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Full Length Research Paper

Horrifying disasters in western Kenya; Impact on education and national development

Achoka Judith S. K. and Maiyo Julius*

Masinde Muliro University of Science and Technology, Kenya.

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The occurrence of natural disasters has shown a positive trend as annual incidents of disaster events have increased on the continent. Approximately two-thirds of the 3.3 million people in Western Kenya fall below the poverty line, leaving the region stuck in poverty traps that prevent sustainable development. Schools in the region are hampered in their operation when the disaster occurs .In third term 2007, many school were unable to open due to flooding, students were transferred to other schools while others dropout of the system. Access to safe water, sanitation, quality education and HIV/AIDS awareness are desperately needed, along with micro-economic development to bring the population up to a livable standard. This study investigates the horrifying disasters in the region and analyzes their impact on education and national development.

Key words: Hazard, disaster, vulnerability, impacts.

INTRODUCTION

Education is frequently touted as the most important factor for achieving sustainable development and used as an important means for changing attitudes and behaviours. The Hyogo framework for action, which was adopted by 168 nations in January 2005 recognize this and encourages government and civic society to use education which facilitate knowledge and innovation ,in order to build a culture of safety and resilience at all levels of the nation (Nakileza, 2007).

Assessment report that preceded the world conference on Education For All held in April 2000,showed that the performance of primary education fell below desired levels (World Bank, 2001),many gains in primary education had diminished due situations of national, international conflicts, natural disasters and extreme poverty (World Bank, 2004) . The HIV/Aids pandemic is seriously affecting education systems today and will continue to have a negative impact in future (Lavell,1999).Thousands of teachers, educational personnel and students have died or been destabilized by Aids, malaria, flooding, lighting and other chronic diseases (World Bank, 2001).

There is convincing evidence that the number and seriousness of disasters are increasing in both developed and developing nations and poor countries and communities are disproportionately affected (DFID, 2004a). Approximately 75% of the world's population lives in areas that have been affected by disasters at least once between 1990 and 2000 and average of 184 people die every day as a result of disasters (IFRC, 2003). Over the last two decades, more than 1.5 million people have lost their lives due to disastrous events. While only 11% of the world population exposed to natural hazards live in countries with a low Human Development Index (HDI), these countries alone account for 54% of deaths. On the other hand, countries with a high HDI represent only 15% of the world population and account for 1.8% of deaths caused by natural disasters. It is estimated that during the last few decades, an average of 250 million people have been affected each year, with nearly 58,000 deaths and more than $67 billion in losses as a result of disas-ters caused by natural hazards. In 1990, 90 million peo-ple suffered the impact of disasters, compared to 255 million in 2003. Between 1990 and 2003, a total of 3.4 bil-lion people worldwide suffered the consequences of disasters (DFID 2004a, IFRC 2003).

Developing countries have devastating disasters; flooding in the Mekong Delta of Vietnam claimed hundreds of lives, the vast majority being young children. In

*Corresponding author. E-mail: maiyokip2004@yahoo.com.

the year 2000, 400 children died and in 2001, over 300 child deaths were recorded. In 2002, 99 children died-out of a total death of 106 in the Delta (Tinh, 2003). A study coordinated by the save children reported that most death were among children aged under six years from poor families. Though infants may be at special risk from fast-rising floods and strong currents, many such children died not during the onset of flooding but when flood waters were well established (UNICEF, 2002, Tinh, 2003).

In Rio de Janeiro, landslides caused 1000 deaths during storms in 1966, rising to 1700 in 1967 because of the development of hazard sites. Hurricane Mitch swept through Central America in 1998 causing severe impacts in Honduras, Nicaragua, El Salvador and Guatemala. The death toll from the high winds, flooding and land-slides was estimated to be 27,000. Mitch severely da-maged 80,000 homes, 2000 drinking water systems and hundreds of bridges (Wisher et al., 2004).

In Pakistan, earthquake that occurred in October 2005 killed 16,000 students, while in Leyte Island in Philippines mudslide buried 200 school children alive. The two deadliest disasters in 2006 were the Indonesian earthquake that killed 5,778 people in May and Typhoon Durian in the Philippines which resulted in 1,399 deaths in December. The European countries: France, Netherlands, Belgium and the Ukraine have been ranked among the top 10 countries most affected by deadly disasters, taking 3rd, 5th, 6th and 9th places respectively. France registered 1,388 deaths, the Netherlands 1,000 and Belgium 940, all due to the heat wave in July 2006, while in Ukraine, 801 people were killed by a cold wave in January 2006 (Nakileza, 2007).

In January 2007, winds from the Atlantic of up to 216 kilometers (133 miles) per hour swept across Europe from Britain into Russia, killing around 40 people. Hundreds of thousands of homes in several countries were affected as winds ripped up trees and power lines. This shows that even countries with the best early warning systems are still vulnerable.

Since 1990, the number of people living on less than a dollar a day has declined from 1.3 billion to 1.2 billion. However this decline has not been spread evenly. In East Asia poverty rates have declined fast enough to meet the goal of eradication of extreme poverty by 2015. But Sub-Saharan Africa lags far behind and in some countries poverty rates have worsened. while the greatest number of poor people live in south Asia, the highest proportion of people is in sub-Saharan Africa, where approximately 51% of the population lives on less than a dollar a day (UN, 2001). In Africa, between 2000 - 2001, about 35 million people, which are equivalent to 13% of the total population in Africa were affected by disasters. In terms of economic losses, disasters significantly derail development in affected countries. For example, the year 2000 flood in Mozambique lowered the country's Gross Domestic Product (GDP) by about 12%, and the 1992 drought reduced Zimbabwe's and Zambia's GDPs by about 9 per cent. In addition to such large, discrete and high impact, hazards erode the development capacity and livelihoods of the majority of the poor and weaken their coping and survival capacities (UNDP, 2004).

Kenya experiences a number of natural hazards, the most common being weather related, including floods, droughts, landslides, lightening/thunderstorms, wild fires, and strong winds. Other hazards experienced in Kenya include HIV/AIDS, and conflicts. In the recent past these hazards have increased in number, frequency and complexity. The level of destruction has become more severe with varying magnitudes, resulting in more deaths of people, animals, destruction of infrastructure, resulting in loss of livelihoods. The effects of El Nino floods of 1998 hit most parts of the country. According to first national water resources management strategy, the EL Nino induced floods of 1997 - 1998 caused some US$151.4m damage in public property. Floods in Budalangi in 2003 displaced 21,000 people, while in Nyando in 2004, 10,000 people lost their properties (Republic of Kenya, 2004).

These alarming facts pose challenging questions: For instance, Is the world advancing unavoidably towards a form of development that generates and increases disaster risk to mankind? What happens to Education of children and communities at large who are affected by the disasters? In all societies, our children represent hope for the future. By extension, schools, because of their direct link to youth, are universally regarded as institutions of learning, both for instilling cultural values and for passing on traditional and conventional knowledge to younger generations. Therefore, protecting our children and schools during natural hazards is paramount in the 21st century. The predictions are not encouraging, for example, projections by the UN suggest that by the year 2050, natural disasters will have caused 100,000 deaths and more than $300 billion in losses per year.

This paper addresses horrifying natural disasters in western Kenya region. More specifically, disasters of floods, lightening, landslides and their implications for education and national development. It also offers suggestions on the way forward.

Trends in disaster occurrences

Available statistical estimates suggest that over the1993 - 2002 decade, there was a global annual average of 540 recorded disasters due to 'natural' and 'technological' hazards, killing 62,000 people and affecting 250 million people each year (Table 1). The figures varied widely: in 2002, the recorded deaths fell below 25,000 but numbers affected exceeded 600 million, whereas in 2003 death reached 90,000. These static's were obtained from various sources that included the ProVention Consortium, the UN International Strategy for Disaster Reduction (ISDR), UNDP's Bureau for Crisis Prevention and Mana-

Table 1. Global trends of disasters

Disasters	Death(thousands)	% of total	Affected	% of total
Drought/famine	276	44%	734	29%
Floods	94	15%	1,401	56%
Windstorms	61	10%	313	13%
Earthquakes	75	12%	35	1%
All natural disasters	531	85%	2496	100%
Technological disasters	93	15%	1	0%
Total	624	100%	2497	100%

Source: FRC (2003)

Table 2. Percent share of the continents in total global number of reported disasters: 1992 – 2001.

Continent	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	average
Africa	15	12	14	15	15	13	17	24	26	26	19
Asia	44	52	45	43	44	46	43	39	38	41	43
America	24	22	20	24	23	24	23	22	19	18	22
Europe	14	11	17	16	14	14	13	13	16	13	14
Oceania	3	3	4	2	4	4	4	3	2	2	3

Source: computed from IFRC Disaster data base.

gement (BCPR), the International Federation of Red Cross and Red Crescent Societies (IFRC).

The number of weather- related disasters continues to rise. The greatest number of immediate deaths in these disasters was attributed to droughts/famines, followed by floods, windstorms and earthquakes. Floods affected more people than any other disaster hazard, though medium and longer-term drought and famine impacts are thought to be significantly under-reported.

The African continents share of reported disasters in the world total has increased over the last decade from 15% in 1992 to 26% in 2001 while the share of other continents either declined or stagnated, as seen from Table 2.

The increasing incidence of disasters in Africa during the last decade has been fuelled by a rising trend of disasters in East Africa. The sub-region has exhibited the fastest increase in disaster events, followed by West Africa and Central Africa since 1990s. East Africa accounted for the largest share (39%) of cumulative disaster, in 1975, followed by West Africa (29%), Central Africa (13%), Northern Africa (11%) and Southern Africa (8%).

The most common individual natural disaster threat in Africa is from epidemic disasters, accounting for 32% of cumulative disaster events during the period 1975 – 2002, as seen from Table 3. Considering the three major natural disaster categories, hydro meteorological disasters dominate, representing 58%, while biological disasters were 35% and geological events accounted for 4%, while famines accounted for 4 percent of all disasters during the period.

Table 3. Occurrence of disaster by type in Africa 1975-2002.

Type of disaster event	Share in total percentages
Epidemic	31.5
Flood	26.7
Drought	20.5
Windstorm	8.8
Insect infestation	3.9
Famine	3.4
Earthquake	2.1
Landslide	1.4
Wildfire	1.3
Volcano	0.8
Extreme temperature	0.6

Source; computed from the CRED database

This overall pattern differs by sub-region: epidemics dominate in East, West and Central Africa, but drought is the most common disaster in Southern Africa while flood is most prevalent in North Africa and East Africa, as seen from Table 4.

The number of people affected by disasters in Africa shows a positive trend but exhibits a pattern with peaks occurring every ten years from 1975, as seen from table 2. In the two worst years of 1984 and 2002, an average

Table 4. Ranking of disaster events in sub-regions of Africa 1975-2002

Disaster	East Africa	West Africa	South Africa	Central Africa
Epidemic	29.8%	39.9%	10.8%	46.5%
Flood	25.6%	21.7%	24.3%	21.8%
Drought	21.2%	20.7%	29.7%	16.1%
Windstorm	13%	4.6%	1.8%	2.3%
Famine	4%	3.8%	5.4%	2.9%
Insect infestation	2.1%	6.1%	0.9%	3.5%
Earthquake	1.7%	0.3%	2.7%	0.6%
Landslide	1.3%	1%	0.9%	1.7%
Volcano	0.8%	0.3%	-	3.5%
Wildfire	0.4%	1%	6.3%	1.2%
Extreme temperature		0.8%	0.9%	-

of about 30 million people were affected annually, mainly by drought. The sub-regional distribution of number of people affected follows a pattern similar to that of disaster occurrences: East Africa accounted for 65% of the cumulative number of people affected by disasters in Africa during the period 1975 – 2002, followed by West Africa (15%) , North Africa (10%), and Central and Southern Africa (4% each).

Numbers are represented as percentages of the total for each sub region accounted by each disaster type. The magnitude of a disaster depends on the characteristics, the probability and intensity of the hazard and susceptibility of exposed elements based on the prevailing physical social and environmental conditions. Western Kenya experiences a number of natural hazards. The most common hazards include: floods, landslides, lightening/thunderstorms, wild fires, and strong winds. Other hazards experienced in the region include HIV/AIDS and conflict. In the recent past these hazards have increased in number, frequency and complexity (Republic of Kenya, 2004). The level of destruction has also become more severe with more deaths of people and animals, loss of livelyhood, destruction of infrastructure among other effects resulting in losses of varying magnitude, (Table 5).

Impacts of disasters on education

Disasters slow down progress towards the achievement of Millennium Development Goals (MDGs) (UN, 2001). Disaster-hit families, who often fail to send children to school, for example in Budalangi, schools were closed down due to floods. In 2007 more than 1000 students in Budalangi were moved in 3rd term to pursue studies in new institution. 405 students from Makinda mixed secondary were moved to St Ann Bunyala Girls, while 536 students from Makinda primary were moved to Mukhobola primary school, others were taken to Mugayo. Pupils of Ligale primary were moved to Kugunga school while others were moved to Musoma. The cost of movement was estimated at 4 million that assisted in acquiring tents which were converted into classrooms. The additional students in the schools compromised sanitation facilities and more mobile toilets were needed (Standard Newspaper, 4th September, 2007). Aspects regarding the environment that surrounds the schools, quality of education, financing, efficiency and effectiveness had to be addressed with urgency.

The effect of floods is evident everywhere in Budalangi, from the desperate faces of the displaced people in camps and their once beautiful homes floating in water. The most depressing effect of the floods is to be found in schools and the pupils who try to make their way there. Going to school is a nightmare, pupils have to either wade through flooded fields or board canoes that are dangerously rowed through the raging river. It's risky for pupils to keep crossing the river in boats but they have no option, pupils have to endure hunger the whole day, as they cannot cross the river daily to go for lunch. The cost of traveling daily to school has risen as pupils have to pay for boat rides in the morning and evening everyday (The Standard 24th September, 2007).

Most schools throughout the region are in pathetic situations and disheartens educationist. For example a school consists of six or ten classrooms in two or three blocks, if the school is fortunate, the oldest block will have been built sturdily, though newer blocks, often built by the community seem temporary .These blocks will vary in quality from mud and cement block used in con-struction. They suffer from inadequate maintenance and the compounds are usually dusty. The additional students from disaster affected areas, leads to hundreds of pupils to squeeze into poorly- lit rooms usually design-ed for not more than forty some without chairs and desks. (Daily Nation, February 9th, 2003).

An appropriate school environment provides adequate level of inputs, such as: personnel, learning materials and facilities that must accompany the learning process for its efficiency and effectiveness. The greater the quality and quantity of inputs the better the quality of output which will satisfy the expectation of the society and the govern-

Table 5. Sample of natural disasters in Kenya.

Year	Type	Location Province	Area	Number of people affected (Aprox)
2007	Floods	Western	Budalangi	10,000
	Landslides	Western	Kubasali	299
	Lightening	Western	Kakamega	8
2006-07	Conflict	Western	Mt. Elgon	2000
2004	Drought	Widespread	Widespread	2.3million
	Landslides	Central	Nyeri, Othaya, Kihuri	5 deaths
2002	Landslides	Widespread	Meru, Murage, Nandi	2,000
2002	Floods	Western and Nyanza	Budalangi, Nyando	150,000
1999/2000	Drought	Widespread	Widespread	4.4million
1997/1998	El Nino floods	Widespread	Widespread	1.5million
1995/96	Drought	widespread	Widespread	1.41million
1991/92	Drought	Rift Valley and North Eastern	Arid and semi Arid districts	1.5 million
1985	Floods	Western and Nyanza	Budalangi &Nyando	10,000
1983/84	Drought	widespread	Widespread	200,000
1982	Floods	Nyanza	Nyando	4,000
1980	Drought	widespread	Widespread	40,000
1977	Drought	widespread	Widespread	20,000
1975	Drought	widespread	Widespread	16,000

Source: Republic of Kenya (2004) National Poverty on Disaster Management (revised Draft) p4, Nairobi, Kenya. Daily Nation 5th September, 2007).

ment. In disasters affected areas in Western Kenya, that include, Budalangi, Kubasali and Mt. Elgon hardly any resources remain to provide learning materials and facilities once the disaster occurs. Although the problem has been acknowledged by the Ministry of Education and the Government, little has been done to address it and so children's performance has remained hampered because of the very paucity of the learning environment. This situation has its greatest negative effects on students who are below the average performance or who need special attention. The weak students will always repeat the same grade severally without improvement which results in dropping out of the school cycle.

Educational attainment is a fundamental determinant of human vulnerability and marginalization. Basic literacy and numeric skills enable individuals to become more engaged in their society. The destruction of schools is one very direct way in which disasters can inhibit educational attainment but perhaps more important is the drain on household resources that slow and sudden-onset disasters inflict. Households frequently have to make difficult decisions on expending resources on survival and coping with poverty, or on investments (such as education and health care) to alleviate human vulnerability and enhance longer-term development prospects. Unfortunately, for the poorest, there is no choice a human vulnerability deepens as resources are targeted towards survival thus ignoring the call to enroll and retain their children in schools due to high opportunity cost of education. Disasters occurrence in western region does not discriminate against the teachers and non teaching staff, all are affected equally, they are displaced, their properties destroyed and some even loose their lives. Schools are directly affected because they can not operate effectively without key human resource pillars. Disasters may exacerbate factors that cause children to drop out of school. Qualified teachers may find it difficult to take up teaching jobs in this regions thus causing perennial shortage of qualified staff. Ultimately, this will affect enrollment, quality of education, overall performance of the students and the school. Gains that have so far been registered following the introduction of free primary education in 2003 could be eroded. This situation will result in an increase in wastage as a result of students dropout and repetition. This could render the country una-ble to attain the Millennium Development Goals and Education for All (EFA) goals.

Historically, the education sector has been marginalized in disaster prone regions. Yet Education plays pivotal role in enhancing sustainable development in the nation, this should be considered when planning policies and making operational decisions concerning primary and secondary education (Anderson, 1985) .What must be remembered is that the total well being of children should always be at the core of any educational effort. Children who are both mentally and physically in good shape, and thus healthy and motivated in life, are also likely to learn more and make better use of their learning.

This is severely hampered in Western region by the frequent disasters which leave the students orphan, psychological disturbed and de-motivated due to effect of disasters to their families.

Impact of disasters on national development

Disasters have direct, indirect and secondary effects on development. Direct damages include all damages to fixed assets, capital and inventories of finished and semi-finished goods, raw materials which occur simultaneously or as a direct consequence of the natural phenomenon causing a disaster (CRED, 1997). In western region of Kenya this has manifested itself through floods in Budalangi which have displaced millions of people and destroyed a lot of properties. Similar destructions have been experienced in Kubasali North of Kakamega where the landslides killed 18 people, destroyed properties and left the people without land for cultivation (Standard Newspaper 8thSeptember, 2007).

Indirect damages relate to the effect of flows of goods that will be produced and services that will not be provided after a disaster. They are measured in monetary, rather than physical terms. Indirect damages may increase operational expenditure following the destruction of physical infrastructure or inventories and additional costs for the provision of services. Disasters can also result to additional costs incurred due to the use of alternative means of production and/or distribution resulting from the non-provision of goods as services, losses of income resulting from the non-provision of services in utilities and losses of personal income in the case of total or partial loss of the means of production, business and livelihood.

Secondary effects covers the overall economic performance of the economy as measured through the most significance macro-economic variables such as decline in tax revenue or increases in current expenditure, secondary effects are fast over a particular fiscal year and can spill over to subsequent year.

Disasters affect poverty reduction in several ways: they have macro-economic impacts, directly through physical damage to infrastructure, productive capital and stocks, but also indirectly by affecting productivity, growth and macro economic performance. These effects hit the poor people hardest because they will not access adequate social amenities at affordable prices (Lavell, 1999). The government will loose tax revenue due to diversion of resources into disastrous regions. Moreover recent studies suggest that both governments and donors tend to fund disaster relief and rehabilitation assistance by reallocating resources from development programmes. This can be expected to affect the poor disproportionately through adverse effects on poverty reduction efforts. High frequency hazards, such as floods trigger immediate food crisis, but can also have long-term effects which impede recovery in interim periods especially when combined with other pressures such as HIV/AIDS, poor governance and conflict (Adams, 1990).

Floods are accompanied by a wide range of health hazard such as malaria, cholera, typhoid and bilharzias, the situation leads to strain on medical facilities. The situation is usually made worse due to overcrowding in the camps; leading to deaths in camps. Toilet facilities although not common among the Budalangi people, which exist are submerged by the floods and hand-dug wells at higher grounds collapse thus water becomes a bigger problem (Mango, 2003).

Disasters leave women and girls with heavier responsibilities and workloads and often poorer health (Cuny, 1983). Disasters in western Kenya have been associated with increased domestic violence and sexual harassment, where parents especially fathers run away from their families leaving the entire burden to the mothers.

Children are in greater danger in floods landslides and lightening regions because they fall victim of drowning, starvation and disease. Disasters directly cause disease and damage to health infrastructure, while indirectly lowering disease resistance by heightening poverty and malnutrition.

They may also lead women and girls to resort to sex work and risk HIV infection which have long-term devastating effects to the community and nation at large (Anderson,1985).

Disasters increase rural-urban migration, and in cities disproportionately affect slum dwellers in the region, which result to street children (who ought to be at school) in the major towns such as Kakamega, Mumias, Busia and Bungoma. This worsens the security in the affected areas. These diverse consequences tend to go far beyond the immediate impacts which make media headlines and international disaster statistics. This is one reason why their role in holding back development may be much underestimated.

Disasters lead to increase in the country's external debt. Investment needed to promote reconstruction in the affected regions represents a diversion of resources from other previously planned development projects. This investment along with expended during humanitarian response period are seen to have negative effects on development (Stephensen, 1991, Anderson, 1985).

Landslides undermine the different dimension of human security (i.e livelihood, social and ecological) in western region of Kenya. They have negatively impacted on the productive capacity of the land hence contributing to high poverty levels.

Landslides raise formidable challenges in the mountain ecosystem all over the world. Large scale disasters have significant humanitarian, social security, political and economic implication that undermines human security. Disaster leave large numbers of people ill, disabled, widowed, orphaned, displaced or suffer from post-trau-matic stress disorder (Basu, 2005), thus human development

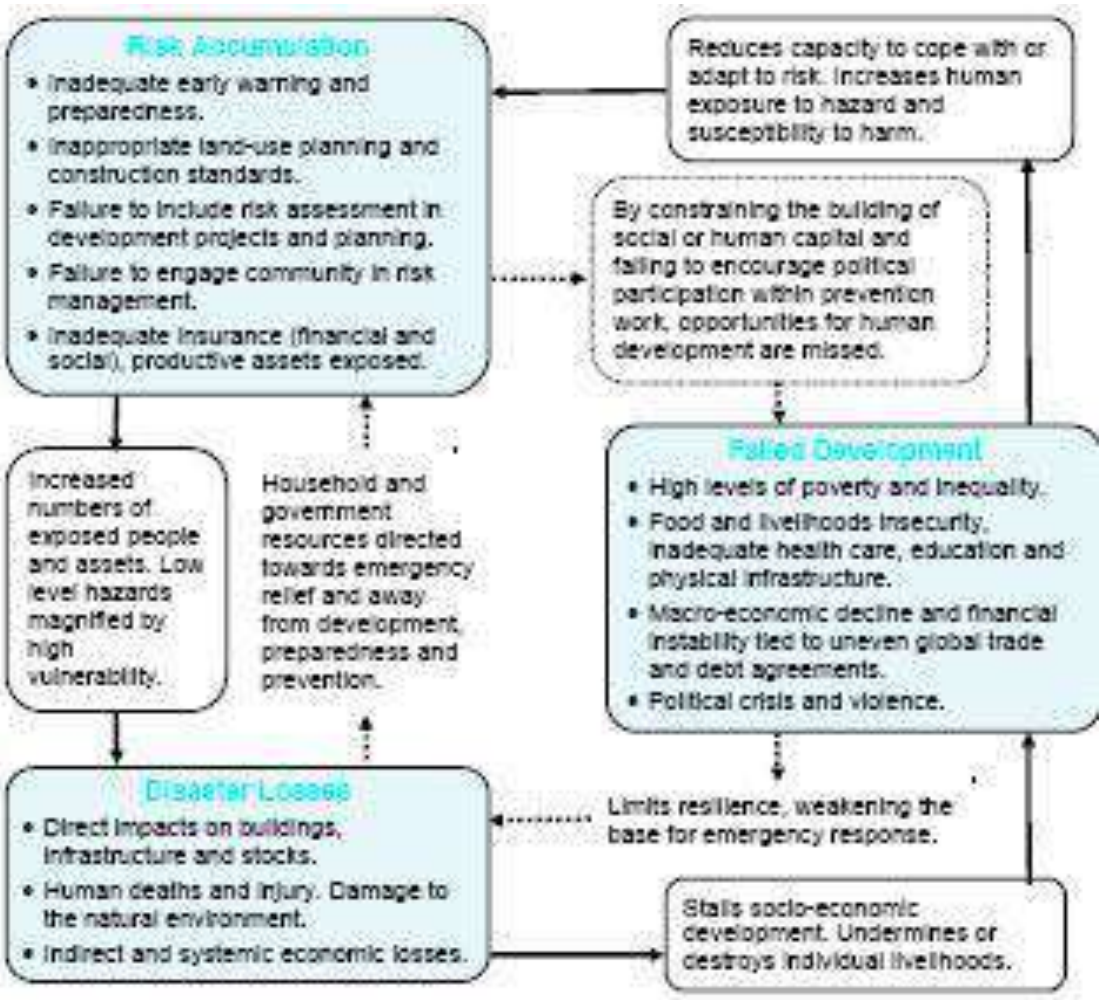

Figure 1. 'Vicious spirals' of disaster risk and development failure 54 IDS (2002).

is increasingly being threatened by disasters.

Conclusions

Education is seen as a human right, a key to civilization and enlightenment and as source of wealth and power. It's the cornerstone of the growth and development of any country's social economic and political institutions. Education in western regions faces several hindrances that challenge Kenyans desire to educate and invest in education due to horrifying disasters that have increased in numbers and occurrences. Schools in this region operate differently as compared to other regions and yet they have to sit for the same national examinations. Disasters have led many schools to be closed, students dropouts have increased, properties destroyed, infra-structure damaged, these have a direct effects to the development of our nations. Disaster risk reduction has not so far received serious attention as a facet of development, despite the increasing seriousness of disaster impacts on our education sector and general development. There is an urgent need therefore for all educational stakeholders to seek strategies to solve the pandemic.

Recommendation

Education is crucial to advancing further development. No sustainable development can take place without a concerted focus on education in natural disaster prone areas. It must be acknowledge that the government of Kenya has made strides towards achievement of basic education for all Kenyans, but more needs to be done. To promote excellent education in the region and the development of the nation, the study recommends the following:

1. The ministry of education should establish mobile boarding schools in the affected areas which can accommodate both the students and teachers in order to reduce the trend of dropouts and wastage among school in the province.

2. The ministry of education should provide the learning

materials and facilities e.g. books, uniform, laboratories equipment, school fees waiver rather than depending on the parents who are already financially stricken by the disasters.

3. Disaster reduction initiatives should be rooted in schools and in educational programmes, but also in social community programmes and activities. The ministry of education should establish a special course for the schools in the Western region of Kenya on the effect of disaster on development that can be integrated with other courses in the learning activities.

4. The government should explore the scope for promoting financial instruments for risk management for example affordable insurance schemes to transfer disaster risk, including through partnership arrangements with private sector financial services providers.

Appendix A: vicious spiral

The link between disaster and development can be best expressed as a vicious spirals as shown in Figure 1.

Without effective risk reduction measures, dangers to people and assets are magnified, in turn increasing the likelihood and severity of disaster. Failure to mitigate avoidable disaster risk leads to direct disaster impacts such as damage to housing or infrastructure, in turn holding back development and undermining livelihoods.

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