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Community Preparedness to Recurrent Flood Disasters in Babessi, Rural Cameroon

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Abstract

Purpose: Flood is a recurrent natural disaster that has caused enormous human and material damage in many places and continues to hit rural communities at an alarming rate. Flood affects the community extensively and it is crucial for them to be prepared to reduce the risk faced in the event of a flood disaster. The need to improve on education, local flood disaster committee, public awareness and early warnings as preparedness measures to prevent and manage flood disasters by rural communities is therefore indispensable. This study aims to determine the current level of flood preparedness amongst households in Babessi, Cameroon as well as other contributing factors to preparedness such as the availability of flood forecast and early warning and public awareness to prepare for floods.

Methodology: This study used the mixed methods approach that combined descriptive and analytical perspectives. It collected and analyzed both qualitative and quantitative data concurrently and sequentially and integrated data at one or more stages in the process. Using a structured questionnaire, data was purposively and randomly selected from 317 households from the same. Quantitative data were supplemented by 7 key informant interviews and 2 focused group discussions. All quantitative data generated from the questionnaires were entered into a template designed in the Statistical Package for Social Sciences (SPSS version 20). The data were cleaned and later on analyzed using both SPSS and Microsoft Excel 2013. For qualitative data (FGDs and KIIs), they were recorded in the field using Dictaphones (voice recorder) and later on transcribed and typed into a word processing program (Microsoft Word 2013). The transcribed data were analyzed using Nvivo version 11, and themes were established in relation to research objective. Results were presented using tables, figures and charts.

Findings: Using descriptive analysis, the findings indicated that the preparedness measures were mostly stocking of equipment (sand and sand bags) followed by emergency savings, stocking of emergency relief materials (food, water and drugs). Availability of flood forecast and early warning systems, education and public awareness were low overall preparedness level. The population of Babessi needs heightened sensitization on the impending dangers of flood hazard and be encouraged to participate in implementing the adopted strategies to prevent and manage subsequent flood disasters.

Recommendations: The Social Representations Theory (SRT) informed this study. A social representation is a system of values, ideas and practices regarding a given social object, as well as the elaboration of that object by a group for the purpose of communicating and behaving. For policy, to enhance information dissemination, investments should be made in improving communication infrastructure and disseminating timely and accurate information about flood risks, early warnings, evacuation procedures, and available support services.

Keywords: *Flood, Disaster Community, Flood Preparedness, Early Warning*

1.0 INTRODUCTION

Flooding is one of the Earth's most common, most destructive and deadliest natural hazards as flood damages continue to rise worldwide with dire consequences for natural, social, physical, financial and human capital (Bang et al., 2017). Flood is a recurring climatic hazard with substantial challenging effects on the lives and livelihoods of people living in flood prone areas. Yet, managing their impacts remains one of the greatest contemporary challenges in flood-prone countries. Natural hazards took away 1.2 million lives over the decade between 2002 and 2012, affecting 268 million people and causing economic damages worth $1.7 trillion (UNISDR, 2015). Indeed, the number of people affected by natural disasters worldwide is on the rise with annual economic losses between $250 million and $300 million (UNISDR 2015; World Disaster Report 2015).

In 2016, global natural disasters caused economic losses of US$ 210 billion – 21% above the 16-year average of $174 billion. Flooding, earthquakes and severe weather were the topmost hazards that occurred just in 2016, which together, produced 70% of the economic losses in 2016 (Aon, 2017). This study aims to assess the causes of the 2019 floods and determine the current level of flood preparedness amongst households in Babessi, Cameroon as well as other contributing factors to flood preparedness in the study area. This study is expected to enhance knowledge on local level preparedness for well-informed decision and policymaking. The results of this study could also be used by international institutions in understanding the implementation of the Sendai Framework for Disaster Risk Reduction in Cameroon and other countries.

Flood Hazard: Generalities

The global frequency and severity of natural hazards is causing great economic losses, socio-political instability and increasing vulnerability to poverty whilst manmade hazardous events are exacerbating the effects of these hazards. Moreover, there is considerable uncertainty on current and future natural hazard trends. However, predictive modelling suggests that future occurrence of natural hazards will generally result from climate oscillations (IPCC 2014). They are one of the most frequent and virulent extreme events worldwide. Their frequency is linked to the consequences of climate change and socio-economic development (Balgah et al., 2013). For many decades, floods have accounted for most of the global effects of natural disasters on economic growth and livelihood outcomes (Buchenreider et al., 2021). In fact, flooding was the major source of recorded global disasters between 2000 and 2019; floods were also the second largest natural disaster after droughts, in terms of the total number of affected persons over the same period (Tanoue et al., 2021).

Floods have occupied the premier rank among global environmental disasters in the past twenty years in terms of the frequency of their occurrence; floods account for 44% of all the registered disaster events (Hirabayashi et al., 2013), and top the list of natural disasters in terms of economic damages: they cost USD 651 billion in this time-span (UNDRR, 2019). Floods were only second to drought, with 1.6 billion people being affected worldwide (Tanoue et al., 2021). Seven million people were affected by floods in Africa in 2020; this was the highest impact on record since 2006. The bulk of the effects are recorded in Sub-Saharan African (SSA) countries (CRED, 2021), in which the pervasive flood-related devastation of livelihoods is expected to surge as the frequency of events increases (Edoun et al., 2015); this is in a context characterized by a weak formal and informal institutional capacity for disaster management (Balgah and Kimengsi, 2022). This is

expected to retard economic and social change, in that it will scale back the attained progress in reducing poverty, and negatively affect the global capacity to achieve the sustainable development goals (SDGs) of the Global Agenda 2030 (Bastagli and Holmes, 2014). These expectations have provided the impetus for a strong flood research agenda in SSA, Cameroon and Babessi in particular (Nji et al., 2019).

Cameroon is one of the Sub Saharan African (SSA) countries most hit by climatic extreme anomalies. Her geo-physical location, tectonic history and climate makes her one of the most susceptible countries affected by natural hazards such as floods in Africa (Nji and Balgah, 2019). The regularity and devastation caused by such hazards along the active Cameroon Volcanic Line (CVL) are becoming more frequent and even more disastrous, affecting livelihood assets including human, social, financial, natural, physical capital (Bang et al., 2017). The country is becoming more prone to and persistently hit by floods but also by droughts, mud flows, rock fall, lahars, volcanic eruptions, toxic gas emissions, earth tremors and landslides which occur on a regular annual pattern (Nji and Balgah, 2019). Between 1998 and 2006, 4,200 people were affected by flooding in Cameroon, according to data from the Centre for Research on the Epidemiology of Disasters' Emergency Events Database (EM-DAT, 2021). In 2007, more than 10,000 people were affected in a single year, 2008, 25,000 and in 2012, nearly 52,000 (EM-DAT, 2021). The Baba 1 floods of 2015 which is a neighbouring community to Babessi left around 100 people from 65 families homeless, completely submerging 35 homes and causing enormous economic, agricultural and psychological damages in the community (Bruno, 2015).

Escalating floods are expected to inflict adverse effects on many Cameroonian households and communities, given their heavy reliance on agriculture for livelihoods dependence of most households on agriculture (Ngu and Kimengs, 2016). Current agricultural contribution to the country's GDP could drop by 14% points from 20% now to an estimated 6% in 2025 (Yenshu, 2013). This drop will resolve mainly from higher incidence of flooding in the south and in the north of the country. A fundamental step towards reducing the effects of floods in Cameroon lies in identifying risk management strategies whose validity supersedes specific geo-ecological zones (Yenshu, 2013). However, the victims are not always passive in the face of such events. Often, they may apply either adaptive or coping strategies. Whilst adaptive strategies aim at minimizing flood risks, coping strategies are employed to deal with the aftermaths (Serre et al., 2016).

One way to reduce flood effects in Cameroon is to develop an overarching policy agenda for flood management. For instance, the Sendai Framework for Disaster Risk Reduction (2015-30), one of the first major agreements of the post-2015 Global Agenda, supports countries in identifying and implementing concrete actions to protect development gains from the risk of various disasters (www.undrr.org/implementing-sendai-framework/ what-sendia-framework, accessed on 05 February 2023). Such an overarching policy agenda for flood management will greatly benefit from empirical research and the identification of robust trends for all cases, space and time (Balgah and Kimengsi, 2022).

Knowledge and understanding of flood preparedness at community and household levels are crucial for effective formulation of appropriate flood management plans and adaptation strategies that are suited for specific environmental conditions such as the western highlands area of north west Cameroon, with frequent flood occurrences. Despite the criticality of understanding how local communities in flood prone areas prepare for and deal with impacts of floods, limited studies

including that of Belle et al. (2017) and Solh & Van Ginkel, (2014) have been conducted to shed light on local level drought preparedness. Belle et al., (2017) for instance focused on communal preparedness of farming communities to drought and not flood in Zimbabwe. Other studies on flood preparedness have focused on macro level preparedness, and analysis of preparedness using secondary (Wilhite, 2000). In Cameroon, few studies (Bang, 2021; Bang, 2022; Aka et al., 2016) have focused on local preparedness for flood management. However, none of them focused on flood preparedness at community level. Thus this study aims to assess local communities' preparedness in dealing with recurrent flood in the western highlands area of Babessi in North West Cameroon.

The Social Representations Theory (SRT) which is a Social Science approach to flood disaster management informed this study and focuses on understanding how this phenomenon is perceived in society: how people believe and feel about it (Aniah et al 2016). This theoretical model endeavours to tackle the issues within an integrated context that draws upon Social Representations Theory (SRT) (Moscovici, 1988). A social representation is a system of values, ideas and practices regarding a given social object, as well as the elaboration of that object by a group for the purpose of communicating and behaving. Accordingly, it provides a given group with a shared social "reality" and "common consciousness" about a particular social object (Aniah et al, 2016) and in this case, flood disaster is the social object. SRT considers critically vital the information that circulates in society (for instance in the media, textbooks and literature) and the ideas in people's minds. SRT provides a framework for understanding and exploring how scientific knowledge diffuses in society and can become associated with intergroup power struggles (Aniah et al, 2016; Moscovici, 1988).

2.0 METHODOLOGY

Study Area Description

The study was conducted in five flood prone localities in Babessi village, located in Babessi Sub-division, Ngoketunjia Division in the North West Region of Cameroon, precisely in the Ndop Plain, between latitudes 6˚50'N and 6˚39'N, and longitudes 10˚23'E and 10˚28'E (Figure 1). The study was conducted specifically in Abakwa, Mbezoh, Chui, Tchechuma and Karbamouh. These localities were selected due to the fact that they are located in flood prone areas, with some level of security and easily accessible. The study site was equally purposively chosen because it has been struck in recent years by devastating floods. The Ndop Plain is drained by the Nun River and its numerous tributaries. The Bamendjin Dam, constructed on the Upper Nun River further down the Ndop Plain, increases the risk of floods because the dam has caused the water table to rise in many areas of the Ndop Plain, Babessi village inclusive.

This makes the subdivision prone to flooding. Babessi is made up of agrarian population of about 12,566 inhabitants (BUCREP 2005: 321). The population depend mostly on crop and livestock production for their subsistence with few engaging in trade, fishing and craft. The main food crops produced in order of priority are; maize, rice, beans, soya beans, colocasia, yams, groundnuts, cassava. Perennial crops include plantain, Arabica coffee, Robusta coffee, oil palm and garden crops include tomatoes, huckleberry, okra, water melon, cabbage, pepper (Divisional Delegation of MINADER, 2010). Livestock reared in the study area include cattle, sheep, goat, and poultry.

Babessi is characterized by the Cameroon type equatorial climate with two seasons: a rainy season of eight months (mid-March to mid-November) and a dry season of four months (mid-November

to mid-March). The rainy season is characterized by torrential down pours ushered in by the monsoon winds, at times accompanied by destructive storms and hailstones. Mean annual rainfall is about 1700 mm. The dry season runs from November to March with annual maximum temperatures ranging between 27.2oc – 33.6 oc and minimum temperatures at 7.8 oc – 15.9 oc (Aka et al., 2018).

The vegetation is mostly the Sudanian savannah composed of tall grass and stunted trees. This vegetation has been degraded by human activities like bushfires, intensive farming, overgrazing and exploitation for firewood and settlement have thus considerably modified the plant community. Thus exposing the area into flooding condition (Aka et al., 2018). Natural gallery forest can be found in some valleys alongside man planted vegetation like palm trees and raffia palms all of great economic importance in the study area. Species like Eucalyptus, kola and Pygeum africanum exist. They are of economic value to the inhabitants who used them for construction, fuel, food and as medicine. Some of these medicinal plants are even exported (Babessi Council Development Plan Draft Report, 2011).

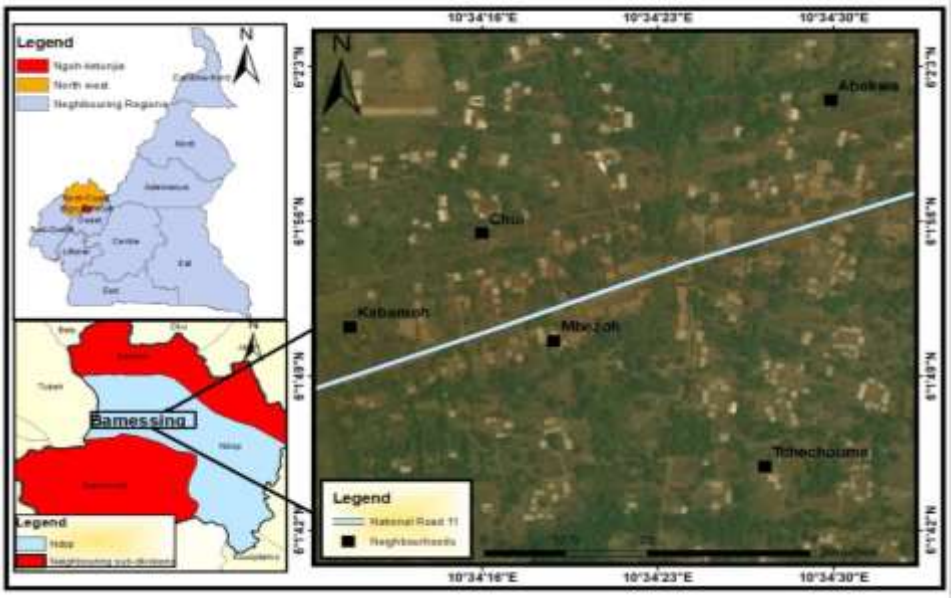

Figure 1: Map of Babessi, Northern Cameroon Showing the Study Sites

Source: Authors' construction from GPS coordinates obtained during fieldwork, 2021

Research Design and Data Collection

This study is characterized as a mixed study, that is, a descriptive and analytical study. It involved a combined methods approach, which refers to the collection and analysis of both qualitative and quantitative data in a single study in which data are collected concurrently or sequentially, and involve integrations of the data at one or more stages in the process of research (Creswell et al., 2003). This study combined the cross-sectional survey and the ethnographic (observation, interviews and focused group discussions) designs. The survey design was used to gather information from individuals with the use of questionnaires and the ethnographic design was used to collect data from observation through a transect walk in the community to observe the various preparedness measures that were employed in the study. Focused group discussions and key

informant interviews were also employed using respondents knowledgeable in the study and to compliment data from observation.

The use of the two methods also increased the robustness of the results through triangulation and cross-validation and provided a clearer and better picture of rural community flood preparedness strategies than would otherwise have been achieved by using either of these methods on their own. for this study, qualitative method was mostly used to gather data on key informant interview, focused group discussions and observation while quantitative information was gathered using just one instrument which was questionnaire survey and this was in order to supplement data collected from the other three research instruments mentioned earlier. Also, both primary and secondary data were collected for this study. Primary data were obtained from field survey, while secondary data were collected from both published and non-published materials, government documents, and news reports.

Purposive and snowball sampling techniques (Kothari, 2004) were used to select household respondents and key informants for the study, respectively. Purposive sampling was necessary to ensure that those with in-depth knowledge of flood experience were included in the study. Primary data were collected face to face by the researcher and three research assistants in English and Pidgin English Languages (the main languages spoken by the respondents). Household interviews were conducted solely in Pidgin English while interviews were conducted in both English and Pidgin languages. A total of 317 household heads or their representatives were included in the study.

The sampled households were determined using the formula proposed by (Bartlett et al., 2001), where 50% of the population of Babessi was estimated to be exposed to flood and depend on climate sensitive livelihoods including crop production and livestock. And a 95% confidence interval was used. Only adult participants (≥18 years old) who gave consent to participate in the interviews were included in the study and questioned. Key informant interviews were guided by written questions to ensure the objectives of the study were met. Examples of questions asked included, respondents socio-demographic profile, levels of household flood preparedness, existence and knowledge of flood policies/plans and local flood committee in enhancing preparedness, institutional plans for household preparedness, and sources of flood information and household preparedness.

Data Analysis

Inferential and descriptive statistics were used to examine flood preparedness by respondents. Analysis of qualitative data, including, community preparedness to floods was collected through FGDs, Observation and Key Informant Interviews. The datum was analyzed through content analysis method and word verbatim. Narrative and quotations were used to make emphasis on certain comments and also validate the results of the survey. Quantitative data collection for this study included, structured interview administered to heads of households or their representative. Data from structured interviews were analyzed using the Statistical Package for Social Sciences (SPSS) version 20 together with Microsoft excel version 2013. Quantitative data analysis in this study concentrated on the mode of frequencies of scores by household heads. The results are presented in tables and charts. The differences in the means between treatments were separated by Duncan's Multiple Range Test at 5% significance level.

3.0 FINDINGS

Socio-Economic and Demographic Characteristics of Respondents

The socioeconomic and demographic characteristics that were deem necessary to influence the respondents' preparedness for floods were identified and analyzed and included age, education, marital status, household size, income and flood experience. These factors are important because they affect the economic behaviour and capacity of households to effectively prepare and respond to flood. The distribution of respondents according to various socio-economic and demographic characteristics is summarized in Table 1.

Table 1: Socio-Demographic and Economic Characteristics of Respondents

Variable	Sub-Variable	Statistics	
		Frequency	Percentage Response (%)
Age group in years	21-30	42	13
	31-40	93	29
	41-50	80	26
	≥ 50	102	32
Gender	Male	157	49
	Female	160	51
Education	No formal education	135	37
	Primary	147	52
	Secondary	17	5
	Vocational	12	4
	Higher	6	2
Monthly income (normal time)	0-25,000	153	48
	25,001-50,000	80	25
	50,001-75,000	58	19
	75.001-100,000	26	8
Income during and after floods	0-25,000	179	54
	25,001-50,000	67	21
	50,001-75,000	51	16
	75.001-100,000	20	6
Household size	1-3 persons	45	14
	4-6	120	38
	7-10	116	37
	≥ 11	55	14
Marital status	Single	23	7
	Married/co-habiting	279	88
	Widow(er)	13	4
	Divorced/separated	2	1
Belonging to a group	Yes	259	82
	No	58	18

Generally, the survey comprised of both male (49%) and female (51%) respondents who were of ages 20 and above 50 years. The mean age of the study respondents was 43 years. This suggests that most of the respondents are still very active. This mean is lower than the life expectancy of 57 years in Cameroon (World Bank, 2014b). It was necessary for the study to include both males and females in order to determine the differences in their levels of preparedness to flood disaster. It was observed that more women were likely to be more prepared than men to deal with impacts of floods. The resettlement of men to other towns for greener pastures and due to the insecurity posed by the Anglophone crisis in the study area which led to the kidnappings and killings of men can explain women's high preparation for floods compared to their male counterparts. This finding is in line with (Aka et al., 2018) who also noted more female participation in their study conducted in Babessi subdivision, Cameroon.

In Babessi Cameroon, agriculture is the major livelihood activity of the people especially old people with little educational attainment that could enable them secure wage or salaried jobs. Thus majority of the old age group usually stay in their area of birth to practice crop production and livestock rearing for their subsistence, hence the high number of aged population observed in the study area. The fertile soil of this plain has greatly increase the yields of farmers whose main occupation is agriculture. As a livelihood source, most of the respondents were involved in farming activities to sustain their families (82%). However, while 11% were engaged in fishing, 3% were business persons and 4% of the respondents had salaried jobs. Generally, majority of the respondents were farmers (82%) and the least were business persons probably because Babessi is a rural community with agriculture as the main source of livelihood.

The majority (52%) of the respondents have attained primary level education, with some 37% having no formal education. Education level has a role to play in the determination of preparedness strategies that households can implement. Lack of formal education implies that majority of the respondents are illiterate who can barely understand complex scientific management measures that could be implemented to effectively prepare for and respond to flood. Higher education attainment increases the capacity of family heads to get, decode and comprehend information for innovative decision making (Molua, 2012).

Only a handful of respondents (2%) had higher education. Implying the lack of comprehension of sophisticated scientific innovations such as weather data interpretation and changes in agricultural practices as well as food consumption patterns in times of climatic shocks (Molua, 2012; Belle et al., 2017; Ngaka, 2012), notes that primary and secondary education are not enough for one to adequately adapt to climate change shocks such as flood events but should have attained tertiary education. Hence the lack of tertiary education by the respondents in Babessi indicates challenges in their understanding of scientific issues such as flood preparedness. Education can equally influence the preparedness of household to flood through its potential to influence the income earned by the household head. Higher and tertiary education enrolment should be encouraged in the community to increase chances of livelihood diversification and scientific understanding of flood management measures.

The economic status of the respondents is crucial for flood decision making and adoption of flood preparedness actions. The monthly income of the majority (48%) was below 25,000 FCFA (about 42USD). More respondents (57%) reported to earn below 25,000 FCFA during and after flood. This implies that flood affects the income of households thereby exacerbating their vulnerability

to poverty and reduces capacity to prepare for future flood events. A study by Cvetkovic revealed that households with income above RSD 90,000 were highly prepared and took preventive actions than those with RDS less than 25,000 to deal with a disaster in Serbia (Cvetkovic, 2016). Disaster experience can influence household preparedness. The majority (79%) perceived future floods to be more severe in the near future and a threat to their lives and livelihood. This shows that there is urgent need for proactive measures to be put in place to enhance the response and adaptive capacity of vulnerable communities.

The majority, eighty-eight percent of the respondents were married or co-habiting. With household sizes ranging from 1 to >16 person per household. The majority of the household in the study area have large family sizes of 7 to 10 persons living and feeding in a household. A large family size especially in poor African settings means large mouth to feed during flood and much burden on family financial stability especially those with large number of dependants. Household size also determine the number of people that are at risk of food and water insecurity when a flood strike. The large household size in the study area can be explained by the religious and cultural practices explained above as well as agricultural practices, where a large family can be a source of labour for crop and livestock production (Molua, 2012).

However, this can only be true if there are more energetic adults than dependants in a family to provide required labour and income for household sustenance. A study by Belle et al., (2017), showed that out of a household size of five to eight people, only two could provide farm labour which was below the expected number to fully utilize a 2 to 3 acres of land. Although large household sizes in African countries have been presumed to be an important source of labour, it affects food consumption needs and resources for family sustenance during disasters like floods (Ndlovu, 2010; Molua, 2012). Belonging to a social group is also an important assert for community preparedness as seen in this study that majority of the respondents (82%) belonged to a social network. This is as a means to accumulate social capital. The results from the socio-economic and demographic information reveal that the mean age of study participants was 43 years with a mean monthly income of FCFA 46,608 while the mean household size of study participant was 6 with a mean duration of stay in the community 34 years.

Causes of floods in Babessi

Local opinions of the causes of floods have important consequences on agrarian community's preparedness for, and response to flood hazard. Hence, it was vital to study the causes of flood in the study area (Figure 2). The findings indicated that 84% of the respondents indicated that the floods are caused by heavy and consistent rainfall due to seasonal changes. This was supported by key informant interview where he reported that heavy and consistent rainfall experienced in 2019 resulted in the complete crop failure in some parts of Babessi locality. Also, 70% of the respondents strongly agreed to the causes of floods in Babessi that poor refuse disposal and poor drainage systems account for the floods while 66% strongly agreed that the failure to maintain and manage drainage systems contributes to floods in Babessi.

The results equally demonstrated that 33% of the respondents agreed that deforestation and grazing are responsible for flooding in the area and 30% of the respondents agreed that water from the Bamendjin dam construction is responsible for flooding. On the other hand, a handful 5% of the respondents agreed that supernatural phenomenon was one of the causes of flooding in Babessi. Recurrent floods in Babessi village of the country have increased stress on crops, resulting in

complete crop failure and decreasing yields (Lambi and Kometa, 2014; Epule et al., 2021;). Poor crop yields due to heavy and consistent rainfall evolution can lead to food shortages and starvation in households. Although food shortage may be resulting predominantly from droughts, it is worth noting that sporadic floods which are significant to the water-stressed study area may also pose the same threat to households (Bang et al., 2017; Nji and Balgah, 2019).

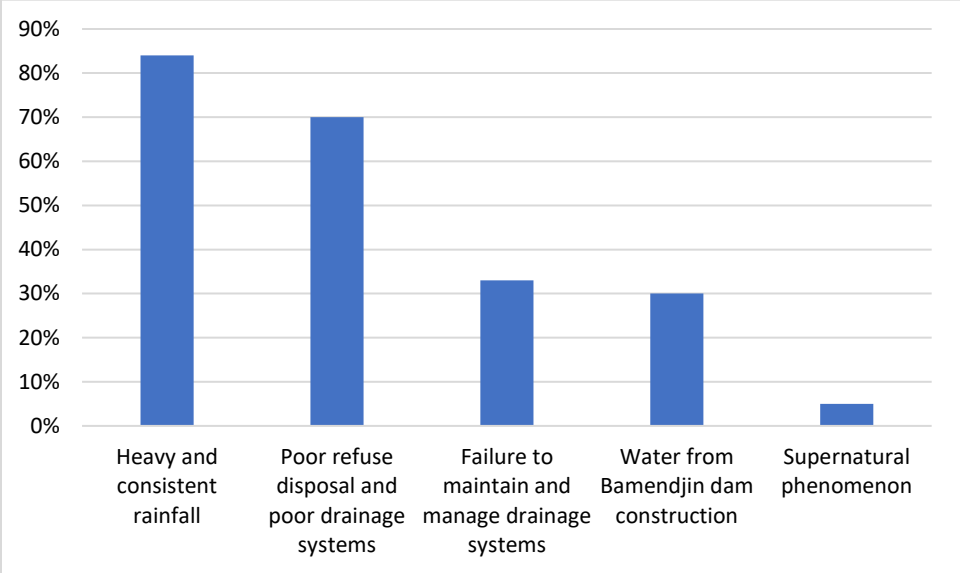

Figure 2: Causes of Flood Disaster in the Study Area

The analysis of the community preparedness to recurrent flood disasters in Babessi, rural Cameroon, revealed that there are many contributing causes to flooding in the area but the paramount cause is heavy and consistent rainfall that is attributed to seasonal changes. Previous scientific data by Aka et al., (2018) has revealed that the causes of floods in the area include natural causes (siltation, peculiar geomorphology, the nature of soils, and rainfall) as well as anthropogenic causes (subsistence farming, plantation agriculture, the dam-backing effect of the Bamendjin Dam, and dumping of refuse into rivers). Perhaps, Babessi lies in the flat topography of the Ndop Plain, with a mean annual rainfall of 1700 mm and heavy clayey and impermeable soils. During heavy downpours, the Nun River often overflows its banks making the risk of flood disaster high in the area.

Also, poor refuge disposal and poor management of the drainage system contributes to flooding in the area. These findings corroborate those of (Fongwe, 2010; Balgah et al., 2015), who affirmed that the major causes of floods are high rainfall and poor drainage system. Since the valleys are often very fertile, it is likely that earlier dwellers acquired land in these areas, which have turned out to be highly vulnerable to floods. Based on the assumption that a 'top-down approach' is not adequate for its implementation, development policy and emergency intervention should be coupled by a grass root or 'bottom-up' approach to enable communities concerned to function and contribute as a cohesive group. Theoretically, a community-based approach insists that people targeted for humanitarian assistance have the right to participate in making decisions that affect their lives as well as the right to information and transparency from those responsible to providing assistance; this will enable those who are affected to be better protected and their capacity to

identify, develop and sustain solutions will be strengthened. Consequently, humanitarian resources will be used more efficiently.

Community Preparedness Measures to Flood

Disaster preparedness is the knowledge and capacities developed by governments, professional response and recovery organizations, CSOs, communities and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent or current hazard events or conditions. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems. It is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery (Aka et al., 2016).

Flood Policies and Plans

The availability of a flood policy and plan is an appropriate measure towards a successful flood management and adaption both at the institutional and community levels. The majority (60%) of the respondents claimed their communities had no policy and plans to deal with floods. While only 26% reported there exist flood policies/plans. The remaining 14% were unaware if there is a policy/plan or not on flood preparedness and management. Interview with the study respondents confirmed that there are no strategic plans and policies for flood preparedness and management at community level in Babessi. But authorities to implement disaster risk management actions is drawn from various pieces of legislation and decrees that address disaster risk reduction in one form or the other.

These include, Law No. 86-16 of Dec 1986, which reorganized civil protection and Law No. 98-15 of 14 July 1998, which provide guidance on activities and events classified as dangerous or unhealthy. Others are Decree No. 98-31 of March 1998, which determines the organization of emergency and relief plans, Decree No. 96/054 of 12 March 1996 which determines the composition and duties of the National Council for Civil Protection and Decree No. 2004/99 of 26 April 2004, which reorganized the Ministry of Territorial Administration and Decentralization (MINATD) and streamlined it into the current Ministry of Territorial Administration (UNDRR, 2020). The role of the new municipal councils in the new decentralization code, has this new addition included in the code; - preparation and implementation of specific council plans for risk prevention and emergency response in the event of disasters like floods (Cameroon, 2019).

Despite the highly stated plans and decrees on flood preparedness and management, they are merely paper and crisis disaster based with little implementation as very few respondents knew of the policies and plans in place to guide their preparedness for floods. Studies conducted by Bang, Miles, & Gordon, (2019) and Belle et al., (2017) in Cameroon and Zimbabwe, respectively, also showed lack of awareness of a comprehensive disaster reduction policy and plans for the countries. The poor functionality of the various flood structures can explain the lack of community preparedness policy and plans. The governments' strategies towards flood and disaster preparedness have remained theoretical instead of practical (Bang et al., 2019).

In general, the result suggests that communities had no plans to deal with floods and/or even if there were plans they were not widely known by community members. According to Sivakumar et al., (2014) flood management policy and preparedness plans are key to flood management and ensures an effective and timely response in case of a flood. This suggests a lack of commitment of

local authorities to put in place appropriate measures to better equip exposed population with what should be done in case of a flood. The low level of awareness of the respondents of the existence of the policy and plan is an indication of a very low level of institutionalized measures to enhance flood preparedness in the study community. This means that there is low level of initiatives towards formalizing and publicizing the available flood management interventions.

Availability of Sand and Sand Bags and Preparedness

The stocking of equipment (sand and sand bags) was widely reported (71%) reported to be practiced as a flood preparedness measure in the area while 29% of the respondent mentioned that they did not practice the use of stocking of equipment. This is similar to the findings reported by Islam (2016) who equally reported the use of sand and sand bags a flood preparedness among residents of Bangladesh to cope with repeated flood episodes. We observed the use of sand, mud and sand bags around buildings and water channels to prevent runoff water from entering settlements and far lands thereby causing destruction. This practice was not effective as witnessed in the 2019 Babessi flood whereby water heights was closed to 2 meters high and easily penetrated into houses and farm land.

Local Flood Management Committee and Preparedness

The availability and access to flood committee members at all levels of government including the local communities is crucial for effective flood preparedness and risk reduction as they serve as avenues for the promotion of resilience practices. Majority (54%) of the respondents claimed there was no permanent flood risk reduction committee in their community while 20% accepted that there was a permanent flood risk reduction committee in their area. The remaining percentage (26%) were not aware if there is a permanent flood reduction committee or not and neither did they know any member of the flood management committee.

Key informant interview revealed that the local flood disaster management committee task force that direct community members to collaboration with council members and workers from Upper Noun Development Authority (UNVDA) in Ndop, Cameroon, to dig trenches to canalize water but not effective due to insecurity in the area as a result of the Anglophone crisis in the area for fear of kidnappings and killings. Equally, Nojang & Jensen, (2020), also found that local chiefs in Fako Division, Cameroon, were not aware of any disaster management agency in the country that they could look up to for disaster assistance, although required by law to carry out disaster management role in their communities. The presence of an active local flood management committee has an influence on the implementation of flood risk reduction interventions in local communities to ensure high level of preparedness (Sivakumar et al., 2014).

The results imply that local communities or their leaders are not fully involved in the flood control committee and have no saying in the planning and implementation of preparedness and mitigation activities. It can therefore, be deduced that the local flood control committee whose activity is to prepare and make plans for combating floods in flood prone communities, especially in Babessi are not performing their duties effectively in sensitizing local communities on what to do to address recurrent floods. This could be explained by the lack of resources to implement flood management practices (Nojang & Jensen, 2020). Financial, human capital and material resources has been highlighted (Bang, 2021; Ndille & Belle, 2014; Bang et al., 2019) as one of the major constrains to effective preparedness and implementation of disaster risk reduction initiatives at all levels in Cameroon and other parts of Africa. Although the establishment of local flood committees is

necessary at the national level in countries prone to flood (Wilhite, 2015), it might not be enough if all stakeholders (including local communities) are not part of the committee and the activities of the committees are not supported and implemented effectively.

Then the structure would struggle to make an impactful influence in addressing the impacts of repeated flood impacts on lives and livelihoods. In all communities, the functions of the Local Flood Management Committee and the Department of Civil Protection should be made known in all communities so that people are aware of the assistance they are entitled to. Even with the creation of a local flood disaster committee to prepare for flood events, findings revealed that this committee was marred by corruption and embezzlement of flood relief items meant for flood victims and it was not also functioning since the escalation of the Anglophone crisis. Some of its members had relocated to other towns of the country for security reasons and others were killed as a result of the ongoing crisis. There is need for more trained and qualified disaster managers in the flood control committee with expertise on floods. Also, funds and material support for flood preparedness and management activities at all levels should be allocated for proper management of disasters in the country.

Flood Education/Training and Preparedness

Respondents training and education is critical in flood management. Knowing what to do and at what time is important for effective preparation. Some 21% of the respondents reported to have received flood preparedness training that helped to build their knowledge on the disaster for better response while the majority 79% did not participate in any training. A similar study conducted by Ndille & Belle, (2014) in Limbe, Cameroon, revealed lack of disaster preparedness by households due to lack of disaster awareness and training. The fact that many people were not trained nor received expect education imply lack of adequate flood response preparation which could reduce negative impacts on households, since disaster preparedness training is one of the key components of flood preparedness framework.

Key informant interview revealed that the council have been training the local community members on disaster management. According to interview, the last training session took place in 2016 and since then, due to the insecurity in Babessi as a result of the presence of separatists, training sessions have not held because their presence instill panic and fear on the population. However, interview revealed that the training was on general disaster management and members of the community who were in attendance were told to take the acquired knowledge back to their localities for dissemination with others. The last training was focused on responding to fire outbreaks, building collapse and stampede because flood was not regarded as a big problem at the time to the community. In reviewed literature such as Hosseini and Izadkhah (2006), there is strong evidence that the more prepared and knowledgeable a community is, the more resilient it becomes to disasters such as flood.

Disaster preparedness and response programs are often more successful if community members participate in planning and training for responses prior to an emergency event. Hands-on flood preparedness trainings and education programs should be continuously conducted annually in the study area to increase household preparedness on what should be done to deal with floods. Bogdan et al., (2021) reported that when at risk communities participate in disaster planning and trainings before a disaster events, they prepare and respond positively to disaster.

Flood Early Warning and Respondents' Preparedness

Early warning enhances decision making and is critical for flood planning and preparedness. Fifteen percent of the respondents revealed that there was flood forecast and early warning system in the community. The various sources of warning were from family/friends, community leaders, local flood disaster management committee and community meetings. But observation revealed that there was no meteorological station in the community that could provide early warnings on weather changes as a means of early preparedness and evacuation thereby making it difficult to prepare and adequately respond to flood episodes. Without preparation, flood response would become primarily reactive, reducing the opportunities to respond in the optimal time frames and with maximum efficiency through warning, evacuation, rescue, property protection and other activities.

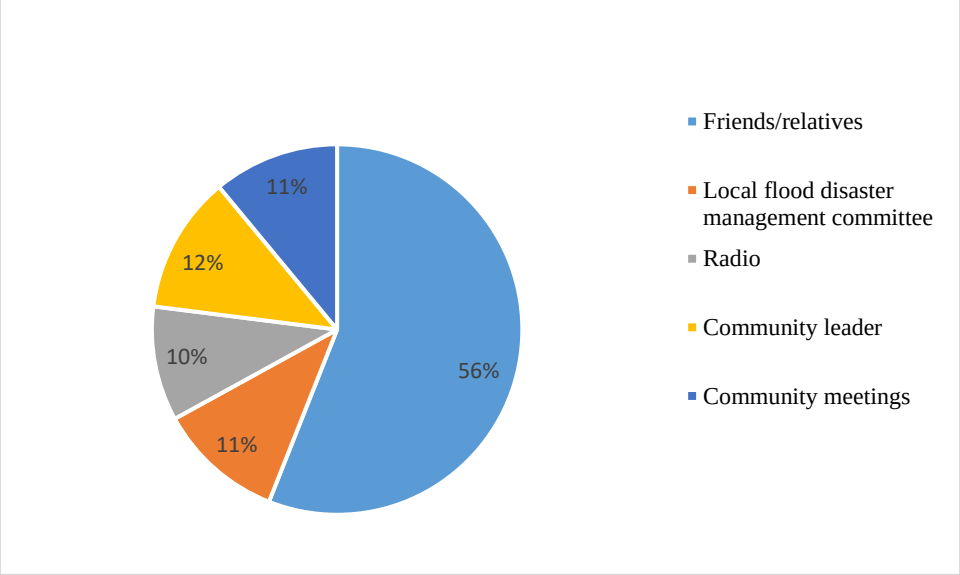

Figure 3: Major Sources of Flood Preparedness Information

Figure 3 shows that most respondents (56%) rely on friends and relatives and the least depended on the 10% Radio. Twelve percent (12%) community leaders, and 11% each, depend on community meetings and local flood disaster management committee members, respectively. Most respondents depend on friends and relatives who use indigenous and generational experiences to predict flood which they find to be suitable, easy to access and understood by members compared to extension workers. This finding supports that of Nojang & Jensen, (2020) and Tume, Kimengsi, & Fogwe, (2019), that households in the Fako division and western highlands of Cameroon, respectively, rely on family and friends for hazard preparedness and adaptation knowledge. It further agrees with Radeny et al., (2019), who found that households in Borana community, Ethiopia, rely on friends, neighbors and relatives for early weather warning information. The radio had the least respondents (10%) as a source of warning information.

This is because few households had access to electricity, which limits them from owning electronic gadgets like televisions and radio sets. Field observation shows that most people use simple phones that can be charged with a small solar panel. This finding is similar to (Belle et al., 2017) who found that a negligible percentage (11%) of farmers relied on radio and television for warning

information, mainly because they could not afford radios and televisions. Community leaders and meeting groups also provided respondents with warning information to assist them prepare for the disaster. Interview with a participant in Chui quarter revealed that the community leader usually holds meetings with the population when the raining season is approaching to guide them on what can be done to protect their crops and livestock and improve crop yields.

Respondents also emphasized that scientific early warning systems are very weak or limited. Responses indicate lack of consistency in monitoring risk zones. This finding is similar to that of Miles. (2017) who reported that the volcanically active Mt. Cameroon region, lacked consistency in monitoring due to poor, even complete lack of, maintenance of faulty monitoring equipment and that the 1999 eruption of Mt. Cameroon had especially taken everyone by surprise largely because of inoperative equipment (Miles et al., 2017). Bang also cited the devastating 2012 floods in Northern Cameroon where the hydrological regimes of the rivers in the region were not monitored, although the region experiences annual flooding (Bang et al., 2019).

Scientific early warning has been recommended as crucial for disaster preparedness and adaptation in flood prone areas (Mohammed et al., 2018; Wilhite et al., 2014). Early warning is critical because it can reduce the community's vulnerability as it allows for early preparation. Interview with a respondent in Abakwa showed that his household was taken by surprise when the community experienced flood in 2019 and he had to lose all her yields in the event. This could have been avoided if the community is provided with detailed information of the weather early enough to enable them take action. There is need to enhance information sharing amongst community members which is informed by scientific early forecast and communicated in local languages understandable to members of exposed communities for proper decision making.

Also, where the government disaster management strategy has shown a leaning towards some disaster preparedness efforts, they have remained theoretical rather than practical (Bang et al., 2019). For instance, although Law No. 86/016 of 1986,1 adopted to reorganize civil protection, provided for the creation of a national observatory for disasters, with local branches established to permanently monitor disaster-prone areas. This organ has not yet been established more than three decades after this law was enacted. In addition, disaster management suffers from inadequate financial support due to the low priority accorded to risk reduction in Cameroon's national budget (Bang, 2016).

Availability of Emergency Shelters and Preparedness

Emergency shelters are very necessary and important in disaster preparedness as a measure to curb disaster impacts when they strike. Focused discussion in our study revealed that the council has allocated land for resettlement of flood victims in Chingong quarter in Babessi but the initiative is marred with corruption because those in charge of sharing the land to flood victims are asked to pay some money before their own portion of land is given. Flood victims are also unwilling to relocate there because they do not have adequate funds to raise houses in the land provided. This study realized that their reluctance was due to social attachment to their present site and the fact that where they were relocated to was for temporal basis. For instance, informal discussion during observations informed us that in Babessi, dead family members are inside houses. Therefore, relocating them to emergency shelters will mean departing from love ones or memorable sites which the living maintained a feeling of attachment with the dead relations.

Indigenous Flood Forecasting and Preparedness

Indigenous knowledge (IK) of weather forecasting is an essential component of flood risk reduction especially in the study area where modern scientific information systems are either weak or limited (Bang, 2021). Some respondents used indigenous knowledge to predict flood occurrence which guided them to make decisions on their daily and livelihood activities. The various forms of indigenous information practiced by the respondents to predict floods include, the weather (46%), frequent lightening (33%), the appearance of dark clouds (15%), and the remaining (6%) mentioned appearance of certain insects (Figure 4). These findings were supported by a FGD participant who stated that "we usually observe the weather becoming cold and dark, we know there will be heavy rains that could lead to overflow of streams into settlements and farm lands.

Another added that "Also, when we see a particular ant appearing, then we can tell that it would rain heavily". This finding is concurrent with other studies conducted in other parts of Cameroon and Africa (Filho et al., 2022; Maliki & Pauline, 2022; Radeny et al., 2019; Tume et al., 2019) that agrarian communities make use of indigenous knowledge for climate disaster planning and preparedness. The results imply that the study community rely highly on local knowledge which is shared amongst family members and friends for decision making on livelihood adjustments. This is partly due to the none availability and limited understanding of scientific weather information associated with low educational capacity of the respondents. This suggest the need to integrate indigenous knowledge and conventional weather forecasting system for improved accuracy of rainfall prediction.

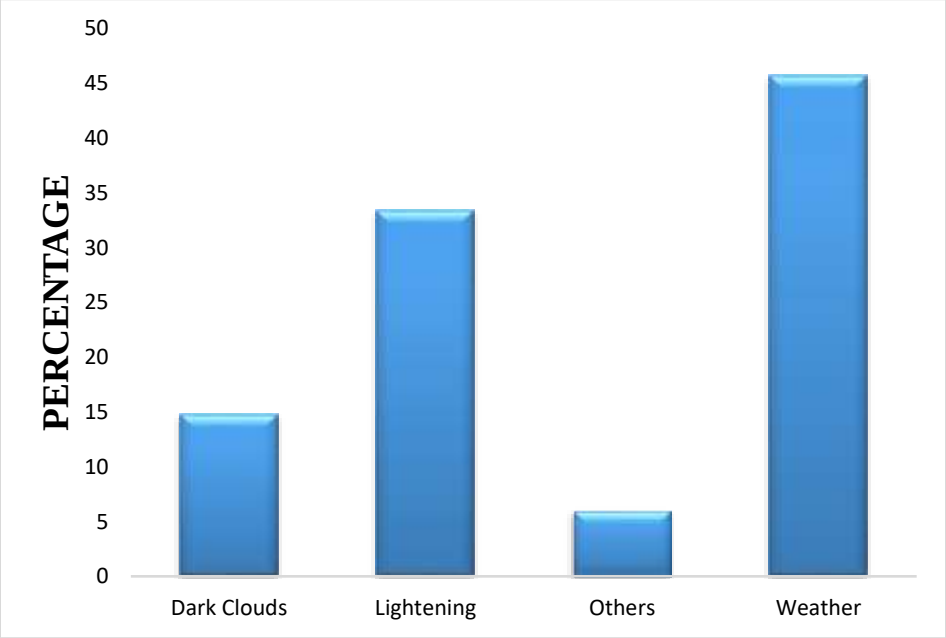

Figure 4: Signals that It Will Rain

4.0 CONCLUSION AND RECOMMENDATIONS

Conclusion

The Ndop plain is prone to recurrent floods requiring proactive preparedness for effective response and recovery from the hazard impacts. The main results revealed that the main cause of floods is

heavy and consistent rainfall. Also, poor refuse disposal and management of the drainage system account for most floods in this area. This is as a result of the topography and climatic variability of the area. The area is located in a plain surrounded by hills, valleys and dams which exposes the community frequent and recurrent flooding.

Again, the study found that although respondents depended on their social connectedness and local knowledge for flood preparedness decision making they are not fully prepared to deal with current and future floods. Community preparedness to flood disasters is low because of few flood hazards and disaster safety trainings and capacity building of the population, lack of heightened awareness and sensitization campaigns on handling flood disasters, extension/scientific support service, limited respondents' preparation for, and response to flood and the fact that flood hazard and disaster education is not a priority in the study area and has led to the inability to combat flood incidents.

Recommendations

The study recommends the increase involvement of local community members in the local flood management committee that would lead the establishment of community flood management committee that can enhance the implementation of flood plans at the grassroots level for effective response and recovery, thereby fulfilling priority 4 (Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction) of the Sendai framework. Preparedness plans should be made available to all community members and should be tested yearly for possible improvement.

The lack of awareness of the laws and policies governing flood management in the community by the majority of the respondents and low involvement of a community members to the local flood management committee, deprive communities of the critical resources (human, financial, technological and material) to deal with floods. An in-depth study on the role and extent to which the local flood management committee has influenced community flood management in other villages within the Ndop plain of Cameroon is recommended. The population of Babessi needs to be sensitized on the impending danger of any flood hazard and be encouraged to participate in implementing the adopted strategies to prevent and manage subsequent flood hazards. Efforts within flood risk management have to create solutions based on community ownership and consensus. By preparing and increasing community awareness and capacity of local Governmental authorities to handle flood situations has been recognized as a focal point for flood risk management.

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