the affected area. However, the provision of humanitarian assistance must be in accordance with the United Nations general Assembly Resolution **46/182 (1991)**. The Resolution affirms that the sovereignty, territorial integrity and national unity of states must be fully respected in accordance with the charter of the United Nations. In this context, humanitarian assistance should be provided with the consent of the affected country and in principle on the basis of an appeal by the affected country. What happens therefore where a

country has not requested for assistance even though it can not take care of its population?

International scholars have suggested that the norm – **Responsibility to protect (R2P)** can be invoked to provide humanitarian assistance in the event of natural disaster. For instance the Democratic People Republic of North Korea, Iran after the 1990 earthquake, Afghanistan after the 1998 earthquake and Myanmar after cyclone Nargis refused external humanitarian assistance. Humanitarian assistance may be refused for national interests and ideological differences. In this type of situation, opinions have varied whether the **R2P** can be invoked to provide assistance. It is safe and it is widely accepted that humanitarian assistance should be with consent or on request.

Laws have been passed by some developed countries to reduce disaster in zones prone to geologic hazards. After a major earthquake near Long Beach, California, USA, in 1993, the California legislature passed a regulation known as the Field Act, which created improved construction standard for school buildings. Many of those standards are still being followed. Their effectiveness was demonstrated in subsequent earthquakes, notably the major one in San Fernando in 1971, it was noted afterwards that damage to school buildings from earthquake was almost wholly limited either to schools built prior to 1993 or to those later buildings whose engineers had been permitted to deviate from strict compliance with the Field Act.²⁰

6.0 AFRICA CONTINENT AND RESPONSE TO EARTHQUAKE

Africa continent has not witnessed Earthquake of Catastrophic dimension like the type experienced in Europe, Asia and North America. Historically, the most severe earthquake of magnitude 6.3. occurred on 29 September, 1969 in Ceres, Northeast of Cape town, South Africa. The event resulted in 12 lost lives and numerous damaged buildings in the town of Tulbagh.²¹ Countries like Tanzania, Democratic Republic of Congo, Morocco have experienced tremors in the form of slight shaking and rocking of building for few seconds in the past. The absence of major earthquakes in the countries of Africa does not translate to immunity against the hazard. Africa countries should be prepared to learn from the experience of other continents that have had bites of the hazard and evolve measures to reduce any disaster that may accompany the hazard in the future if it occurs.

The countries in the continent should have a blue print for urban and regional planning. In Nigeria, the urban cities of Lagos, Port Harcourt, Abuja, Kaduna etc have experienced the incident of collapsed buildings on regular basis from 2008 to 2013. The incident, which though is not an earthquake induced occurrence requires the government to provide measures for urban and regional planning in order to ensure that people do not build houses in seismic zone and to ensure that houses are built to specifications approved by the government for each location.

In Nigeria, every public building is required to be covered by an Insurance Policy against accident. The insurance Act 2003 provides as follows:

“Every public building shall be insured with a registered insurer against the hazards of collapse, fire, earthquake, storm and flood”²²

The Act provides also that

“No person shall cause to be constructed any building of more than two floors without insuring with a registered insurer his liability in respect of construction risks caused by his negligence or the negligence of his servants, agents or consultants which may result in bodily injury or loss of life to or damage to property of any workman on the site or of any member of the public”²³

²⁰ Montgomery, C.W. OP.Cit P.479

²¹ South Africa Spotlight on Earthquake (2010), Aon Benfield Natural Hazard centre Africa, Johannesburg, University of Pretoria.

²² 65 (1) of the Act

²³ S. 64(1)

The Nigerian Urban and regional Planning Act²⁴ is a bold step towards safeguarding the populace from disaster that may occur from earthquake or other natural disasters. The Act empowers the Federal Government to formulate national policies for urban and regional planning and development. The law enjoins developer while submitting his application form for development to submit also a detailed environmental impact statement for –

- (a) a residential land in excess of 2 hectares; or
- (b) Permission to build or expand a factory or for the construction of an office building in excess of four floors or 5000 square metres of a lettable space; or
- (c) Permission for a major recreational development.²⁵

The Control Department may approve or reject an application for development permission.²⁶ The government through the appropriate department can issue a stop-work order for any unauthorized development.²⁷ Apart from stop-work order, the government can demolish a defective structure that may pose a danger or constitute nuisance to the occupier or the public.²⁸

The Act is noble in its effort to preserve the environment through the provision that requires developer to preserve or plant trees around the buildings. The control department is enjoined to grant development permit subject to a provision on the preservation of existing trees and or planting of a new trees. The department has the power to make tree preservation order for securing such amenity within its area of jurisdiction.

The countries in the continent should incorporate in their development plan programmes to mitigate disasters arising from natural hazards like earthquake. This is necessary in view of the fact that it is not possible to predict or prevent the occurrence of earthquake but the effects can be mitigated through adequate planning.

The economic activities of oil prospecting and exploration; solid mineral exploration in some countries of Africa like Nigeria, Cameroon, Ghana, South Africa etc which started in the colonial days can precipitate or trigger natural disaster like earthquake in the future. Earthquake is not a one day effect but a built – up stress of many years. Because of poverty, Africa countries still rely on boreholes and well for household and domestic water use.

Every household in both rural and urban centres has a well or borehole to access drinkable water. Road construction and urbanization are impacting more on the planet earth. This is a clarion call in African countries to arise to the challenges of Earthquake like the European countries through a common policy for the continent in order to nip at the bud the causative factors of natural hazard like earthquakes.

CHINA AND LEGAL RESPONSE TO EARTHQUAKE

China is one Asian country that has experienced catastrophic Earthquake in the world over the years. The earthquake that occurred in 1556 in China claimed 830,000 lives and in 1976 china experienced another earthquake that caused the death of 655,000 people.²⁹ There is no doubt therefore that the experience of china, which is calamitous and a harrowing one, informed her decision to employ legal instrument to tackle the harsh and damaging effect of earthquake.

The government in China enacted on 29 December 1997 the “Law on Protecting Against and Mitigating Earthquake Disasters” which came into force on 1 March 1998. China, by this legislative place is no doubt the first country in the world to apply legal instrument to control the challenges of earthquake in her territory.

²⁴ Cap N138 LFN 2004

²⁵ S.33 of the Act

²⁶ S.34 of the Act

²⁷ S.53 of the Act

²⁸ S. 61

²⁹ See Montgomery C. W. Op. cit pp. 67-68

The China approach unlike the approach of other countries is a national and at the same time both preventive and precautionary. The Law has six chapters divided into forty-eight articles. The law was enacted in order to protect against and mitigate the safety of the peoples lives and property and the smooth progress of the socialist drive.³⁰ The Law is designed to tackle the challenges of earthquake at every stage. The Law is applicable to earthquake monitoring and prediction, protection against earthquake disasters, measures for earthquake emergencies, post earthquake relief and reconstruction etc which are carried out within the territory of the Peoples Republic of China.³¹ All units and individuals are obligated to take part in protecting against and mitigating earthquake disasters in accordance with the law.³²

The Law devotes chapter two (Articles 9-16) to Earthquake monitoring and prediction. The Peoples Republic of China has a duty to strengthen the work of earthquake monitoring and prediction. The state is to encourage and give aid to scientific and technological research in earthquake monitoring and prediction in order to promote such monitoring and prediction gradually.³³

The problem of earthquake in China is considered a problem for the citizenry. The Law provides that after the occurrence of a destructive earthquake, the local people's government at all levels in the earthquake stricken areas are to mobilize forces from all quarters to rescue people and mobilize grassroots units and personnel for self and mutual rescue. The local people's governments at all levels in non-earthquake stricken areas are also to mobilize people from all sectors of the society to provide aid to the earthquake stricken areas in the light of the earthquake solution and the disasters of a severely destructive earthquake, the state council is required to provide aid to the earthquake stricken areas and charge the competent department for comprehensive management of the economy with the duty of co-ordinating the efforts for disaster relief in all round way and together with the relevant departments under the state council, make an overall plan for relief funds and materials.³⁴

The law provides for sanctions for any contravention of the provision. Any construction unit that in violation of the provisions in paragraph 3 of Article 17 of the law fails to conduct seismic safety evaluation or provide fortification against earthquakes in compliance with the requirements for such fortification, which are drawn up on the basis of the results of seismic safety evaluation shall be ordered by the competent administrative department for seismic work under the state council or the administrative department or institution for seismic work under the local peoples government at or above the country level to get it right and be fined not less than 10,000 yuan but not more than 100,000 yuan.³⁵

The law provides for other sanctions for violating the salient provisions of the law. The Peoples Republic of China by this legislative piece has demonstrated her sincerity towards the plan to mitigate the catastrophic effect of earthquake in the society. The realization of the goal of this law depends on the government and the society at large. Realization of law is always an act of human conduct in which given rights and duties are accomplished in form of authorization, permission, demands and prohibitions. With the enactment of a normative act arises concrete legal relations. Accomplishment of subjective rights and the fulfillment of legal duties because a reality through the conduct of human being. When in a society, its members behave and function according to law, it is possible to assume that law is being realized and the aim of legal regulation is achieved.³⁶

The people of china have experienced the trauma of earthquake from 1290 to the present time. The law will be realized as it represents the aspiration of the people to mitigate the catastrophic effects of earthquake.

³⁰ Article 1

³¹ Article 2

³² Article 8

³³ Article 9

³⁴ Article 33

³⁵ Article 44

³⁶ Gasiokwu, M.O.U (1999) Sociology of Law. Mono Expression Limited, Enugu, Nigeria, P. 78

CONCLUSION

Earthquake is a natural hazard which has had adverse effects on humanity over the years. Earthquake like other Environmental hazards has not received the needed attention in the world except in those countries where it has caused havoc. The causes of Earthquake can be reduced through policies that will minimize the disaster. African countries should take a cue and learn from other countries that have experienced earthquake. Earthquake cannot be prevented but the effects can be minimized. It is expected that other countries of the world would take a cue from China by evolving a legal instrument to confront the challenges of earthquake. The social character of legal regulation consists in the establishment of order in social relations. Order in an organized society can exist only when the citizens behave according to the stipulations of law.

Thus realization of law in its social character means conduct in consonance with the norms of law. From the point of view of law, human behavior is that which is not against the law and is also socially useful.³⁷ The time is now for every country of the world to wake up from slumber. The Nations of the world should act individually and collectively to tackle the danger earthquakes pose to the world environment.



³⁷ Gasiokwu. Ibid.