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KNOWLEDGE, ATTITUDE, AND PRACTICES OF PEOPLE TOWARDS SETTLING IN RISK RIPARIAN LOCATIONS AT THE TOKWE MUKOSI DAM.

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DEDICATION

All the work contained herein is dedicated to my parents Mr and Mrs Huni, my beautiful sisters Tariro, Chido and Shamiso also a special dedication to my best friend Lynet Lamack and my sweetheart Tendai Mamire for their unwavering support to my education financially, morally and emotionally. May the Lord continue blessing them.

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A special gratitude to Chief Chivi who happily allowed and gave me permission to carry out my research project among the people at Tokwe Mukosi. Also, a special thank you to my supervisor Mr. Tendai Nyamugure for patiently guiding, encouraging, advising and correcting me throughout the journey, and until the end of this research project. Above all, I would like to thank the Almighty God who continues to guide and protect us in our day to day activities.

ABSTRACT

Riparian locations deliver a range of ecosystem purposes and services such as wetland products, recreations and tourism. Therefore, this is why people chose to live in such areas for agricultural purposes and also fishing. Living in riparian locations such as the people staying in the riverine areas of the Tokwe Mukosi is associated with a lot of risks and dangers that is for example floods and waterborne diseases. The main objective of the study is obtaining information about the knowledge, attitude and practices of the people towards their settling in the risk riparian locations. The research method used in the study is a qualitative design because paradigm is flexible and suitable in capturing behaviour and perceptions of research participants. A questionnaire was designed that consisted of both open and closed ended questions. The questionnaire prepared by the researcher consisted of four parts; the first part which is to collect information about the demographic characteristics of respondents, the second part consisted of question covering aspects of knowledge regarding flooding risks, third part consists of attitude of workers in regards to hazards and the last part which is the fourth part that consist of practices of the workers in a way to ameliorate the risks which emanate from hazards and measures they put in place to ameliorate the risk. knowledge on flood hazard and risk by respondents staying near Tokwe-Mukosi Dam. The results showed that nearly 80% or respondents confirmed the area had experienced floods, with 75% acknowledging that the emergency preparedness and response personnel were fully knowledgeable with regards to flooding. The major risks which the respondents were prone to were floods (70%), bilharzia (55%) and typhoid (4 0%). However, most respondents (68%) considered the benefits of staying near the dam to outweigh the risks. The total knowledge score of 4.07 which converts to 40.7%. Also the respondent's attitudes towards flood hazard and risk around Tokwe-Mukosi Dam showed that most respondents regarded flooding interventions as necessary (67%), and perceived emergency preparedness and response programmes as costs to the local authority (55%). However, most respondents did not think flood trainings were a were waste of money (54%). The majority of respondents believed they were safe if floods occurred (75%), though they perceived the dam to enhance malaria (78%) and bilharzia (73%), hence were willing to relocate to areas not prone to floods (76%). Total attitude score was 5.59 which converts to 55.9% which was rather fair. More so, the majority of respondents confirmed that flood prevention procedures were being followed by every resident (68%), with most respondents having measures to avoid loses in the event of a

flood (74%). In addition, most respondents participated in flood consultation (80%) and attended workshops on flooding (72%) In order to avoid bilharzia and malaria, most respondents boiled water before drinking (84%) and used mosquito nets (78%) respectively. Overall, total practice score was 7.16 which converts to 72%.

Conclusion suggested that most respondents had a high knowledge on flood hazard and risk and were aware of the major risks they were prone to. Such awareness aids in flood preparation and respondent are more likely to take precautionary actions and follow emergency procedures. The attitude of the people showed that majority of respondents regarded staying close to the dam as beneficial as it provided them with potable water, fishing, irrigation, and recreational opportunities. Lastly three quarters of respondents had measures put in place to avoid loses in the event of a flood attributed to better knowledge on flood hazard and risk they acquired from participating in awareness campaigns and flood consultations.

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CHAPTER ONE

1.1 Background of study

To begin with, riparian areas act as an essential interface between aquatic and terrestrial ecosystems and it offers ecological corridors for the migration of people and wildlife. Riparian locations also deliver a range of ecosystem purposes and services such as wetland products, recreations and tourism. Therefore, this is why people chose to live in such areas for agricultural purposes and also fishing. Riparian zones are frequently defined by vegetation communities along stream banks. Floods are measured as an overflow from the river or a water body that can end in damage therefore it is a natural disaster. These floods can be of advantage to the river and the riparian area but they cause harm to human structures and activities. Due to settling in these riparian zones, it can cause damages to human in that area and therefore their lifestyle changes.

Effects of floods have elevated due to a couple of factors such as rising sea level and also activities that people engage on the riparian zones. In the world most cities, the problem of floods is swiftly growing. Riparian areas have been altered due to people using the land whichever way they want to. Due to human activities these areas are now risky to human life and wildlife and property. For example, in Nigeria a city called Ibadan ,has faced countless flood incidents and these floods often transpire in August due to deforestation of some wetlands and riparian forest .Again the southwestern United States that is before the European pioneers ,the minor population masses directed to minimal and limited effects in the riparian areas and the people increased throughout the 16^{th} century ,and the rise in people headed to important growth in the use of riverine areas with negative effects on their value. Again, in the United States, it is assumed that sixty-six percent of these riparian areas have been turned into new land uses mainly agriculture.

It is assumed that human activities have mostly caused damage to riparian locations that the people that stay there are the ones who engage in some activities that cause the damage. In Arizona and New Mexico, it is believed that riparian locations have been lost due various uses of land. However, people have settled in riparian locations because of its benefits and this can be of great danger. There are number of reasons why people choose to continue staying in those areas, some of the reasons could be they lack adequate knowledge about the

dangers of the area or their culture and beliefs prohibit them from going anywhere. Floods are mostly likely to occur and this could take the lives of other and also destruction of infrastructure.

Since a riparian location is a land adjacent to a water body, people want to settle there for their own advantage since they can do their farming activities there. A healthy riparian ecosystem is essential to maintain water quality and biological reliability in surface water system. Even though its importance, natural disasters such as flooding usually occur and cause a huge damage. For example, in Africa there is the Njoro and Kamweti River in Kenya and people stay in the riparian areas together with their livestock. The community practice agriculture and also provide their livestock shelter. However, activities along the riparian location of the river such as enlarged human and livestock population growth, unexpected settlements, increase in agricultural activities and cutting of vegetation can lead to land degradation and the soil may lose its fertility. These are negative impacts on the riparian location caused by the community that is anthropogenic activities that people do without knowledge on the damages they might cause.

Therefore, in 2014 heavy rains hit southern parts of Masvingo in Zimbabwe and that rising water endangered to sweep away the dam wall leading to floods. There was a national disaster that lead to people being homeless, landless and poor. What happened at the Tokwe Mukosi was not wholly the government's fault but also the people were somehow to blame? Despite of this some people continue to live in the risky riparian location due to dangers not knowing how dangerous it is or not having adequate information about the dangerous and also their attitude and practices may be a problem. This study therefore pursues to determine the knowledge, attitudes and practices of riparian communities in the study area

A KAP study is used to collect data on a certain population's knowledge that is what they know, their attitude which is what they think and their practices that what is done about certain topics. The information is obtained through various methods such as interviews in order to obtain the information from the community.

1.2 PROBLEM STATEMENT

Due to people settling in risk riparian locations at the Tokwe Mukosi dam in Masvingo, it has caused a lot of damages and loss of lives together with livestock. Despite some people being relocated to safer areas others still are not willing to move and relocate to safer locations. The

dangers associated with staying at the riparian area include flooding which can lead to destruction but not everyone is willing to move. Some people resist change and believe they are comfortable with where they live even though it's quite risky. Even though what happened in 2014 which lead to the resettlement of some families to the Chigwizi area but resistance was faced during this period. Resettlement is a compound and multifaceted phenomenon regularly used by governments to then transfer communities from supposed unsafe conditions to new places (Montreux et.,2018). (Ferris ,2014; McMichael et al.,2019) Certain people continue to resist resettlement even though living in the riparian location has shown its dangers. This may owe to their lack of knowledge or poor attitudes that may affect their practice.

After observing the risks of living on the riparian location at Tokwe Mukosi the aims of this study are to observe how knowledgeable the people are in the riparian community on the issue of settling in risk riparian location, how well they value or believe on settling in that location and also the practices done in order to protect themselves.

1.3 RESEARCH AIM

To assess the knowledge, attitude and practices of people towards settling at risk riparian locations at Tokwe Mukosi.

1.4 OBJECTIVES

1. To determine the knowledge of the people towards settling in risk riparian locations at the Tokwe Mukosi.

2. To evaluate the attitude of the people towards settling in risk riparian locations at Tokwe Mukosi.

3. To determine the practices of the people towards settling in risk riparian locations at the Tokwe Mukosi

4. To determine factors affecting resettlement of people in risk riparian locations at Tokwe Mukosi to safer locations.

1.5 RESEARCH QUESTIONS

1. What knowledge do the people at Tokwe Mukosi have towards settling in risk riparian locations?

2. What attitude do the people at Tokwe Mukosi show towards settling in risk riparian locations?
3. What practices are being done at Tokwe Mukosi towards the settling in riparian locations?
4. What might be the factors affecting the resettlement of people at risk riparian locations at Tokwe Mukosi?

1.6 JUSTIFICATION

The problem of people living in the riparian locations of Tokwe Mukosi is an issue that needs to be addressed by the government to avoid the people being affected by disasters that occur in the riparian location. The government is going to benefit from this study as it will obtain information on the community that live there. Having an understanding on the knowledge, attitude and practices of the people towards their settling in risk riparian locations might help provide essential information about the people and how to change their minds about resettlement and also giving. them. enough knowledge about how unsafe the area is. It is important to explore the reasons behind the people settling in that area and also how well they know about the area, their attitude towards their settling their and practices done towards their settling there.

This study might help since the local authority will find a way on how to transform the mind-set of the community and make the people realise on the importance of relocating to risk free areas. Since a national disaster once occurred at the dam when the dam wall collapsed due to heavy rains and resulted in flooding which caused damage. It is possible that this might probably happen again therefore it is very important for the government to take note of this research and have some information on the people living in the riparian area and address the situation in a proper way. It is important to carry out this study in case there are also people in the country that live close to dams and are prone to danger therefore this study can help the community and government on certain information on how to address the issue of people living such locations and the measures need to be done.

1.7 CHALLENGES

Since this research involves having to give some of the villagers living in the riparian location questionnaires it is a challenge because some of them do not know how to read and also the villagers have an attitude towards people who want to question them about their staying there.

More so, the people are afraid to answer to anyone as they fear being moved without their concern therefore they are not friendly and the researcher has to exercise patience towards the villagers in order to make them participate.

CHAPTER 2

LITERATURE REVIEW

2.1 RIPARIAN LOCATIONS

To begin with a riparian is known as vegetation, environments, or ecosystems linked with bodies of water for instance tributaries, springs and ponds or be determined by insistent or asymmetrical surface or subsurface water. Moreover, riparian areas are the green ribbons of trees, bushes, and herbs developing along watercourses. Again riparian structures that we appreciate consist of the cottonwood groves where we picnic alongside sandy riverbeds, the green, cool regions following the stream where we like to fish, and wetlands with ducks, tadpoles, and dragonflies. Also T. G. Parmenter, I. S. Tarboton, and C. Koich discovered that riparian areas were measured to be affected by stream dynamics that is flooding and supervision of riparian areas can itself distress the value and magnitude of adjacent water that is through nutrient transfer. In the study, if there was any uncertainty around what was to be elaborated within the riparian area, it was taken as being land up to 10 meters away from stream banks either side of a water body.

2.2 KNOWLEDGE OF PEOPLE TOWARDS SETTLING IN RISK RIPARIAN LOCATIONS

Traditional knowledge is a cumulative corpus of expertise, awareness and beliefs, traditionally handed over generations, describing the interactions of living organisms among themselves and with their environment (Berkes et al). Originating from everyday interactions with the environment (Fabricius & Koch,), it underlies a knowledge of ecosystem processes at temporal and geographical scales that would be impossible to document by standard scientific investigation (Huntington). Traditional knowledge may consequently lead efforts towards the preservation of habitats, supporting conservation initiatives at the species level (Huntington, Rajamani) According to Patricia M. Candelaria1 and Raul G. Bradecina nearly all of the domestic defendants are attentive to the presence of the riparian environments in their localities. Though, after being displayed on atlases, 28% of them might accurately identify the rivers they claim to be aware on the map. As respects the knowledge of household respondents on the advantages of rivers to the communities, 31% or one third are aware that farmers and fishermen are benefitted by the rivers and tributaries in their communities. As respects the awareness of the household respondents that poor communities

would be most obstructed if rivers and its tributaries will dry up or lower its water volume, more than one half or 61% are aware that poor communities will be harmed if rivers drop its water volume.

These indicate that majority of the households along the riverine communities of Goa are aware of the existence of the riverine ecosystems in the area but are not well-informed enough of their names and their detailed geographic locations. This could be explained by the inadequate information on the riverine ecosystems that can be communicated to the households. The lopsided proportion of positive response between the benefit of the river to the farmers and fishers, and the negative effect of the reduction of river water volume to the community reflected the pervasiveness of the threat of degradation of the riverine ecosystems in Goa which invited the relatively higher proportion of concerned household respondents to the perceived effect rather than the benefit from the river. Importance of water to human life cannot be over stressed; consequently, water pollution may create pandemic. of illness as well as early death, not only among human beings but also among other living creatures. Water contamination may impair productivity since no manufacturing can take place without water. In many regions of Nigeria, particularly in the riverine areas water is their major source of livelihood since they are largely into fish farming.

The demand for fresh water is swiftly expanding at a larger pace around the globe. However, current information suggests that 1.2 and 2.4 billion people suffer from lack of adequate water supply and secure sanitation correspondingly. In Nigeria more than half of the population is impacted Oladapo (2012). Ilaje and Eseodo local governments are one of the most populous local governments in Ondo State with a population number of two hundred and seven thousand and fifty-four (207, 054) Nigeria Policy Commission (2014). (2014). It has a coastline living stretching over 280km (Bent) the longest coast line in Nigeria crude oil producing zones. The local supervisions which were founded by the federal government on October 1, 1996, comprise of about six hundred (600) towns and villages. One of the primary environmental problems that people living in riverine regions are confronting is water pollution. In Ondo State, Ilaje and Eseodo are the two biggest local governments in the riverine regions, and the primary environmental alarms confronting the area is water pollution. As the industrial revolution that begun in 19th century continued, water contamination became a big concern. Factories found water sources, mostly rivers, a convenient method of waste disposal chemical from farms, especially big farms made its way

back to the river; consequently, there are many variables that lead to water pollution. The assumption that oil drilling is the sole significant cause of pollution in riverine regions in Nigeria is not entirely accurate. Human causes which are gradual always impact or contaminate water. In Nigeria particularly among the population of riverine region, there is a notion that water contamination in the area is typically as a consequence of oil drilling going on in the area. Many are not aware that other human causes also contribute to water contamination in the region.

2.3 ATTITUDES OF PEOPLE TOWARDS SETTLING IN RISK RIPARIAN LOCATIONS

An attitude toward a notion is described as a person's overall sentiment of liking or disfavour towards that idea (Ajzen and Fishbein 1980). A person who feels that executing a certain conduct will lead to beneficial consequences would have a pleasant attitude towards completing the behaviour. In average, more than half of the household respondents indicated agreement on all factors employed that represented their sentiments supporting riverine governance. Patricia M. Candelaria and Raul G. Bradecina estimate that the majority of the families in the communities situated adjacent to the riverine ecosystems of Goa display a great attitude toward the sustainable governance of the ecosystems. The variables used to capture attitudes towards riverine governance enclosed aspects of ecosystem governance such as local knowledge, access of all stakeholders to decision-making, mainstreaming marginalized sectors in ecosystem governance, resources, environmental services with direct and indirect benefits to society, monitoring and law enforcement, and livelihood. The relatively large loadings on the agreement scale among the answers to these variables appear to imply the presence of the propensity for acceptance among households of the favourable anticipated effects from these features of riverine governance that affected positive attitudes. This preservation in the choice to skip the "strong agreement" answer with a rating of 4 appeared to explain the predicted comprehensive knowledge on these areas of ecological governance that would need substantial effort in public education among families in the future. Among the attitude variables employed, two reported the greatest percentage of agreement: (1) local knowledge and practices are not useful in riverine planning and management (73%), and (2) both fish and crops are equally essential to consider in riverine management (74%). The former observation appears to imply the respondents' quiet desire

for evidence-based decision-making in riverine ecosystem management, separate from the existing taboos and conventions that regulate the present practices of most of the families in the region. The second observation is likely to imply the respondents' subtle appreciation for a comprehensive strategy for riverine governance that balances the use of water for preserving the population of fish stocks in the river with the usage of water.

T. G. Parminder, I. S. Tarboton, and C. Koich undertook a study of 60 farmers to discover their approaches towards riparian management concerns and the principles they used to make judgments about riparian management techniques. Most farmers showed varied views towards maintaining the riparian region, incorporating features of density farming and preservation agricultural. Burden agricultural existed as resulting in difficulties with erosion, silt, swampy places, and a lack of animal safety. Conservation farming was thought competent to give better agricultural profitability and more biodiversity. Farmers picked riparian management approaches that they felt would lessen the difficulties created by pressure farming and get the advantages of conservation farming. Adoption of new technologies would only take place if the innovations were regarded as viable and did not raise managerial complexity. An understanding of farmers' perceptions about managing riparian areas can help policy agencies target educational interventions encouraging farmers to improve the sustainability of their resource use.

2.4 PRACTICES OF PEOPLE TOWARDS SETTLING IN RISK RIPARIAN LOCATIONS

Based on the journal written by Patricia M. Candelaria and Raul G. Bradecina, the practices of a large proportion of households' responses relative to the utilization of riverine resources as documented by this study reflected the most common unsustainable behaviours of resource users directed at riverine ecosystems. It was discovered that the practices adopted by families in the riverine ecosystems of Goa are dominantly extractive in character, with 30% of the household respondents identifying the practice of quarrying, followed by domestic activities, which represented 18% of the replies. Quarrying or sand mining in rivers by families motivated by the need for sand owing to the change to building concrete dwellings as an adaptation strategy to the rising frequency of typhoons in the region could possibly endanger river bank stability. Hackney et al. (2020) offered empirical data to indicate that when the

rate of sand extraction due to sand mining overtakes the pace at which the yearly sediment load is transferred from upstream to replace the sand in river beds, the river beds may be adequately lowered. This may cause river bank instability, possibly destroying buildings and infrastructure and jeopardizing life. Aside from quarrying, other unsustainable behaviours have also been reported, such as the dumping of waste into rivers and fishing utilizing electric fishing and poison fishing techniques, as verified by 49% and 45% of the respondents, respectively. The literature in resource management and conservation often enlightens the attitude toward natural resource management as a tendency to implement certain sustainable resource management techniques. However, the present practices of families in Goa looked to be at variance with the pervasive mind set for riverine administration in the region. This remark is in parallel with the research by other academics in Malaysia who have typically concluded that the attitude of the people towards the environment or their degree of care for the environment was high; nevertheless, it was not in conjunction with sustainable behaviours. (Aini et al., 2006).

Most townships and urban centres in the emerging nations of South Asia are now classified as popular flood risk areas (M.A.U.R. Tariq). Similarly, this is also being observed in Africa since most of the metropolitan centres in this region are situated near flood-risk regions. Urbanization in these developing nations and the concomitant rapid expansion of people living in cities have led to an expansion of unplanned and unregulated land development activities (D. Mu et al.). These activities, which notably involve floodplains in the cities, might significantly enhance the flood danger to life and damage to property. Due to the increasing unplanned development, notably the cities in South Asia and Africa (G. Di Baldassarre et al.) have suffered an equal rise in the number of deaths attributable to floods. Accordingly, this has been identified as one of the biggest challenges for flood risk management and mitigation in the cities of these developing countries. The conventional approach to mitigate flooding has primarily involved a structural approach to modify flood characteristics. (F.Y. Teo)

Whilst structural mitigation measures may lower flood levels and extents, without effective floodplain planning, the advantage from the structural works is lost owing to increasing flooding from unplanned development. Based on the experiences of the developed nations,

there is a need to consider flood risk in designing future development plans to make cities more resilient and sustainable, practically with a set of principles for managing floodplain development (B. Caddis et al.) It is envisaged that the ideas employed in the recommendations be implemented into a national strategy for floodplain development, which demands that the authorities produce clear, resilient, and forward-looking strategic plans. Thus, with smart design and the best management of floodplains in these places, the danger connected with floods may be avoided. The South Asian area has a long history of floods. Floods are of different types, notably flash, coastal, riverine, hill torrential, etc., which have been acknowledged as responsible for the erosion of land masses. It further deteriorates the infrastructure, vegetation coverings, and crops. (K. Zhang et al.)

Further, the destruction increases water contamination and causes water-borne illnesses that end up in the form of epidemics in the flood-impacted regions. Losses of human lives and animals, higher commodities prices, instability, turmoil, and outlays for rebuilding infrastructure are the additional layers of hardship a state has to bear after the floods are over. Above that, the resources earmarked for disaster management as a swift reaction to assure rescue, give relief, and undertake urgent recovery operations are also necessary (M. Ghatak et al.) Amongst natural calamities, the biggest financial losses with the highest mortality tolls have been observed during floods (N.E. Alias et al.). Unfortunately, this trend goes worse when it comes to the less developed industrial-based and low-human development index countries. In spite of dedicating considerable resources, flood mitigation measures in these countries are still not proving adequate. According to Stewart et al. (2005), Luce and Holden (2009), Safeeq et al. (2013), higher and more variable winter flows (Hamlet and Lettenmaier 2007; Hamlet et al. 2013), and potential shifts in vegetation composition and abundance (Dwire and Mellmann-Brown 2017). Manage upland vegetation to reduce risk from large-scale, high-severity fire in riparian areas (e.g., with thinning and prescribed fire) (e.g., with thinning and prescribed fire) restore riparian obligate species. promote appropriate livestock grazing management and proper use standards. Reconnect floodplains and side channels to improve hypothetic and base flow conditions. Manage for highly functioning riparian areas that can mitigate high flows.

CHAPTER THREE

TOKWE MUKOSI LOCATION

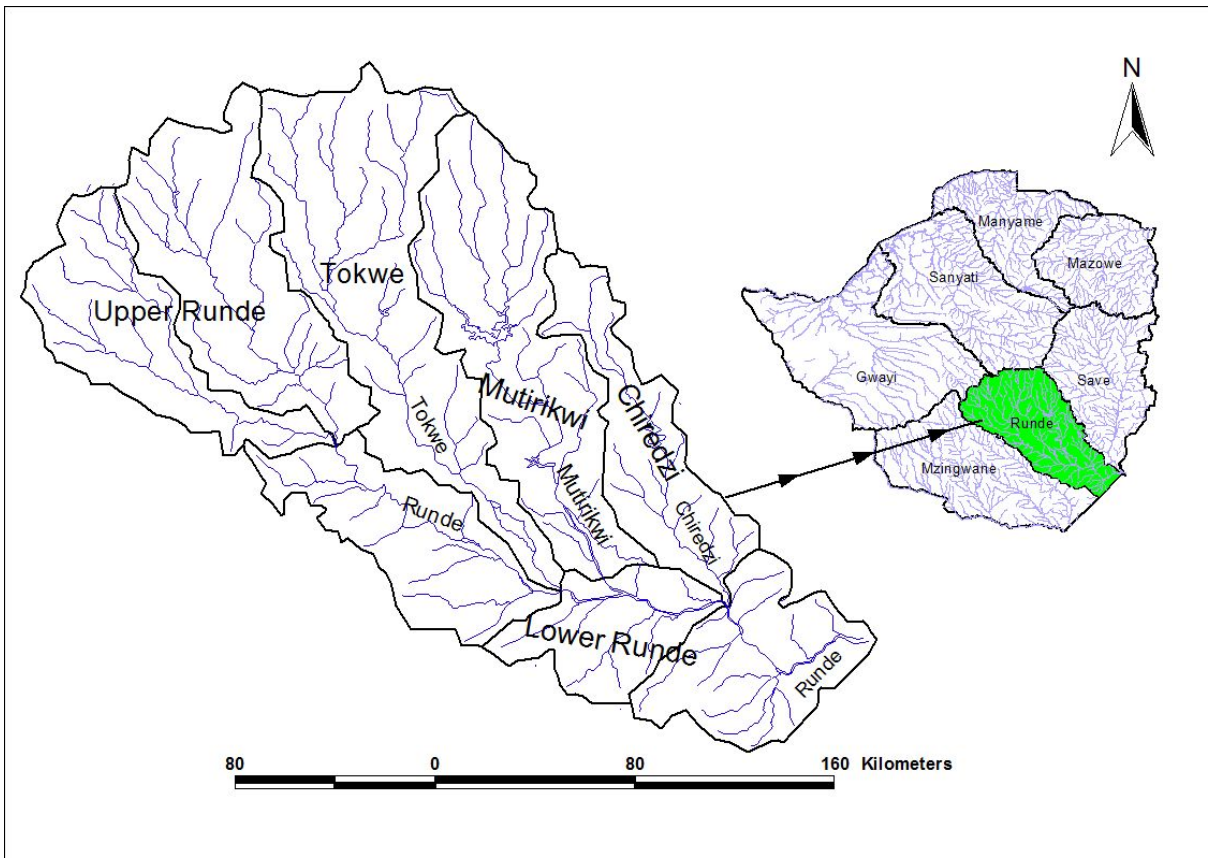

Fig 1 showing the location of Tokwe Mukosi dam.

3.1 Description of the study area

Tokwe Mukosi Dam is a concrete-face rock-fill dam on the Tokwe River, just downstream of its convergence with the Mukosi River, approximately 72 kilometres (45 mi) south of Masvingo in Masvingo Province, Zimbabwe. Tokwe Mukosi is about 90.3 metres (296 ft.) tall and creates a 1,750,000,000 m3 (1,420,000 acres) reservoir, the biggest inland dam in the country. It is linked with the hydroelectric power station that has 12 megawatts (16,000 hp) fixed capacity.

3.2 Research Design

It is explained that a research design mainly refers to the strategy of the research that explains how, when and where the data is to be collected and analysed. (Yin 2003) Therefore in this

research qualitative design is going to be used. This reason is that this paradigm is flexible and suitable in capturing behaviour and perceptions of research participants. Trochim (2006) asserts that a qualitative design allows the researcher to use a variety of techniques which facilitates checking of reliability of data. Neuman (2000) posits that the qualitative research design has a language of 'case and context'. Qualitative design allows studying the participants in their nature society setting. The case study will be suitable for this study because it brings a case to life than to use statistical data. Borg et al., (2009) asserts that a case study is a method which involves the investigation which makes a detailed examination of a single subject of a group of the research being done. Mhlanga (2003) states that a case study is a research approach situated between concrete data taking techniques and methodological paradigm. A case study is also defined as a research strategy on an empirical inquiry that investigates a phenomenon within its real-life context (Creswell, 2012). The chief characteristics of case study research are therefore quite relevant to this study which sought to investigate into risks associated with residents in riparian locations and their attitudes and perceptions towards these risks.

3.3 Study Population

Moreover, no research is carried out from nothing but it should be conducted using a population. Best et al., (2002) describes a population as the complete collection about which precise facts is necessary. The target population included all the people living in the riparian locations.

3.4 Sampling

Sampling is the response of choosing from a much large population, a group which will represent the total group. Cohen et al., (2007) states that sampling is obtained in such a way that every member of the population has an equal chance of being observed. Therefore, the purpose of sampling is to reduce the total population into a workable subset which will be used by the researcher to collect the needed data from the study. In this study the researcher used purposive, stratified random sampling and simple random sampling. Purposive sampling was done to select the sample from the entire population. Therefore, this type of sampling ensures that the researcher has access in-depth knowledge about risks in riparian areas and resident's perceptions. Stratified random sampling was used to select the respondents. Population was put into strata depending on the distance from the dam. This was done to

avoid the bias which might emanate if the researcher get data from one group of people (Babbie, 1990). Simple random sampling was employed to select elements from each stratum since it gives all members of the population the equal chances of participating.

3.5 Sample Size

Furthermore, the investigator used Epidemiology Information Statistics Calculator to estimate the sample mass with sample power of 80% at 95% confidence interval giving a sample of 100 participants.

3.6 Questionnaires

Best et al., (2002) describes a questionnaire as a document that covers questions intended towards obtaining evidence from people for the study. Investigator structured a questionnaire that contained together open and closed ended questions. The questionnaire prepared by the researcher consisted of four parts; the first part which is to collect information about the demographic characteristics of respondents, the second part consisted of question covering aspects of knowledge regarding flooding risks, third part consists of attitude of workers in regards to hazards and the last part which is the fourth part that consist of practices of the workers in a way to ameliorate the risks which emanate from hazards and measures they put in place to ameliorate the risk. For an improved reliability and validity of the study the researcher conducted a pilot study. Questionnaires were distributed to a limited number of respondents to respond to the questions to test the effectiveness of the tool. Modifications were done to the questionnaires where necessary and thus improved reliability and validity. The researcher used questionnaires because the questionnaire ensures respondent anonymity and privacy which encourages honest answers and the data provided by questionnaires is easy to analyse and interpret.

3.7 Ethical considerations

Creswell (2003) supposed that a researcher partakes the responsibility to respect the privileges, necessities, morals and wishes of the respondents. Ethical principles such as voluntary participation, anonymity, confidentiality and disclosure were also detected in the study.

3.7.1 Principle 1: Voluntary participation

No one was obligated to partake in the study. Again, partakers were allowed to pull out from the study at any time without any unfavourable consequences and harm because of their withdrawal.

3.7.2 Principle 2: Anonymity

Participants' names were not captured in the data collection tools to safeguard the identity of respondents.

3.7.3 Principle 3: Confidentiality

Distinctiveness of respondents was omitted in the study to promote confidentiality. Special data collected through the questionnaires and company information gathered was kept under lock and tight security to protect against unauthorised use.

3.7.4 Principle 4: Informed consent

A discussion by the participants was held to discuss the objectives, procedures and risks for the study

CHAPTER FOUR: RESULTS

4.1 SOCIO-DEMOGRAPHIC ATTRIBUTES OF RESPONDENTS

Table 4.1 shows the demographic characteristics of the selected respondents living close to Tokwe-Mukosi dam. The study managed to interview a total of 100 with the majority of respondents mostly females (58%). Of these respondents, the highest number were married (88%) with the majority age class being >40 years (44%). Most of the respondents attained secondary education (78%), were unemployed (72%), and had resided in the study area for a period of 6-10 years (45%).

Table 4.1: Socio-demographic characteristics of the study respondents

Characteristic (*n*=100)	Category	Frequency (%)
Gender	Female	58
	Male	42
Marital status	Married	88
	Divorced	5
	Single	7
Age class	<30 years	35
	31-40 years	21
	>40 years	44
Highest level of education attained	Primary	12
	Secondary	78
	Tertiary	10
Employment status	Unemployed	72
	Employed	28
Residence period in study area	<5 year	36
	6-10 years	45
	>10 years	19
Village	Gororo	30
	Manjongo	20
	Museva	30
	Zivhu	20

4.2 KNOWLEDGE ON FLOOD HAZARD AND RISK

Table 4.2 shows the knowledge on flood hazard and risk by respondents staying near Tokwe-Mukosi Dam. Nearly 80% or respondents confirmed the area had experienced floods, with 75% acknowledging that the emergency preparedness and response personnel were fully knowledgeable with regards to flooding. The major risks which the respondents were prone to were floods (70%), bilharzia (55%) and typhoid (4 0%). However, most respondents (68%) considered the benefits of staying near the dam to outweigh the risks. The total knowledge score of 4.07 which converts to 40.7% was however low.

Table 4.2: Knowledge on flood risk by respondents around Tokwe-Mukosi Dam

Knowledge	Frequency (%)		Preferred score	Score
	Yes	No		
Has this area has ever experienced floods?	21	79	No	0.79
Emergency preparedness personnel in the area are fully knowledgeable with regards to flooding?	75	25	Yes	0.75
Which of the following risks are you prone to?				
Floods	70	30	Yes	0.70
Bilharzia	55	45	Yes	0.55
Typhoid	40	60	No	0.60
Do you think benefits of staying near the dam outweigh the risks?	68	32	Yes	0.68
Total knowledge score				4.07

The total knowledge was calculated as total score divided by possible score then multiplied by 100%. Thus, it was (4.07/6) *100 = 68%

The perceived benefits of staying near the dam varied by each village. In Gororo village most respondents perceived recreational activities (29.0%)as a benefit of staying near the dam whereas in Manjongo village the most benefit was availability of potable water (24.3%). In Museva and Zivhu villages, irrigation was the major benefit attaining values of 37.1% and 25.8% respectively (Fig. 4.1).

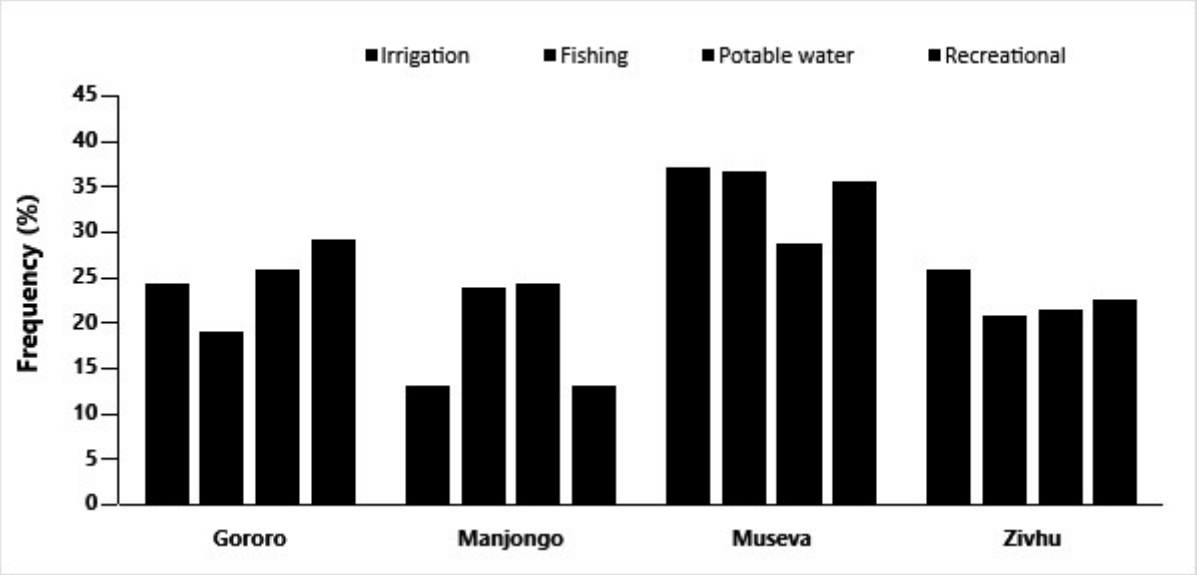

Fig 4.1: Perceived benefits of staying near the Tokwe-Mukosi dam

4.3 ATTITUDES ON FLOOD HAZARD AND RISK

The respondent's attitudes towards flood hazard and risk around Tokwe-Mukosi Dam are presented in Table 4.3. most respondents regarded flooding interventions as necessary (67%), and perceived emergency preparedness and response programmes as costs to the local authority (55%). However, most respondents did not think flood trainings were a were waste of money (54%). The majority of respondents believed they were safe if floods occurred (75%), though they perceived the dam to enhance malaria (78%) and bilharzia (73%), hence were willing to relocate to areas not prone to floods (76%). Total attitude score was 5.59 which converts to 55.9% which was rather fair.

Table 4.3: Attitudes on flood risk by respondents around Tokwe-Mukosi Dam

Attitudes	Frequency (%)		Preferred response	Score
	Yes	No		
Do you think flooding interventions are necessary in your area?	67	33	Yes	0.67
Is an emergency preparedness and response programme a cost to the local authority?	55	45	Yes	0.55
Do you think flooding trainings are a waste of money?	46	54	No	0.54
Integrated emergency preparedness and response is necessary in flood prevention?	81	19	Yes	0.81

Do you think you are safe if floods happen?	75	25	Yes	0.75
Do you think this dam enhances malaria?	78	22	Yes	0.78
Do you think this dam enhances bilharzia	73	27	Yes	0.73
Are you willing to relocate to an area not prone to floods?	76	24	Yes	0.76
Total attitude score				5.59

The total attitude was calculated as total score divided by possible score then multiplied by 100%. Thus, it was (5.59/8*100) = 70%

Most respondents in Zivhu village were willing to stay near Tokwe-Mukosi dam as it was their ancestral land (33.3%), whereas in Gororo village most respondents had a fear of relocation (35.7%). In Manjongo village, most respondents considered the land to be highly productive (29.8%) hence were willing to stay near the dam. On the other hand, resource availability (32%) in Museva village was the major driver for staying close to the dam (Fig. 4.1).

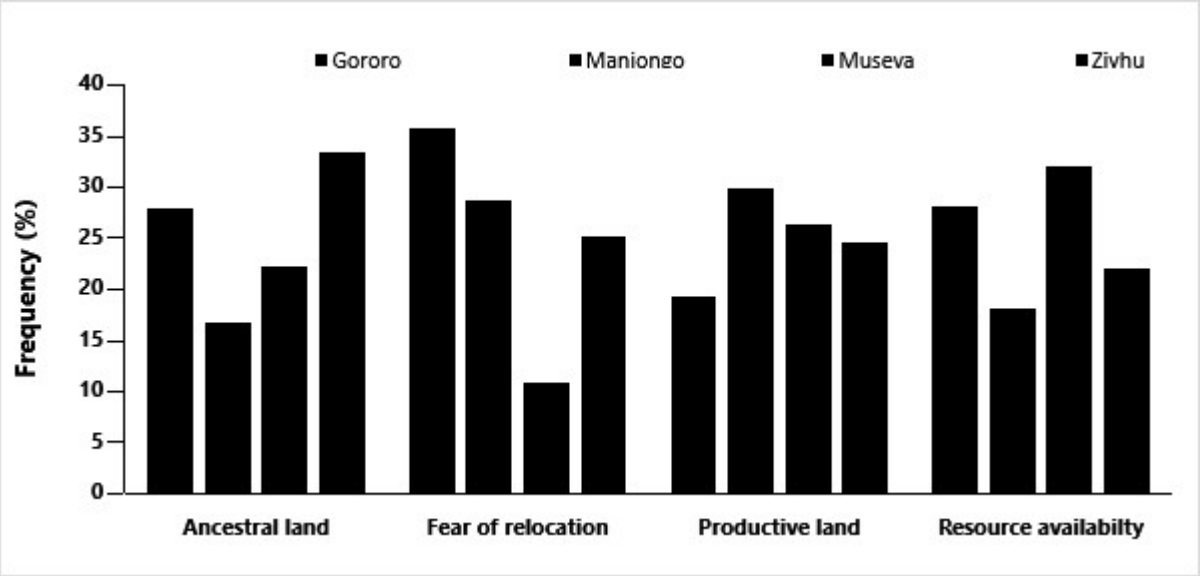

Fig. 4.2: Reasons for willing to stay near Tokwe-Mukosi Dam

4.4 PRACTICES ON FLOOD HAZARD AND RISK

The majority of respondents confirmed that flood prevention procedures were being followed by every resident (68%), with most respondents having measures to avoid loses in the event of a flood (74%). In addition, most respondents participated in flood consultation (80%) and attended workshops on flooding (72%) (Table 4.4). In order to avoid bilharzia and malaria,

most respondents boiled water before drinking (84%) and used mosquito nets (78%) respectively. Overall, total practice score was 7.16 which converts to 72%.

Table 4.4: Practices on flood risk by respondents around Tokwe-Mukosi Dam

Practice		Frequency (%)		Preferred response	Score
		Yes	No		
Flood prevention procedures are being followed by everyone?		68	34	Yes	0.68
Are there measures you put in place to avoid loses in the event of a flood?		74	26	Yes	0.74
Do you participate during consultation on flood issues?		80	20	Yes	0.80
Do you attend awareness workshops on flooding?		72	28	Yes	0.72
Measures to avoid bilharzia:	Boil water before drinking	84	16	Yes	0.84
	Not playing in stagnant water	72	28	Yes	0.72
	Not urinating in the dam	64	36	Yes	0.64
Measures put in place to avoid malaria:	Mosquito coils	66	34	Yes	0.66
	Mosquito nets	78	22	Yes	0.78
	Mosquito repellents	48	42	Yes	0.58
Total practice score					7.16

The total practices were calculated as total score divided by possible score then multiplied by 100%. Thus, it was (7.16/10) *100 = 72%

4.5 FACTORS AFFECTING PRACTICES ON FLOOD HAZARD AND RISK

The factors affecting practices on flood hazard and risk are shown in Table 4.5. The factor scores ranged from 4.71 (employment status) to 7.54 (educational level). In addition, gender, level of education, employment status and residence period significantly influenced practice scores on flood hazard and risk ($p < 0.05$).

Table 4.5: Factors affecting knowledge, attitudes and practice on flood hazard and risk

Variables	Score	df	Sig.
Gender	6.39	1	0.0367*
Marital status	5.11	2	2.9742
Age	4.97	2	8.6352
Level of education	7.54	2	0.0092*
Employment status	4.71	1	0.0157*
Residence period	6.03	2	0.0428*

*denotes significantly different ($p<0.05$)

CHAPTER FIVE: DISCUSSION

5.1 KNOWLEDGE ON FLOOD HAZARD AND RISK

Most respondents had a high knowledge on flood hazard and risk and were aware of the major risks they were prone to. Such awareness aids in flood preparation and respondent are possible to take preventive activities then follow emergency measures (Al Qahtany and Abubakar, 2020). Similarly, Miceli (2008) reported concern about flood risks being connected to advanced levels of tragedy awareness. Likewise, Tomio *et al.* (2014) reported high knowledge scores on disaster preparedness among Japanese communities. However, Bhandari and Takahashi (2022) reported that 80% of respondents had poor knowledge on disaster preparedness as they did not participate in community drills due to language barriers. Such a lack of awareness increases flood vulnerability (Mondino *et al.*, 2020).

Some respondents perceived flood trainings as a waste of money because they believed they were safe from floods. Such passive behaviour increases their risk to flooding, as reported by Husaini *et al.* (2016). The majority of respondents were willing to stay near Tokwe-Mukosi dam as it was their ancestral land, the land was highly productive with high resource availability. Likewise, Chan *et al.* (2022) reported that most people were willing to stay in flood prone areas as it was a historical land, with family traditions and due to the strong community bond, they had formed. However, some respondents stayed unwillingly due to financial burdens thus would not be able to start afresh in relocated areas. In the present study, some respondents had a fear of relocation due to emotional and financial necessities tallying with the findings of Seebauer and Winkler (2020).

5.2 ATTITUDES ON FLOOD HAZARD AND RISK

The majority of respondents regarded staying close to the dam as beneficial as it provided them with potable water, fishing, irrigation, and recreational opportunities. In a study by REACH (2015), some respondents were not willing to evacuate flood-prone areas as they wanted to protect their livestock thereby reducing economic loss. Elsewhere, Reynaud *et al.* (2013) reported people staying in flood risk areas due to fishing, whereas Chan *et al.* (2022) reported that some residents were willing to stay in flood prone areas due to irreplaceable memories they had with the area. Similarly, Juarez-Lucas *et al.* (2018), asserted that the benefits of staying in flood risk areas include agricultural and capture of wild fish.

5.3 PRACTICES ON FLOOD HAZARD AND RISK

Three quarters of respondents had measures put in place to avoid loses in the event of a flood attributed to better knowledge on flood hazard and risk they acquired from participating in awareness campaigns and flood consultations. These measures included moving to higher ground, evacuating the area, and taking supplies. In contrast, Bhandari and Takahashi (2022) concluded that more than 70% of the respondents were incapable to accomplish precautionary practices counter to natural disasters. In addition, there was no guarantee for the establishment of essential facilities like water and food, first aid kits and necessary medications. In the present study, 72% most respondents had good practice on flood hazard and risk, tallying with the findings of Thomas *et al.* (2015). However, Bhandari and Takahashi (2022) reported that 95% of respondents had poor practices on disaster preparedness due to poor knowledge.

5.4 FACTORS AFFECTING PRACTICES ON FLOOD HAZARD AND RISK

As asserted by Reynaud *et al.* (2013), Thistlewaite *et al.* (2018) and Lechowska (2021), flood hazard as well as risk are influenced by socio-demographic characteristics, including knowledge around hazards, and former adversity practices. In this study, gender, educational level, employment status and residence period influenced practice on flood hazard and risk. Males had lower flood hazard and risk practices than females, this is because females stand extra worried than males when it comes to the threats, and likely anticipate greater destruction if a flood occurs (Weichselgartner and Pigeon, 2015; Mondino *et al.*, 2020) hence they readily prepare. However, this is in distinction through the conclusions of Liu *et al.* (2022) who testified no association between gender and flood risk perception.

Those who attended tertiary education had better flood hazard and risk practices compared with the less educated, as they could comprehend flood risk protocols. However, Mondino *et al.* (2020) concluded that education had no significant influence on the flood hazard and risk practices, though this was attributed to a narrow range of the respondent distribution. Similarly, Tomio *et al.* (2014) and Armas *et al.* (2015) propounded that the level of education, is not key in hazard awareness. In this study, the employed and the unemployed had significantly different practices towards flood hazard and risk. This is attributed to the employed having a better income hence would want to protect their estate and investment from flood disasters, tallying with Bhandari and Takahashi (2022). However, Mondino *et al.*

(2020) asserted that higher income earners tend to reside in hilly areas farther away from the floodplain as such regarded themselves as not threatened by floods. Furthermore, proximity to the source of the flood hazard results in higher flood risk perception and practice (O'Neill *et al.*, 2016).

Respondents who had resided for more than six years close to Tokwe-Mukosi Dam had better flood hazard and risk practices compared with those with less than five years' occupancy attributed to past flood experiences and understanding the dynamics of the area. These findings tally with Reynaud *et al.* (2013) who concluded that communities with past overflow involvements are aware, resolute and encouraged to upkeep flood risk managing actions. Similarly, Fatti and Patel (2012), and Thistlewaite *et al.* (2018) concluded that earlier flooding experience increases knowledge and improves attitudes and practices on flood hazard and risk.

Considering that most respondents confirmed that emergency preparedness personnel in the area were fully knowledgeable with regards to flooding this improved their practices towards flood hazards and risk. Likewise, Fatti and Patel (2012) deduced that practices on flood hazard and risk are influenced by belief in the authorities responsible for managing flood risk to effectively manage the floods. Also, communities that receive early warning information about flooding have a higher positive attitude to flood risk management than those who do not receive such information (Adjabeng, 2020). As such, being foretold of an imminent flood also improves practice thereby reducing fatalities and loss.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The study showed that knowledge on flood hazard and risk was high as most respondents were aware of the potential hazards they were prone to and considered the benefits of staying near the dam to outweigh the risks. Reluctance to leave the flood prone area was mainly due to fear of relocation, resource availability and ancestral land. The major benefits of staying closer to the dam were fishing, irrigation and availability of potable water.

The respondent's attitudes towards flood hazard and risk was mainly fair. Though some respondents regarded flooding interventions as necessary, the majority of respondents believed they were safe if floods occurred. On the other hand, practice on flood hazard and risk was high as seen through participation in flood consultation and setting up measures to avoid loses in the event of a flood.

The factors affecting practices on flood hazard and risk included gender, level of education, employment status and residence period. In addition, knowledge was influenced by age, educational level and residence period. On the other hand, practice was influenced by gender, marital status, and residence period.

6.2 RECOMMENDATIONS

1. Raising public awareness on flood hazard and risk will aid in minimising loses associated with floods.
2. Periodic training of flood prone societies to manage with adversities such as floods and reduce its adverse impacts.
3. Early warning systems to detect and signal occurrence of floods, to increase preparedness and consequently take action.
4. Setting up safe evacuation centres in the event of a flood.
5. Obtain information on communities residing in other flood prone areas so as to adopt essential behaviours for effective handling of impending floods.
6. Future research to focus on strategies of improving flood risk management.

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