

ENVIRONMENTAL CONSERVATION AND DISASTER MANAGEMENT IN TANZANIA

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ABSTRACT

This research paper considered critically, the concept of Environmental Conservation, conservation techniques, analysis of the remote causes of environmental disasters, environmental degradation and possible management principles for national development and poverty reduction. Development is a continuous process which builds upon previous. This anchors on preservation or conservation of existing facilities and infrastructure upon which national wealth has been invested. Protection of life and properties; is key to any responsible government and environment is a vital issue too. Fire, flood, erosion, deforestation, greenhouse effects, ozone layer depletion and destruction of the ecosystem amongst others shall be considered vis a vis their effects on the environment and suggestions made as to how they can be effectively managed for national growth and poverty reduction. Conservation techniques of afforestation, creation of national reserves and town planning were also considered. The paper created a balance between natural and human disaster management as a means of environmental conservation towards national development and poverty reduction. Although the content of this paper are by no means exhaustive on this topic, they provides a bird's eye view of the principle concern in disaster management and the use of early warning systems for disaster vulnerable areas, specifically in Tanzania.

Key words: Deforestation, Desertification, Natural Disaster, Conservation, flood.

1.0 INTRODUCTION

Natural hazards and disaster occur at regular but unpredictable intervals and affect people around the world. They may be caused by climate (drought, flood, and cyclone) or geology (earthquake, volcano, tidal wave, and landslide) or the environment (pollution, deforestation, desertification and pest infestation) or a combination of these. It should be noted that natural hazards become disasters only when they strike vulnerable societies or communities. An earthquake might cause little damage if it takes place in an empty desert. Disasters occur when the two factors of people living in unsafe conditions and natural disaster combine ⁽¹⁾. Thus, natural hazards become disasters when people, homes and individuals are destroyed. With increasing level of poverty, population pressure and environmental degradation, this means increasing numbers of people are vulnerable to natural hazards in the world. In 2002, there were more disasters reported than in any of the preceding ten years. (ISDR data 2002.). Fortunately, the 2002 disasters appeared less deadly than before, 24,500 people were reported killed, compared to the decade's average of 62,000 per year, but 608 million people were affected, three times the annual average from 1992 -2001 ⁽²⁾. Disaster affects the world poorest the hardest. Of the 24,500 people killed in 2003, just 6% lived in countries of high human development. Weather related disasters rose from annual average of 200 in 1993 - 1997 to 331 per year in 1998 - 2002. Between 1993 -2002, famine was by far the deadliest disasters killing at least 275,000 people (measuring half of all reported fatalities), although this is probably a gross underestimate ⁽³⁾. Flood affects more people across the globe. (140 million per year on average) than other natural and technological disasters put together. According to Nishikawa (2003), almost 40% of natural disasters occurred in Asia between 1991 and 2000 and the total affected people in the region account for almost 90% of the world total. Earthquakes, flood, cyclones, typhoons, droughts, landslide, volcanic eruption and snowstorms represented the hazards in the region, affecting a large number of people. Canadians have experienced the upward trend in natural disaster loss (Henstra and McBean 2004), for example the ice storm which struck eastern Canada in January 1998, caused at least 28 deaths and it was estimated to have costed over CDN\$5 billion ⁽²⁾. (OCIEP 2002).

Africa has not been left out from the effects of natural disaster. An example is the eruption of the Bnea Mountain in Cameroon that affected so many lives, properties and agricultural farms. It is in view of all of these that this paper is aimed at examining the natural disasters, their causes and consequences in Tanzania in order to proffer a concrete solution that will ensure the conservation of the Tanzanian environment and proper management of all forms of disaster ⁽⁴⁾.

1.2 CAUSES AND CONSEQUENCES OF NATURAL DISASTER IN TANZANIA

Tanzania has experienced a number of natural hazards and disaster over the years. The two principal causes of the hazards / disasters are climate (droughts and floods) also known as hydrological hazards and environmental degradation mainly caused by (deforestation and desertification) and a combination of these as highlighted by the following details ⁽⁵⁾.

1.2.1 ENVIROMENTAL DEGRADATION CAUSED BY DEFORESTATION

Deforestation is a major problem challenging the forest ecosystem of Tanzania. A high population of the country depends largely on fuel wood as the principal source of energy. As the population of the country increased, the demand for energy also grew and this accelerated the rate of deforestation and has been contributing to the occurrence of natural hazards and disasters in Tanzania. The Tanzania environment has also been degraded. ⁽³⁾.

1.2.2 ENVIROMENTAL DEGRADATION CAUSED BY DESERTIFICATION

Desertification is defined as the gradual spread of the desert to other parts of the country or region. It has been responsible for the large environmental degradation problems faced by Tanzania. The primary cause of desertification is deforestation which is caused by lumbering, agricultural activities, road construction, mining, urban expansion and fuel wood harvesting. The spread of the desert leads to air pollution, drying up of streams and rivers, spread of spiral winds, sand dunes and dry environments ⁽⁴⁾. All these bring deterioration to the Tanzania environment.

1.2.3 DROUGHTS, FLOOD AND CYCLONES

Droughts and flood are the primary hazards affecting Tanzania as a country. Droughts ranked in the top three for all areas affected when weighted by mortality and nearly all areas affected when weighted by GDP. For example, Tanzania has experienced 12 droughts as a nation recording no death. However the total number of people affected by the drought stood at 12,863,483 (Data from the Center for Droughts and Risk Research at Columbia University, 2005). Floods have caused more death than any other disaster-causing agent in Tanzania. For example, there have been twenty four (24) flood disasters in Tanzania during which five hundred and thirty one (531) people were killed and 843,046 people were affected, properties worth millions of dollars were also destroyed. Also one cyclone disaster took place in Tanzania killing four people and the total numbers of people affected stood at 2500 ⁽⁵⁾.

1.2.4 EARTHQUAKE

This is a major geological hazard that has been frequent in Tanzania and has brought about destruction to lives and properties in the country. There have been eight earthquakes in Tanzania causing seven deaths and affecting four thousand people. Thus, earthquake is the third major cause of disaster in Tanzania and needs some attention ⁽³⁾.

1.3 ENVIROMENTAL CONSERVATION AND DISASTER MANAGEMENT IN TANZANIA

As earlier pointed out, environmental degradation in Tanzania has emanated from the problems of deforestation and desertification, which contributes, to natural hazards and disasters. Most of the other environmental degradation problems like erosion, ozone layer depletion and pollution are products of deforestation and desertification. Therefore, a solution to deforestation and desertification invariably solves the other environmental problems mentioned above. Environmental conservation and management is the major approach to tackling environmental degradation and this can be achieved in Tanzania via;

1. Aforestation and reforestation programmes through the establishment of shelterbelts, windbreaks and establishment of national parks, game reserves and wild life sanctuaries. Extensive shelter belts should be established in most places affected by desertification, and droughts in Tanzania. Wind breaks and line planting should be encouraged around houses as this has much benefit to man and the environment ⁽³⁾. The Tanzania government should consciously plan and demarcate various parts of the country for

the establishment of national parks and also increase the numbers of game reserves and wild life sanctuaries in the country. In addition, determined efforts should be made by the government and the entire people of Tanzania to embark upon tree planting and general efforts towards the conservation of the environment. Policies and laws should be made towards this and incentives given to individuals, groups, local and international organization interested in carrying this work ⁽²⁾.

2. Much sensitization/publicity and education should be carried out to encourage tree planting and environmental conservation. Further more, proper town planning policies should be made and implemented accordingly to ensure a habitable and most beautiful environment for the entire people of Tanzania.
3. There should be a well organized and scientific data base system (SDBS), networking and information sharing (NIS) which will not only help in improving preparedness and providing decision options in crisis management, but also helps in the assessment of losses and damages. Detail guidelines and appropriate techniques should be evolved besides improving administrative and organizational network for this purpose ⁽⁷⁾.
4. Within the disaster prone areas, vulnerability analysis (VA) and risk hazard and hazard mapping (RHM) should be carried out on a large scale so that area specific plans (ASP) could be prepared and the disaster reduction activities and social economic development of the area could be integrated appropriately.
5. Improve reliability of informations from the meteorological services so that impending disaster from rainfall can be known early enough.
6. In the areas of droughts, information from the meteorological services is also very important. A good example is the days of Joseph in Genesis 41: 25 - 57, "when he relied on accurate information from the supreme God to read the season of rainfall and the subsequent drought that will follow immediately after rainfall".
7. A well designed drainage system will help put an end to the resulting effects of flood.

1.4 GUARDING AGAINST DISASTER OCCURRENCE AND RE - OCCURENCE IN TANZANIA: "CONTRIBUTIONS OF GOVERNMENT AND OTHER ORGANISATIONS

- **ROLE OF GOVERNMENT/ NGOs.**

Government intervention can also be required where there is a problem of reliable information; where people are unwilling or unable to become familiar with information about risk, regulations can provide protection externally. An example of this is setting an enforcement of land-use regulations in hazardous areas like floodplains. Government is charged with the responsibility of rendering services needed for disaster mitigation. Services for disaster mitigation can be broadly grouped into four categories, including: Hazard assessment and monitoring, Planning, Prediction and warning system, Public education and research. One of the first steps to mitigation of natural disasters is to identify and assess hazards that threaten a community. Once the hazards have been identified, the vulnerability of the community can be assessed and policy can be made accordingly.

There are three forms of hazard assessment, each involving a different degree of sophistication ⁽⁸⁾.

1. Hazard identification, which involves a survey of an area to identify various hazards and estimate their magnitude and probability of occurrence.
2. Vulnerability assessment, which develops the relationships between identified hazards, existing and future populations and property that are or will be exposed to the hazard to "estimate damage and casualties that will result from various intensities of the hazard". And
3. Risk analysis, which "involves making quantitative estimate of the damage, injuries, and cost likely to be experienced within a specified geographic area over a specific period of time ⁽⁸⁾.

A detailed and comprehensive hazard assessment, particularly if it incorporates risk analysis, provides the information necessary for decision-makers to identify policy options and determine the appropriate strategy for mitigating natural hazards that threaten communities. Once vulnerabilities have been identified, action can be taken to reduce risk. Individual communities may lack the resource or technical expertise to undertake a comprehensive hazard assessment, so intergovernmental cooperation in this area is very important. Encouraging examples of this can be found in several Canadian provinces; for example, the British Columbia Ministry of Energy and Mines has conducted detailed assessments of the earthquake and landslide hazards in the province, which have been incorporated into regional and local planning (Government of British Columbia, 2002) ⁽⁸⁾. New technologies are evolving to permit more sophisticated assessments of hazards. Advanced remote sensing techniques and improvement in geographic information systems (GIS) allow hazards to be digitally mapped and modelled to determine the present and future risk associated with them ⁽⁸⁾.

1.5 EMERGENCY RESPONSES: A TOOL FOR DISASTER MANAGEMENT

Disaster management is a complex series of activities, which include risk assessment preventive measures, preparedness to cope with future disasters, emergency response to a disaster, recovery and rehabilitation. An emphasis on good development and community preparedness can reduce the impact of disasters especially for the most vulnerable people living in hazard prone area to help them recover after having lost their means of livelihood. ⁽⁸⁾

1.5.1 EMERGENCY RESPONSE.

Each disaster has unique circumstances and the response needs to be tailored to meet the specifics of the disaster areas and the response in general include the following ⁽⁸⁾.

1. Search – finding those who may be trapped under collapsed building.
2. Assessment of needs – working out what is required. In what quantities, and for whom.
3. Health – provision of medical care and preventing the spread of disease through immunization, provision of safe water and food, waste disposal and burial of the dead.
4. Basic needs – procuring and distributing food, shelter and clothing
5. Livelihood and economy – assisting people to earn a living to help them recover.
6. Emotional Support – counselling and reuniting separated families.
7. Logistics – transportation of people and equipment.
8. Infrastructure – rebuilding roads, electricity, telephones, water pipelines, and waste disposal systems.

To make the multi-disciplinary and multi-sectoral effort more effective, it is indispensable to create a linkage between the local people, who are put in danger for possible disasters, and the communities, which could help the local people before, during, and after the disasters. Governments and scientific communities should develop preventive measures and technologies and should disseminate the information on disaster countermeasures to the local people timely and efficiently. For example, typhoon forecasts by meteorologists must reach the people at risk to urge their evacuation if necessary. Local houses must be properly built with affordable technology to be earthquake resistant. Numerous sectors such as governments, community organizations, mass media, NGOs, schools could play a critical role as a transmitter ⁽⁹⁾.

1.5.2 DISASTER RECOVERY

After the immediate danger is over, families need assistance to rebuild their lives and their livelihoods. Communities need to rebuild their social and physical infrastructure and the economy needs revitalization. It takes time and money to plan and ensure long time development and future disaster preparedness are appropriate for everyone. Damaged structures and services may not necessarily be restored in their previous locations or forms as the disruptions can be an opportunity to make improvements. Seasonal factors must be considered; the planting season will affect when seeds need to be distributed and the onset of cold weather will affect the style of shelters provided.

1.5.3 DISASTER PREPAREDNESS

Much can be done to prepare for future disaster by: Modifying or removing some of the causes of the hazard – for example by building houses away from hazard prone areas, building levy bands in flood prone areas. Using improved stoves to avoid the spread of fire etc. reducing the effects of the hazard if it occurs – for example by building houses to standards which will protect people during a hazard, developing response plans, clear definition of roles and training of emergency service personnel, collection and rehearsal (such as evacuation drill).

1.5.4 PREDICTION AND EARLY WARNING SYSTEMS

An important component of a national mitigation strategy is an effective prediction and warning system that provides information concerning the likely occurrence of future events and warns the public about impending hazardous events. The prediction component of this service involves collection of information on the past and present occurrences of hazardous event and scientific analysis to provide information on the past (up to the present) frequency of occurrence and characteristics of events. Weather and climate forecasting are common tools of prediction that are valuable in the mitigation of natural disasters e.g. flood. Credible scientific analysis of long-term climatic trends can encourage policies designed to increase community disaster resilience and reduces losses, such as building restrictions and land-use planning. Short-term prediction and advance warning of specific extreme weather events can enable communities to take necessary precautions to reduce their impact. Short-term prediction is highly valuable for reducing business losses as well; for example, airlines are able to use weather information to decide on the feasibility of continuing or canceling flights based on an assessment of conditions ⁽⁹⁾.

Once predictions have been made, an effective warning system allows people to take appropriate action to protect themselves before a disaster. This helps to reduce injury and loss. In order to be effective, components of the disaster warning process must be integrated and maintained, including sensing and observation equipment, processing and modeling facilities and appropriate communications systems for delivery and dissemination. A major administrative detail in this area is who should be the official authority to issue disaster warnings. On one hand, disaster warnings are for the good of the public, suggesting that authority for their distribution should be reserved for public control. On the other hand, private meteorological companies argue that they should have the right to issue disaster warnings as well, or risk losing credibility in the eyes of the public. The importance of this issue should not be understated, as problems arise when there are no defined rules for the issuance given by public agencies and private firms can cause confusion, alarm and panic among emergency personnel and vulnerable populations. An example of this occurred in the United States before the 1988 Hurricane Gilbert, when an evacuation advisory issued by a private meteorology firm was contradicted by the US National weather service, causing confusion and panic among Texas residents along the coast of the Gulf of Mexico ⁽¹⁰⁾.

1.5.5 DEVELOPMENT

Rebuilding after a disaster provides significant opportunities for improved development:

1. Response and recovery planning to prepare for future hazards.
2. Upgrading infrastructure, roads, and communication, water and sanitation systems, to withstand disasters and assist response.
3. Building hazard resistant public buildings and houses to reduce the impact of local hazards in the future.
4. Developing skills of local personnel to increase their capacity to respond in an emergency ⁽⁵⁾.

2.0 CONCLUSION

In order to confront the emerging issues related to disasters and disaster reduction, multi-level and multi-dimensional coordination and collaboration are essential to make the efforts more efficient and effective. The involvement of all the sectors of the society is also crucial to reduce the vulnerability and risk to disasters and to fill the gaps between disaster reduction, preparedness, response and reconstruction. Furthermore, to strengthen disaster reduction capacity at the community level, it is indispensable to

promote and strengthen partnership among various sectors including national and local governments, public and private sectors of the society, among others, NGOs and other community based and donor organizations.

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