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## **A Critical Review of the Disaster Management System in Ghana**

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### **Abstract**

The study addresses the Ghana National Disaster Management organisation (NADMO) challenges and assesses the duties and performance in mapping up strategies to control hazards across length and breadth of the country. NADMO is a disaster management organisation established by ACT 517 of 1996 to coordinate national (both governmental and non-governmental) effort at reducing risk associated with hazards such as flooding, earthquakes, bushfires and evacuation of Ghanaians from foreign countries that can have negative impact on a population which is over 20million people. A systematic review of peer-reviewed papers on disaster management in Ghana was conducted. Disasters annually ravage numerous parts of the country. Disasters is the most severe and prevalent adverse event and has serious implications for sustainable development. This research analyzes the causes of flooding and its impact on the general population in Ghana. The study also finds that the underlying drivers of disasters are flooding and evacuation of Ghanaians from foreign lands. How effective NADMO has been in creating awareness for disaster preparedness among vulnerable communities across the country was also evaluated. Before the establishment of NADMO in 1996, both humans made and the Natural Disaster Relief Committee (NDRC) managed natural disasters. The operations of NDRC were basically ad-hoc measures to disaster management. Therefore, the study recommends that the disaster management agency must be strengthened through capacity building and sufficient budgetary provisions to ensure effective and efficient coordination to reduce disaster risk

**Keywords:** national disaster management organisation, hazards, national disaster relief committee, natural disaster.

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## INTRODUCTION

“According to Mshelia. (2016) disasters are occurrences, human-made or natural, that cause loss to human lives, damage to life and property resulting in ecological deterioration, destruction in utility facilities and other services on a scale sufficient to require national and international response to assist the affected communities”. As United Nations (UN) is concerned on global security called on all member states in 1965 true its Resolution 2034 of the General Assembly to establish the appropriate planning and intervention mechanisms best adapted to each country particular situation to manage disasters.”

‘In furtherance to this initiative, with the UN General Assembly pre-occupied by the increased incidence of man-made disasters natural, and the lack of an integrated system for coordinating international efforts to deal with the problem declared the period 1990-2000 as a decade for disaster reduction. The International Decade for National Disaster Reduction initiative was set up. (UNISDR, 2015a, p.4)

According to United Nations Development, A Global Report on Reducing Disaster Risk “After the UN General Assembly under the Resolution 42/169 of 1987 adopted the initiative several declarations were made. In 1994, At the World Conference on Natural Disaster Reduction in May in Yokohama, Japan, each country was asked to bear the primary responsibility for protecting its people, infrastructure, and other national assets from the impact of human and natural disasters. Accordingly, a committee of experts report made recommendations on strategy for natural disaster mitigation and prevention that were adopted by the UN as its Declaration GA 44/236 of 1989”.

‘ ‘ Safer World’ ’ which was Yokohama strategy and its Plan of Action mandated each country to establish a disaster management organisation or system to implement the said action plan. On the International Decade for Natural Disaster Reduction (IDNDR), which was embodied in the UN General Assembly’s Resolution 49/22 of 13<sup>th</sup> December 1994 on which after the stipulated decade was replaced by the International Strategy for Disaster Reduction (ISDR).

“One of the cardinal principles of the initiative was the encouragement giving to each member country to establish a permanent organisation or agency to be responsible for disaster management. Ghana took advantage of this step and in 1996 barely a year after a sub-regional meeting was held in Nairobi, Kenya on strategies for risk reduction, the Government of Ghana by Act of Parliament 517, 1996 established NADMO to minimise disaster losses. Since its inception, it has evolved various strategies for the reduction of damage to property and of loss of life. Among the functions of the Organisation was to disseminate public information on human activities most likely to cause environmental disasters in the country to ensure safer communities” (Handy, 1990).

Having experienced some disasters in vulnerable communities in Ghana the need for an organisation to create risk awareness among such communities in particular and the public in general became paramount. Despite the long history of disasters in the country, there was no national organised agency responsible for disaster management. There used to be an ad-hoc committee known as the Disaster Relief Committee that was usually assembled in times of disasters to assess the needs of the

victims and provide relief until Cabinet came out with the National Disaster Bill in 1995 that was approved by parliament in 1996.

The Act mandates and authorises the objectives and functions of the Organisation, which include preparation of National, Regional, Metropolitan, Municipal, and District Disaster Management Plans, and to manage disasters and similar emergencies in the country as well as to coordinate emergency response activities. The Organisation has established well-coordinated working relations with UN Agencies, multilateral and bilateral donor agencies, governmental and non-governmental agencies and the private sector. It has offices in all the regional and district capitals of the country (Act 517, 1996).

In order to effectively manage these disasters technical committees comprising representatives of Ministries, Departments, Organisations, NGOs as well as professional bodies were formed. Similar committees were established in every district based on the disaster type prevalent in the area. Abass, K. (2020) posited that managing disasters in the country had been perceived by the NADMO as a national duty but the difficulty in educating and mobilising communities that perceive risk reduction measures as the responsibility of the government has made the work of NADMO very cumbersome in the face of its scarce resources and capacity constraints. Ghana is located at the West Coast of Africa and lies between Ivory Coast, Togo and Burkina Faso with the Gulf of Guinea bordering the coast as shown on the country profile map below (see fig 1). It covers an area of 23,540 square kilometres and has a population of about 20million with a GDP of \$600.

According to Wilson (2020) due to the absence of a coherent disaster management mechanism in Ghana. NADMO is the organisation that is constitutionally mandated to effectively collect data on hazards and disseminate such information to the public to reduce vulnerability in the country. Unfortunately, NADMO has not lived up to expectation due lack of resources and lack of political commitment. Disasters such as fire out breaks and flooding occur almost every year with inevitable casualties. For instance, the fire out breaks at the Tema Harbour in May 2004 resulted in many casualties. A similar situation occurred in 2000 when Accra was flooded due to days of torrential rains that exposed the inadequacy of drains and improper maintenance of existing drains.

According to Asiedu (2020) The circumstances under which lives and property are lost annually in Ghana due to disasters are of great concern to many. Information on safety measures at homes and work places are not properly disseminated. The wealth of knowledge acquired in Security Studies at the Cranfield University has given the author the impetus to conduct research into NADMO' s operations since the author is of the conviction that the concept of Human Security as defined by the "United Nations is being practised by the organisation. Any event or process that leads to large-scale loss of human lives or lessening of life chances and undermines States as the basic unit of the international system is a threat to international security. The UN goes beyond the traditional concepts of defence and security in which the state was the entity protected to discourse on issues like Human Security with which the world must be concerned now and, in the decades, ahead. As a disaster management organisation, NADMO appears to be slow with its legislative

responsibilities, although it has only been in existence for about ten years its working document; the national disaster plan is still not widely known in Ghana. NADMO collaborated with the Ministries Departments and Agencies (MDAs) for the strategic hazards mapping in the country out of which the national disaster plan emerged. The Minister of Interior launched the plan that covered all the disaster types in 1997” (Santos, 2018).

According to Fawundu (2003), Lack of resources has made it difficult for its effective implementation and as such the general public have not seen the benefit. Therefore, public support on the plan is low. Though Ghana might not be regarded as one of the most disaster-prone countries in Africa, occurrences of natural hazards like floods, droughts, bushfires, diseases and pest infestations have had their severe impact on human lives and the national economy as a whole. Government has indicated that it regards issues of disaster as very important, and had included disaster management as a focal area under the Ghana Poverty Reduction Strategy 7, aimed at reducing extreme poverty and social deprivation.

According to Aliyu (2017) the UN Representative in Ghana said in Accra at a workshop on Disaster Reduction towards Sustainable Development in Ghana that, disasters and development are related because the root causes of disasters are contained in present-day developmental processes and in the light of this Fawundu urged disaster managers to tackle disasters as a developmental concern. Therefore, is vital for NADMO to play a leading role to make the public aware of the existing types of hazards, the efforts being made by the Government to reduce disaster risk and what stakeholders and individuals can do to ensure safer communities.

The purpose of this study therefore, is to examine and understand the peculiarities of NADMO as it goes about the task of managing disasters risk in the country. A good understanding of the challenges/the difficulties and the prospects of NADMO’ s is crucial to its effectiveness. This dissertation is an attempt to contribute academically to the Department of Security Studies Institute’s understanding on the concept of Human Security in the post cold War 8 era and particularly in the 21<sup>st</sup> Century and to assist the Ghana National Disaster Management Organisation to re- orientate itself for an effective disaster management in Ghana. Similarly, the outcome of the study would assist further research in the subject area since there was limited time allocated to the study.

“Hazard mapping is perceived as a process of identifying and documenting geographic information on all hazards and their degree of risk. The main objective is to produce maps indicating ecological and geographical locations of hazards to guide in formulating policies, programmes and legislation regarding disaster management in Ghana. In this regard, all the seven National Disaster Sub-Committees carried out hazards mapping exercises in Ghana in a holistic manner in 1997. Both human made and natural disasters are predominant in the country. In all they can be categorised under seven major headings; Disease (Epidemic), Fire and Lightning, Hydro- meteorological Pest and Insect Infestation and Geological hazards are the natural hazards. Whilst human made hazards includes failure of structures such as collapse of buildings, mines and dams as well as civil wars”. (1997 NADMO) Disease (Epidemic) hazards that have been identified by the Ministry of Health in

collaboration with NADMO include Cerebro-Spinal Meningitis (CSM), which normally affects people living in the Northern sector of the country because of the higher temperatures in most part of the year with average daily temperature of 34oC. Diseases such as Cholera and Yellow Fever are generally widespread in the south.

Cholera attacks people living in southern Ghana mainly in the coastal areas during the raining reason and Yellow Fever is limited to the Northern sector of the country.

Pest and Insect infestations have also been noted, as hazards since they cause considerable damage to their hosts prominently among them are crops and timber, livestock and poultry and food storage. Post-harvest losses of cereal crops such as maize and rice and tubers such as yam and cassava have been a major reason for lower income to farmers since crops are harvested and sold at lower prices due to lack of proper storage facilities. (NADMO 1997). Fire and Lightning hazards include domestic fires as a result of cooking or keeping petrol in the house. There are also industrial and commercial fire outbreaks as a result of mechanical fault or someone's negligence. Ecological (bushfires) are also rampant in the savannah zone in the north during the dry season as well as in the cocoa growing areas of Ashanti, Brong Ahafo and the Western Regions. The bushfires could be either natural in which case it would be caused by lightning or human made where a piece of lighted cigarette thrown away by a smoker could ignited to burn a lot of cocoa farms and forest. (1983 GNFS). Hydro-meteorological hazards include rainfall/runoff flooding and river/lagoon flooding. These are natural occurrences. Some are caused by human activities; they include dam burst spillage and blocking of river courses with structures such as houses and stores. Hydro-meteorological hazard maps include the extent of flood prone areas within the catchments of rivers, lakes and lagoons. Flooding could occur in any part of the country during the raining season between the months of May-July every year, as well as limited places in (Ashanti, Brong Ahafo, Northern and Greater Accra Regions) between the months of September and November (2000 Hydrological Services Department).

According to Amoako and Inkoom (2018) what normally exacerbates the situation is how people could build houses on water course as well as throwing garbage in the drains thereby blocking the free flow of water leading to flooding that cause havoc such as loss of live and collapse of buildings. The committee consist of members from twenty-two organisations including NADMO, Hydrological Services Department, Ghana Water Company, Ministry of Health and headed by Meteorological Services Department (1997 NADMO). There is also the issue of oil spillage, pollution of water supply systems from mining activities as well as deforestation and desertification that stem from human made activities such as farming and lumbering are widespread. All kinds of accidents including road accidents are common all over the country. But aviation and maritime accidents are limited to the coastal areas where the capital, Accra is located. Occasionally unresolved misunderstanding between churches, tribes and communities could also lead to violent situation. (1997 NADMO) Geologically southern Ghana especially, Central and Greater Accra Regions have been identified as active seismic areas and are therefore prone to earthquakes. According to Quaah (1988) regarding cases of landslides and soil erosion are severe at the coastal areas throughout the year. In the

three Northern Regions of the Country (Upper East, Upper West and Northern Regions) where the land is almost bare in the dry season, soil erosion occurs during the raining season.



### Ghana: Country Profile



<b>Location:</b>	Western Africa, bordering the Gulf of Guinea, between Cote d'Ivoire and Togo
<b>Area:</b>	238,540 sq km
<b>Population:</b>	19,894,014
<b>Population growth rate:</b>	1.79% (2001 est.)
<b>Literacy:</b>	64.5%
<b>GDP:</b>	\$600
<b>Natural hazards:</b>	Landslides, fires and lightning, flooding and earthquakes
<b>Disaster Management body:</b>	Ministry of Interior - National Disaster Management Organization (NADMO)

*There are no records of major National Disasters. -Source 2003 ISDR*

Figure 1: Country Profile

Therefore, the study aims are as follows:

To understand the important role NADMO plays being a disaster management organisation in Ghana

To identify constraints faced by NADMO being a disaster management organisation in Ghana

To consider the links between NADMO and disaster management and the general Ghanaian populace

To identify some causes of flooding in Ghana.

To recommend legislative empowerment for NADMO as a disaster preventive and management organisation.

### LITERATURE REVIEW

There are substantial materials available from Internet and publications that concerns disaster management. Thus, in reviewing in the literature, one has to be very selective regarding the books to discuss issues relating to the Ghanaian context. Therefore, the safety Chain Davis (2019), the pressure and release models by Wisner

et al (2004), Vickery et al (2017) and Coburn et al (2002) were the key focus. Hence in the discussion references were made to these texts.<sup>1</sup>

According to Atanga (2020) “disasters may be defined as an event that is usually unexpected and sudden that intensely alters the beings, objects and localities where it occurs”. It results in loss of health and life in the local population, causes severe environmental damage and the destruction of material goods resulting in a dramatic disruption of normal patterns of life. Such disruption, which may be local or national in scope, gives rise to the need for immediate intervention and humanitarian aid. Some disasters are caused by hazards such as tsunamis, earthquakes and volcanic eruptions that cannot be predicted due to lack of existing technology. Although their effects can be minimised given the willingness of those concern hazards such as floods can be prevented controlled or their impact could be reduced if appropriate risk reduction measures were in place before their occurrence.

Disasters effects vary according to the magnitude of the event itself and any pre-plans available to reduce the impact of the event. The impact of a disaster could cause direct and indirect losses to a community. The physical destruction is considered a direct loss such as property/economic and financial losses as well as environmental degradation. The indirect losses include loss of livelihoods and loss of markets. The intangible loss also covers issues such as loss of lives and injuries to people<sup>2</sup>. It is noted that developed countries have been able to reduce such losses. However, developing countries including Ghana still face major challenges due to low concern from political leaders, research communities as well as the vulnerable communities.

In order to reduce existing risk levels, disaster prevention measures must be considered a major part of sustainable development. Given the negative impact of disasters on the development of the communities they strike, risk assessment must be incorporated into the key social and economic fabric of each country or region, comparing the cost of taking preventive measures with that of disaster recovery.<sup>3</sup>The effective way of reducing disasters is through co-ordinated effort from all sectors. Davis, (2004) designed a model (Figure 2) as a safety chain indicating how disasters can be reduced through various measures such as structural and non-structural measures as discussed below.

Further, it is illustrated by Wisner et al (2004) that lack of action by community concern can progressively lead to a disaster. These two models are discussed in relation to the Ghanaian context in the section that follows.

#### *Models of Disaster Management*

The literature review section dealt with how disaster management experts have provided means by which disasters could be minimised in communities through the application of appropriate risk reduction measures. This section discusses two models of disaster management that emphasise on community disaster preparedness. The two models are the Safety Chain Model and the Pressure and Release Model. Disaster risk reductions are activities such as retrofitting, training, awareness creation, plans etc., that have been undertaken to lessen the impact of hazards. If such activities are absence within vulnerable communities, the impact of the hazard could generate into a disaster. The impact of natural disasters such as,

floods earthquakes and droughts could be devastating resulting in many casualties. Coburn et al (2002) indicated that the impact is more severe in developing countries where there are no mitigation and preparedness measures. They explain that such measures must be taken before the event with the view to minimise or eliminate its impact. These measures are illustrated on a chain model, Figure 2 (Davis, 2004) The idea of the chain is that disaster risk reduction measures are dependent on each other in an interlocking manner and that each link should be as strong as the others in order to achieve safer communities.

The measures consist of structural and non-structural components. The latter refer to measures that are taken to ensure the safety of elements within a building. Risk reduction is by means of land-use planning and controls, early warning systems and awareness, insurance policies, legislation and regulatory measures. It also includes education and training activities such as evacuation plans, drills, and preparedness curricula among others. Structural mitigation on the other hand involves the creation of physical structures such as hazard resistant building construction. For countries prone to natural disaster, each of these measures is as important as the other if development is to be sustained. To achieve these goals there is the need for teamwork among the various stakeholders in disaster management. Therefore, both developed as well as developing countries must ensure that such policies are enacted and effectively implemented.

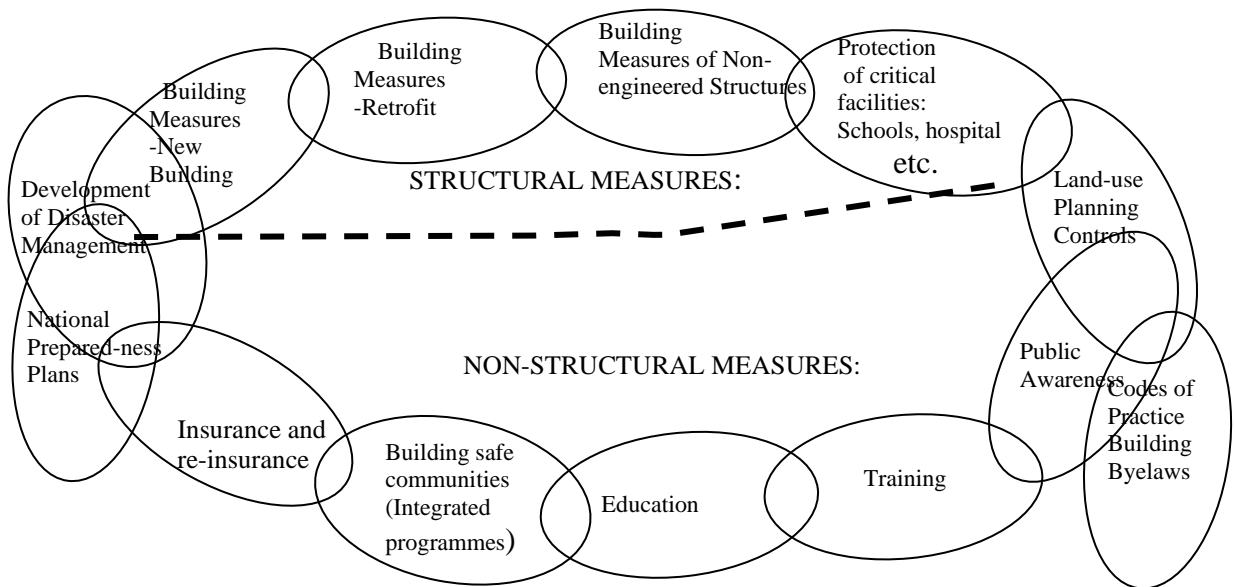


Figure 2, The Safety Chain

Source: Davis, I. (2004). Cranfield University, RMCS, Resilience Centre

Vickery (2021) argued that another reason is due to the infrequency of the seismic activities and marginalisation syndrome, as people living in earthquake areas feel invulnerable to disaster events. According to B. Wilson. (2018) they may not even see the need for the provision of for example, earthquake-resistance in relation to the



demand for social amenities such as good roads hospitals and school in their communities.

There are in many earthquakes prone countries seismic policies and strategies for protecting public and private buildings. But the policies are specifically designed for the prevailing hazard type. If a country is to adopt such policies, they have to be translated to suit their environmental context. Vital national issues must be translated into action such as policies and the adoption of strategies for implementation in order to attain sustainable development. Such policies may be implemented in the course of other actions. A community that acts to improve its plan checking and building inspection is taking an important step to improve the disaster resistance of its environment. A country with limited resources would have to implement programmes with multiple benefits. This will strengthen the community's preparedness and safeguards investments. Coburn et al (2002) recognise that the destructiveness of a disaster is mostly governed by the nation's preparedness.

Policy makers and local government officials have the powers to make the physical environment resilient to disasters through the development of pro-active policies such as urban planning, land-use control, and building regulations. But it is the vulnerable communities that recognize the risk of their infrastructure and lives and implement the programmes that have been developed in their own way. The disruption of facilities especially schools, hospitals, government buildings and individual livelihoods could cause serious damage to community activities. Therefore, building owners, developers, and insurance companies need to understand the disaster risk and to take measures to protect their properties to avoid human loss in the event of any disaster.

The United Nations initiated the Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disaster (RADIUS) project in 2000, with the view to finding pragmatic solution in reducing disaster impact on urban cities globally. The findings indicate that in assessing the disaster risk, the political, economic, social, and cultural context of the hazards plays a major role in developing and implementing the needed risk mitigation measures. An earthquake disaster for instance is a function not only of the expected physical impact of future earthquakes but also the capacity of the affected city to sustain that impact, and the implications of that impact to the region and beyond. Therefore, if the disaster impact is to be reduced, appropriate risk reduction measures needed to be incorporated development programmes through policy enactment.

Although much effort has been spent in policy formulation and plans for reducing risk in many countries policy makers might not have been successful in reducing disaster risk due to lack of coordination among stakeholders in disaster management in developing countries including Ghana where many actors are involved in decisions making. This could either increase or decrease the threat of disasters to such countries. The capacity of a community to mobilize collective action in response to perceive risk depends directly upon the degree of awareness, level of skills, access to resources, and commitment to informed action policies and strategies among its members prior to the occurrence of the disaster. In this regard, subsequent actions

will depend upon the initial choices made or not made, the mix of strengths and weaknesses revealed in the community's capacity to coordinate its activities in response to threat, resulting in substantial variation in collective performance over time (Comfort, 1999).

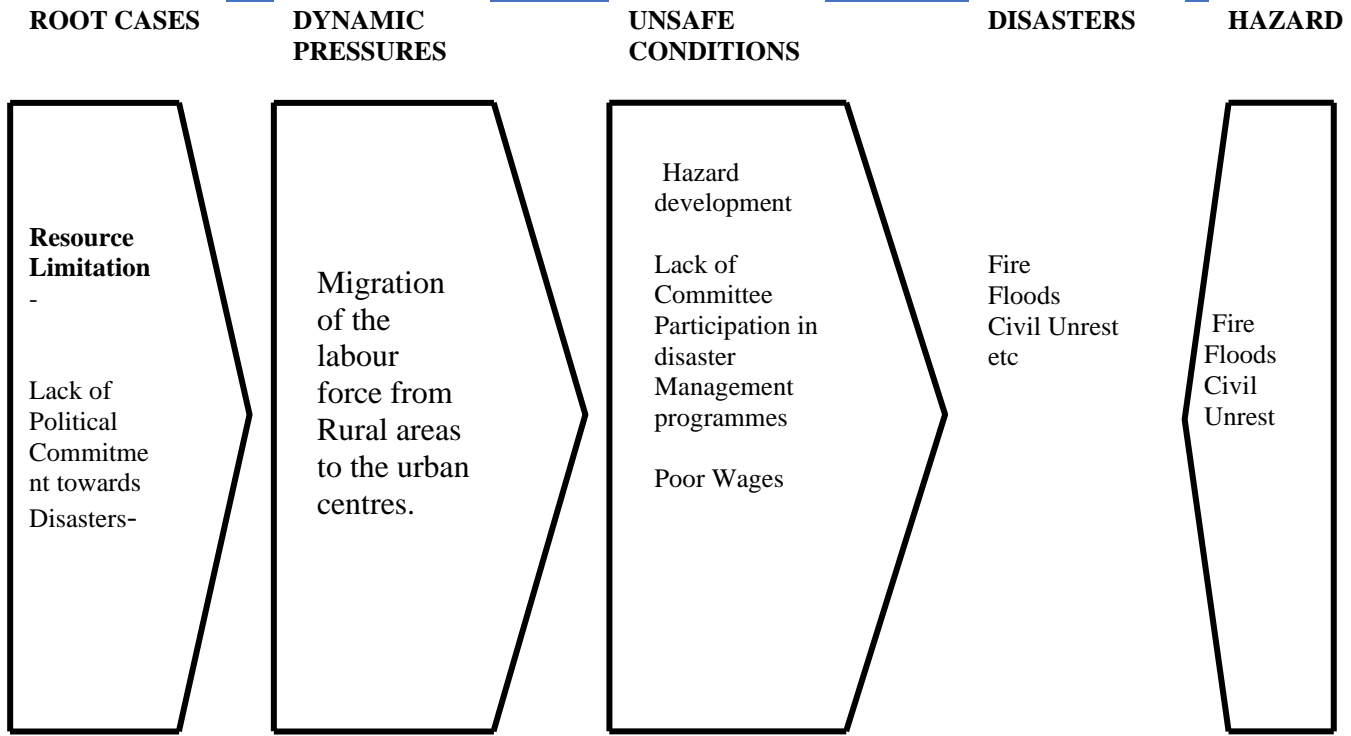
Ghana has had various forms of disasters ranging from natural to man made. The fire outbreak at the Takoradi market in 2004 and the Accra Sports stadium disaster in 2001 among others will be discussed in detailed in chapter five. Despite that fact those disasters have caused property and life losses to the nation less priority is given to mitigation and preparedness measures. Emphasis is placed on provision of relief after the event. Disaster mitigation measures vary from society-to-society and country-to-country. Many individuals in the industrialized countries have become more resilient because of insurance and so overall post-event aid is of different order than that in most parts of the third world (Haresh, 2017). The ' ' pressure' ' model further outlined factors that generate hazards conditions that could lead to a disaster.

#### *Pressure Model*

The causes of this increased vulnerability can be related to a Pressure model (after Wisner, B. et al, 2004) shown in Figure 3. Wisner et al (ibid) observed that disasters occur as a result of the interaction of hazard (which refers to the natural event such as floods that may affect different places singly or in combination) and a vulnerable situation. The authors argue that the risk of disaster is a compound function of a natural hazard and the vulnerability of people and property to that specific hazard. This includes space/ time exposure to the hazard event. Three elements are recognised by Wisner et al (ibid). These include risk, R, which is the disaster (a combination of vulnerability with the probable level of loss to be expected from a prediction), the vulnerability, V (the potential for casualty, destruction, damage, disruption or other form of loss in a particular element) and the hazard, H. The relation of these elements is expressed in an equation indicated below:

$$R = H \times V$$

Further, the authors explained that a disaster occurs when a significant number of vulnerable people experience a hazard and suffer severe damage, or it could be a disruption of their livelihood system in such a way that recovery is unlikely without external aid. To understand the risk in terms of vulnerability analysis, the authors introduced the Pressure model to show how natural hazards affect vulnerable society. Thus, a disaster is the interaction of two opposing forces those that generate vulnerability on one side, and the natural hazard event. To relieve the pressure vulnerability has to be reduced. This model is adopted and modernised to illustrate the vulnerability and disaster management in Ghana.



Pressure 4 the Release Model

The progression of safety

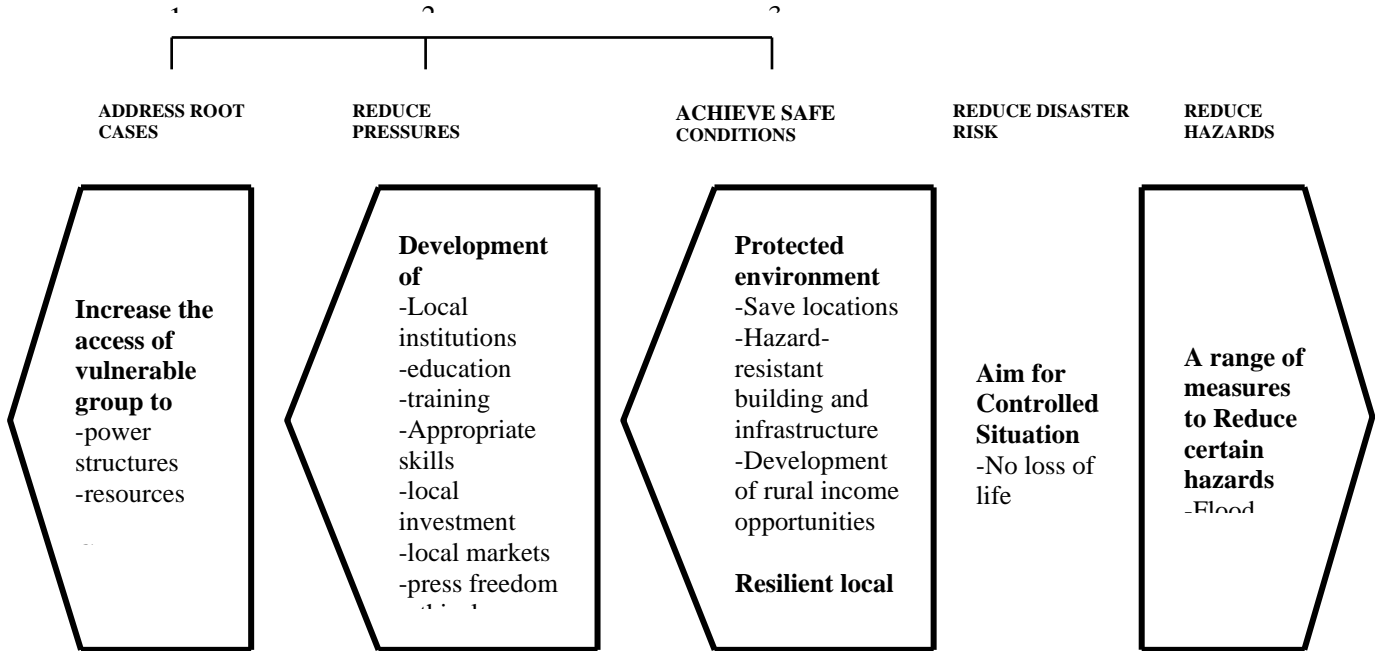


Figure 3: the pressure model  
 Source: isner, et al (2004)

The key issues to note in this ‘ ‘ Pressure’ ’ model are: Firstly, that vulnerability is composed of varied elements- causation and effects. Secondly if the unsafe conditions are addressed (and this the normal process of reduction in hazard-prone countries), and this protection is *not* accompanied with attention to both root causes as well as the dynamic pressures, then the unsafe conditions will recur. There are currently no means to reduce the earthquake hazard, although measures can be taken to reduce secondary impacts such as the risk to post-earthquake fires.<sup>4</sup>

To account for disasters will require tracing the connections that link the impact of hazard on people with series of factors and processes that generate vulnerability (Wisner et al, *ibid*). The creation of vulnerability has three sets of links that connect the disaster to processes that are located at decreasing levels of specificity from the people impact upon by a disaster. Wisner, et al (*ibid*) observed that the most distant are the root causes, which are interrelated set of widespread and generated processes within a society and the world economy. In relation to Ghana and other developing countries these root causes are the long-return period of disasters and lack of resources in developing risk reduction measures. The long-return period of earthquakes affects the allocation and distribution of resources among different constituencies in southern Ghana since political leaders will regard seismic protection the lowest in their priority list. Further, vulnerable communities will tend to lose confidence in the local knowledge about the reality of a major earthquake in Ghana. Vulnerable community tend to believe that serious disaster will never occur in their lifetime. Therefore, such communities are likely to design and construct low standards of buildings and more so will not see the need in contributing to building safe schools and hospitals. Additionally, there is a low priority for government interventions to reduce both human made and natural disasters due to lack of resources and long-return period. This lack of intervention has led to the creation of dynamic pressures.

Dynamic pressures are processes and activities that ‘ translate’ the effects of root cause both temporally and spatially into hazard conditions (Wisner et al, *ibid*). The authors observed that dynamic pressures channel the root causes into particular forms of hazard conditions. In relation to Ghana, these processes include economic growth, short-term political perspective, population growth, rapid urbanisation and lack of rural opportunities. The rapid economic growth in southern Ghana is directly linked with the population expansion of the cities in the south. Rural-urban migration is in response to the economic and social inequalities that are inherent in the root causes. Such migration will subsequently put pressure on the government to expand existing facilities such as housing and schools. However, the short-term political perspective will affect the expansion of these facilities if they are not completed before change of government.

Wisner, et al further observed that hazard conditions are the specific forms in which the vulnerability of a population is expressed in time and space in conjunction with a hazard. In relation to Ghana, these are factors that create hazard conditions. They include the lack of: building controls; land-use planning; enforced building codes; political awareness; public awareness and education. The design and construction of buildings especially safer communities in Ghana lack disaster requirements. In order

to reduce floods and other vulnerabilities in the community's policies makers will need to consider all these factors during planning.

### **METHODOLOGY**

The study focused on the National Disaster Management Organisation and its agencies. The method in collecting data is based on both primary and secondary data sources. The primary data is based on the administration of questionnaire to some disaster experts and officials of NADMO. This study employed a systematic review of journal articles sourced from several academic database. Such an undertaking involves framing a research question, locating previous research, selecting relevant studies, evaluating the findings, analyzing and synthesizing information, and summarizing and reporting the evidence in a manner that a new and clear conclusion can be drawn and new knowledge produced (Khan et al. 2003)

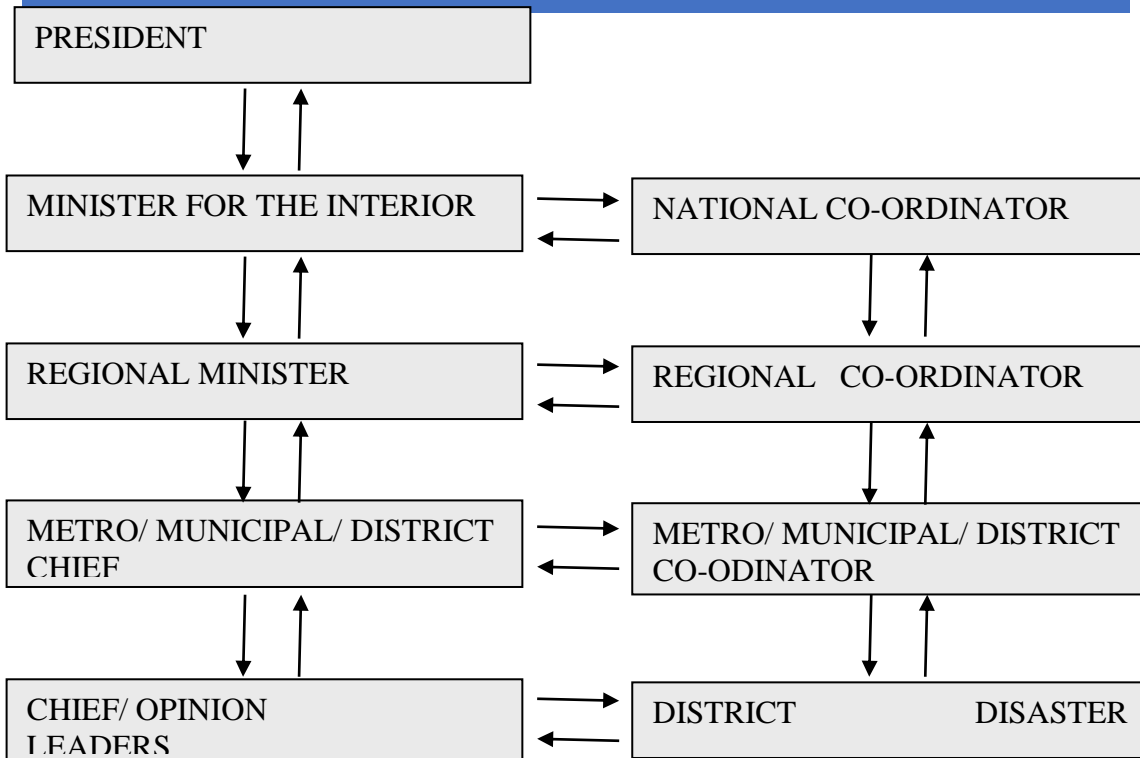
Searches was conducted using some keywords for articles. Keywords used included "disaster management in Ghana" which produced 112 results and "causes of disasters in Ghana" resulted in 21 results. All of the articles appearing in the results of the search for causes of disasters also featured in the broader search on disaster management in Ghana. The period was used to ensure currency of the causes of the disasters. The articles were scanned and then selected based on the relevance of their title and abstract to the assessment. According to Sileyew (2019), research methodology generally provides researchers with the blueprint for research.

Finally, other relevant documents including National Disaster Plan, journals and reports on case studies were collected from Ghana National Fire Service and NADMO Headquarters in Accra. The secondary data was based on consultation and analysis of available literature documents and charts, obtained from libraries and Internet sources.

#### *National Disaster Management Organisation*

The National Disaster Management Organisation (NADMO), established in January 1997, replaced former ad-hoc Disaster Relief Committees at national and district levels, as the focal point for disaster management.

The National Disaster Management Committee, chaired by the Minister of Interior, has administrative oversight responsibilities for NADMO and reports to the National Security Council, which is NADMO's Governing Council. The NADMO National Secretariat services the Committee, with the National Coordinator as the Secretary. Seven National Technical Committees of experts from government and non-governmental organizations advise the Committee. NADMO is decentralised to the regional and district levels by legislation and has recently extended its reach to the sub-district level through a re-organisation exercise. The 10 regional and 110 district disaster management committees are serviced by NADMO secretariats at those levels.



*Fig. 5: Organogram of National Disaster Management in Ghana.*  
 Source: National Disaster Management Organisation

NADMO was established by Parliamentary legislation under the National Disaster Management Organisation Act, 1996 (Act 517) on 11 September, 1996. Yerimia (2004) indicated that the Act was under review to cover the extension of the organisational structure to the sub-district level. There exists a National Disaster Management Plan, developed in September 1997 that covers hazard mapping, education and training for preparedness and mitigation measures, emergency response and relief management, and, rehabilitation, resettlement and reconstruction. Some of the regions and districts have completed their disaster management plans that include prevention interventions.<sup>5</sup> The Ghana Poverty Reduction Strategy incorporates disaster prevention in its thematic focus areas and has been financing NADMO's activities aimed at improving the capability of disaster management agencies in disaster prevention. The programme of institutionalising Disaster Volunteer Corps, including Anti-Bush Fire Squads, at the local level has helped to promote preventive culture. Another initiative involves the highly successful education and awareness efforts in northern Ghana to combat epidemics of cerebro-spinal meningitis. A comprehensive anti-HIV/AIDS programme that emphasises preventive behaviour with the support of UNICEF, WHO, USAID and other international and local NGOs are also underway.

The National Disaster Management Plan (NDMP) is oriented towards response but incorporates reduction and prevention thrusts. Prevention has been recognized in the national poverty reduction strategy. Several agencies incorporate prevention

measures in their regulations, such as the building codes of the Town and Country Planning Department that regulate development of settlements and the built environment. However, poor adherence to and implementation of these regulations negates their effectiveness in disaster prevention.<sup>6</sup> Nonetheless, there exists a high level of commitment to improving disaster risk reduction mechanisms that has and financially handicapped.

## DISCUSSION

It is important to relate principles of disaster management in Ghana to what actually happens in specific disaster situation. Therefore, to examine critically the effectiveness of NADMO operations in Ghana, two case studies have been selected:

Flooding in Accra in 2000 and evacuation of Ghanaians from Libya. These was chosen based on the challenges they posed to national disaster plan as well as to NADMO' s preparedness for managing disasters in Ghana. NADMO' s experiences from these disasters have been incorporated into its strategic plan for effective disaster management in Ghana.

### *Flooding in Accra in 2000*

According to the ministry of Works and Housing, (2001) in April 2000, the Meteorological Services Department made an announcement through the media (both print and electronic) that the years rainfall would be intensive particularly in the Southern part of the country in June. Since Accra is on a low-lying area in southern Ghana and therefore prone to perennial flooding even with little rainfall in a season. Any small amount of rainfall can flood the city. Armed with the early warning through the weather forecast, the stakeholders such as the Metropolitan Assembly, the Ministry of Local Government, the Hydrological Services Department of the Ministry of Works and Housing, NADMO and the Town and Country Planning Department intensified their activities in April 2000 with the view to reduce the impact of the flood in Accra. The Metropolitan Assembly and the Town Planning Officials identified and destroyed unauthorised structures that might prevent the Smooth flow of the water from drains and watercourses through Korle Lagoon (the only water channel through which water enters the sea) at the southern end of the city. In order to reduce flooding in Accra, the Hydrological Services Department of the Ministry of Works and Housing have decided to desilt the drains and watercourses before the onset of the rains annually. Information from the Hydrological Services Department indicated that their Emergency Flood Relief Fund for that year was exceeded by 50%.

### *Main Drivers of Flooding in Ghana*

#### *Urbanization*

According to Bandaiko, AnnanAggrey, and Arku (2021) Ghana is rapidly urbanizing but without the requisite infrastructural base required to sustain the growing population. Fox, Bloch, and Monroy (2018) postulated that the urban growth rate is expected to continue to rise and Ghana,s growth rate and population size have been particularly notable as the country has in recent decades become an urban giant in Africa. According to Abass 2020; Echendu and Georgeou (2021) the rapid and unplanned nature of urban growth has made many cities in Ghana hotbeds of health and environmental problems such as flooding. Urbanization is the

rate of movement of people from rural to urban areas in search of better living opportunities and the process has emerged as a leading cause of flooding in flood-prone African urban centers (Abeka et al. 2020; Mashi et al. 2020). The expansion and densification of cities change the natural landscape of a place as land-use modifications are implemented to suit the needs of humans. According to Korah and Cobbinah (2017) these changes increase impervious areas and significantly reduce vegetative cover that acts as a buffer against floods by absorbing surface water. When the natural vegetative cover is cleared to make room for construction the resultant impervious surfaces do not absorb water, thus increasing run-off. Urbanization in Ghana has occurred in a largely unplanned fashion and led to the establishment of a surge in informal settlements. These different experiences suggest that there are ways to manage urbanization more effectively and to mitigate issues like flooding.

#### *Inadequate drainage systems and waste management*

According to Asiedu 2020; Salami, Von Meding, and Giggins (2017) the dearth of adequate stormwater-management infrastructure and drainage is one of the leading causes of flooding in Ghana. According to Adedeji, Odufuwa, and Adebayo (2012), Effective planning practices incorporate sustainable drainage management but poorly constructed and managed drains are hallmarks of the majority of Ghanaian cities. Most of the storm drains are open and small and this design feature makes them unable to support large volumes of water during heavy rainfall. In addition, the absence of covers makes them easy dumping sites by undisciplined citizens. Most of the drains are furthermore characterized by poor or an absence of connectivity to discharge points (Frimpong 2013).

#### *Poor physical planning*

According to Adedeji, Odufuwa, and Adebayo (2012) the importance of spatial planning in mitigating environmental disasters and achieving sustainable development cannot be overemphasized. According to Frick-Trzebitzky and Bruns (2019) yet, the planning system in both Ghana is generally inadequate and has been criticized for ineffectiveness and lack of integration with. According to Korah and Cobbinah (2017). Ghana is characterized by poor urban governance and weak planning institutions despite their rapid population and urban growth. The result is the inability of physical planning to keep up with expanding size of cities in the country. Urban planning presents opportunities for regulating the environment, mitigating global warming, and achieving sustainable development.

#### *Evacuation of Ghanaians from Libya in 2000*

"In 2000, Ghanaians among other Africans were forced out of Libya on political reasons. A total of 5200 Ghanaians were evacuated from Libya. There were 4,940 male adults, 167 adult females and 92 children. The total cost of the excise was 350 million cedis about 50million dollars at that time which was born by the state (NADMO). NADMO had to mobilise these returnees and encourage them to undertake income- generating ventures. This was to prevent them from travelling outside the country for greener pastures. However, such programme could not be sustained. Although NADMO did well in receiving the returnees, it had failed in mobilising and supporting the youth for gainful employment. Records available at



the Ghana Immigration Service indicated that in 2004 a total number of 6,666 Ghanaians were deported as illegal immigrants from Libya and the situation not only kept reoccurring but is getting out of hand" (Asiedu, 2020).

## FINDINGS

The study mainly focused on disaster risk reduction in Ghana. Therefore, the safety Chain Davis (2019), the pressure and release models by Wisner et al (2004), Vickery et al (2017) and Coburn et al (2002) were the key focus.

From the empirical literature disaster risk reductions are activities such as retrofitting, training, awareness creation, plans etc., that have been undertaken to lessen the impact of hazards. If such activities are absence within vulnerable communities, the impact of the hazard could generate into a disaster.

The study revealed that policy makers and local government officials have the powers to make the physical environment resilient to disasters through the development of pro-active policies such as urban planning, land-use control, and building regulations. However, from the empirical literature there are some peculiar challenges of disaster risk reduction.

*The following shortcomings were revealed from the study;*

1. From the safety chain model the costs involved in implementing disaster risk mitigation measures (such as structural and non-structural) are expensive and as such most developing nations ignore them due to economic constraints.
2. Lack of political will: in assessing the disaster risk, the political, economic, social, and cultural context of the hazards plays a major role in developing and implementing the needed risk mitigation measures
3. Low education and training activities such as evacuation plans, drills, and preparedness curricula among others also impedes disaster risk reduction.
4. Infrequency of the seismic activities and marginalisation syndrome, as people living in earthquake areas feel invulnerable to disaster events. They may not even see the need for the provision of for example, earthquake-resistance in relation to the demand for social amenities such as good roads hospitals and school in their communities lessen disaster risk reduction.
5. From the study it has been realised that if information gathered on risk reduction are not disseminated properly to those who need them then it has not served its purpose.
6. It was also realized from realised that some of the stakeholders' roles are not properly defined and as such they (Police and Fire Service) do not play their roles very well.

Over the years NADMO has been coordinating national efforts at hazard mapping, Vulnerability assessment and strategic planning to reduce the impact should there be an occurrence of any natural disaster. In the area of pest and insect infestations Ministry of Food and Agriculture have been playing a leading role in identifying what, when and how insect and pests affect crops, timber, livestock and poultry. The Ministry works hand in hand with other collaborating agencies such as the Ministry of Health, Ministry of Environment Science and Technology, Environmental Protection Agency and the University of Science and Technology to research into the problem in a way to reduce the impact of pests and insect infestation in crops, timber

and livestock among others. Most of these research recommendations however, are not implemented and as such discouraged further research leaving the problems unattended. Policy makers argue that researchers do not research into issues that are relevant to Ghana's socio-economic development such as how to reduce poverty and how to process agricultural products for export and accuse them of concentrating on educational research that do not have immediate impact on the economy. Research for knowledge not research for development. Any time there is severe drought Ghana receives food assistance from World Food Programme and her bilateral and multilateral partners. The Ministry of Health in conjunction with NGO's (local and international) the UN and Consultants have been working to map out the geographical areas of high incidences of epidemics and immunise the people to prevent high casualties. Sometimes lack of effective medication and ignorance on the part of the people in the diseases endemic area could lead to high casualties.

Recurrent floods and windstorms, for example, not only destroy national wealth, but also hinder efforts to accumulate physical and human capital. It is important for NADMO to assess disaster impacts to help government to adjust its financial planning scenarios and economic growth rate projections to offset or reflect the social, economic and environmental impacts of shocks caused by disasters mainly the vulnerable communities and tourists. Communities that are vulnerable to disasters such as earthquakes to oblige the government to develop appropriate seismic policies, for communities could make such a demand. These measures can be successful only with the cooperation of the beneficiary communities, their decision-makers, government and the scientific community.

In view of the low public perception of the effects of earthquakes, the consequences of major event are bound to be high. The creation of awareness is not easy to sustain in view of resource limitations and the nature of the economy but should any disaster occurs it will make it difficult for Ghana to meet the targeted Millennium Development Goals by 2015. The destruction of infrastructure and the erosion of livelihoods are direct outcomes of disaster. But disaster losses interact with and can also aggravate other financial, political, health and environmental shocks. Such disaster losses may setback social investments aiming to ameliorate poverty and hunger, provide access to education, health services, safe housing, drinking water and sanitation, or to protect the environment as well as the economic investments that provide employment and income.

## **RESULTS**

NADMO has realised the usefulness of integrating the land-use planning for flood prone flood control such that flood-prone areas that are not yet developed are set to benefit from the development policies. Land-use planning at the local or municipal level could be a useful tool in reducing future flood damages as land along river Odaw had been turned to parks and recreational uses. It has also been noted that the best way to reduce future flood damages is to prevent development from occurring on flood-prone lands. Zoning of such lands is an effective approach, but generally should be coupled with the broader land-use planning to ensure that the land has a defined use. Zoning of flood-prone lands as ecological reserves or protected wetlands can often help to meet broader environmental or biodiversity goals. It is

important, however, to ensure that the supporting infrastructure such as buildings and houses are located away from the flood-prone area or are flood proofed. It is also important that livestock, machinery or stored crops can be evacuated quickly from the area in the event of a flood. This underscores the importance of a flood forecast, warning and response system. It may be less expensive in the long run to physically relocate flood-prone development or buy it out as part of a disaster assistance programme. Compensation as part of disaster assistance should always have as a goal the reduction of future flood damages. Rather than simply paying for damages, the funds should be focused on flood proofing, buyout, relocation and public education on the risks and consequences of living on flood-prone lands.

### **CONCLUSION AND RECOMMENDATIONS**

This article has shown that disasters in Ghana especially flooding is caused by a mix of socio-political factors (unplanned urban expansion, inadequate drainage systems and waste management, and poor spatial/physical planning). There is evidence that the climatic factors being experienced today are worsened by human actions. It is thus safe to conclude that the flooding being experienced in this country is mainly due to anthropogenic factors. Working at scales that are larger than a particular geographic area is consistent with the tenets of sustainable development and multilateral collaboration can foster the design of novel strategies that would not otherwise be available.

In order to achieve the ultimate goal for this study, some recommendations that could guide policy makers, National Security Council, NADMO and major stakeholders in disaster management in Ghana are suggested. These are made on the basis of the positive and negative findings that came out of the study.

On the positive aspect, all the ten regions in Ghana and their districts have NADMO offices with personnel manning them. NADMO has been acknowledged in most of the communities in view of the relief assistance that the organisation has been providing during disasters. There is also the existence of a good plan at the national level serving as a working document that enables the organisation to respond to disaster everywhere in the country. Another positive sign is that disaster risks in Ghana are relatively low and as such the country has never witness any major disaster. However, specific roles are not clearly defined on the plan and as such stakeholders do not know their roles during disasters. Poor implementation of structural and non-structural measures including building measures retrofitting and land use controls, weak risk assessment involving organisation and poor feedback prevail. Capacity building at NADMO must therefore be strengthened to enable it play an effective co-ordination role in the disaster management system in Ghana. Low probability of National events results in apathy, which requires dissemination of information on hazards. On the basis of the above findings the following recommendations are made to ensure effective disaster management in Ghana. Firstly, there is the need for urgent integration of risk reduction strategies into development initiatives. Secondly, effective disaster management strategy must be implemented to reduce disaster risks of the poor and the disadvantaged communities. Also, the disaster management agency must be strengthened through capacity building and sufficient budgetary provisions to ensure effective and

efficient coordination. Furthermore, the introduction and implementation of a new Disaster Management Act which will bring about a uniform approach to disaster management, Seeks to eliminate the delay created by current legislation regarding declarations of disasters and addresses legislative shortcomings by implementing key policy objectives that will enable NADMO to prevent people from engaging in hazardous activities.

Monitoring, tracking and collection of information on phenomena and activities that trigger disaster events are crucial for the implementation of risk reduction measures. Moreover, the sharing of such information and creating awareness about the issues will enable all role players, including communities, NGOs and Government to gain a better understanding of the relationship between human action, natural phenomena, environmental vulnerability and risk. Creating awareness is vital to the success of any strategy on managing disaster events. The disaster management organisation must therefore be strengthened to enable it intensify the awareness campaign to reduce preventable death as a result of disasters such as stadium disaster, flood and fire outbreaks.

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