

## **FLOOD DISASTER PREPAREDNESS & EMERGENCY RESPONSE BY STAKEHOLDERS IN LOWER NYANDO BASIN, KISUMU COUNTY, KENYA**

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### **ABSTRACT**

The capacity to withstand flood disasters depends on strong disaster preparedness planning by stakeholders, a strong network and the resident's resilience and ability to bounce back to normal after a disaster. This paper focuses on flood disaster preparedness and emergency response among stakeholders in the flood prone area of Lower Nyando basin, Kisumu County, Kenya. The study targeted heads of households, Govt. officials, heads of NGOs, FBOs, as well as CBOs. The research adopted both correlational and survey research designs. Simple random technique was used to select 384 household heads. Purposive sampling was used to select key informants. Both primary and secondary data were sourced using questionnaires, interviews, FGDs; direct observation and document analysis. The study established that most of the sampled household heads 149 (38.8%) were prepared for floods. In addition, 133 (34.6%) of the respondents were of the view that the community was fairly adequately prepared for future floods. A paltry 46 (12.0%) were of the opinion that the community was not adequately prepared. The results revealed that 143 (37.2%) of the respondents were not sure whether the Government was prepared for future floods while 125 (32.5%) were of the view that the Government was not adequately prepared. From the results, 82 (21.4%) of respondents indicated that NGO support was very adequate while 22 (5.7%) indicated that it was adequate. The FGD, participants highlighted the community's strength in lending a helping hand to friends as adequate. A total number of 167 (43.5%) respondents indicated that there was no support at all from FBOs. This shows that FBOs were not active in offering support during floods probably because the required assistance was too heavy for them. Timeliest support was usually obtained from relatives (82.3%), NGOs (72.4%), friends (66.7%) and neighbors (62.0%). From the findings it is evident that the residents of lower Nyando basin were not passive observers of the risks associated with flooding in particular. They were trying their best to adapt to the situation at household as well as community level. The key finding was that readiness strategies largely depended on individual household efforts. The study concludes that weak systems and poor Government coordination can hamper preparedness and response capacities. The research recommends prioritizing multi-sectoral collaboration approach to flood preparedness to prevent and respond to disaster as opposed to single sector.

**Key Words: Floods, Preparedness, Vulnerability, Support, Resilience**

## 1.1 BACKGROUND TO THE STUDY

Preparedness is the state of readiness which enables organs of state and other institutions involved in disaster management, the private sector, the communities and individuals to mobilize, to organize and provide relief measures to deal with an impending or current disaster or effects of the disaster. According to FEMA (2009), preparedness is a continuous cycle of planning, organizing, training, equipping, exercising, evaluation and improvement activities to ensure effective coordination and the enhancement of capabilities to prevent, protect against, respond to, recover from, and mitigate the effects of natural disasters, acts of terrorism, and other man-made disasters. Preparedness enhances the mitigation process that is very important in the disaster management cycle. Flood disasters are a major global problem and many developing countries are affected by floods to some extent and find it particularly difficult to protect their people against such disasters.

The Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action (“Yokohama Strategy”), adopted in 1994, provides landmark guidance on reducing disaster risk and the impacts of disasters. The review of progress made in implementing the Yokohama Strategy identifies major challenges for the coming years in ensuring more systematic action to address disaster risks in the context of sustainable development and in building resilience through enhanced national and local capabilities to manage and reduce risk. Resilience refers to “The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure This is determined by the degree to which the social system is capable of organizing itself to increase this capacity for learning from past disasters for better future protection and to improve risk reduction measures” (UN/ISDR, Geneva 2005). To attain this expected outcome, the Conference resolved to adopt five strategic goals. One of the goals was development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level, which can systematically contribute to building resilience to hazards (UNISDR 2015).

Effective flood risk reduction measures require an understanding of the processes that cause floods, the magnitude, appropriate analytical methods and environmental assessment procedures and need to be implemented to reduce the risks (UNISDR 2004). According to Masese et al., (2016), floods cost communities in terms of lives lost, economic and environmental damages and human suffering. This negative impact is suffered due to measures that are not in place. One reason would be budgets that are insufficient to cater for those measures.

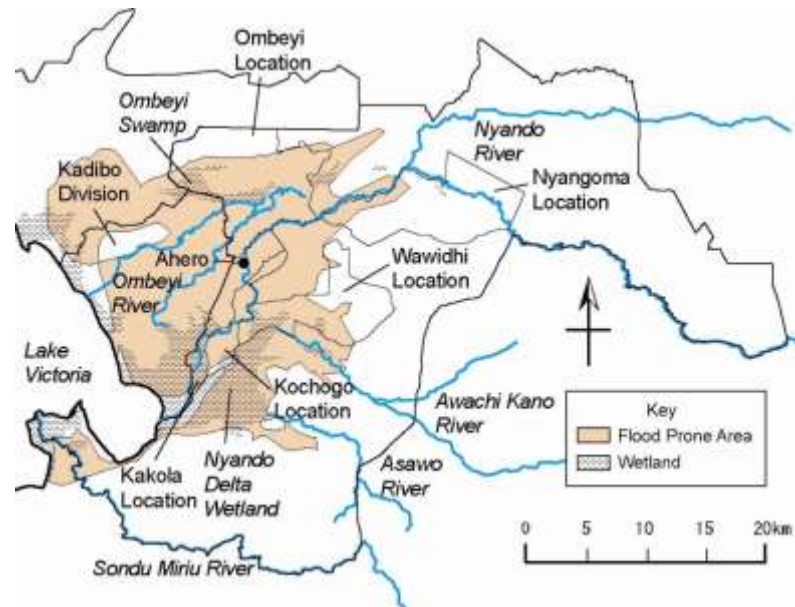
Kenya as a developing country has had to deal with some of these impacts (damage) of disasters. Common disasters experienced in Kenya are floods, fire, drought, spillages and minor earthquakes (GoK 2009). At times of disaster, impacts and losses can be substantially reduced if authorities, individuals and communities in hazard-prone areas are well prepared and ready to act and are equipped with the knowledge and capacities for effective disaster management.

According to the Draft Disaster Management Policy (GoK 2007), one aim of the policy is to prepare communities at all levels by strengthening their capacities, preparedness and resilience. The Government is ultimately responsible for disaster management while citizens are responsible for taking measures to protect their lives and property. Financial provision is required for all aspects of disaster management, mitigation, prevention, preparedness, and response and monitoring. It is also vital for the communities to understand the hazard so that they get prepared.

Lower Nyando basin is one of the flood hotspots in Kenya 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) shares the same view with Telewa, (2011) with regard to the period of flood except the latter goes ahead and deliberates on how to manage it. Masese et al., (2016) observe that 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). It is in view of this that the study sought to determine the state of preparedness of this basin that severely suffers from floods annually.

## 1.2 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  $34^{\circ}45' 0''$  E and  $35^{\circ} 21''$  E. Figure 1.1 indicates the flood prone areas



in Nyando.

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

## 1.3 STATEMENT OF THE PROBLEM

According to the Disaster Management Act 57 of 2002, preparedness is the state of readiness, which enables organs of state and other institutions involved in disaster management, the

private sector, the communities and individuals to mobilize, organize and provide relief measures to deal with an impending or current disaster or effects of the disaster. Its imperative to ensure that in times of disasters appropriate systems, procedures and resources are in place to assist those afflicted by the disaster and enable them to help themselves. The Disaster Management continuum consists of four phases' preparedness, mitigation, response and recovery. Preparedness and mitigation are vital stages in the Disaster Management Process because they take care of the other phases that follow. Floods in Nyando basin pose a serious threat not only to the lives of the residents, but also to the environment and economy. Incapacity to deal with floods ignores important components such as early warning and preparedness plans which should be in place. In this community unsafe conditions include primarily the physical location; the Nyando River with its danger to the community that cannot afford safe buildings, subsequent failure by government to oversee appropriate land use planning, and the implementing and enforcing of building codes and by-laws respectively. This has been reflected in the impacts of floods in Nyando basin which are loss of property, upsurge of diseases thereby leading to the disruption of normal life (Masese et al., 2016). This study conducted an assessment of the state of preparedness to floods in Lower Nyando basin with a hope of informing households, authorities and key stakeholders of the need for planning and preparation so that the threat to human life, property and the environment is minimized.

#### **1.4 AIM OF THE STUDY**

This study aimed at assessing Lower Nyando Basin flood disaster preparedness in order to determine measures that need to be put in place to prevent the impact of floods leading to better performance in flood disaster preparedness and response.

#### **1.5 SIGNIFICANCE OF THE STUDY**

It was presumed that the results of this study would be useful to policy makers, disaster risk management stakeholders including nongovernmental organizations, civil society as well as academicians in analyzing floods, and to plan for them. Informed decision-making (by both policy makers and the vulnerable communities) relies on the availability of information about the flood risk contexts such as this study seeks to bring to the fore.

#### **1.6 RESEARCH DESIGN**

Qualitative research was the most appropriate method to acquire data and information from the respondents. Structured questions were compiled in a questionnaire to assess the preparedness of the households Nyando regarding floods. A list of open and closed ended questions were administered in order to probe the participants to bring out their opinions on the information sought, and control the flow of the interview respectively. The officials were very much keen to respond as a way of enhancing the corrective in as far as disaster management was concerned, and also to put forward their concerns regarding service delivery. Their willingness and availability simplified the research process.

#### **1.7 RESULTS AND DISCUSSION**

##### **1.7.1 Subjective Responses on Preparedness to Flood Risk**

Given that the respondents to the questionnaire had been affected severally by floods, this study incorporated anticipation questions for eliciting subjective probabilities on preparedness for future flood events and the adequacy of disaster relief provided by stakeholders. These kinds of responses were used by Samphantharak and Chantarat (2015)

successfully in Thailand to gauge household's preparedness to floods after the 2011 mega flood. The interpretation of the results was derived from responses from an interview with household heads which was based on their opinion and experiences with previous floods. The responses were measured using a 5 point Likert scale where 5 = Very adequate, 4 = Adequate, 3 = Not sure, 2 = Not adequate and 1 = not prepared at all were the values. It is widely acknowledged that individuals, households and neighborhoods are able to influence their level of vulnerability through preparedness (Heijmans, 2009). The respondents in this study were asked questions to determine their confidence on what each household head thought about their own ability, community, Government and stakeholders in securing their homes in case of future floods.

### 1.7.2 Households preparedness and vulnerability to flood risk

The ability of people to anticipate flooding is very critical as it provides them with the tools to undertake measures that will minimize their exposure to risks and vulnerability. Preparedness activities are designed to where possible, reduce social disruption while helping affected populations to respond to and cope with the consequences of a disaster. The respondents were asked to rate their level of preparedness in anticipation of floods based on own opinion and past experiences with floods. The results are summarized in Table 1.1.

**Table 1.1 Households preparedness and vulnerability to flood risk**

Households' preparedness for floods	Frequency	Percent
Very adequate	149	38.8
Adequate	115	29.9
Not sure	75	19.6
Not adequate	30	7.8
Not prepared at all	15	3.9
<b>Total</b>	<b>384</b>	<b>100</b>

The study established that most of the sampled households 149 (38.8%) were prepared for floods, 115 (29.9%) were adequately prepared, 75 (19.6%) fairly adequate, (7.8%) not adequate 15 (3.9%) were not prepared at all. These findings without doubt suggest that because the area is annually flooded they had every reason to anticipate for and be well prepared for the floods. From the FGD and key informants, it emerged that floods had implications for the development of the people in Nyando basin and the nation as a whole. They were of the view that hazards such as floods entail that efforts should be directed at formulating sustainable mitigation measures involving households. In view of climate variability, efforts have been geared towards household resilience thus the high number of households prepared for floods. This finding is in agreement with West & Graham (2012) who found that people previously affected by flooding are often well prepared for that aspect of the flood disruption which directly affected them.

In light of this finding, they went on to recommend that messages given to flood-affected residents outlining what actions they might take should be accompanied with reminders of the total impacts and consequences of such emergencies (West & Graham, 2012). Planning is a complex process that can only be carried out effectively with a good foundation of resources, institutional arrangements and information. Some households sold their household goods in anticipation of floods. Borrowing and selling of assets by families in distress are coping actions that have been mentioned in findings of other researches (Jahan,

2000; Few *et al.*, 2004; Sharma, 2000). It was expected that people who have long experience with flooding would develop methods to mitigate their impacts.

### 1.7.3 Community's Preparedness for Floods

Communities that have been affected by flood hazard in many flood prone countries are assumed to be well informed of potential hazards, vulnerability of risk elements and potential exposure. Community Based Disaster Preparedness recognizes that people in high risk areas have used local knowledge to develop their own adaptation strategies to reduce the impact of disasters. Respondents were therefore asked to gauge the preparedness of the community for future floods. The results are summarized in Table 1.2.

**Table 1.2 Preparedness of the Community for Floods**

Community's preparedness for floods	Frequency	Percent
Very adequate	69	18.0
Adequate	133	34.6
Not sure	133	34.6
Not adequate	46	12.0
Not prepared at all	3	0.8
<b>Total</b>	<b>384</b>	<b>100</b>

From the results, 133 (34.6%) of the respondents were of the view that the community was fairly adequately prepared for future floods while 46 (12.0%) were of the opinion that the community was not adequately prepared. From FGD, the research established that Kenya Meteorological Department (KMD) had not established a community radio station that disseminates information and alerts the community on possible flooding. This would have been the reason why many residents were of the opinion that the community was not prepared. However, dykes had been constructed to mitigate the impacts of floods. Though the residents of Nyando did not destroy dykes, the dykes had introduced a new problem of fighting over land.

Residents of Nyando basin community were also reported to be dependent on relief. They however reported that relief from the government was usually not enough and it had been politicized. A discussion with leaders of the non-governmental organizations in the area such as World Vision, DANIDA, the Kenya Red cross, revealed that these organizations originally received funding from the European Union for their activities. For years, the community had relied on relief from these organizations during floods. However, the European Union carted out of the study area about six years ago. Key informants were of the opinion that the relief supplies were inadequate leaving many victims vulnerable. Prepared communities are more aware about the basic concepts of disasters, causes of disasters and have a contingency plan on what needs to be done in the event of a disaster. These lacked in Nyando basin therefore making the community vulnerable. Vulnerability of communities can be reduced through increasing preparedness and resilience or capacity to cope in the event of flooding.

### 1.7.4 Government's Preparedness for Floods

Good governance is a pre-requisite for flood risk management. Without good governance and strong leadership, the government will not have the legitimacy or support to carry out flood risk reduction measures. Good governance must support risk reduction measures,

advocate emergency preparedness, awareness and early warning systems. Respondents were asked to state whether the Government was prepared for future floods. The results are summarized in Table 1.3

**Table 1.3 Government's preparedness for floods**

<b>Government's preparedness for floods</b>	<b>Frequency</b>	<b>Percent</b>
Very adequate	54	14.1
Adequate	24	6.3
Not sure	143	37.2
Not adequate	125	32.5
Not prepared at all	38	9.9
<b>Total</b>	<b>384</b>	<b>100</b>

The results show that 143 (37.2%) of the respondents were not sure whether the Government was prepared for future floods while 125 (32.5%) were of the view that the Government was not adequately prepared. The study however established that the Government set up relief camps on safe grounds and evacuation centers which accommodated mostly women, children, the elderly, and people with disabilities and persons with chronic diseases. Men went out to look for means of survival, and provide security to their property against petty crime.

From the FGD and key informant interviews, it emerged that the Government provided some relief which was not systematic and organized. Without emergency plans, response to floods was prone to being ad hoc and disorganized. This result shows that the Government was not adequately prepared for future floods. Even though Kisumu County Government made a great effort after a flooding event to rehabilitate and reconstruct the damaged infrastructures such as roads, bridges, riparian structures as well as other drainage improvement, the works were limited to small-scale, and far from satisfying an appropriate flood control. There is need for counter-measures to release lower Nyando basin from the menace of flood damage. This calls for improvement in the governance of government to remove the mistrust and assure citizens of commitment to risk reduction by displaying political commitment and elevating disaster risk reduction as policy priority in Lower Nyando basin.

### **1.7.5 NGO's Preparedness for Floods**

Flood events elicit emergency rescue operations by both public and private agencies. These are top-down interventions aimed at saving lives in crisis situations (Opondo 2012). In the aftermath of floods, many residents received help from the government and other organizations. To determine preparedness, respondents were asked to state their own opinion on whether NGOs were prepared for future floods. The results are summarized in Table 1.4.

**Table 1.4 NGO's Preparedness for Floods**

NGO's preparedness for floods	Frequency	Percent
Very adequate	60	15.6
Adequate	25	6.5
Not sure	246	64.1
Not adequate	47	12.2
Not prepared at all	6	1.6
<b>Total</b>	<b>384</b>	<b>100</b>

The findings indicate that, 246 (64.1%) respondents were of the view that the CBOs preparation was fairly adequate while 47 (12.2%) were of the contrary opinion. A good number of respondents 60 (15.6%) felt that NGOs preparation was very adequate. From these results it's clear that NGOs were prepared for floods. The FGD, participants noted that they would sometimes access external financial supports from CARE International, Red cross, World vision, Ogra Foundation and Omega Foundation which aided local residents in improving their physical household assets (e.g., upgrading houses and providing water filters, and loans for small-scale agriculture) and capacity building (e.g. costs for training courses and flood risk management for local people and authorities) and in psycho-social support during floods. These kinds of supports are necessary for them to enhance their flood responses.

These findings are in tandem with Opondo (2012) who found out that in the aftermath of the December 2011, in Budalangi floods, many residents received help from the Government and Non-governmental organizations (NGOs). Although more than (75%) of the respondents received relief aid of one form or another, many complained that the assistance provided was inadequate.

In Nyando basin, NGOs such as CARE, Red Cross and Action Aid played an important role in post-coping response to flood disasters by distributing flood relief, agricultural inputs and subsidized micro-credits in flood affected regions. An interview with an NGO representative underscored the fact that flood disasters usually generated a lot of good will. The outpouring of relief assistance could, however, overwhelm the local NGOs of the humanitarian effort. He reiterated that they found it difficult to co-ordinate emergency operations because local officials came into the scene without prior experience in relief operations. However most key informants in this particular area stated that these NGOs played almost a minimum role while asserting that most flood-affected families depended on relatives, neighbors and informal micro-credit systems to cope with floods.

### 1.7.6 FBO's Preparedness for Floods

In the rural floodplains, churches are supposed to play an important role in urgently mitigating flood impacts. Believers of religions in the rural floodplains help flood-affected residents reduce flood related impacts due to their charitable funds. In this study, respondents were asked to state their opinion on preparedness of FBOs in anticipation of floods. The findings are summarized in Table 1.5.



**Table 1.5 FBO's preparedness for floods**

<b>FBO's preparedness for floods</b>	<b>Frequency</b>	<b>Percent</b>
Very adequate	22	5.7
Adequate	25	6.5
Not sure	162	42.2
Not adequate	91	23.7
Not prepared at all	84	21.9
<b>Total</b>	<b>384</b>	<b>100</b>

The findings indicated that 162 (42.2%) of the respondents were of the view that FBOs were fairly prepared for future floods while 91 (23.7%) of the respondents were of the opinion that FBOs were not adequately prepared. Only 84 (21.9%) indicated that FBOs were not prepared at all. This large number of respondents who are of the view that they are fairly prepared clearly contradicts what was gathered at FGD that very minimal help came from the FBOs. An interview with heads of FBOs noted that church funds are used to provide food to poor flood victims and help poor residents to improve or rebuild their houses as well as to provide financial assistance to construct small public infrastructure (e.g., small bridges, local roads, traditional healthcare houses). Besides, these funds were used to provide free food to ill residents in the locality.

In some societies, natural disasters are considered to be acts of God and taken as if there is nothing human beings could do to prevent hazards from turning into disasters. Lack of faith in the social system and lack of confidence in the ability to manage flood risks manifests itself in resistance to any such change. A very interesting finding was that no financial help came from the police and the church.

“The church only offers prayers with no material support.” (Field data 2014).

This suggests that the church, security agencies and NGOs are themselves limited or constrained in providing assistance to households. The FBO heads and security agencies who were key informants clarified that as much as they were willing to assist they were limited in resources and would therefore only offer intangible material help in terms of prayer and security. The household survey data indicated that donations from the charitable funds were statistically insignificant among various religions and varied between believers and non-believers. It has been established that organizations related to the Catholic Church were main religious organizations that provided emergency assistance to flood victims in Budalangi (Opondo 2012).

From these Likert scale responses, ranking was done to compare preparedness levels by different stakeholders using Spearman's rank correlation coefficient. The results were recorded in Table 1.6.

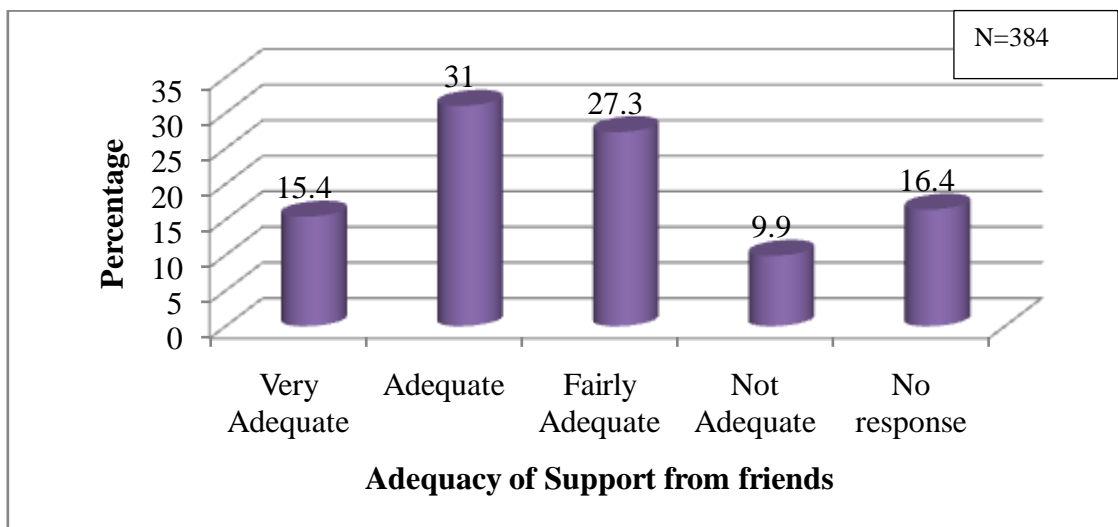
**Table 1.6: Level of Preparedness for Different Stakeholders**

Preparedness for floods	Households	Community	Government	NGO	FBO
Very adequate	1	2	3	2	5
Adequate	2	1	5	4	4
Not sure	3	1	1	1	1
Not adequate	4	3	2	3	2
Not prepared at all	5	4	4	5	3

From the rankings, households and the general community were the stakeholders that were most adequately prepared for floods while FBO's were the least prepared.

### 2.8.1 Support Received from Friends

The essence of a social network is the provision of financial and moral support during emergencies. Respondents were asked to state their opinion on whether the support received from friends was adequate. The results are summarized in Figure 1. 2.

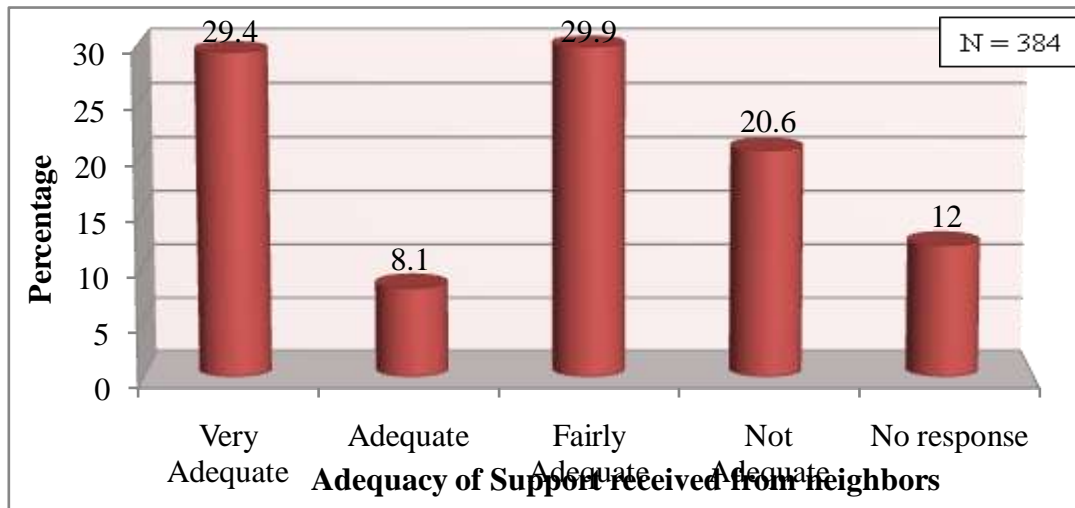


**Figure 1.2: Adequacy of support received from friends**

From the results, 59 (15.4%) of respondents indicated that it was very adequate, 119 (31.0%) indicated that it was adequate, 105 (27.3%) showed that it was fairly adequate, 38 (9.9%) for not adequate and 63 (16.4%) indicated that there was no service at all. A Chi Square test of variation conducted on data showed that there was a highly significant ( $p < 0.01$ ) variation of responses on whether services received from friends were adequate ( $\chi^2_{4,0.01} = 59.75$ ). This shows that friends also played a great role in providing support during floods.

## 2.8.2 Support Received from Neighbors

In rural societies like Nyando basin, residents depend on each other for mutual assistance in times of need. This being an important coping strategy, respondents were asked to state their opinion on whether the support received from neighbors' was sufficient. The results are summarized in Figure 1.3.



**Figure 1.3 Adequacy of support received from neighbors**

A Chi Square test of variation conducted on data showed that there was a highly significant ( $p < 0.01$ ) variation of responses on whether support received from neighbors' were adequate ( $\chi^2_{4,0.01} = 75.79$ ). From the results, 113 (29.4%) of respondents indicated that it

was very adequate, 31 (8.1%) indicated that it was adequate, 115 (29.9%) revealed that it was fairly adequate, 79 (20.6%) said it was not adequate while 46 (12.0%) were of the opinion that there was no service at all.

From the FGD, participants highlighted that the community's strength in lending a helping hand to friends was seen as adequate. During the first few days, there was goodwill from neighbors and relatives who were not affected by the floods an indication that communities are willing to assist each other during calamities in their own way. This element of cohesion can be further strengthened with public awareness. In the event of floods people called out to each other to support them showing a greater solidarity than in usual circumstances. The support was mostly in sharing, caring and comradeship and not necessarily material or financial.

“My neighbor's son carried my sick child from my house to a safe ground, I was expectant and had two other small children, and I would not have managed to move all of them on my own.”  
(Field data 2014)

In Budalangi, Opondo (2012) found out that help from neighbors was least common because neighbors had to deal with similar flood impacts at the time support was needed. Most of the help received from other people was in the form of food, cash, materials and time, for example in helping to repair houses. This shows that neighbors' played a great

role in helping others during floods and this brought about cohesion in the community as people came together to share their joys and sorrows.

### 2.8.3 Support Received from Government.

Respondents were asked to indicate their opinion on whether the support they received from the government was adequate. The results are summarized in Table 1.7.

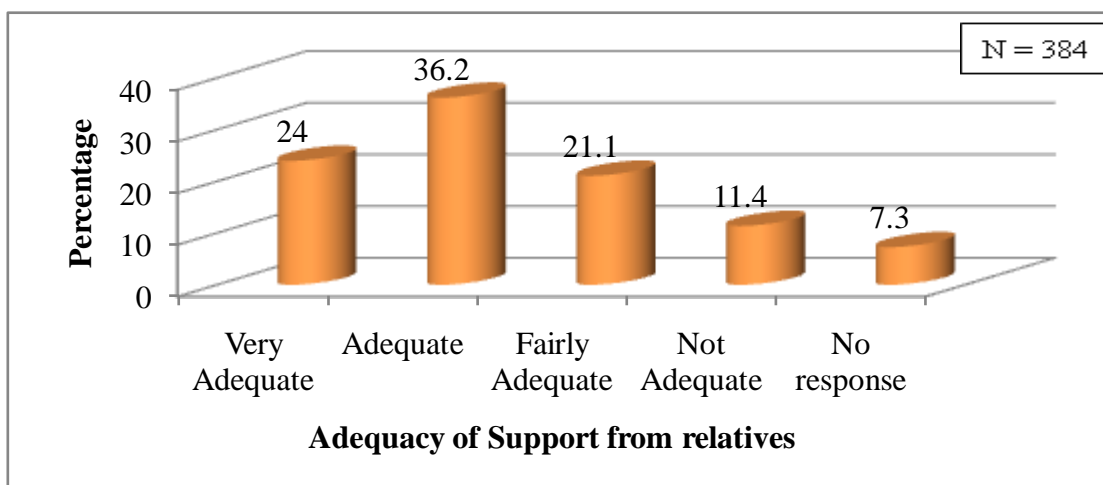
**Table 1.7 Adequacy of Support Received from Government.**

Adequacy of support received from government	Frequency	Percent
Very adequate	22	12.2
Adequate	47	5.7
Fairly adequate	122	31.8
Not adequate	124	32.3
Nil	69	18.0
<b>Total</b>	<b>384</b>	<b>100</b>

A Chi Square test of variation conducted on data showed that there was a highly significant ( $p < 0.01$ ) variation of responses on whether support received from the Government were adequate ( $\chi^2_{4,0.01} = 107.07$ ). From the results, 22 (12.2%) of

respondents indicated that it was very adequate, 47 (5.7%) indicated that it was adequate, 122 (31.8%) showed that it was fairly adequate, 124 (32.3%) for not adequate and 69 (18.0%) indicated that there was no service at all. In earlier FGD discussions, it was pointed out that the Government provided minimal support during floods. These results further attest to the fact that the government was doing very little to help residents during floods.

The study sought to establish the respondents opinion on level of adequacy of support received from different people and organizations during the flooding period. During an interview, the respondents were asked to rate the sufficiency of relief support they received from relatives. The results are summarized in Figure 1.4.



**Figure 1.4 Adequacy of Support Received from Relatives**

A Chi Square test of variation conducted on data showed that there was a highly significant ( $p < 0.01$ ) variation of responses on whether support received from relatives was adequate ( $\chi^2_{4,0.01} = 98.63$ ). From the results, 92 (24.0%) of respondents indicated that it was very

adequate, 139 (36.2%) indicated that it was adequate, 81 (21.1%) showed that it was fairly adequate, 44 (11.4%) for not adequate and 28 (7.3%) indicated that there was no service at all. This shows that relatives played a great role in providing support during floods. From the FGD it emerged that most support came from the Red Cross, relatives, and a few sympathizers.

This findings are in agreement with (Kandji, 2006) who found out that Kenyans who live in risky environments employ a rich variety of strategies to reduce their exposure to climate hazards and cope in times of crisis. Common strategies used to minimize the adverse consequences of (climate) shocks are to, “in order of importance, spend cash savings, sell assets (animals), work longer hours, reduce food consumption and receive help from family and friends” (World Bank, 2007).

#### 2.8.4 Support Received from Government.

Respondents were asked to indicate their opinion on whether the support they received from the government was adequate. The results are summarized in Table 1.8.

**Table 1.8 Adequacy of support received from Government.**

Adequacy of support received from government	Frequency	Percent
Very adequate	22	12.2
Adequate	47	5.7
Fairly adequate	122	31.8
Not adequate	124	32.3
Nil	69	18.0
<b>Total</b>	<b>384</b>	<b>100</b>

A Chi Square test of variation conducted on data showed that there was a highly significant ( $p < 0.01$ ) variation of responses on whether support received from the government were adequate ( $\chi^2_{4,0.01} = 107.07$ ). From the results, 22 (12.2%) of respondents

indicated that it was very adequate, 47 (5.7%) indicated that it was adequate, 122 (31.8%) showed that it was fairly adequate, 124 (32.3%) for not adequate and 69 (18.0%) indicated that there was no service at all. In earlier FGD discussions, it was pointed out that the Government provided minimal support during floods. These results further attest to the fact that the government was doing very little to help residents during floods.

### 2.8.5 Support Received from NGOs

The study sought to determine the respondent's opinion on whether the support they received from NGOs was adequate during flooding season. The results are summarized in Figure 1.5.

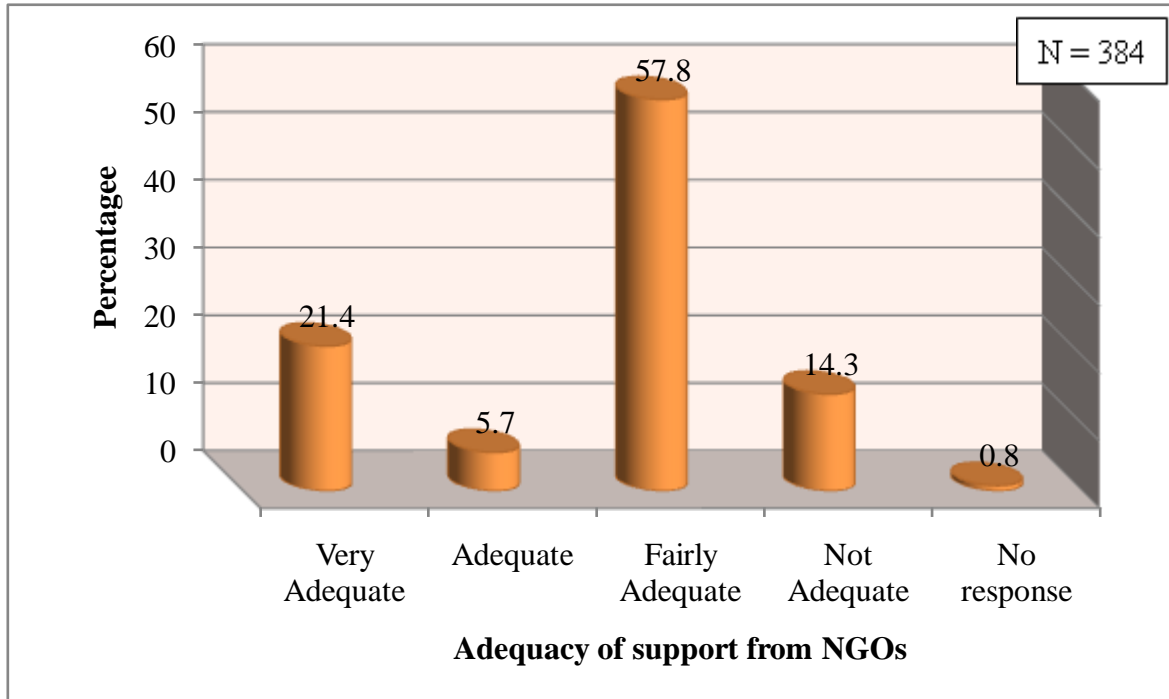


Figure 1.5 Adequacy of support received from NGOs

A Chi Square test of variation conducted on data showed that there was a highly significant ( $p < 0.01$ ) variation of responses on whether support received from NGOs were adequate ( $\chi^2_{4,0.01} = 376.91$ ). From the results, 82 (21.4%) of respondents indicated that it was very

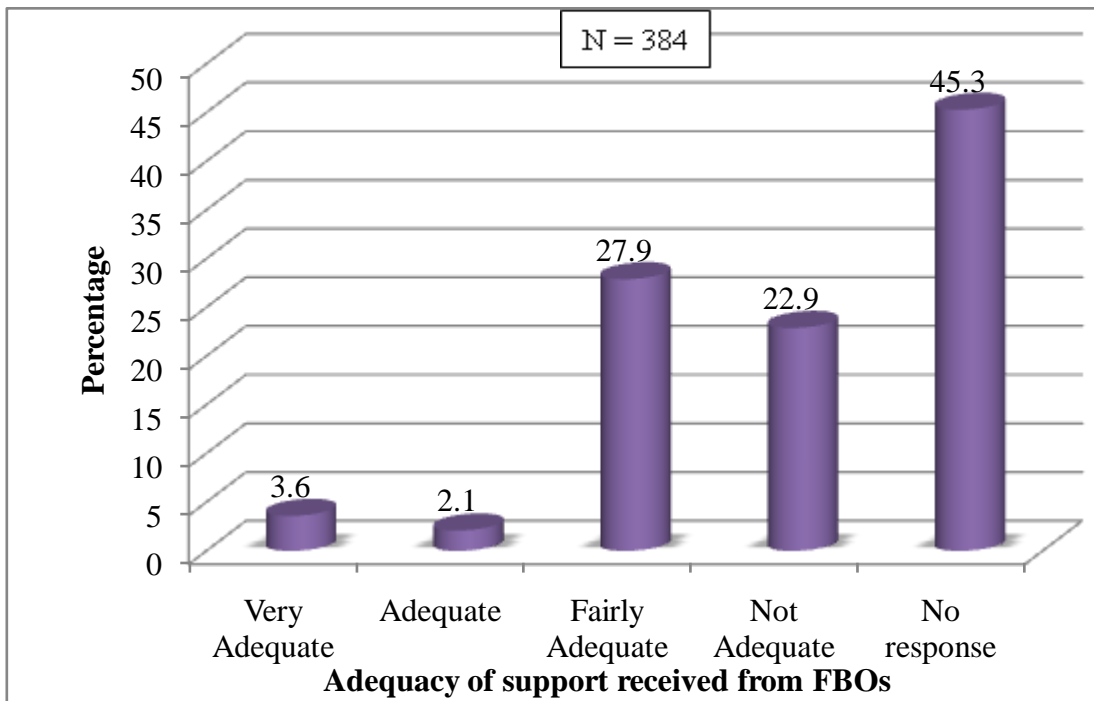
adequate, 22 (5.7%) indicated that it was adequate, 222 (57.8%) felt that it was fairly adequate, 55 (14.3%) were for the services being adequate while 3 (0.8%) indicated that there was no service at all. This result shows that NGOs were not very active in offering support during floods. FGD findings support the above results where it was observed that flood victims got support from the Red Cross but the help was very insignificant and that only a few people benefited as seen in Plate 1.1. The help came in terms of food, blankets and medicine.



**Plate 1.1** Red Cross in action at Obiayo rescue center in Ombeyi during floods in 2014

### 2.8.6 Support Received from FBOs

Respondents were asked to state their opinion on whether the support they received from the FBOs was adequate. The results are summarized in Figure 1.6.



**Figure 1.6** Adequacy of Support Received from FBOs

A Chi Square test of variation conducted on data showed that there was a highly significant ( $p < 0.01$ ) variation of responses on whether support received from FBOs were adequate (

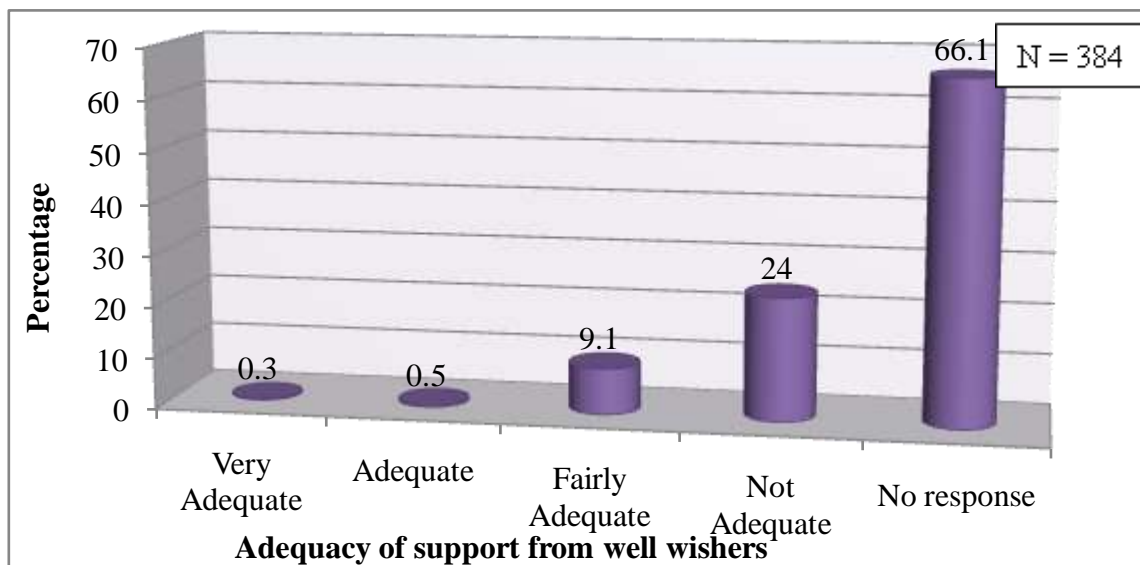
$\chi^2_{4,0.01} = 232.43$ ). From the results, 14 (3.6%) of respondents indicated that it was very adequate, 8 (2.1%) indicated that it was adequate, 107 (27.9%) showed that it was fairly adequate, 88 (22.9%) for not adequate while 167 (43.5%) indicated that there was no support at all. This shows that FBOs were not active in offering support during floods probably because the required assistance was too heavy for them. From the FGD it emerged that although they were happy with the little what they received, it was not adequate to cover for the period that they would have no means of survival. One participant noted

“We would still be happy even if they gave us water because at least it would be something.”(Field data 2014)

The FBO’s pledged to support the affected but the pledges were not fulfilled. Some of the participants noted that they were not even consulted on their preferred items of relief prior to the relief distributions. This is an indicator that there is need to ensure that disaster response is need based to guarantee its effectiveness and a need to reach more of the vulnerable people especially since they had not been reached during relief distribution.

### 2.8.7 Support from Well Wishers

Respondents were asked to indicate their opinion on whether the support they received from the well -wishers was adequate. The results are summarized in Figure 1.7.



**Figure 1.7 Adequacy of Support from Well Wishers**

A Chi Square test of variation conducted on data showed that there was a highly significant ( $p < 0.01$ ) variation of responses on whether support received from well-wishers were adequate ( $\chi^2_{4,0.01} = 582.28$ ). From the results, 1 (0.3%) of respondents indicated that it

was very adequate, 2 (0.5%) indicated that it was adequate, 35 (9.1%) showed that it was fairly adequate, 92 (24.0%) not adequate and 254 (66.1%) indicated that there was no support at all. This shows that well- wishers were not active in offering support during floods. From the FGD it is clear that neighbors who coupled as well wishers were also



affected by floods or they were economically vulnerable and seemingly unable to provide the required assistance. This perhaps is a pointer to social vulnerability.

### 3.9. Timeliness of Support

Household heads who were the main respondents of this study were asked to state their opinion on whether the support they received from different stakeholders during floods was timely or not. The results were tabulated using means and standard deviation. They are summarized in Table 1.9.

<b>Statement</b>	<b>Freq.</b>	<b>%</b>	<b>Mean</b>	<b>S.D</b>
Timely support from relatives	316	82.3	1.1771	0.3822
Timely support from NGO's	278	72.4	1.2760	0.4476
Timely support from friends	256	66.7	1.3333	0.4720
Timely support from neighbors	238	62.0	1.3802	0.4861
Timely support from government	171	44.5	1.6328	1.6313
Timely support from FBO's	74	19.3	1.8073	0.3949
Timely support from well wishers	56	14.6	1.8542	0.3534

From the results, timeliest support was usually obtained from relatives (82.3%) and NGOs (72.4%) followed by friends (66.7%) and neighbors (62.0%).

### SUMMARY

The broad objective of the study was to investigate the level of preparedness to floods among households in Nyando basin. The study established that the factors that affect the community's level of preparedness to flooding in Nyando basin include: poverty, rapid population growth resulting in encroachment of the flood-plain resulting to poor drainage, low levels of education, poor health, gender inequality due to the patriarchal nature of the society, living in fragile and hazardous locations, lack of access to resources and services, lack of information and knowledge, lack of public awareness and limited access to political power and representation. The study further established that household economic characteristics, such as income level, occupation, access to credit, insurance and employment have a positive influence on preparedness to floods. The study posits that preparedness to floods increases with low formal education, less secure employment, low income, lack of credit worthiness, lack of insurance and informal source of livelihood. One of the reasons is that low income diminishes peoples' ability to employ preparedness activities.

During the study it became evident that the residents of lower Nyando basin were not passive observers of the risks associated with flooding in particular. The residents were trying their best to adapt to the situation at household as well as community level. The main finding was that these preparedness strategies largely depended on individual efforts. Some of the strategies established include construction of flood diversion trenches, blocking of water inlets using available materials to divert water and digging trenches around houses before floods.

## CONCLUSION

The study concludes that the County Government of Kisumu sets aside funds for emergency, build strong infrastructure like schools, hospitals and bridges by adhering to laid down flood proofing regulations, building well equipped rescue centers, hospitals and investing more on preparedness. Kisumu County Government initiatives to control house construction in the basin and across the natural drains should also be increased. Multi-sectoral approach to flood mitigation as opposed to single sector should be promoted as there are inter-linkages in terms of flood impact on various aspects of society. The County Government should do all it can to make available large numbers of housing plots located on safer sites for all income groups. Kisumu County Government should work closely with the populations they are supposed to serve for that is what devolution is all about.

## REFERENCES

- Federal Emergency Management Agency (FEMA) (2009) FEMA P695 Recommended Methodology for Quantification of Building System Performance and Response Parameters. Project ATC-63, Prepared by the Applied Technology Council, Redwood City.
- Few, R. (2007). Health and climatic hazards: Framing social research on vulnerability, response and adaptation. *Global Environmental Change* 17 281–295.
- Government of Kenya (2007). *Mission Report to Assess the Impacts of Floods in Budalang'i and Rachuonyo Districts in Western Kenya*. Nairobi: Ministry of State for Special Programmes Government of Kenya.
- Government of Kenya (2007). *Mission Report to Assess the Impacts of Floods in Budalang'i and Rachuonyo Districts in Western Kenya*. Nairobi: Ministry of State for Special Programmes Government of Kenya
- Government of Kenya. (2009). *National disaster response plan*. Nairobi: Ministry of State for Special Programs and Ministry of Provincial Administration and Internal Security National Disaster Operation Centre Retrieved from <http://www.imf.org/external/pubs/ft/scr/2010/cr10224.pdf>.
- Heijmans, A. (2009). *The social life of community based disaster risk reduction* AON Benfield: UCL Hazard Research Centre, Disaster Studies.
- Jahan, K.M., Ahmed, M. & Belton, B. (2010) *The Impacts of Agriculture Development on Food Security: lessons from Bangladesh Aquaculture* Research 41: 481-495
- Kandji, S. T. (2006). *Drought in Kenya: Climatic, economic and socio-political factors*. New Standpoints, (November-December).
- Masese, A. Neyole, E. Ombachi N. (2016) *Loss and Damage from Flooding in Lower Nyando Basin, Kisumu County, Kenya*. International Journal of Social Science and

- Humanities Research ISSN 2348-3164 (online) Vol. 4, Issue 3, pp: (9-22), Available at: [www.researchpublish.com](http://www.researchpublish.com)
- Ongor, D. (2007). Integrating water resource management and flood management: Community participatory approach: A case study of the Nyando river watershed in Kenya. *Catchment and Lake Research*, 6:50-55.
- Opondo, O.D. (2012) *Loss and damage associated with adverse livelihood impacts of flooding in Budalangi division, Western Kenya: Loss and Damage in Vulnerability Countries*. Bonn: United Nations University Institute for Environment and Human Security (UNU-EHS),.
- Otiende, B. (2009). 'The economic impacts of climate change in Kenya: riparian flood impacts and cost of adaptation' [online] [weadapt.org/knowledgebase/files/758/4e25a4b8c8bf61C-kenyariparian-floods-case-study.pdf](http://weadapt.org/knowledgebase/files/758/4e25a4b8c8bf61C-kenyariparian-floods-case-study.pdf) (accessed August 2013).
- Sakijege, T., Lupala, J. & Sheuya, S. (2012). Flooding, flood risks and coping strategies in urban informal residential areas: The case of KekoMachungwa, Dar es Salaam, Tanzania *Jamba: Journal of Disaster Risk Studies* 4(1).
- Samphantharak, K. and Chantararat, S. (2015). The effects of Natural Disasters on Household preferences and Behaviors: Evidence from Thai farmers during and after the 2011 Mega flood. In Swada, Y and S. Oum (eds.), *Disaster Risks, Social Preferences, and Policy effects: Field Experiments in selected ASEAN and East Asian Countries*, ERIA Research Project Report FY 2013. Jakarta: ERIA, PP 57-84.
- Sharma, D. (2000). *Coping strategies and early warning systems of tribal people in India in the face of natural disasters: case studies in Maurbhanj, Orissa and Dungarpur, Rajasthan, India*. New Delhi: International Labour Office.

- Telewa, M. (2011, February 8). Kenya drought means no school rations. BBC News. Retrieved from <http://www.bbc.co.uk/news/world-africa-12371130>.
- UNISDR. (2004). *Living with Risk. A Global Review of Disaster Reduction Initiatives*. Hyogo (Japan): United Nations International Strategy for Disaster Reduction pp. 584
- UN/ISDR (2005a). Proceedings of the Conference, World conference on disaster reduction. Building the resilience of nations and communities to disasters. 18-22 January 2005, Kobe, Hyogo, Japan, In: *UN/ISDR - Inter-Agency Secretariat of the International Strategy for Disaster Reduction* (Ed.). Geneva: United Nations.
- UN/ISDR. (2005b). *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters (HFA)*, UN/ISDR - Inter-Agency Secretariat of the International Strategy for Disaster Reduction, United Nations, Geneva.
- UNISDR (United Nations International Strategy for Disaster Reduction). 2015. *Sendai framework for disaster risk reduction 2015–2030*. [http://www.wcdrr.org/uploads/Sendai\\_Framework\\_for\\_Disaster\\_Risk\\_Reduction\\_2015-2030.pdf](http://www.wcdrr.org/uploads/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf). Accessed Apr 2015.
- West, C.& Graham, A. (2012). *Emergency preparedness in Scotland 2012*. London: British Red Cross/Scottish Government.
- World Bank. (2004). *Kenya hazard profile*. Retrieved from <http://info.worldbank.org/etools/docs/library/114813/bestcourse/docs/Course%20Projects/Country%20Hazard%20Profiles/Country%20Hazard%20Profiles/Kenya>
- World Bank. (2007). *Natural disaster hotspots* Washington, DC: Case Studies Hazard Management Unit.
- World Bank Group. World development indicators 2012. Washington D.C: World Bank Publications; 2012.

