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URBAN DROUGHTS AND FLOODS IN MAIDUGURI: TWIN HAZARDS OF A VARIABLE CLIMATE

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Abstract

Maiduguri, an important city in the Sudano-Sahelian zone of West Africa, experiences both drought and floods. Although droughts are more popular, floods are a seasonal occurrence in parts of the city in the average rainy season. Both hazards exert a heavy toll on their victims. Present response to the hazard problems is characterised by a fire-fighting approach which does little about future occurrence. Much of the perception and response is spiritual and stops short of needed structural and organisational programmes for effective mitigation of hazards. Future occurrences of drought and flood may have more adverse effects as land use in the city becomes more complex and agricultural and water supply system comes to depend heavily on surfacial sources. Future effects will also depend on the socio-economic conditions of the people at risk and the capacity of those who help them. Governments and people need to work together to reduce drought and flood hazards.

Introduction

Maiduguri is a medium sized city of about 700,000 population. It is located in the Sudano-Sahelian zone of West Africa precisely at 11°51'N and 13°05'E. It experiences a dry-wet season made up approximately of eight dry months and 4 wet months in the average climate year. The city is divided into many wards (see fig. 1) which may be described more or less as high, medium and low density in terms of population. Drought and flood hazards are experienced in the city. The issues of these twin climatic events form the subject of this paper.

Climatic variability is a natural truism as rains can, and do fail even in humid areas; and deserts experience floods from heavy, though infrequent downpours. J.S. Jenkin's observation about Australia's climate is more or less true universally. According to him, "The dry season is followed by a year of freshets and floods: the rains are then incessant, but they diminish in number and quantity, in each succeeding year, until the dry epoch again recurs" (NICHOLLS 1987:63). This rainfall experience which is common to all areas shows that endemicity of climatic variability is a global phenomenon, at least in the short-term. Though this pendulum-like climatic swing is a fact of life, certain climatic experiences in certain areas are regarded as almost a myth. For

example, the average southern Nigerian who has never experienced rainfall in the dry belt of Nigeria believes that flood occurrence in the dry belt is a virtual climatic impossibility. This belief was very strong until floods and flood hazards in this dry belt were portrayed through television broadcasts. The myth of flood has been strongly encouraged by the politics of disaster in the country in which drought and desiccation problems of the dry belt had been overplayed in order to secure a substantial amount of the Ecological (Disaster) Relief Fund established by the Federal Government. ODIHI (1994) calls the myths that deny the existence and non-existence of hydrological and/or climatic events where they truly exist or do not exist "hydroclimatic fallacies".

More surprising than the denial of floods in the dry belt of Nigeria by inexperienced southerners is the official denial of flood in the belt. This denial of the flood problem has been both implicit and explicit. It is implied in the lack of flood hazard mitigation preparedness in the programmes of the various States' Emergency Relief Agency (SERA) in the dry belt. Its most explicit statement was the unwillingness of the Borno State Government to nominate for training in Lagos at little or no cost to the Government, even one person in the national flood disaster mitigation training programme held in Lagos before the September 13, 1994 flood in Maiduguri. The lack of official interest was because it was erroneously believed that such a programme was "not relevant". The fact is that flood is a seasonal experience in many parts of the state and the state had in the past used flood hazard to obtain resources from the Federal Government and people for relief purposes. ODIHI (1994) showed that urban floods in Maiduguri are seasonal and costly experiences for its many victims. Floods, he noted, constitutes an important factor of residential locational decision in the city and it is therefore an important factor affecting property value.

Droughts, unlike floods, are widely recognised environmental hazards in the dry belt of Nigeria - the zone north of Lat. 10°N. This popularity of drought is the result of its frequent occurrence. The endemicity of drought in the zone has a historic recognition as can be seen in the fairly long history of traditional coping mechanisms which include irrigation and food sharing. More recently proactive stance of government manifested through its many drought hazard mitigation schemes (e.g. buying and storing of grains in good harvest years for sale to the public in bad years, irrigation schemes and research into, and introduction of drought-resistant varieties) is both an admission of, and response to drought problems. Nor can drought be ignored in this belt where its frequent occurrence is devastating to millions of people.

This paper is both historic and futuristic in orientation. It is historic because it portrays the occurrence of the twin hazards of drought and floods in Maiduguri, their effects, perceptions and societal response to them. On the other hand, it is futuristic because it attempts to portray the effects of droughts and floods when they recur in the future. The basis for the attempted portrayal of the effects of future hazards is today's realities - the perception of, and response to the flood problem, the socio-economic conditions of the people

and the land use types as well as their geography (i.e. their location and the implications of such location for hazard related damage). The paper argues that damage resulting from hazard occurrences in the future is likely to be more serious for reasons of changing urban land use from more compatible (adaptive) to more damage prone types, and worsening socio-economic conditions that reduce mitigation capacity and effectiveness.

Concept of urban drought and flood

The concept of urban droughts and floods from the perspective of this paper are presented in this section. Urban drought in this paper refers to situations when available water is inadequate for meeting needs (demand). Urban drought in Maiduguri is therefore a combination of four major droughts portrayed in the drought literature. It can be a meteorological drought which occurs when precipitation or rainfall in this case is below the long term. It may also be a hydrologic drought which occurs when the water level in the stream, dam or reservoir falls below a critical level and threatens dependent systems or activities such as water supply or hydroelectricity generation or navigation. It may also be an agricultural drought, the occurrence of which relates also to the timing of rainfall as well as its amounts. Urban drought may be conceived also in terms of supply system related problems which deny the supply of water for domestic, commercial, recreational or industrial uses in the city. Supply related problems affecting water supply may be mechanical, electrical or social. Together these problems define the inappropriateness of the technology of water supply in the local context (ODIHI 1988). For example, mechanical problems could persist for days, months or even years because there are no experts to fix them, or no spare parts to use in fixing the problems. Local problems include poverty or location in a non-serviced part of city which denies service to certain people or places.

Urban flood as conceived in this paper equally falls into the major types of urban floods in the literature and more. Urban flood is defined as any overland flow over urban streets or land which is enough to cause significant property damage; traffic problems, nuisance and health hazards (see RASHID 1982; ODEMERHO 1988). Urban flood in this paper also refers to inundation of compounds and houses by stagnant but sufficient water to cause damage to houses and personal effects of householders. The concept of urban flood in this paper thus includes river flood, flash floods and rain water pondages.

Past droughts and their effects

Many droughts have occurred in Maiduguri or in the larger Sudano-Sahelian zone since the beginning of the 20th century (see table 1). Many of these droughts were long in duration (i.e. they were multiple year droughts), high in intensity or both. Some writers think that the recent decades have been one

long drought in the West African Sahel with some years offering only a brief relief (see GLANTZ 1987). Some scholars believe that there is a decadal drought recurrence in the zone (see table 1). The periodic recurrence view of drought has been a subject of debate among scholars but what cannot be contested is the fact that drought is a "recurring [if] a periodic phenomenon; it is a part of climate not apart from it" (GLANTZ 1987: 298). As can be seen from table 1, Maiduguri and its greater region has experienced major droughts between 1900 and 1995.

Effects of droughts in Maiduguri have always been serious. The serious nature of drought effects in the city derives from the status of the city of Maiduguri. It is at once a state and regional capital for administrative and religious functions, and an international centre for commercial activities. The implication of this status of the city is the difficulty of knowing the true extent of the effects of environmental hazards such as droughts. What we are able to know is, in my view, always an underestimation of the true situation. This is so because much of the socio-economic interaction between Maiduguri and many African countries are not open or official. Therefore, a study confined to Nigeria would fail to capture conditions outside the country. A transborder study is required for acceptable approximation of the true situation.

Table 1: Some recent droughts in Maiduguri : 1940 - 1994

Year			
Started	Ended	Duration (Years)	Description
1941	1942	2	
1944	1944	1	
1947	1949	3	
1968	1973	6	A very long drought. Very serious with human, animal and environmental consequences
1983	1987	4	
1990	1993	3	

Preliminary results of a recent survey conducted in the heat of the Nigeria-Cameroon crisis over the disputed Bakassi Peninsula when transborder communication was adversely affected show that Maiduguri traders of both manufactured and agricultural goods (including poultry products) experienced a decline in their business of between 60 and 70 percent of daily and weekly sales. The post-crisis part of the same survey has confirmed the importance of the international component of the Maiduguri economy. International clientele from Cameroon, Chad, Niger, Central Africa and Sudan are visible in their linguistic shibboleth, foreign (international) currencies, sometimes in their mode of dressing and motor vehicle registration. Their transactions in foreign

currency such as the CFA and the U.S. dollar contribute substantially to the sustenance of the booming international foreign currency market in the central Monday Market. The point is that environmental hazards such as droughts and floods have effects that go beyond the boundaries of Maiduguri Metropolis, Borno State or even Nigeria. Although the real extent of the effects may not fully be known their broad outlines are well understood. Some of the important effects of drought are presented in table 2.

Table 2 shows that effects of drought can be grouped into environmental, social, economic and spiritual. The spiritual effect of drought is a binder of the other effects. Drought provokes religious consciousness. The religious response is both prayer and admonition to "righteous" life which among other things includes humans living as a part of the total environment not apart from it. Spiritual admonition advocates harmony between humans and other elements in the total environment. Economic effects of drought include failure of urban agriculture which has become increasingly important since the introduction of the structural adjustment programme (SAP) in 1986 (see ODIHI 1994). The attendant price inflation is responsible for failure of small businesses due to diversion of capital to the household concerns both by the traders and clientele and depression in the small business sector. ODIHI (1988) identified small businesses affected by Maiduguri drought as arts and crafts, restaurant and hawked food and fashion among others. The environmental or ecological effect includes desiccation, increased fire hazards, overgrazing and increased animal mortality which provokes the economic response of stock liquidation in a distress market of sale-dampened prices. The problem of prices (i.e. less money for the poor's goods and food price inflation) causes the social problem of malnutrition and undernutrition for the urban poor.

Table 2: Some effects of droughts in Maiduguri

Effects	Description
Environmental	Increased aridity; desiccation; desertification (deterioration in plant life and erosion); increased air pollution: dustiness; Increased fire problems
Hydrological	No stream (Alau River) flow; no runoff; litter aquifer recharge increased mining of ground water resources
Water supply	Cuts in water supply; increased hawked water (mai moya) prices, increased water pollution; increased use of polluted water; increased water recycling
Sanitation	Decline in environmental and personal hygiene
Health	Increased in skin and waterborne disease; increased susceptibility to sickness due to nutritional problems
Social	Increased food problems (hunger, starvation or famine); influx of environmental refugees leading to overcrowding. Increased morbidity
Demographic	Population shifts: rural-urban migration which swell up Maiduguri's population; increased international migration leading to refugee problems from countries to the north
Economic	Loss of business; decline in big business due to reduced patronage; food and water price inflation; decline in urban agro-pastoral economy
Agricultural	Failure of flood and irrigation-dependent agriculture in the Jere Bowl and in the metropolis; reduced farm incomes; increased indebtedness of farmers; farm labour redundancy. Decline in urban pastoral economy due to increased animal mortality and panic sales of animals in distress dampened-price markets

More recently, especially as Maiduguri's water supply has increasingly come to be dependent on surface sources - the Alau Dam - drought in the area affects water supply in the city more adversely. Hitherto, when the city was more dependent on underground water, especially the lower aquifer which is a paleoresource, drought effect was less adverse on urban water supply. The distribution of effects of drought is shown in table 3. The poor are more adversely affected than the rich. Almost all the small businesses adversely affected by drought were operated by poor people (93.41 per cent). All the people who experienced drought related undernutrition and malnutrition belong to the low-income bracket (i.e. they were poor). For those who were above the starvation line (i.e. those households with annual per capital income of more than N 200.00 in 1986-88, more than N 600.00 in 1989-90, more than N 1700.00 in 1991-92; and more than N 3000.00 in 1992-93), the effect of drought was price inflation and reduction in the bundle of luxury goods they consumed. For the struggling poor, however, it is as one victim of drought put it - "a bruising experience of a naked person who attempts to strip."

Floods and their effects

Contrary to the hydroclimatic fallacy which denies the existence of floods in Maiduguri, parts of the city suffer from flood problems in the average rainy season. Floods usually accompany long or intense rainfall events. Floods may also occur when the antecedent moisture condition (AMC) is favourable even if the rainfall event is small in amount and/or short in duration. For example, previous events may have caused a saturation of the soil ponding of water meaning that the flood threshold condition is closed to being reached. Under such a situation a little rainfall causes floods. Table 4 shows the number, type and place (ward) of important flood events in Maiduguri during the period 1988 to 1994 while table 5 shows their effects. Fig. 1 shows the wards frequently affected by certain types of floods.

Table 3: Distribution of the effects of droughts in Maiduguri

Types of Effects	% of Households Affected		
	Lower (400)*	Medium (200)	High (100)
Food problems	100	6.00	3.00
Demographic			
Sickness	20.00	0.00	0.00
Movement of household member	45.00	0.00	0.00
Altered personal hygiene (reduced baths or laundry)	97.00	3.00	0.00

Total loss of business	58.00	13.00	0.00
Decline in business (reduced volume)			4.9
Loss of jobs	94.00	5.00	0.00

*Number of respondents from class.

Table 4: Some recent flood events in Maiduguri: types and places affected

Year	Types	Compound	River/dam	Affected wards
1988	Yes	Yes	No	Bulumkutu, Gomari, Gamboru Bulabulin, Gomari Abuja, Gwange, Mairi, Bolori, Wulari
1989	Yes	Yes	No	Bulumkutu, Gomari, Gamboru, London Ciki, Bulabulin
1990	Yes	Yes	No	Bolori, Bulumkutu, Gomari, Gamboru, London Ciki, Bulabulin
1991	Yes	Yes	No	Bulumkutu, Gomari, Gamboru, London Ciki, Bulabulin
1992				Bulumkutu, Gomari, Gamboru, London Ciki, Bulabulin
1993				Bulumkutu, Gomari, Gamboru, London Ciki, Bulabulin
1994	Yes	Yes	Yes	Bulumkutu, Gomari, Gamboru, London Ciki, Bulabulin(Gwange, Bulabulin, Gamboru)*
1995				Bulumkutu, Gomari, Gamboru, London Ciki, Bulabulin

* Alau Dam Failure Flood of September 13, 1994

It is evident from the tables that the frequency of flood occurrence in parts of Maiduguri is high and their effects are adverse and serious. One of the serious effects of floods is permanent or temporary displacement of victims many of whom are too poor to afford housing in safer areas. These victims of floods often seek refuge in the homes of their relatives or friends where they cause over-crowding. Another important effect of floods in Maiduguri relates to hazards. Safety of both life and property is compromised as is environmental and human health. Flood poses significant problems in any of its forms: it sweeps away humans, vehicles, homes and business, and other types of property in its flash form, drowns humans, animals and damage property in its flash and ponded form; and causes erosion (structural damage) to roads, houses and trees in all its forms. Health hazard is an important effect of flood in Maiduguri. This is especially the case in wards such as Bulumkutu, Bulabulin and others where pit latrines are common (95,74 percent), pipe water service is poor or non-existent and there is a heavy dependence on compound wells. Floods cause pit latrines to fill up and spill, polluting wells. Epidemics especially of water borne diseases such as diarrhoea, dysentery and typhoid are more common during the rainy season when the risks of water pollution are higher.

Perception of drought and flood

Drought and flood are reviewed by some respondents in Maiduguri as an act of God. Over 65 percent and 31 percent of respondents see drought and floods respectively as the acts of God.

Table 5 : Effects of floods in Maiduguri

Type	Description of Effect
Environmental	Ponding of areas including streets. Flourishing of amphibious life e.g. frogs with their attendant noise which becomes a big nuisance in the night; death of such animals when flood conditions cease results in serious odour.
Structural	Houses may fall, crack or weaken; roads may be eroded. Tree falls may occur. Power and communication lines may be damaged.
Traffic/communication	Movements of all kinds are impeded by flood conditions; occurrence of dangerous traffic conditions; speed is affected and some places may be temporally isolated.
Water Supply	Supply of water in places dependent on wells may be adversely

	affected: flood water causes pollution and brings about lack and expenditure. Pit latrines may get filled up from flood waters and spill over into compound wells.
Health	Dependent on polluted water causes water borne disease incidents to increase; wetting of walls in the warm weather of Maiduguri favours moulds which trigger asthmatic attacks for asthma patients; Abundance of stagnant water favours mosquito breeding with consequent malarial attack increase.
Social	Flood causes temporary displacements of victims leading to overcrowding in hosts' homes or homelessness. The September 13, 1994 flood resulted in deaths of people and animals.

These hazards are seen as either a punishment for apostasy or as messengers to remind humans of the divine - human (God-human) relationship. Level of education of the respondent did not significantly alter the divine view of hazards as over 52 per cent of respondents with at least secondary education held this view. However, the discipline of the graduate respondent (people with at least a bachelor's degree) appeared to affect their view. About 90 per cent of graduate respondents with climate, geography, engineering and hydrology related backgrounds see the problem as related to climate or meteorology, hydrology or drainage. The remaining approximately 5 per cent saw the hazard problems as resulting from divine, natural and cultural sources. The perception of the solutions to the problems mirrored the perception of the causes. Spiritual response is important in the view of respondents. Prayers for rain in the mosques and churches were advocated by governments, traditional and religious leaders during droughts. Assistance to hazard victims were often canvassed for on the platform of religion. At the individual level of the victims response to drought and flood hazard, mostly took the form of repairs to damages caused by the hazards. The survey failed to find anybody or business which had an insurance against drought or flood hazard related damage. Although flood proofing of houses was needed and some of the techniques within the competence of house owners repairs or rebuilding of houses did not incorporate them. Use of cement which was generally observed was not primarily for flood proofing purposes.

From the portrayal of societal perception of, and response to the environmental hazards of drought and floods in Maiduguri, we can reasonably predict or talk about the impact of future hazards. The discussion that follows is an attempt to understand both the hazard realities of the past and the future against the background of history, present conditions and those likely to obtain in the future.

Discussion

Experience shows that Maiduguri and the wider Sudano-Sahelian area is an endemic drought area where flood, though, less frequent does occur. Thus the environmental fallacies and the absence of adequate hazards coping strategies incorporating the endemicity of drought and flood in the development planning process are unfortunate. Both hazards are likely to recur in the future with devastating effects as the city increases in its population size and socio-economic complexity. The contemporary trend of increasing surface water resources dependence and urban agriculture means that effects of either drought or flood in future will be more adverse.

Perception of both drought and flood hazards are both interesting and usual. Hazard perception in Maiduguri is similar to what obtains in many technologically less developed societies. Studies of hazards in Nigeria are full of the view that hazards are divine messengers of the gods to punish apostasy or remind humanity of their obligations in the human-god relationship. For example, many studies on the urban flood problem in Ibadan blamed it on changing societal values and apostasy (see JIBOWU 1981; ODIHI 1985). ODIHI'S (1988) study of Maiduguri drought shows the pervasiveness of the divine origin view of droughts. This view of environmental hazards is not restricted to traditional Nigerian cosmology but appears to obtain elsewhere in Africa as TIMBERLAKE'S (1985) analyses of underdevelopment problem in Africa shows. Ngugi wa Thiong'o in his "Petals of Blood" alludes to the environmental calamity-apostasy link when he says "we went to the city to save Ilmorog from the drought. We brought spiritual drought from the city". (NGUGI 1977:192). This perceived link between apostasy and environmental calamities such as droughts and floods is a view that is historical and goes beyond Africa. In both the Bible and Koran - the holy books of the Christian and Islamic faiths, such a view is dominant (see, for example, Genesis 6-7; 1 Kings 18).

It is important to note the significance or prominence given to spiritual factors in both the perception of, and response to the environmental hazard problem. Drought is perceived as a concomitant of spiritual drought. Flood is similarly perceived as a result of spiritual flood of sin. In other words, environmental calamities are seen to be precipitated by spiritual droughts (absence of godly values) and spiritual floods (predominance of worldliness or ungodliness). The official (modern and traditional) response given to drought and flood problems is mainly spiritual. This underscores the role of perception in response. Human action usually flows from human understanding of a problem. The variation in the response to the problems of drought and flood is due largely to the variation in the perception by victims and government. Many of the victims see the problem, if not apart from, then in addition to the divine origin, as due to lack of certain socio-economic conditions, essentials or safety nets, or presence of certain conditions that predisposes them to

environmental hazard problems. This is why they are involved in mechanical or physical repairs, or relocate from unsafe areas.

Perception has been an important response factor problem in Africa and indeed the larger technologically less developed world. Perception, lack of technological/economic capacity or political will have hampered meaningful planning to reduce the damage caused by drought or flood. Thus, in spite of the familiarity with environmental hazards, "in under-developed areas drought [or flood] means more than reduced incomes for farmers and merchants. It often means hunger, disease, human emaciation, mass migrations of people and animals, conflict within and between cultural groups, starvation and death" (HIDORE 1983:290). TIMBERLAKE (1985) made the important distinction between drought occurrence in the technologically advanced countries and Africa. He noted that hazards only devastate on the pages of newspapers in the former while they devastate people and human systems in Africa.

Although weather, especially the lack of rain is first to blame "whenever the cry of drought [or flood] is raised, [and] the fundamental characteristics of the climate may be part of the problem" (HIDORE 1983:290-291), TIMBERLAKE (1985) believes that the climate thesis tempts African leaders to apathy as there is little they can do about weather. The facts of endemicity of the hazards and their response-conditioned differential impact on societies both suggest that humans and the organisation of the human society are implicated in the scourge of environmental hazards. Everybody and especially policy makers need to have the correct perspective of hazards and their impact for as Mario Murillo noted: "Nothing influences our behaviour like our perspective. What we see is the thrust of our life. Scales fall off our view of things, and to see rightly is to empower to live rightly" (MURILLO 1991:124).

Hazards of the future

The relationship between the different parts of the time cycle is aptly captured in African cosmology, morning and evening seem inseparably linked as the saying: "The morning is the father of the evening" portrays. This adage seems to suggest that "origin" and "destiny" are related in a cause-and-effect way. The beginning (origin) is an important factor shaping the "end" (outcome) or the "end" as an "effect" (outcome) of the beginning is the African cosmological thesis used to view the future effects of the climatic twin hazards of drought and floods in Maiduguri. We ask: "What is the Maiduguri of the future in relation to the hazards of drought or flood?" It is important to ask this type of question because the hazard endemicity thesis of this paper suggests that drought and flood events will occur in future as they have done in the past. The attempted answers below assume some socio-economic and political conditions.

Hazards are implicit in everyday conditions. In fact they have been regarded as "extensions of the everyday condition". The nature of impact of future drought or flood in Maiduguri is predicated on the perception and response being given to these hazards today, on the one hand, and the nature of urban land use at the time of hazard occurrence. It will also depend on the wealth or poverty of people as victims, and society at large.

Present response can be characterised as crisis management as opposed to risk management. As Governor Robert Kerrey of Nebraska noted:

Government [and people] can react to disasters in one of two ways. One approach is to wait until an event occurs and try to mitigate the consequences by whatever means available as quickly as possible. Alternatively, procedures may be developed before a disaster that will define mechanisms to respond to various kinds of events. The first of these approaches is crisis management and the second is risk management. (KERREY 1987)

The fire-fighting approach is the popular approach in Nigeria and this explains why drought and other environmental hazards continue to exert a high toll on the populace. Although victims of hazards desire to engage in risk management strategies their poverty makes this difficult or impossible. The poor who are adversely affected usually lack not just the financial resources to replace what has been lost as a result of hazard but sometimes the means of their livelihood. Paradoxically, urban disaster burden is borne overwhelmingly by the poor segment of the urban community. Those who offer relief in the absence of sustained organised relief schemes or in the face of denials of problem are relatives, many of whom themselves live in the margin.

Poverty problems which prevent the poor victims of drought and flood from hazard mitigating actions underscore the importance of the right perception of hazard by government in a society where individual initiative is hampered by material poverty, and ignorance. The poor even in the face of proper perception or knowledge cannot implement programmes aimed at mitigating future hazard damage. The poor both as a group or individuals lack adequate resources to make necessary investments to mitigate or avoid future losses. They live under conditions of numerous and serious deprivations and the tyranny of the urgent (i.e. hunger caused by lack of food, money or energy, health problems caused mainly by their deprivations) which hinder considerations for the future in spite of the need to do so (ODIHI 1995). Indeed the urban poor live in George Awoonor-William's world "among the sharps of the forest" where returning is not possible and going forward is a great difficulty." And the tenacity of the problems of life is like "the chameleon faeces into which I have stepped, when I clean it cannot go" (AWOONOR-WILLIAMS 1986:73).

The urban hazard which affects the poor brings into sharper focus the poor's precarious position in relation to the rest of the society. Their further impoverishment by drought and flood hazards increases the gap between them and more affluent members of the society and delinks them from the

development process. ODIHI (1988; 1994) observed that some poor victims of urban hazards withdraw their wards from schools and training. Ken Keobke in what he called "irony of disasters" observed that when ruin attends disasters the poor often not only lack the resources to make restoration possible but also the chance to earn necessary money to replace what was lost in the disaster even. Then, "soon a cycle of poverty and debt sets in that consumes their savings, the remains of their farms and their hope" (KEOBKE 1993:13).

Mitigating impacts of future urban hazards

Mitigation of urban hazards in Maiduguri needs to begin with the understanding of the disaster process. As BAIRD et al. (1976:2) observed a meaningful starting point for disaster analysis is to see disaster as the "extreme situation which is implicit in the everyday condition of the population". As a result fruitful consideration of hazards needs to incorporate the organisation of the particular society in which hazard is occurring (O'KEEFE 1975; WESTGATE and O'KEEFE 1976). The Nigerian society in its present organisation is not well suited to help poor victims. This is evident in the denial of the existence of certain environmental problems and in the distribution of relief materials which is not commensurate with needs. Though much money and materials were obtained as relief from governments including international ones, philanthropists for the relief and rehabilitation of the September 13, 1994 flood victims, many have complained about the inadequate attention given to them.

The lack of opportunities for the poor is part of the hazard problem which current employment and remuneration problems seem to be exacerbating. Mitigation of future urban hazards must begin with assisting the poor now to have a higher capacity to avoid or mitigate damage in the future. The needed assistance is the empowerment of the poor in their area of weakness. For some it would be employment, retraining with a view to self-employment or more paying jobs or skill acquisition. Flood problems can be reduced by encouraging a better environmental sanitation culture that improves the effectiveness of urban drainage system; and formulation and enforcement of land use regulations and building codes that reduce flood damage. Such regulations include restriction of the flood plain to uses that are compatible with floods and prohibition of residential uses in the flood way as obtains along the course of the Alau in Gwange and Bulabulin wards. Housing development should also include adequate infrastructural development of roads that permits free passage in times of environmental emergencies. Flood resistant materials such as cement and fired bricks should be used to build houses. Compounds must have effective drainage to prevent water from ponding within.

Substantially, the urgent issue concerns what must be done to insulate society from the scourge of the twin hazards which in all probability will recur in the future. The question is particular to the hazard victims, people and

governments in Maiduguri although the problems posed by the twin hazards, are to my mind, general to Nigeria and indeed to humankind. If the issue of urban hazards in Maiduguri is well understood and correctly (adequately) handled the present instant synonymity of natural event occurrence with disaster will cease. There is need for a broad base participation that involves the grassroots, government and non-governmental organisations working together to understand and mitigate the problem of the twin hazards. As in the words of NGUGI (1972:50)

"We must strike for a form of social organisation that will free the manacled spirit and energy of our people so we can build a new country and sing a new song."

We must do this to realise Basil DAVIDSON'S (1975:14) hope: "to change fear into confidence, despair into hope, anger into understanding, even hatred [of those who benefit from our misery] into love."

This done, environmental disasters flowing from droughts and floods will be denied a future in Maiduguri though drought and flood, the twin events of a variable climate may continue to occur.

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