

WORRYING DELUGE: INFLUENCE ON HOUSEHOLD'S WELLBEING AND ACCESS TO EDUCATION IN LOWER NYANDO BASIN, KISUMU COUNTY, KENYA

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ABSTRACT

Floods affect households each year in Lower Nyando basin and have significant detrimental impacts on the people. Immediate impacts include loss of human life, damage to property, destruction of crops, non-functioning infrastructure and deterioration of health conditions. This study examines the impacts of floods on Education, sanitation conditions along with flood induced health problems. The study targeted 384 heads of households, Govt. officials, heads of NGOs, FBOs, as well as CBOs. The research adopted the cross-sectional research design. Simple random technique was used to select the household heads who were the main respondents from three locations vulnerable to flooding namely Wawidhi, Kakola and Ombeyi. Questionnaires, interviews, FGDs; direct observation and document analysis enriched this study. Descriptive statistics were used in data analysis. The investigation revealed that floods cause loss of learning hours, poor academic performance, high pupil absentees, poor syllabus coverage, and a high turnover of teachers. Physical health impacts of floods revealed include overwhelming psycho-social effects, water-borne and respiratory illnesses. Sanitation facilities became unusable during and after floods. The study recommends provision of learning facilities in relocation camps in order to ensure learning is not disrupted as well as enforcement of building codes during construction of school infrastructure. Flood warnings and insurance can also help to mitigate flood impacts. The study concludes that, both government and households recognize the seriousness of the flooding problem and realize the need to mitigate its impact.

Keywords: Floods, Households, Impacts, Nyando basin, Education, Health.

INTRODUCTION

Floods have two important aspects; magnitude and fabric of the society affected or the level of vulnerability (Das, *et al.*, 2011). They cause about one third of all deaths, injuries and damage from natural disasters (Askew, 1999). Seemingly floods are the most destructive of all natural disasters. In 2011 alone, floods and mass movements represented the largest portion of disasters globally (Guha-Sapir *et al.*, 2012). Disasters impair a community's ability to cope with risk and result in a serious disruption of capacity that involves widespread human, material, economic or environmental loss. Water-related disasters are undoubtedly the most recurrent, and pose major impediments to sustainable socio-economic development, as witnessed with disasters such as the Indian Ocean tsunami in 2004, Hurricane Katrina in the USA in 2005, Cyclone Sidr in 2007 and Cyclone Nargis in 2008 (UN, 2009). During the period 2000 to 2006, some 2,163 water related disasters which were reported globally in the EM-DAT database were, Hurricane Katrina in the USA in 2005, Cyclone Sidr in 2007 and Cyclone Nargis in 2008 (UN, 2009). During the period 2000 to 2006, 2,163 water related disasters were again reported in the EM-DAT database. This is a pointer to great damage caused by floods globally. In Africa, floods have largely affected countries in Western,

Central and Eastern Africa regions. In September 2012, floods forced 15,000 people to leave their homes in northern Uganda where the deluge destroyed houses, crops, roads and bridges. These floods also affected the re-opening of schools (IRIN 2012). According to the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA 2008), the cumulative number of people affected by rains and floods in 2007 in Southern Africa was more than 194,103 persons. Kenya's record of disasters indicates the worst floods recorded in 1961-62 and 1997-98, the latter ones being the most intense, most widespread and the most severe. During this season the flooding was associated with the *El Nino* phenomenon. *El Nino* is a disruption of the ocean-atmosphere system in the tropical Pacific having important consequences for weather around the globe (UNDP, 2004). This phenomenon had serious impacts on the social, economic, environmental, physical and psychological wellbeing of people and even on the political and institutional levels of the country. This study examined the impacts of floods on households with a hope that such an investigation will be useful for both short term and long term flood mitigation in lower Nyando basin so as to secure the social and economic livelihoods of this population living with risk.

LITERATURE REVIEW

In 2008, Kosi River in North Eastern Bihar burst its banks and caused unprecedented loss to lives, livelihoods, infrastructure and property. Thousands of people were affected after flash floods submerged hundreds of hectares of farmland and displaced hundreds of families in the region. The farmland which supported some 1,200 families had their livelihoods and food security disrupted (IRIN, 2008). The immediate impacts of flooding include loss of human life, damage to property, destruction of crops, loss of livestock, and deterioration of health conditions owing to waterborne diseases. As communication links and infrastructure such as power plants, roads and bridges are damaged and disrupted, some economic activities may come to a standstill, people are forced to leave their homes and normal life is disrupted. Similarly, disruption to industry can lead to loss of livelihoods. Damage to infrastructure also causes long-term impacts, such as disruptions to supplies of clean water, wastewater treatment, electricity, transport, communication, education and health care (Apan, et al., 2010). Seemingly floods have serious impact on the social economic lives of the people.

Effects of floods on physical health include shock, gastrointestinal illnesses (particularly if flood waters are contaminated with sewage) and respiratory illnesses (Hajaet, et al., 2005). Tapsell (2000) gives evidence of gastrointestinal effects after the severe flooding in the Midlands, UK in 1998. Reacher, et al., (2004) further noted an increase in self-reported gastroenteritis and respiratory complaints following the 2000 floods in Lewes, England. Carey (2005) analyzed disastrous outcomes for vulnerable people, comparing the different effects of floods in Peru. Numerous deaths, illnesses, disablements of people were among the most evident results of floods in this country. A survey by the Asian Disaster Preparedness Center in 2002, in Cambodia, seeking to identify the impacts of disasters on the education sector, revealed that floods is one of the factors disrupting study program accomplishment and thus affecting the quality of current education, particularly in provinces which are prone to floods and where schools were constructed without proper flood resilience (ADPC, 2002). This was because when there were floods, student's encountered difficulties in going to school due to road damages and having to travel across rivers. This affects the school programs and contributes to high level of absenteeism due to lack of proper safe-learning spaces, hence affecting performance. This then justifies the necessity of undertaking this study since it aims at finding out the effects of flooding in order to find the best ways of making early response to flooding more effective so that in the process learning programs

take place. According to the WHO (2001) psychological health impacts, although well documented in the literature, have yet to be fully addressed in terms of disaster preparedness or service delivery. But impacts that have been recorded include acute stress, clinical depression and anxiety, as well as post-traumatic stress disorder (PTSD). A number of reports have shown that these impacts are made worse by the scale of the flood, the time taken to return to normal the presence of contaminants, evacuation, and ineffectiveness of other actions and help received (Green, et al., 1985a, b; Tapsell & Tunstall, 2002; Tapsell, et al., 2003). Victims of the 1997 floods in California showed evidence of acute stress, with both short and long term reactions (Welde, et al., 2001). Increases in stress and depression were also observed following various floods in the UK (Bennet, 1970; Green, et al., 1985b; Tapsell, et al., 2002; Reacher, et al., 2004). These lasted for years, and although the effect may have diminished with time, recurrence could occur in response to triggers, such as anniversaries (Echterling, 1987). Psychological health is strongly mediated by support structures and interventions have the potential to reduce the mental health impact if timely and comprehensive (WHO, 2001).

Cognitive psychological impacts of floods may also occur. Thus those who have had an experience with floods in the past may believe they are at an immediate risk when they are not, and consequently experience anxiety more often than before the flood, sometimes with persistent effects (Beck, et al., 1985). Children may also be affected psychologically, although the severity is mediated by the degree of support from their family structure. Green, et al., (1985) documented psychological effects specific to this group, including symptoms of PTSD and behavioral difficulties several months after the flood. Fordham and Ketteridge (1995) established this trend of effects in Scotland. It is important for school children to be well to enable them pursue learning. This contribution comes in handy since after a flood, as has been mentioned, the victims are likely to face psychological torture whose effect could be devastating thereby affecting performance.

A study by RPA (2005) in England and Wales showed that damage to and loss of memorabilia and irreplaceable items was ranked as a major impact by respondents. Although ranked below the effort of getting a house back to normal, having to leave home, and anxiety about future flooding, the loss and damage of memorabilia was ranked above health impacts. Financial hardships after a flood can also be devastating and have strong links to psychological health (Green, et al., 1985b). Flood impacts on communities are complex and varied. There is some evidence that, in the aftermath of a flood, cohesion can increase with everyone pulling together. Gordon (2004) terms this as social fusion. He however points out that, much of this evidence is anecdotal. This study will highlight problems faced by households in Nyando as well as focus on improving education and health that would be inept. It should also be noted that this will go a long way in supporting systems that are affected by floods.

Study Site

The study was done in Nyando basin. The Nyando River Basin covers an area of 3500 square kilometers in Kisumu County. The Nyando River catchment straddles the equator bound by longitudes 34°45' 0"E and 35° 21"E. Figure 1 indicates the flood prone areas in Nyando basin.

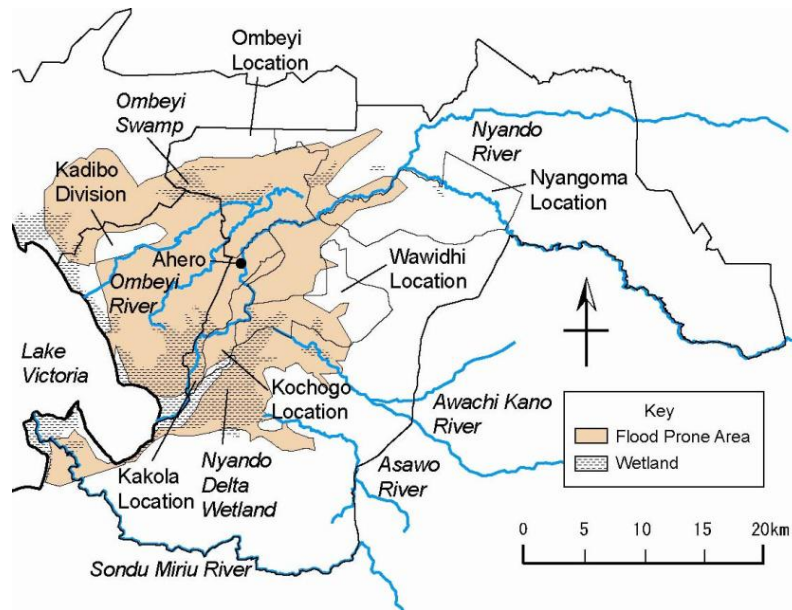


Fig 1: Flood prone areas (JICA/MoPD 2005)

Floods in Nyando Basin

According to Telewa (2011) Nyando basin experiences two spells of flooding. The two spells are the long rains in March to May and short rains in October to December. Ongor (2007) and Jamba, (2010) share the same view with Telewa (2011) with regard to the period of flood except the latter two go ahead and deliberate on how to manage it. This study observes that unfortunately school programs are usually at their peak during the times mentioned. In spite of being a regular event every year, the life and livelihoods of the residents is severely disrupted by floods. Furthermore, since independence, this part of Kenya had been marginalized by the central government in terms of investments and economic resources for expanding flood control (Otiende, 2009). Along with the damages and losses in their homes, essential needs of life like water supply and sanitation conditions become unbearable as the residents suffer from various health problems during and after the flood. The education system also gets interrupted during floods. The area therefore provided a fertile environment for this study.

Study Population and Sampling

The study targeted 384 household heads. This formed the basis of the study which was to investigate the adaptation mechanisms of households to flood risk in lower Nyando Basin, Kenya. Targeted stakeholders were the Kisumu County Commissioner, Deputy County Commissioners, Chiefs, Sub-chiefs, and Village elders, Faith Based Organizations (FBOs), NGOs like CARE, Red Cross, Action Aid, Ogra Foundation, Victoria Institute of Research and Development (VIRED), Japan International Co-operation Agency (JICA), Omega Foundation and insurance company managers who were all interviewed to establish their role in mitigating the effects of floods. Purposive sampling technique was used to select the three locations under study. Two out of the seven locations in Nyando sub-county and one location in Muhuroni sub-County were selected because of the high risk of flooding associated with these locations. Considerations were applied on the basis of meteorological information by the Kenya Metrological Department (2012/2013) on the extent and frequency of flooding, discussions with the village elders on the area's history of flooding, close proximity to the

river and subsequent visits to the area. The final selected areas of study were high-prone flood locations identified as Wawidhi and Kakola in Nyando Sub-County and Ombeyi in Muhoroni Sub-County respectively (GoK, 2009). The locations that had not experienced flooding were left out because they would not yield the required data for this study. In order to take a random sample, a sample frame in the form of a list of all the household heads in each of the villages / clans was drawn with the help of local leaders who acted as gate-keepers to this study. The names and/or identification numbers of all household heads were written on pieces of papers; whereupon the desired sample was selected by picking the required number of papers. This was done by using the lottery method whereby numbers/names representing each element in the target population was placed in a container and thoroughly mixed. The researcher then blindly selected chips from the containers until the desired sample size was obtained. Gate-keepers who were conversant with the villages aided in identifying the selected homesteads.

Data Collection

The study collected both primary and secondary data. Different research instruments were used for complementary purposes. This ensured a triangulation approach to data collection. The study used a questionnaire, key informant interviews schedules, FGDs, and Observation check lists as tools of data collection. Questionnaires were administered to the sampled household heads. Focus Group Discussions were carried out among groups of 8-12 persons particularly heads of households and stakeholders. This work was supplemented with site visits to those areas that had been affected by flooding.

Data Analysis

Qualitative data was obtained from the open ended sections of the questionnaire and interviews and analyzed using the thematic approach. Analysis was done by use of descriptive statistics (percentages, and frequencies). This was used in describing and documenting the state of affairs as they were.

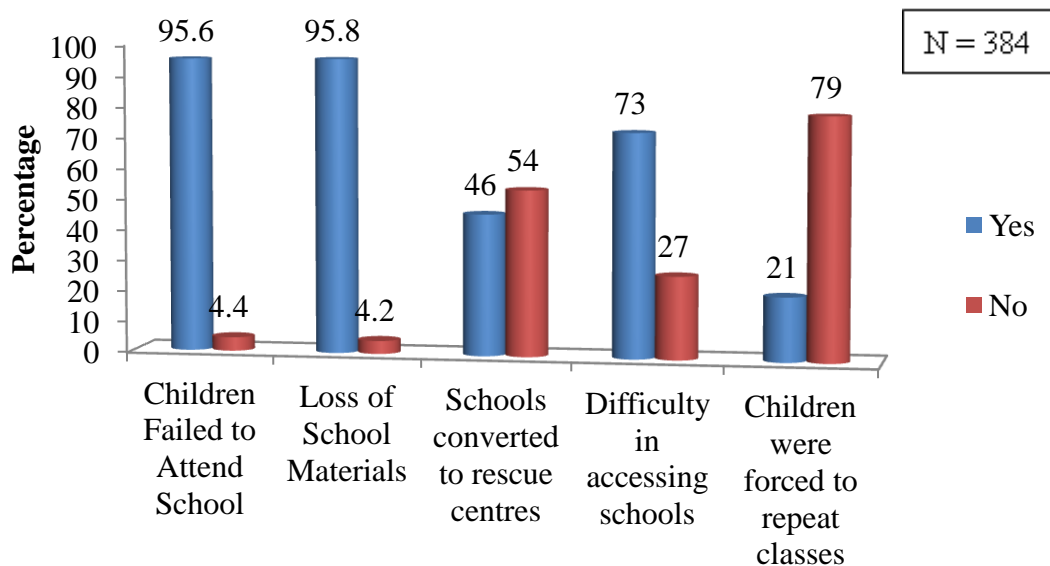
Research Objective

The main objective of this study was to examine the impact of floods on the household's wellbeing and access to education in lower Nyando basin, Kisumu County, Kenya.

RESULTS AND DISCUSSION

Effects of Floods on Education

To give effect to the constitution, the Basic Act (No 14 of 2013) was passed into law to regulate the provision of Education (GoK, 2010). In addition, Kenya adopted various general and specific policies on Education the most recent being Vision 2030. It is against this background that the study sought to find out the effects of floods on the teaching and learning process. The results are summarized in Figure 2.



Effects on Education

Fig 2: Effects of floods on education

The sampled households indicated the availability of education facilities in their communities. However, majority of the respondents 368 (95.8%) underscored the fact that flooding disrupted their children from attending school because their school uniforms and books got soaked in the flood while shoes got lost while 16 (4.2%) did not report this. The study also established that 367 (95.6%) respondents reported that their school going children failed to attend school during the flooding period while 17 (4.4%) respondents did not. Emergency Appeal Kenya (2013) indicates that Nyando Basin is one of the worst affected regions by floods in Kenya. In Asia, it was revealed that floods is one of the factors disrupting study program accomplishment and thus affecting the quality of current education, particularly in provinces which are prone to floods and where schools were constructed without proper flood resilience (ADPC, 2002). This was because when there were floods, student's encountered difficulties in going to school due to road damages and having to travel across rivers. It can be noted that efforts have been made in Nyando basin to supply foodstuffs, mosquito nets, beddings, build dykes and dams but an extraordinary oversight has been on direct efforts to provide 'alternate schooling'.

During the FGD, participants revealed that heavy floods forced their school children to stay in the house for two to seven days while waiting for the floods to subside and get classrooms ready for effective teaching and learning process. The study revealed that sometimes the depth of flood waters could be as high as six feet. Reminiscing on the events of the previous rainy season when it flooded, one key informant said that:

The Ahero-Rae-Obiayo road got closed for two weeks during the floods while Ombeyi, Obiayo, Jagoto and Bega primary schools in Ombeyi location also closed for about a month due to the floods. The makeshift bridges got carried away. Parents considered crossing the river extremely dangerous. Chances of drowning should one slip into the water were very high. In some instances, the Sub-County Education Officers issued directives sending pupils away from school for unspecified periods when their schools got submerged in floods (Source: Field data, 2014).

In corroborating the informant, an FGD participant added that:

Some parents became apprehensive and could not allow their children to go to school during floods. Personally, I feared exposing mine to any harm due to floods. From previous flooding incidences, I had witnessed a handful of funerals: most as a result of flooding. Schools do not resume immediately after the rains: sometimes, desks need to be replaced, new books need to be bought and some classrooms need repair. Rainy season also precipitates a break of waterborne diseases (Source: Field data, 2014). The FGDs clarified that this adversely affected the learning process of the children because of the infrequent attendance to school caused by damage to infrastructure and multiple sicknesses due to floods. A key informant informed this study that floods also affected teachers in the study area. Most stayed away from work or even sought for transfers to other places. This led to poor coverage of the syllabus on good time and repetition of learners because of poor performance. This in turn led to a high dropout rate. In addition the study also established that most of the classrooms in the primary schools were semi-permanent which would not offer a favorable environment for learning during floods. Furthermore, some of the schools were used as emergency shelters for animals and human beings during emergencies.

These results are in agreement with those of a study by Ochola, et al., (2010) which established that flooding is a recurrent phenomenon in Nyando and those schools are exposed to floods. This vulnerability status was attributed to lack of funds, poor building standards, local topography, soil types and inadequate drainage. This would perhaps explain why the literacy levels for Nyando stand at 65.7% (GoK. 2010) and can as well be a pointer as to why Nyando performs poorly in national examinations. Onditi (2007) found out that during floods, many pupils were engaged in the rice fields and other farm activities for the sake of earning some money leading to loss of learning hours. Improving education infrastructure safety can have multiple benefits. Education is one important factor in battling floods. Given that flooding is a sudden onset disaster that is likely to cause a lot of damage, it is important to put specific teaching plans that would reverse the effect of the disaster. It is important that parents and guardians are capable of facilitating education amidst disaster as was done in 2004 following the tsunami (World vision 2008). The same contribution demonstrates the need of refurbishing schools after 2004 tsunami. "Migrating schools" were introduced in Addis Ababa in 2003 in cases where schools were not reachable due to floods (IRIN 2003). This contribution can be easily attained since during floods there is plenty of migration to safe areas and at these places such schools can be established. Telewa (2011) indicates that where community actions were involved in choosing sites for construction of evacuation centers, raising grounds, class rooms and pit latrines, learning is sustained. The mentioned site would act as support service to flood victims. The strategies implemented should aim at orientating the pupil on being resilient to floods. At the end of learning, the pupils should not be affected by floods.

Effects of Floods on Health

Health care facilities are one of the important factors which reflect the socio-economic status of a population. Health-care systems act as the backbone of relief operations during emergencies, and equitable access for all persons to quality medical care remains a high priority in the event of a flood. The design of health-care infrastructure and systems will impact the delivery of services during a flood. These systems, however, are vulnerable to damage, disruption of service, interruption of water supply and excess medical demand without any notice. When these basic services are no longer operational or operate at reduced capacity, human well-being is deemed to be at risk. The study sought to investigate the

effects of floods on the health of the respondents. The results are summarized in Figure 3 in percentages.

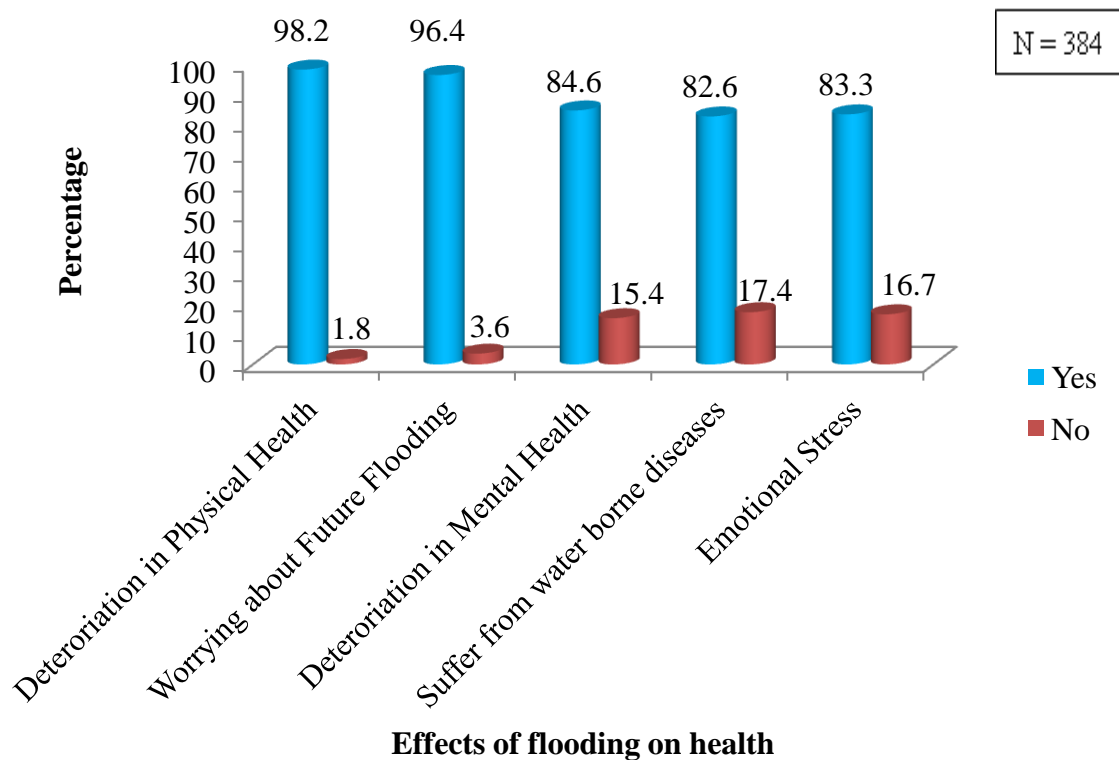


Fig 3: Effects of flooding on health

The study found out that the health impact is a serious challenge to community members whenever there was an incident of flooding. The main hospital in Nyando is Ahero County Hospital located in Ahero town. Other health facilities in Nyando basin include: 10 dispensaries, 8 health centers, 2 nursing homes and a small number of medical clinics. The study observed that these health facilities are quite spaced making people travel long distances to get assistance. Additionally, these facilities are not well equipped to handle serious emergency cases and did not have enough in-patient facilities. They also did not have enough personnel, equipment and medicine. Access to the health services was also hampered due to damaged and/or washed away roads, bridges and culverts. Findings indicated that members of households suffered from water-borne diseases during past floods. Due to using polluted water, more than half of the respondents reported suffering from various diseases. Many respondents, 377 (98.2%), reported that their households suffered from various diseases during floods such as malaria, typhoid fever, diarrhea, pneumonia, bilharzias, dysentery and skin diseases.

In addition to these, many children suffered from malnutrition as a result of food shortages during floods. These results are similar to those of Mungai, et al., (2004) in which malaria epidemics were found to occur annually between May and July in Nandi and Kericho counties which form the upper parts of the Nyando river basin after long rains. These findings also concur with Hajaet, et al., (2005) who stated that physical health impacts of floods include shock, gastrointestinal illnesses (particularly if flood waters were contaminated with sewage) and respiratory illnesses. Reacher, et al., (2004) also noted an increase in self-reported gastroenteritis and respiratory complaints following the 2000 floods in Lewes, England. Carey (2005) analyzed disastrous outcomes for vulnerable people, comparing the

different effects of floods in Peru. Numerous deaths, illnesses and incapacitations of people were among the most evident results of floods in this country. The health impacts of floods were also stressed by participants of the focus group discussions. The Participants noted that, after a flooding incident, there was an outbreak of diseases including malaria and diarrhea in the communities. During the study 317 (82.6%) of the respondents reported that, usually, after the flooding episodes they suffered from water borne diseases. Risk of acute infection is further exacerbated by population displacement, overcrowding and disruption of Water Sewerage Systems (WHO, 2005(a)). In Wawidhi the children suffered from typhoid fever, diarrhea and pneumonia. This, according to FGD participants resulted from the filth that was carried by the floods into homes and the severe cold that came with floods. These activities increased the vulnerability of people contracting diseases and strange illnesses. The illnesses became an additional burden on household expenses. Those who would not afford the medical bills found themselves in trouble because private clinics which are many in the area charged exorbitant fees for treatment. There is the need to educate communities to clean their choked gutters and also change their attitudes of throwing rubbish and solid waste into floodwaters, and stop open defecation which contributes to the problem. This finding from the FGD is corroborated with an interview with the MoH who was a key informant. He asserted that:

Floods bring about a number of health problems like cholera, malaria and other waterborne diseases such as dysentery and diarrhea. The stagnant water is a breeding place for mosquitoes leading to high cases of malaria. There are also cases of skin infection including feet due to the contaminated water. Further, the floods create an indirect problem: fear of new HIV/AIDS infections (Source: Field data, 2014). This finding is supported by (GoK, 2010) which states that life expectancy in Nyando has reduced by about 10 years to (37.7%) for men and (52.8%) for women respectively compared to the national average of (60.4%) during the last two decades due to HIV/AIDS. Because of high poverty levels in this area, prostitution is a huge problem. Service delivery in hospitals was also affected as the buildings were partly submerged and the roads became impassable for the Nyando residents, as well as the healthcare employees. The respondents were asked to state if they experienced any worries regarding the onset of floods. The findings revealed that 325 (84.6%) of the respondents reported psychological effects related to flooding while 320 (83.3%) reported getting panic attacks during the rainy season. The respondents revealed a high level of anxiety in some individuals whenever it rained heavily. Increase in stress and depression were observed among 370 (96.4%) of the affected households.

The mental health impacts resulted mainly from the destruction during the event itself, loss of life and/or property, problems in the recovery period, geographic displacement, anxiety about event recurrence, and stress in dealing with builders and repair of homes in the aftermath. Several studies report common mental disorders such as anxiety, panic attacks, increased stress levels, mild/moderate/severe depression, irritability, nightmares, sleeplessness, Post-Traumatic Stress Disorder (PTSD), anger, tantrums, mood swings, increased tensions in relationships (e.g., arguing), difficulty with concentration, suicidal thoughts, alcohol dependence, and psychosomatic disorders (Hajaet, Ebi et al. 2005; Penning- Rowsell, Tapsell et al. 2005; Vasconcelos 2006; Mason, Andrews et al. 2010). According to Opere (2013), poverty has made it difficult for a large percentage of rural people in Nyando basin to access medical facilities. Hence, this has promoted high morbidity caused by waterborne and water related diseases which are otherwise treatable. Lack of social amenities in rural areas is also thought to contribute to the low level of preparedness of the local population to handle the flood menace. This is because facilities for dissemination of information to the general

populace are often inadequate or completely lacking thus making community mobilization during emergencies a difficult task. This finding is in tandem with Beck, et al. (1985) who found out that those who have been flooded in the past may believe they are at immediate risk when they are not, and consequently experience anxiety more often than before the flood, sometimes with persistent effects. This finding is also supported by Reacher, et al., (2004) who observed increases in stress and depression following floods in the UK among the elderly citizens and women. Following the year 2000 disastrous outcomes of floods in England, Carey (2005) analyzed its outcome and reported acute psychological stress with both short and long term reactions. Psychological health is strongly mediated by strong support structures and timely interventions can reduce mental health impacts. During floods some people's mental and social health may be affected and may continue over long time culminating to both primary and secondary stressors (Stanke *et al* 2012). This contribution comes in handy since after a flood, as has been mentioned, the victims are likely to face psychological torture whose effect could be devastating. After the flood, many participants in the FGD reported a period of ongoing anxiety and stress associated with being out of home for more than a month and making necessary arrangements for repairs.

The experience appeared quite traumatic with words frequently used to describe the situation like 'shock', 'fear' and 'panic'. In the FGD, behavioral problems were reported among children. It was also noted that stress was age related with this problem affecting mostly those between 35-70 years. In addition to the physical and health risks related to floods, the psychological impact caused long-term effects which were aggravated by lose of relatives, income-earning activity disruption, possible evacuation and the need to repair houses or replace physical household assets. The study also found out that 320 (83.3%) of the respondents suffered emotional stresses during and after floods. It further emerged from the focus group discussions that old people and poor females were most affected psychologically by flood impacts. Both Berkowitz *et al* (2010) and (Stanke *et al* (2012) agree that there is need for psychological support skills for flood victims to help them recover emotionally. Health services should remain accessible, operational and reach those most in need during a flood event.

Effect of Floods on Water Supply and Sanitation

For improved health of the people, sanitation issues must be addressed as a way of forestalling outbreak and spread of diseases. A clear link has been established between water-borne diseases, heavy precipitation and sewerage outfalls when treatment facilities are overwhelmed and sewerage is discharged into the natural environment or upstream portions of a river following a flood (WHO, 2011(a). This study sought to find out the effects of floods on water and sanitation. The results are summarized in Figure 4.

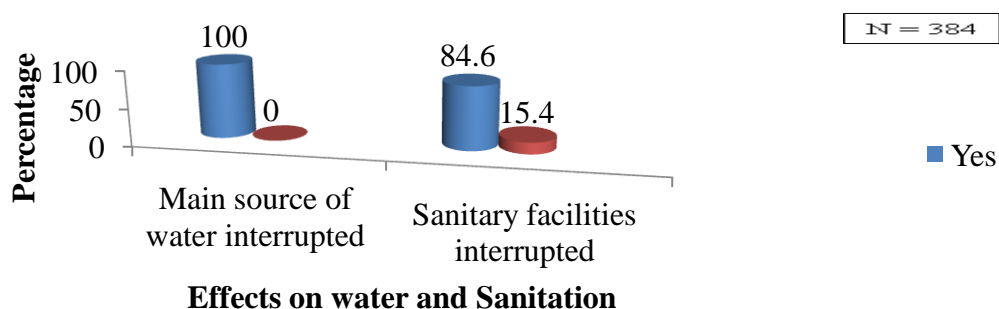


Fig. 4: Water and sanitation

The survey established that the River Nyando was the chief source of water for domestic use followed by boreholes for most of the sampled households. In this study, all the respondents 384 (100%) reported that this main source of water was interrupted during floods. This means that households would continue to be vulnerable to increased disease outbreak as long as the river continued to be the main source of drinking water. This was as a result of contamination that occurred during flooding. One respondent noted:

The reason we have increased disease burden at household level is because of the unsafe water source and flooded sanitation facilities (Source: Field data, 2014).

Key informants noted that major stakeholders in this sector were Inter Diocesan Christian Community (IDCC), Local Government and Sustainable Aid in Africa International (SANA). Their roles were classified as provision of water and sanitation. Despite the fact that the water department was striving to ensure adequate supply of water that met acceptable standards, there was a high incidence of water borne diseases. This study concurs with Heron (2007) who, in a study conducted in Ivory Coast, established that flood affected areas had to deal with the spread of infections and water borne diseases, cholera, dysentery and diarrhea which increased the need for safe drinking water and the provision of water purification tablets during flooding seasons. The County Commissioner who was a key informant attributed the high incidence of river pollution to the use of agro-chemicals in the rice farms, untreated human waste from the latrines, throwing waste into the river, open defecation and domestic activities. This means that both in the dry and flooding seasons, these residents have to use unsafe water sources for drinking and domestic use, therefore amplifying their vulnerability to water borne diseases.

CONCLUSION

This paper investigated the impact of floods on the household's wellbeing and access to education in lower Nyando basin, Kisumu County, Kenya. Drawing on this research, it has been observed that public structures in lower Nyando basin are vulnerable to floods. The Government and other Key Stakeholders should be hands-on in guaranteeing that schools' physical environments are safe, easy to repair, and resilient. Building codes in schools need to be enforced by relevant authorities to avoid use of sub-standard materials. The Programs in Teacher Training institutions also need to have courses on Education in emergencies to help in inculcating the much needed awareness to students. Flood warnings and insurance can help mitigate flood impacts. NGOs too need to incorporate health and hygiene related activities in their programs. Provision of credit or financial support for safe water supply, construction of sanitary facilities and health and hygiene awareness should be prioritized. Open defecation should be discouraged by authorities. The County Government of Kisumu should help these households to build cheap latrines. The present study area should be treated as a priority area since it is not only one of the most vulnerable regions of Kenya but water supply and sanitation conditions of the people are wanting. The community in Nyando Basin needs to be prepared at all times to manage floods as soon as they occur since they know the times of the year when they are most affected. The study observed that these poor rural households use short term temporary measures to mitigate the impacts of floods. However, this position can be improved in order to elevate the socio economic status of these households who live below the poverty line through stimulation of resilience programs. The study recommends that the Government designs appropriate institutional management interventions capable of transiting victims (households) from being painful victims to developing adaptive capacity to live with recurring floods in Nyando basin.

Suggestions for Further Research

Since it is not possible to fully eliminate floods and thereby eradicate the associated health impacts, a risk assessment to characterize and prioritize health risks needs to be carried out. This will assist in the development of mitigation measures that increase the resilience of exposed populations.

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