INVESTIGATING THE IMPACTS OF FLOODS ON THE SOCIO-ECONOMIC LIVELIHOODS OF PEOPLE AT NKANDO COMMUNITY IN MULANJE DISTRICT, SOUTHERN MALAWI

GILICEN ANTHONY

[DRM/015/17]

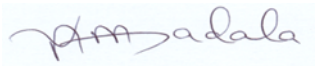
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ACCRONOMYS/ ABBRIVIATIONS

C.D.S.S: Community Day Secondary School

DRM: Disaster Risk Management

DRR: Disaster Risk Reduction

DoDMA: Department of Disaster Management Affairs

EWAS: Early Warning Systems

GDP; Gross Domestic Product

HHS: Households

NGOs: Non-Governmental Organizations

NSO: National Statistical Office

PDNA: Post Disaster Needs Assessment

SPSS: Statistical Package for Social Science

UNDP: United Nation for Development Programmes

UN: United Nations

VCPs: Village Civil Protection Committees

WB: World Bank

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ABSTRACT

Flooding is a phenomenon which can occur if the quantity of water in the watershed exceeds the capacity of the stream, river and lake (Government of Malawi Disaster Risk Management Handbook 2013). Floods cause threats to life, environment and population. This study investigated the socio-economic impacts of flood on the livelihoods of the people of Nkando community in Mulanje district. In this study, descriptive study design was adopted applying both qualitative and quantitative research methodologies.

The research indicated that no river management by the local authorities (53%), built next to the river with low capacity (24%) and low lying area (13%) were identified as being the main causes of flood vulnerability of the people in Nkando community. The research questionnaire also demonstrated that agriculture sector is heavily being affected by floods leading to food insecurity. Further, the study demonstrated that flood affects school attendance due to impassable roads and bridges being submerged. In some cases flood causes an outbreak of disease like diarrhea and malaria/fever. It was also observed that in every hundred people which were sampled, fifty five (55) people their houses collapsed due to floods and lost both productive and non-productive assets either direct or indirect.

It is recommended that Government and key Stakeholders should engage the communities and local authorities in making them aware of the flood risk in view of the climate variability and community based floods early warning system (EWAS) should be developed. There should be a policy to force communities' especially in rural areas to build house using durable materials and away from the flood prone areas and Government and Disaster Risk Management Stakeholders should engage communities in order for them to move permanently to higher grounds as they have expressed a willingness to relocate.

1. INTRODUCTION

1.1. Background

The study investigated the impacts of floods on the socio-economic livelihoods of people at Nkando community in Mulanje district of Malawi. The aim of this study was to provide a thorough understanding of the impact of floods on the socioeconomic livelihoods of people.

Malawi is highly vulnerable to the impacts of extreme weather events. The most common weather-related shocks affecting Malawi are floods and over the past five decades, Malawi has experienced more than 19 major floods, with these events increasing in frequency, magnitude and scope (PDNA) 2019.

Flood event is not considered to be a natural hazard unless there is a threat to human life and/or property Nott (2006). Rivers offer human populations transport links, a water source, recreational amenities, fertile plains and are attractive place for settlements. Floods then become a major natural hazard because of the high human population densities that inhabit these lands.

According to Third World Water Forum: Poverty and Floods held in March,2003, in recent years, floods have become more frequent and of increasing severity resulting into loss of life, injury, homelessness, damage to infrastructure and environment as well as impacting on other critical sectors such as education and agriculture.

Further, Malawi Flood Post Disaster Needs Assessment of 2015 shows that, the effects of damage and losses of 2015 floods were estimated to have resulted in a projected negative impact on Gross Domestic Product (GDP) growth in 2015, to 0.6 percent.

1.2. The problem statement

Nkando community has been affected by floods for several instances. Most villages in Nkando community are allocated along Thuchila river and most land in this area is used

for crop production, mainly vegetable gardening. Other crops grown include maize, pear beans, millet and sweet potatoes. Some livestock farming is also present and fishing is practiced. The flooding in this community causes displacement of people from their usual dwellings resulting into varying impacts on infrastructure, crops, health, education, environment as well as damage to property (Malawi Flood Post Disaster Needs Assessment, 2015).

Despite the increase in the frequency and magnitude, no comprehensive impact assessment study on the socio-economic livelihoods of people has been undertaken at Nkando community. It is impossible to remove the flood risk, what is important is to fully understand the flood risk and the associated effects within the framework of Disaster Risk Reduction (DRR) (Report on the Regional Stakeholders' Consultative Workshop on Disaster Risk Management, 2004).

Hence the response to the impact of hazards such as floods has been reactive. Thus, there was a need to conduct this research project to produce comprehensive impact assessment study on the socio-economic livelihoods of people in this community.

1.3. Main and specific Objectives

This study aimed at understanding the impacts of floods on the socio-economic livelihoods of people at Nkando community in Mulanje district. Specifically, the study has following objectives;

1. To investigate the causes of flooding along Thuchila river at Nkando community in Mulanje district
2. To determine the social impacts of Thuchila floods at Nkando community in Mulanje district.
3. To analyze how Thuchila floods affect Nkando community in Mulanje district economically.

1.4. Research questions

This study answered the following questions:

1. What are causes of flooding along Thuchila river at Nkando community in Mulanje district?
2. What are the social impacts of Thuchila floods at Nkando community in Mulanje district?
3. How do Thuchila floods affect Nkando community in Mulanje district economically?

1.5. Significance of the study

The outputs of the study are key inputs in the designing of sustainable mitigation measures to minimize the socio-economic impact of floods. This study was important to policy makers, Non-Governmental Organizations (NGOs) and other stakeholders to formulate strategies and interventions that will help to enhance resilience and coping capacity in this area. The whole country will also benefit from those policies because the study will assess and estimate how floods affect the people's livelihoods socially and economically.

2. REVIEW OF LITERATURE

2.1. Introduction

Flooding comes with different effects including health, physical, social and economic effects. Studies have been undertaken to reveal how much floods affect people's lives under each dimension of the effects. This study reviewed literature on social economic impacts of floods. Due to unavailability of area specific literature, the review is diverse covering literature from different regions and countries.

2.2. Overview of floods

Borrows and De Bruin (2006) indicated that among natural catastrophes, flooding has claimed more lives than any other single natural hazard. In the decade 1986 to 1995, flooding accounted for 31% of the global economic loss from natural catastrophes and 55% of the casualties. The damaging effects of flooding are likely to become more frequent, more prevalent and more serious in the future.

Nott (2006) indicated that a flood event is not considered to be a disaster unless there is a threat to human life and/or property. The most vulnerable landscapes for floods are low-lying parts of flood plains, low-lying coasts and deltas, small basins subject to flash floods. Rivers offer human populations transport links, a water source, recreational amenities, fertile plains and are an attractive place for settlements. Floods then become a major natural hazard because of the high human population densities that inhabit these lands. He further indicated that the direct impacts of a flood are closely related to the depth of inundation of flood water. The extent of a flood has a direct relationship for the recovery times of social and economic impact to populations.

Guha-Sapir et al. 2004 as referred by Hay et al. (2008), Malawi faces multiple hazards in both rural and urban areas, which include floods, droughts, landslides and earthquakes. Between 1974 and 2003, these multiple hazards cumulatively affected 25 million people making the country one of the worst affected amongst the poor countries based on mean annual number of affected per 100,000 people. The nature and pattern of weather related hazards is changing as a result of climate change becoming more frequent, intense and

unpredictable. For example, before 2001 nine districts in Malawi were classified as flood-prone but in 2001, 16 districts were affected. (Government of Malawi Disaster Risk Management Handbook 2013).

Natural disasters continue to strike and increase in magnitude, complexity and economic impact. Whilst natural phenomena causing disasters are in most cases beyond human control, vulnerability is generally a result of human activity. Therefore, society must recognize and strengthen new ways to live with such risk, and take urgent actions to prevent as well as reduce the effects of such disasters (ISDR 2004).

2.3. Characteristics and causes of flooding

According to Carter (1991:1), floods can be characterized as long, short and no warning depending on the type of floods. For example, flooding within parts of a major river may develop over a number of days or even weeks, whereas flash floods give no warning. Speed or onset of floods may be gradual or sudden and there may be seasonal patterns of flooding. He further indicated that the intensity and frequency of floods have been increasing in the face of climate change, population growth and urbanization. However this view can be criticized as it is not including human behavior on the environment and river management by local authorities and this is a focus of this study.

Dixit (2003) indicated that communities do not live in conditions that are vulnerable to disasters out of ignorance about the hazards or their erroneous perceptions of risk. Instead, most have little freedom to choose how and where they live. Therefore vulnerability is a dynamic process that depends upon the social, economic and political contexts that change overtime, which will consequently affect the probability of loss. These social, political and economic conditions and their interrelationships during normal "times" determine why certain sections of the societies are more vulnerable to disasters than others.

According to Nott (2006), the causes of floods can be divided into physical, such as climatological forces, and human influences such as deforestation and urbanization. The most common causes of floods are climate related, most notably rainfall. Prolonged rainfall events are the most common cause of flooding worldwide. Human impacts on river

catchments influence flood behavior. Land use changes in particular have a direct impact on the magnitude and behavior of floods. Deforestation results in increased run-off and often a decrease in channel capacity due to increased sedimentation rates.

A study conducted by Khandlhela and May (2006), on poverty, Vulnerability and the impact of flooding in the Limpopo Province in South Africa, established that the varying impact of floods on households and the community at large showed that vulnerability to the effects of a flood disaster is an outcome of the interaction between socio, economic and political process. This paper only focused on three types of flood vulnerability which were socio, economic and political. Therefore, it may have missed important aspects of physical and environmental vulnerability which is a focus of this study.

2.4. Socioeconomic impacts of floods on people's livelihoods

Armah et al. (2010), indicated that flooding destroys farmlands which is the main source of livelihood for most families creating a threat to food security. In addressing the flood impacts, the government of Ghana collaborated with international organizations such as United Nation for Development Programmes (UNDP) and World Bank (WB) to implement climate policies to reduce flood impacts such as the development of the National Adaptation Strategy (2012), the National Climate Change Policy (2013) and the National Climate Change Master Plan Action Programmes for implementation (2015-2020). Despite the existence of these policies, flood occurrence continues to exist, impacting and contributing to a lot of structural damages to residential facilities (Rehman et al., 2019). This has implication for practical measures to reduce flood damage on people's livelihoods.

Noy (2009) analyzed disaster effects at a macro level. Amongst the findings presented, disaster effects on economic output are found to be more severe where financial sector development is relatively weak. However, that paper focused on the contemporaneous effects of disasters and therefore may have missed the potentially important effects of financial sector development on the ability of an affected region to recover from disaster which is the focus of this study.

Loayza et al. (2009) indicated that natural disasters have significant effects on economic output in poor countries and not in rich countries, without presenting any evidence as to why this should be the case. Similarly, Raddatz (2007) presented that humanitarian and climatic disasters have persistent negative effects on economic output in poor countries, without exploring the mechanisms behind this finding. Nevertheless, little study has focused on flood impacts on people's livelihoods and this is the focus of this study.

Education as a human right is universal and inalienable and is especially important in enabling people to reach their full potential and exercise other rights. This right does not disappear or get suspended because of disasters and emergencies (Republic of Kenya, 2012a). When education is interrupted or limited, students drop out, with negative and permanent economic and social impacts for students, their families, and their communities. (Matiki, 2005) observed that flooding has a negative impact on school attendance because school children cannot cross flooded rivers. Floods also result in the destruction of water and sanitation infrastructure. This has negative impacts on schools as a result of coming into contact with contaminated water that increases the prevalence of water-related diseases and this leads to chronic absenteeism which hampers learning.

United Nations (UN) (2005) indicated that floods have led to loss of human life, destruction of social and economic infrastructure and degradation of already fragile ecosystems. The UN study further indicated that social impacts include changes in people's way of life, their culture, community, political systems, environment, health and wellbeing, their personal and property rights and their fears and aspirations.

2.5. Conclusion

Overall, from the different studies which have been reviewed, it shows that disasters are increasing in developing countries due to geographical location, urbanization, population increase and poverty. Studies are also showing that floods have negative impacts on socioeconomic livelihoods of people.

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Study area

The study was conducted in Thuchira community at Nkando in Mulanje district, the Southern region of Malawi. The area was selected because it has experienced floods in different rainfall seasons. For instance, the area was affected by 2015 and 2019 floods. The area experiences floods than other areas due no river management by the local authorities, built next to the river with low capacity and low lying area topography enmeshed a long Thuchira river. The following is the map of Nkando community in Mulanje.

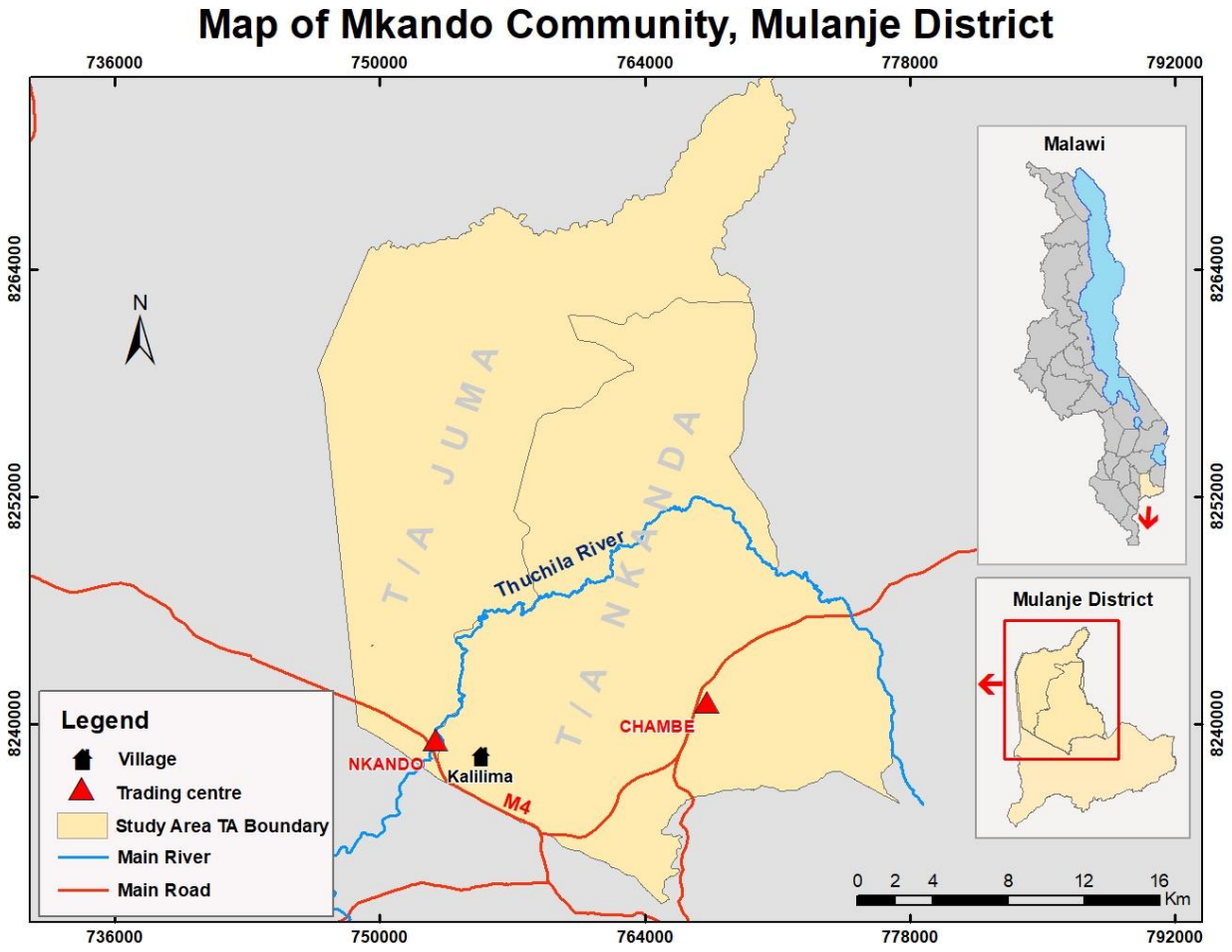


Figure 1 Map of Nkando Community in Mulanje district.

3.2. Study design

Descriptive study design was adopted in this study applying both quantitative and qualitative approaches. In quantitative approach, structured and open ended questionnaire were used to collect the data at household level. This was done to get very reliable and accurate information as those that are vulnerable to flood know the flood risk better than other people due to experience. In qualitative approach, data was collected through interviews with key informants and focus group discussions using a checklist at community levels. The composition of key informants comprised of critical players that have a role in the management of floods at community level and district level.

3.3. Sample selection and size

The sample was made up of eighty seven (87) participants. That is eighty four (84) households and three (3) key informant interviews. To get the individual respondents a multistage sampling technique was used. The first stage was selecting villages which are frequently affected by floods. These villages were; Kalilima, Nsamila, Labana, Nkando and Tambala. This was followed by random sampling procedure to select household from the selected major flood villages of Kalilima, Nsamila, Labana, Nkando and Tambala. Thirdly, a maximum of one respondent was selected from each household and given a questionnaire to answer.

The adoption of simple random procedure was based on the fact that the population was homogeneous in which all members were identical and therefore a sample one was representative of the population regardless of the population. The targeted population were; the chief, district disaster risk management officer, head teachers of basic schools and other option leaders were purposively selected and interviewed.

3.4. Materials and method

The study used both quantitative and qualitative approaches. The study employed both quantitative and qualitative approaches for the purpose of triangulation. The concept of triangulation is based on the assumption that any bias inherent in a particular data source,

investigator and method would be neutralized when used in conjunction with other data sources, investigator and methods. The data sources for this study were primary and secondary data. The primary data included; interviews and questionnaire. The secondary data were existing books, institution documents and internet services.

3.5. Data analysis

Data analysis means the categorization, ordering, manipulating and summarizing data to obtain answers to research questions. Flood impacts assessment on socio-economic livelihoods of people demand an extensive list of data pertaining to the study area, and also it requires information interpretations and decision making. For this study, Statistical Package for Social Science (SPSS) was used to analyze the quantitative data while narrative analysis was used to analyze qualitative data. Data which was gathered were analyzed and presented as percentages in tables, bar graphs and pie charts.

3.6. Conclusion

In conclusion, both quantitative and qualitative approaches were employed for the study. Structured and open-ended questionnaires were used to collect primary data.

4. RESULTS AND DISCUSSION

4.1. Introduction

This chapter provides a discussion on the results of the study based on the objectives of the study. It provides a discussion on the household demographics, livelihood patterns, impact of floods on various aspects, causes of community flood vulnerability, coping strategies, discussion and limitations of the study.

4.2. Results of the study

4.2.1. Household Demographics

The demographic distributions reviewed that out of eighty seven households which were sampled in the study, 69% were male headed and the rest female headed. The demographic also show that 68% of the heads of households were married while 14% were single. Further, 48% of the sampled households have stayed in the area for more than ten years and with 30% stayed in the area for five to ten years. Only 20% of the sampled households agreed that they received warning from government that the area get flooded while 80% did not receive warning. In terms of the ages of the heads of households, the survey findings show that most of them were aged between 20 – 39 (51%) years and 40-59 (30%) years. Refer the table 1 below.

Duration stayed in the area	Sex of household head	Age of household head				Total	Percentage
		16-19 years	20-39 years	40-59 years	Above 60 years		
Less than one year	male	0	5	0	0	5	5.7
	female	0	0	0	0	0	0
Two to five years	Male	4	5	2	1	12	13.8
	female	0	1	1	0	2	2.3
	Male	0	7	4	3	14	16.1

Five to ten years	female	0	9	3	0	12	13.8
More than ten years	male	2	13	11	3	29	33.3
	female	0	4	5	4	13	14.9
Total		6	44	26	11	87	100
percentage		6.9	50.6	29.9	12.6	100	

Table 1. Comparative analysis of household demographics

4.2.2. Livelihood Patterns

The research revealed that the most important livelihood sources were crop production (39%) followed by livestock production (17%) and fishing (13%).Discussions at community levels established that the main source of income for most households was crop production followed by trading and wage labor. The implication is such that since crop production is the main source of livelihood and food, increased exposure to floods will increase their vulnerabilities by compromising their household food security. The figure 2 below shows the community's livelihoods pattern.

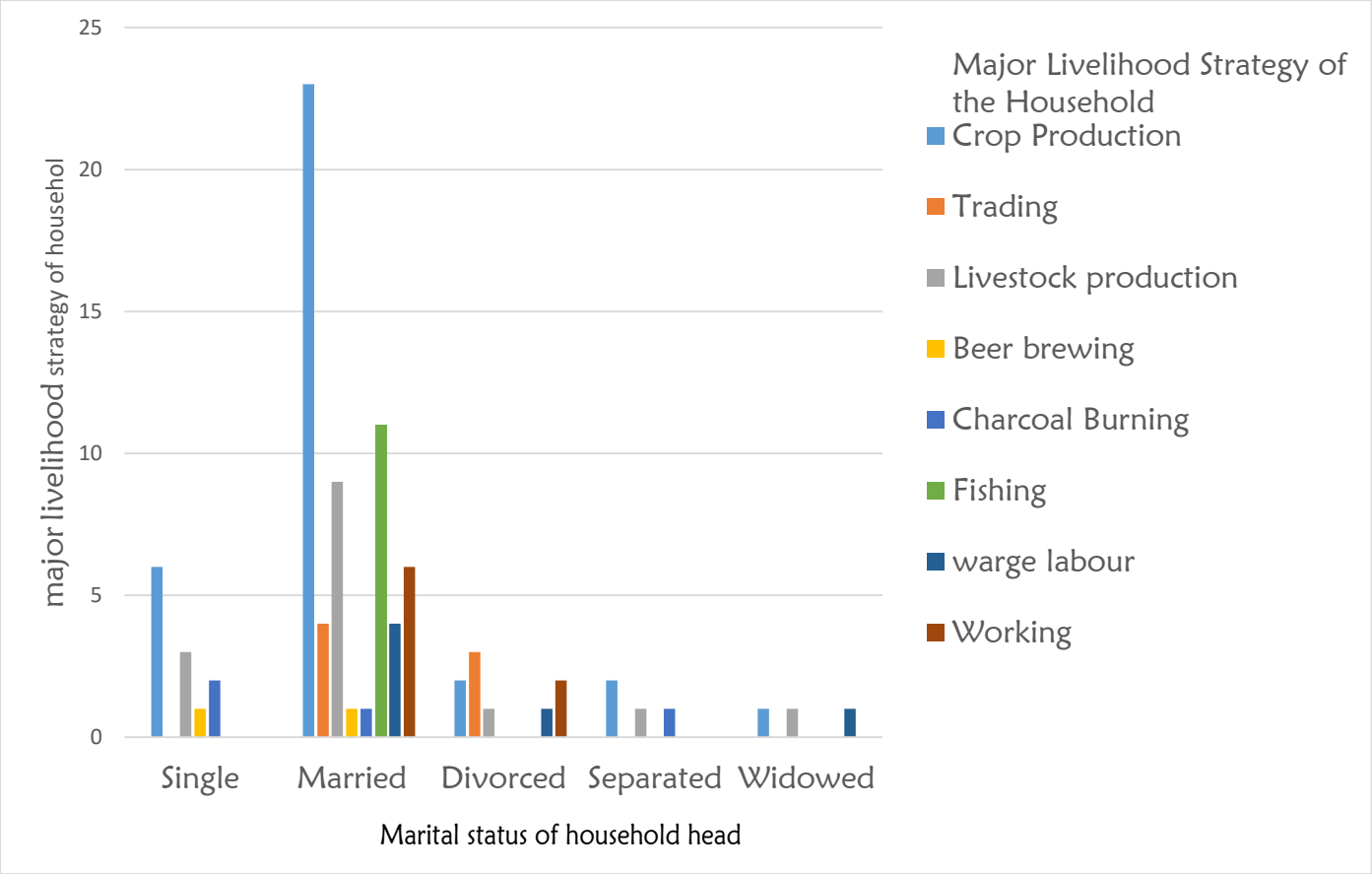


Figure 2. Comparative analysis on the livelihoods types of the Households

4.2.3. Flood Impacts

4.2.3.1 Housing

Among the eighty seven (87) households which were sampled, 55% indicated that their houses collapsed due to excessive impacts of floods while the rest there houses were intact. Out of those whose houses collapsed 55% were forced to be relocated to other areas. Within the number of households who indicated having had their houses affected by floods, 65% were married and 17% were single (refer to the table 2 below).

Marital status of the household head	Number of houses collapsed per marital status out of sampled household (87)	Percentage (%) of the collapsed houses per marital status to the total houses collapsed

Married	31	64.6
Single	8	16.7
Divorced	6	12.5
Separated	2	4.2
Widowed	1	2
Total	**48**	**100**

Table 2 Comparative analysis of the Household Marital status vs. Houses collapsed

4.2.3.2. Property or Assets

The research indicated that assets/ properties were damaged too by floods. Majority of the damaged assets/properties were chairs, hoes, bed, fishing nets and utensils. Some households (36%) indicated that they lost other property such as clothes and blankets. Most of the losses to these assets were due to households' proximity to Thuchila River. Discussions with the communities revealed that some households indirectly lost their assets in that after their houses collapsed, some of the income sources got disturbed. This forced them to sell some assets to raise money to meet other household basic requirements.

4.2.3.3. Agriculture

Seventy-eight percent of the households indicated that their crop fields were damaged by floods of which eighty- two percent was maize (staple crop). This was followed by millet at 14%. This is evidence enough that there was impact of flood on agriculture which is the main source of livelihood and income as discussed under the livelihood patterns (section 4.2.2).

4.2.3.4. Education

All the households which were sampled indicated availability of education facilities in their communities. Out of those sampled, eighty-three percent (83%) indicated that school infrastructure was damaged due to floods and affecting school attendance. The disruption was attributed to various reasons such as roads being impassable and bridges being submerged. This has been shown in the figure 3 below.

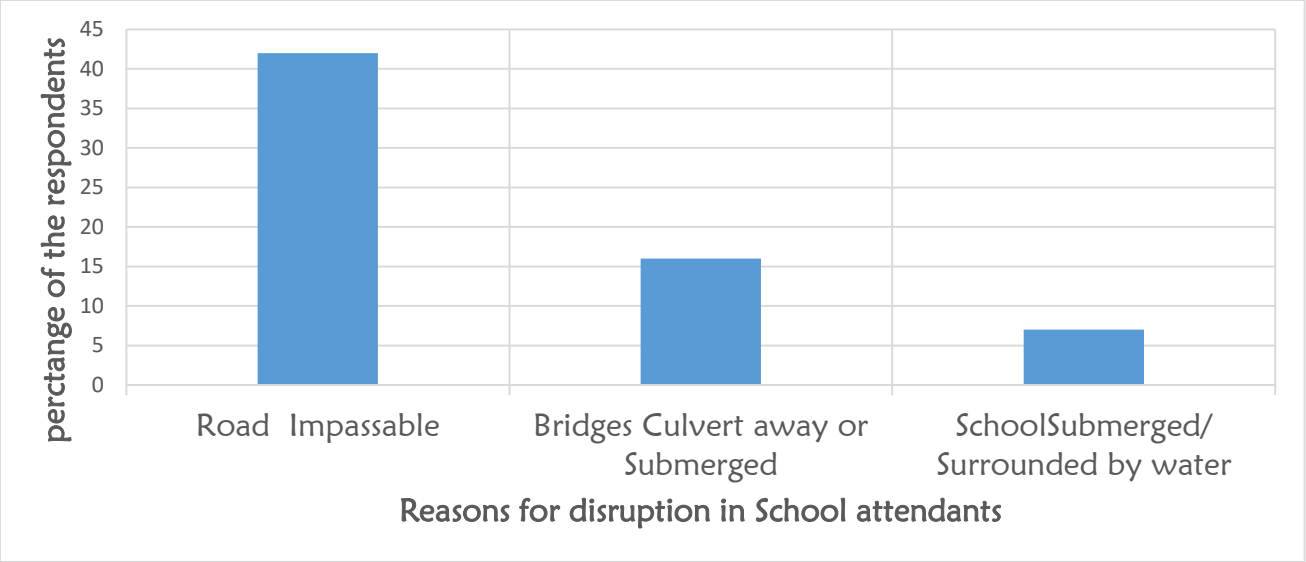


Figure 3. Comparative analysis on the reason for disruption in school attendance

4.2.3.5. Vulnerable groups and Causes of flood vulnerability of the community

The study indicated that out of the household which were sampled, (46%) indicated that children are more vulnerable to floods followed by females. There were varying causes of vulnerability to floods for most people in Nkando community. The fifty-three percent (53%) of the sampled household indicated that no river management by the local authorities is main causes of flood vulnerability while twenty-four percent (24%) of the sample households indicated that built next to the river with low capacity is main causes of flood vulnerability. Low lying area as described by thirteen percent (13%) of the sampled households was also identified as being the main causes of flood vulnerability of the people in Nkando community. This has been presented in figure 4 below.

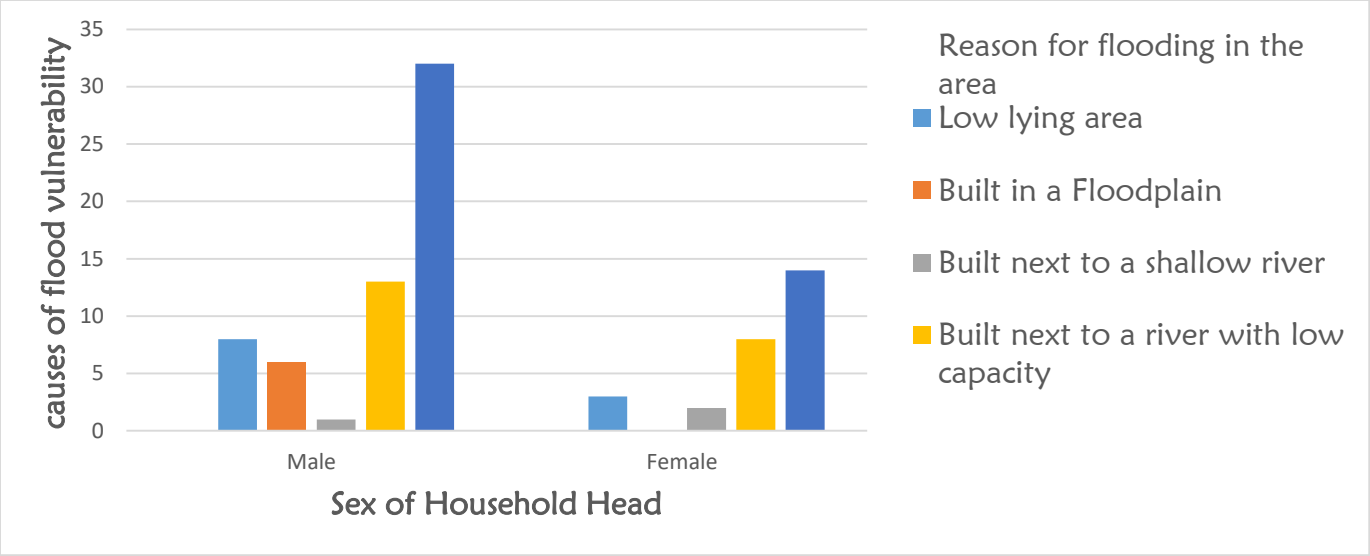


Figure 4. Comparative analysis of the household to causes of flood vulnerability

4.2.3.6 Heath

The research revealed that all the sampled households indicated that health facilities were available at Nkando Trading Centre. Out of the households which were sampled, (30%) had indicated that there was disruption in access to health services due to damaged roads and bridges as a result of floods.

The research also revealed that out of the households which were sampled, 12% indicated having at least one member of their household getting sick during the floods. The most significant diseases experienced among the sampled households were, malaria/fever (33%) and diarrhea (67%).

4.3. Coping Strategies

The research established that sampled households use a range of coping strategies due to the floods. The most important coping strategies were shifting to higher grounds at Thuchila Community Day Secondary School (C.D.S.S) (62%), making furrows and canals (17%), seeking accommodation to relatives that are in safe areas (19%). Two percent (2%) of the sampled households indicated that they climb trees during flooding.

4.4. Discussions of the results

The study indicated that floods have impacts on the livelihoods and critical aspects namely housing and assets, agriculture, health and education of people in Nkando community in Mulanje district.

The major livelihood of the households which were sampled was crop production followed by fishing. The study investigated that over 80% of households had their crops damaged, mainly maize (78%) which is the staple crop and this ultimately resulted into food insecurity at household. This study findings concurs with Armah et al. (2010) who indicated that flooding destroys farmlands which is the main source of livelihood for most families creating a threat to food security.

Housing which were near to Thuchira River and built with low capacity were damaged and the other households were forced to be relocated to other areas. The results also established that households lost a number of assets (both directly and indirectly) making them more vulnerable. The study findings further indicated that, health facilities were affected by the floods due to due to impassable and damaged and/or submerged bridges. Flooding also led to disease outbreak (mainly diarrhea, malaria/fever) at household level

The education (teaching and learning) was disrupted due to impassable roads and damaged infrastructure. Sometimes school being submerged by water. This study findings is contrary to Republic of Kenya (2012a) who reported that education as a human right is universal and inalienable and this right does not disappear or get suspended because of disasters and emergencies. However the study findings are in agreement to Matiki (2005) who observes that flooding has a negative impact on school attendance because school children cannot cross flooded rivers.

The results also show different causes of people's flood vulnerability. These include cultivation along river banks which is increasing the river siltation, residing in flood prone areas, lack of alternative livelihoods and building houses with low capacity. The study findings concurs with Nott (2006) who indicated that human impacts on river catchments influence flood behavior. Land use changes in particular have a direct impact on the

magnitude and behavior of floods. Deforestation results in increased run-off and often a decrease in channel capacity due to increased sedimentation

The results further show that the main coping strategies employed by households were shifting to higher grounds at Thuchila Community Day Secondary School, climbing in trees and seeking accommodation to their relatives who are in safe areas. It is clear from the findings that these coping strategies are not very effective.

The overall objective of the study have to a large extent been realized. Government, NGOs and Disaster Risk Management (DRM) Stakeholders should implement the recommendations proposed in this study.

4.4. Limitations of the results

The study had some limitations as provided below;

1. The sample design did not take into consideration gender balance as more male headed households (69%) were sampled as compared to female headed households (31%).
2. Data access (Key informant interview) was a challenge as some critical players in DRM were reluctant to give the data.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter presents the conclusion and recommendations of the study. The conclusion and recommendations of this research are based reteach objectives and results. The conclusion and recommendations are outlined below:-

5.2. Conclusion

From the discussions under different sectors, it is evidence enough from the study that floods had great impact on the socio-economic status of livelihoods for people in Nkando Community. The study has shown that livelihood patterns play an important role in settlement patterns of people in Nkando community. Residing in flood prone area and no river management by local authorities were identified as being the main causes of flood vulnerability of the people in Nkando community. Out of eighty-seven sampled households, (78%) indicated that their crop fields were damaged by floods of which most of it (82%) was the main staple crop (maize) leading to food insecurity. Further, the study demonstrated that flood affects health services negatively as roads become impassable and in some cases flood causes an outbreak of disease like malaria/diarrhea. In addition, school attendance was disrupted due to impassable roads as school children cannot cross the flood river.

From the study, it was shown that households cope differently when affected by floods. The current coping strategies being employed by most households are not very effective. Discussions at community and district levels established that the coping strategies were not sustainable because they had been using them and yet the situation did not seem to improve. The focus must be on improving livelihood conditions of the people. The communities should be encouraged to build houses using durable materials and away from the flood prone area as a way of coping with the floods.

The outputs of this comprehensive impact assessment study on the socio-economic livelihoods of people are key inputs in the designing of sustainable mitigation measures to minimize the socio-economic impact of floods. More importantly, the study covered different dimensions of flood impacts to present evidence on why flood has negative

impacts on socio-economic livelihoods of people. The study explored behind this mechanisms by looking at the impacts of floods on housing, assets/properties, agriculture, health and education. Contrary to Loayza et al. (2009) and a study conducted by Khandlhela and May (2006), showed that vulnerability to the effects of a flood disaster is an outcome of the interaction between socio, economic and political process. These papers only focused on three types of flood vulnerability which were socio, economic and political. Therefore, it may have missed important aspects of physical and environmental vulnerability which was a focus of this study.

5.3. Recommendations

5.3.1. Policy considerations

The following policy considerations are recommended and if implemented could play an important role in flood risk management. Therefore, Government, NGOs and Disaster Risk Management (DRM) Stakeholders should implement the recommendations proposed in this study.

1. Government and key Stakeholders should engage the communities and local authorities in making them aware of the flood risk in view of the climate variability.
2. Village Civil Protection Committees (VCPs) should be trained on the management of disaster risks.
3. There should be a deliberate policy to compel communities especially in rural areas to build house using durable materials and away from the flood prone areas.
4. Channelization of Thuchila River at Nkando community should be considered.

4.3.2. Consideration for further research

1. There is a need for more research into the human adjustment to the flood hazard in terms of the behavioral responses to floods. The aspect of early warning and how the information is utilized should be investigated.
2. There is need for further investigation on the effectiveness of the area and village civil protection committee on disaster risk management.

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6. APPENDIX

7.1. HOUSEHOLD SURVEY QUESTIONNAIRE

District Name :
Constituency Name :
Ward Name :
Community Name :
Questionnaire ID :
Date of Interview :

A. Household Demographics

Sex of Household Head	Male	
	Female	
Sex of Main Respondent	Male	
	Female	
Age of Head of Household	Below 15 years	
	16 – 19 years	
	20 – 39 years	
	40 – 59 years	
	Above 60 years	
4. Marital Status of household head	Single	
	Married	
	divorced	
	Separated	
	Widowed	

B. Flooding Background of the household

1. How long have you stayed in this area?

1. Less than 1 year	
2. Two to five years	
3. Five to ten years	
4. More than ten years	

2. Were you warned that the area gets flooded before by the district council?

Yes.	No.

3. What prompted you to come and stay in this particular area?

1. To be next to work	
2. To be next to relatives and friends	
3. It is cheaper to stay here	
4. To have my own place and not stay with parents	
5. I had nowhere to go	

4. How frequent is flooding in your area?

1. Once a year	
2. Twice a year	
3. Thrice a year	
4. Very frequent	
5. No flooding	

C. Livelihood Patterns

1. What is the major livelihood strategy of your household? (Rank 4 of them)

1. Crop Production	
2. Trading	
3. Livestock production	
4. Beer brewing	
5. Charcoal Burning	
6. Wage labor	
7.fishing	
8. Other; specify	

2. Indicate secondary livelihood strategies of your household (more than one answer possible)

Livelihood Strategy	Yes	No
1. Crop Production		
2. Trading		
4. Beer brewing		

5. Fishing		
6. Charcoal Burning		
7. Wage labor		

C. Flood Impact on Socioeconomic activities

I. Housing

1. Did your house collapse due to floods?

Yes.	No.(go to III.1)

2. Did the collapsing of the house force you to relocate to a new area?

Yes.	No.

II. Property/ Asset

1. Did the house lose any of the following property or asset?

Property/asset	Yes	No
1.Bed		
2.Fishing Net		
3.Bicycle		
4.Television		
5. Chairs		
6.Radio		
7.Hoe		
8. Others; specify		

III. Agriculture

1. List three main staple crops that you grow:

1.	2.	3.

2. Did the household experience crop damage during the floods?

Yes.	No.

3. Was the main staple crop the one which was damaged?

Yes.	No.

4. Did the household experience any loss of food stocks during the floods?

Yes.	No.

IV. Education

1. Are there any education facilities in your area?

Yes.	No.

2. Was there any damage to school infrastructure (classroom blocks, teacher's houses, toilets) due to the floods?

Yes.	No.

3. If you have school going children in your household, did they experience any disruption in an attendance due to the floods?

Yes.	No.(go to V.1)

4. If the answer to IV.3 above is yes, why? (Indicate main reason)

1.Road Impassable	
2.Bridge Culvert washed away or Submerged	
3.School submerged/ surrounded by water	

V. Health

1. Are there any health facilities in your area?

Yes.	No.

2. Was there any damage to health facilities due to the floods?

Yes.	No.

4. Was there any disruption in access to health services due to the floods?

Yes.	No.

5. Did any of the household members get sick during the floods?

Yes.	No.

6. Which of the following diseases were experienced by the household members who got sick?

1.Diarrhea	
2.Malaria/ Fever	

3.Others Specify	

D. Vulnerable Groups to Floods

1. Who are the most vulnerable households to floods?

Male head	
Female head	
Children	
Other ,specify	

2. What do you think is the reason for the area to flood than other neighboring areas?

1. Low lying area	
2. Built in a floodplain	
3. Built next to a shallow river	
4.Built next to a dam with low capacity	
5. No river and dam management by local authorities.	

E. Coping Strategies

1. What are the main coping strategies that you employ during floods? Rank them in order of importance.

1. _____
2. _____
3. _____
4. _____
5. _____

2. Are the above coping strategies effective?

Yes.	No.

7.2. KEY IMFORMANT INTERVIEW FORM

District Name :

Date of Interview:

Name of interviewee/s (To be administered only to key district officials, NGOs and community members).

NAME	ORGANISATION	POSITION

A. Economic status of the district/community

1. Describe the economic status of the district/ community.

_____
_____
_____

2. What are main economic activities that are common in the district/ community?

_____
_____
_____

B. Flood impacts on socioeconomic activities in the district/ community.

1. What are the effects of the flood on the following socioeconomic activities in the district/ community? (probe both positive and negative effects)

Areas	Level of Effect 1 = No Effect 2 = Moderate 3 = Severe	Comments/ Reasons
Agriculture		
Education		
Road Transportation		
Health		
Trading		

2. How can you describe the impact of the floods on people's livelihoods in the district/ community?

_____
_____
_____

C. Underlying Causes of flood vulnerability of the people in the district/ community.

1. In your view what are the underlying causes of flood vulnerability in the district/ community? (Elaborate).

_____
_____
_____
_____

2. Who are the most groups of people in the district/ community that are more vulnerable to floods? (Give a reason for your answer)

_____
_____
_____

3. Coping strategies of floods in the district/ community

1. What are the development option that might address the flood patterns in the district/ community? (provide both short and long term)

Long term	Short Term
1	1
2	2
3	3