



A PILOT STUDY: INTEGRATING PUBLIC OPINION INTO THE DISASTER RISK REDUCTION POLICES WITH SPECIAL REFERENCE TO FLOODS IN OLUVIL IN AMPARA DISTRICT

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Abstract

The present pilot study aimed to investigate the public opinions, which could influence flood disaster risk reduction policies and make recommendations to incorporate them into the phases of flood management policies. This Survey employed the structured questionnaire as a tool for data collection. Specifically, this study explored the interactive relationships among contextual flood risks and perceived flood risks with the effects of social-demographic variables. In the light of above analysis, it is possible to conclude that flood risks are the higher level threat to Oluvil village compared to other natural disasters. The demographic variables such as age and gender, which characterize the vulnerability of people to floods, awareness regarding floods and prioritizing flood damages, are important for DRR policy and flood control measures. To communicate flood early warning, the loud speakers in mosque is considered as an effective mean in the study area. The importance of television and radio are in decline in disseminating the warning regarding flood threat, which are being replaced by mobile phones. Local communities are in medium level preparedness indicating the need for improving preparedness. Females have more concern for flood threats than males requiring additional flood control measures. It is suggested that proper drainage facilities, disposal of wastes, protection of water points, building evacuation roads and building community shelter are main structural activities for reducing flood hazards, which can be implemented by the local government in Oluvil which can be complemented by policy measures. The findings of this study provide certain insights for policy measures for flood DRR, which can be further, studied for integration into local government policies.

Keywords: Community, gender, vulnerability, flood hazards, local government.

Introduction

Flood hazards are considered as one of the most significant natural disasters in terms of human impact and economic losses all over the world (Jonkman, 2005). According to Alhacoon *et al.*, (2018), the flood recurrent map based on the aggregated annual MODIS data, the eastern and western provinces of Sri Lanka were the most affected by flood events in the past 16 years. Oluvil is one of the village located in the eastern province of Sri Lanka along the eastern coast of Ampara district belongs to the Addalaichenai Divisional Secretariat division and affected by the natural disasters like seasonal floods. Almost 75% of the annual average rainfall occurs during the two monsoon seasons: the southwest (May–September) and the northeast (November–February) monsoons, in which 60% of annual average rainfall occurs from few intense storms. Recurring floods caused by these monsoon rains are a common feature in Sri Lanka and such flooding has affected more than 7.8 million people since 2000 (Ministry of Disaster Management, 2014). In year 2013, over 430,000 people were affected in northern and eastern provinces due to floods (OCHA, 2014). In year 2011, devastating floods mainly in the eastern province including Oluvil were triggered by heavy rains.

In practice, people are the first party suffering from hazards from floods and in the mean time they are the immediate front line volunteers engaging in flood control measures during and immediately after floods at the ground level. Jacqueline *et al.*, (2005) indicated that members of the public are the first responders to a flood threat, and play a critical role in reducing the damage by undertaking individual and group activities such as construction of wall, public information services, monitoring and warning systems, evacuation activities and participating in neighborhood committees. Dili and Timor Leste (2018) reported that an increase in the frequency of floods and consequent impact on lives and livelihoods has led community members to develop some coping strategies based on their existing capacities. According to John Sinclair *et al.*, (2004), the success of flood planning and management relies at least partially on effective and fair public involvement. This is a common understanding and observation that depending on the communities' knowledge of flood hazards, people of the



particular community often take precautionary measures and respond to the flood disaster before outside help comes.

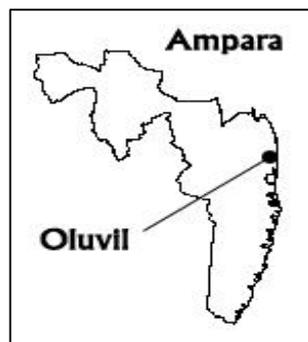
Despite the popular opinion of senior decision-makers, there are arguments that public participation is needed in the formulation of flood emergency response policies and measures. Understanding people's risk perception, opinion and its determining factors are, however, crucial for improving risk communications and effective flood mitigation policies as well. Public participation in disaster risk reduction (DRR) policy formulation will create a sense of ownership for them with the resulting solutions (Mitchell, 2002). Further, It has been identified that the need of empowering the local government as a key priority to encourage democratic decision-making involving the citizens and all key stakeholders at the local level in order to ensure effective implementation of flood related DRR policies and measures (ISDR, 2010).

Therefore, to make any policy effective, involvement of the public is a crucial step. To this effect, it is important to investigate the factors or opinions of public that may influence policy formulation regarding flood hazard mitigation and prevention measures at local level. In addition, the influences of social-demographic factors are potentially important which require data sample from the public to be investigated, and are important predictors for policy formulation. These processes may bring public values and social objectives into decision processes (Higgelke and Duinker, 1993), defining problems more effectively and identifying a variety of solutions. Further, according to Challies et al., (2016), flood management has seen a shift from conventional, structural flood defense to a more integrated flood risk management approach in which structural defense measures are complemented with non-structural or 'soft' measures to reduce flooding effects (e.g. spatial planning, awareness raising, and insurance). Though, structural measures are available to certain extent to formulate flood risk management policies, public opinion at local level among from the affected communities are not sufficiently available in Sri Lanka.

Hence, the main purpose of this study was to investigate the public opinions, which could influence the flood risk reduction policies and measures and make recommendations to incorporate them into the phases of flood management policies. As such, the present study evaluated and assessed in detail several factors from sampled group of public in Oluvil. Specifically, this study explored the interactive relationships among contextual flood risks, perceived flood risks and policy measures, with the effects of social-demographic variables in Oluvil.

Data collection and methodology

Study area



Coastal village of Oluvil was selected as a study area which is located in the Ampara district of eastern coast of Sri Lanka facing the bay of bengal. The major ethnic group of Oluvil comprised of Muslims. It has a population of 8439 people with females about 4194 and males about 4245 accommodated in 7 GN divisions. Extent is about 1627.35 hectares (Survey Department, 2017). In this area, people involve in economic activities such as farming, animal husbandry and fishing. Geographical coordinates of Oluvil village are spreading within the range of 7° 17' 0" North and 81° 51' 0" East. The east part of the Oluvil is found with sea and west part is totally covered by paddy field irrigated from a reservoir called Senanayak Samudra. Adjacent villages cover north and south boundaries. The average annual temperature is about 27.2°C and the average annual rainfall is estimated as 1858 mm.

The source of data for this study was mainly qualitative from both the primary and secondary sources. To collect primary data, questionnaire survey method was used. It was a structured questionnaire prepared in English and translated into Tamil since the people in this area speak Tamil language. Sixty questionnaires (60) were distributed



in person among the public across Oluvil based on population data which were selected at the ratio of 150:1. The randomly selected group of people falls into the age above 20 years old those who are from government and non-government employees, educated and non-educated people, people from Divisional Secretariat Division and Grama Niladhari Divisions. As secondary data, statistics from Divisional secretariat, performance report of District Secretariat, previous researches, newspapers, magazines, and books were used. All the collected primary data were analyzed with the help of SPSS 16.0 software and MS office Excel 2013.

Results and Discussion

Demographic characteristics

Chauvin et al., (2007) revealed that the individual socio-demographic characteristics can play an important role in shaping risk reduction of natural hazards. Therefore, the demographic variables such as the length of time the respondent resided in Oluvil area, type of occupation, respondent's age and the gender were analyzed. The followings are the summary of the results of flood related survey in Oluvil.

Fig. 3.1 indicates that 46% of the respondents are long-time residents of Oluvil having lived here longer than 15 years. This is followed by 42% of respondents who have lived here between 5 and 15 years. In addition, a 12% of residents have lived here for less than 5 years. The results indicated that most of the people (88%) suffered from floods for last 16 years. This finding is important here as we noted already, eastern province is one of most affected one out of two provinces.

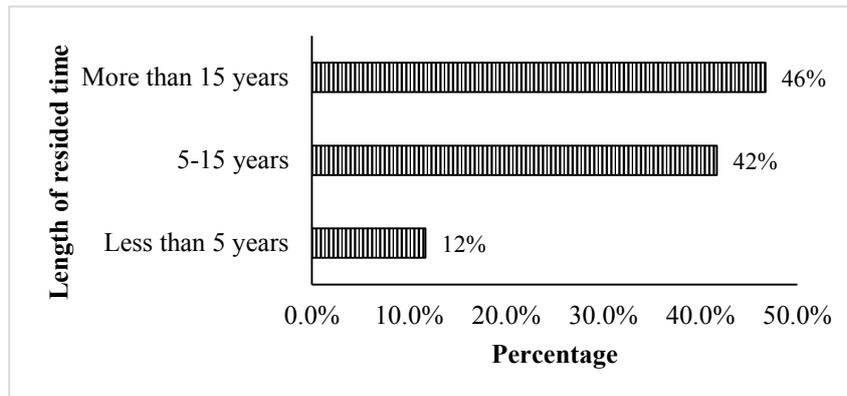


Fig. 3.1: Length of time respondent resided in Oluvil

Grothmann and Reusswig (2006) reported that age has been found to be positively correlated with risk reduction of a number of natural hazards. When looking at the age of the respondents (Fig. 3.2), it can be seen that respondents age were categorized into four different age groups and the greater proportion of respondent falls between the age group of 20-30 years (35%). Moreover, a 33% of respondents fall into the 31 to 40 age group. From the data above, it is clear those adults in their productive age (20-50 years), which form 88% of the respondents, who were more exposed to flood events. Because, they were away from home engaging in economic activities outside the vicinity of house. Age group of more than 50 years accounted for 12% of respondents. These findings are in agreement with Kushani De Silva (2014), they found in Pamunuwila village from the sample they studied, 30.6% of the community is either below age 5 years or more than 60 years who had been at home with others help.

Meanwhile, occupational status of respondents were included under public or government sector (20%), private sector (11.7%), students (10%), retired person (3.3%), self-employed (45%) and unemployed (10%) categories. These findings are related with the finding of Awopetu et al., (2013), they observed that respondents who were in the age group of 26-40 years are affected by the flood in Nigeria and this impacted negatively on the economy of the study area most especially when a large percentage of the respondents are self-employed.

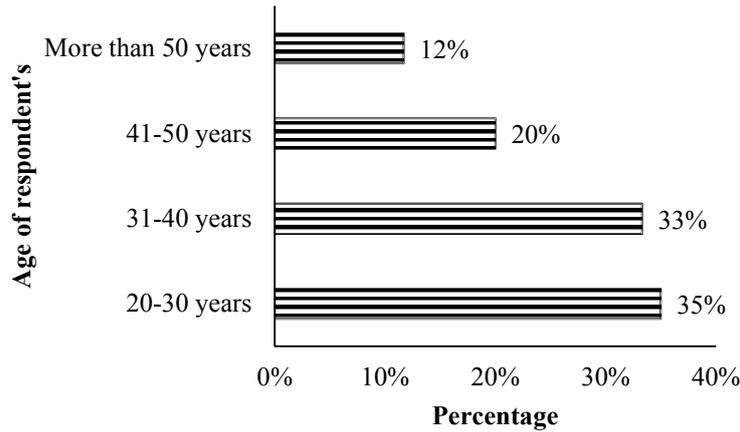


Fig. 3.2: Age group of respondent's in Oluvil

Further, the respondent's gender in this survey was obtained as 63% male and 37% female; this was as result of participation of more males in the survey whereas the statistics as we indicated already shows that 49.6% are females in Oluvil. However, according to Jonkman and Vrijling on average 70% of the males are badly affected due to flood hazards. They attribute this gender discrepancy to the high involvement of male in driving, the high proportion of males in the emergency and supporting services, and male's risk-taking behavior.

Findings of above-mentioned social-demographic factors are potentially important predictors can be considered in the formulation of policies. Wanyun Shao et al., (2017) reported that motivating the elder on relocation, education and on evacuation might create problem for policy makers, this age factor is going to be important since there are 12% of people with the age of above 50 years old.

Flood exposure and vulnerability

The survey results (Fig. 3.3) show that the often-faced natural disaster by people in Oluvil area is flood. It shows floods are the most common and damaging hazard known by the communities. The second most mentioned hazard is drought rather than cyclone, lightening and Tsunami. Further, it is important to note here that the choice of Oluvil as a location to the flood risk survey seems to be correct.

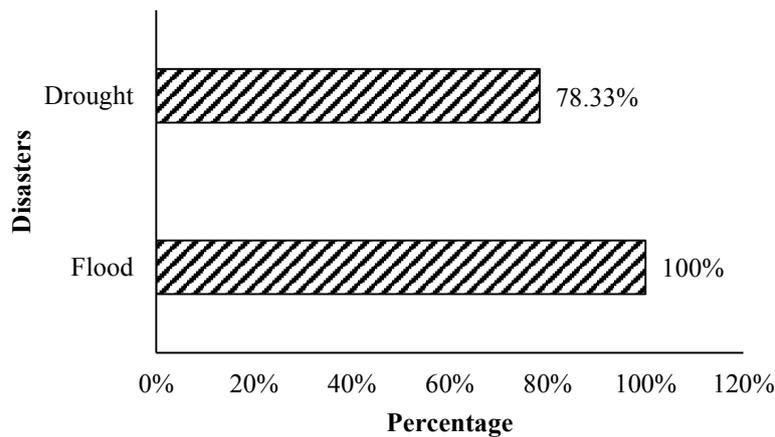


Fig. 3.3: Often faced natural disasters in Oluvil

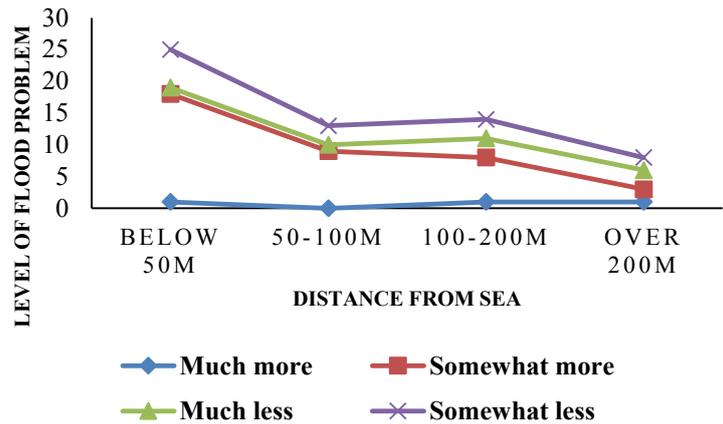


Fig. 3.4: Relationship between levels of flood problem with location of respondents

The level of flood hazard experience may be determined by the location of residence. People living on locations exposed to higher risk values will have a greater chance of experiencing risk related natural hazards. Generally for coastal areas, flooding can happen in two main ways: from sustained heavy rain that doesn't drain away, or from storm surges, when storms drag the sea up and over the coastline. But when they occur together, or in close succession, the consequences can be even more severe. Thus, possibility for economic damages from flooding may be drastically increased. According to the survey (Fig. 3.4), higher percentage of respondents who have stayed at all locations of Oluvil were recorded 'Somewhat more' level of flood problem due to heavy monsoonal rain. Compared with four categories of distance, people who have live below 50m distance from sea (40% of respondents) experience relatively high level of flood problem and people who have live over 200m distance (8.3% of respondents) face relatively low level of flood problem. These may reveal that the residents living permanently in a high-risk place exhibit higher risk compared to residents living permanently in a low-risk place. Lindell and Hwang (2008) argued that staying permanently on a hazardous place may amplify risk perception. And also it gives a crucial message to policy makers to formulate effective flood management policies for those who are affected by both monsoonal floods and sea drag up.

On reporting the frequency of floods, respondents differ. Majority of the respondents (58.3%) stated that they experienced floods five times. Another 26.7% reported that they experienced floods 5 to 10 times and 8.3% stated that they experienced flood more than 10 times. The difference in reporting flood may be due to their difference in age and elder people might have experienced more floods in Oluvil because in our survey around 12% of the respondents are more than 50 years old.

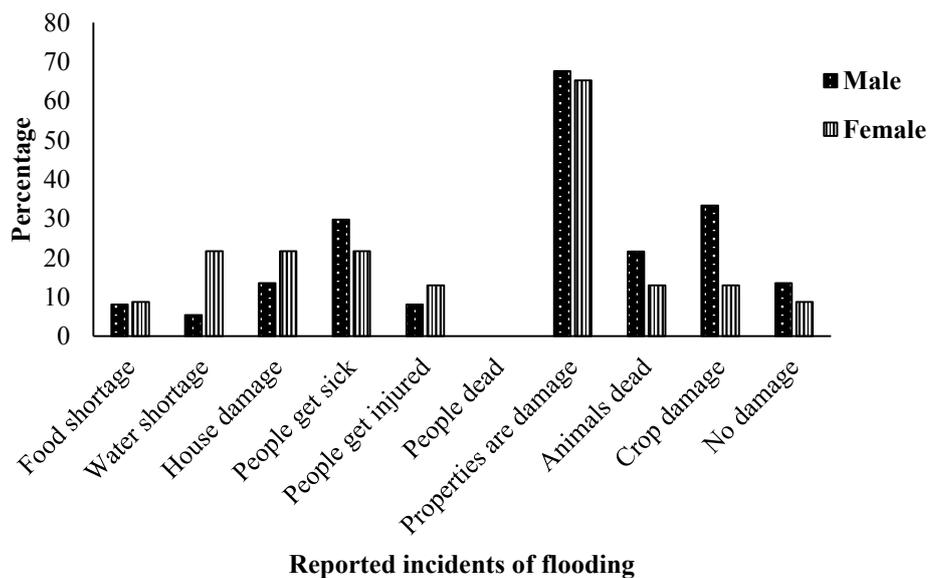


Fig. 3.5: Percentage of reported incidents of flooding gender wise



As mentioned previously, flood is a hazard that hit an important part of communities in Oluvil. The most commonly reported impact (Fig. 3.5) from flooding was properties damaged, followed by crop damage, people get sick and house damage. In the cases of food shortage, water shortage, house damage and people get injured, floods have negative direct and indirect impacts more on females compared to males. It may suggest that females who have the important role at the household level to manage food and water supplies mainly put these elements forward. According to the report of IFRC (2010), women and children are commonly regarded as the most vulnerable groups to the disasters and they have challenged critical barriers including cultural constraints, limited skills, weak physical strength than men and influencing negative incidents. On the other hand males' reporting of damages are different compared to females and they reported on higher percentages in terms of the effect of floods on people get sick, properties damaged and animals dead. These damages are mainly related to income generating sources and main concerns for males. Because in Muslim communities, these elements are mainly managed by males. The survey indicates the priorities of males and females with regard to damages caused by floods in local level, which may be useful for policy makers and implementing agencies, who involve in flood disaster risk reduction and mitigation.

Flood awareness

Fig. 3.6 indicates the knowledge on DMP with age group of respondents. Respondents who were in the age group of 31-40 years (33.3%) have a general understanding of Disaster Management Plan. This is followed by 31.7% of respondents who falls between the age group of 20-30 years. This revealed that young adults (20 – 40 years old) are more familiar with this knowledge than elders in coastal village of Oluvil. Finnis et al.,(2010) shows that young people participating in various activities before, during and after a disaster or a major incident, have a better ability to handle the situation practically, mentally and also actively promoted a better preparedness for flood in their surroundings and home environment. On the other hand, Tarsis Bazana Kabwegyere (2010) reported that individuals in communities can only participate in disaster planning and management when they have updated knowledge and information on the likelihood of disasters and on the appropriate ways of responding to them. From this survey, it is hardly possible for us to comment on the level of current knowledge about flood disasters among people in Oluvil even though around 65% of the respondents indicated that they have a general understanding of disaster management plan.

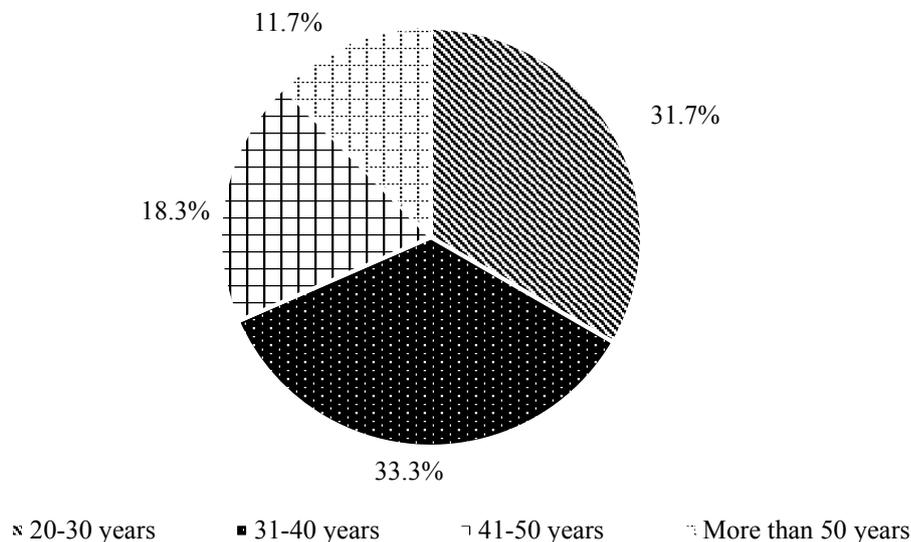


Fig. 3.6: Knowledge on Disaster Management Plan (DMP) for different age group

Further, well-conceived and effectively delivered emergency messages on flood awareness measures can help ensure public safety, protect property, facilitate response efforts, instill public confidence, and help families reunite. In that way, there are many communication tools to choose from, including broadcast media, internet, mobile phones and social media etc. Each has advantages and limitations depending on communication objective and the intended audience. Brian et al., (2010) found that a majority of respondents (63.6%) rely on television for disaster information, followed by 12.6% who rely on information shared by family, friends and neighbors. However, according to our survey multiple answers obtained from respondents in which they reported in more



than one way emergency messages, information about disasters or emergency situations are received; through newspapers (45%), family members and friends (68.3%), television and radio (35%) and internet or mobile phones (26.7%). Decline in television as a source may be due to communication networks, such as mobile phones and computers. The television could be unreliable during disasters because electricity could be disrupted in the village. In addition, majority of respondents in Oluvil mentioned that these early warnings or other disaster information are shared or disseminated among the communities through the mosque loud speakers and help of police officers. These findings reveal the need for effective communications measures and the related policies at local level.

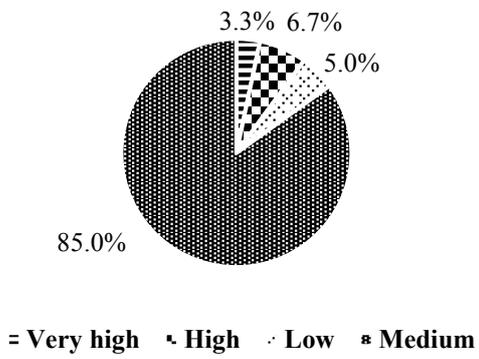


Fig. 3.7: Local communities

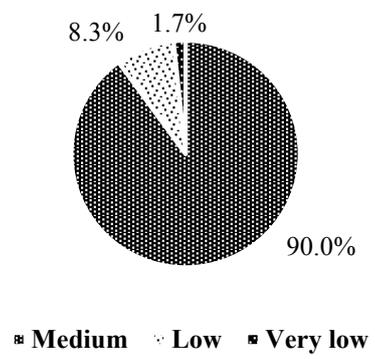


Fig. 3.8: Local government

Figures 3.7 and 3.8 show the level of preparedness of local communities and local government to mitigate natural flood disasters in Oluvil. The survey highlighted the majority of respondents reporting that local communities (85%) and local governments (90%) are in medium level for disaster preparedness. This indicates the necessity for improving the preparedness to floods at local level. Higher level of preparedness becomes very important since the local community are the first responder in the event of a disaster emergency that communities know what, where, when, and how they should plan for responding to and recovering from disasters (Camilla Barker, 2018) and the local government is the grass root level entity working with people.

Local government’s role in flood Disaster Risk Reduction (DRR)

The respondents responded to a question regarding the key preparedness actions (Fig. 3.9) to reduce the flood hazard risks. The most commonly reported flood DRR actions were dug waste pits (85%), build evacuation roads (81.7%) and protect water points (81.7%), followed by build community shelter (68.3%) and make awareness (45%). Regarding cut the dangerous trees close to the house (18.3%) is considered as less important from respondents. Wester and Bron (1998) stated that various flood protection and drainage measures have been taken by both stakeholders and the government to minimize the flood risks and due to government interventions, more than 37% of the Net Cultivable Area (NCA) is protected by improved Flood Control and Drainage (FCD) systems in Bangladesh. Having the results of the survey, it is suggested that proper drainage facilities, disposal of wastes, protection of water points, building evacuation roads and building community shelter are main activities for reducing flood hazards, which can be implemented by the local government in Oluvil.

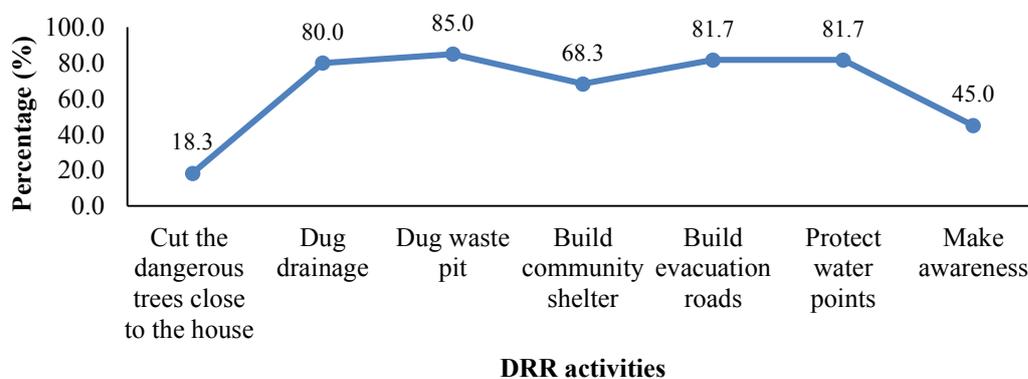


Fig 3.9: Local governments’ role and activities



Only half of the population (Fig. 3.10) reported that implemented DRR activities and measures are helpful to minimize the flood disaster risk in Oluvil. Males are more confident on this matter than females. These may suggest that females are responsible for children during evacuation and often preoccupied with the needs of most vulnerable people, which can increase their feeling of vulnerability. In contrast, males do not often deal with vulnerable people in the community as they are responsible of physical work. Females often put forward the necessity of mutual aid in favor of vulnerable groups in disaster risk preparation. As cited, (JICA, 2010) traditionally DRR planning has been centered on men, and in many cases does not reflect the needs and voices of women and other high-risk groups.

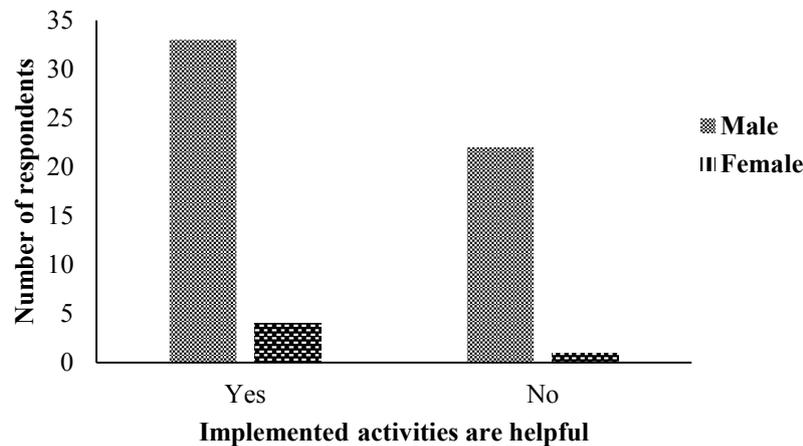


Fig 3.10: Knowledge on implemented flood policy measures for gender wise

Conclusions and Suggestions

The main purpose of this pilot study was to investigate the public opinions, which could influence the flood risk reduction policies and measures and thereby to make recommendations to incorporate them into the phases of flood management policies. In the light of above analysis, it is possible to conclude that flood risks are the higher level threat to Oluvil compared to other natural disasters. The demographic variables such as age and gender which characterize the vulnerability of people to floods, awareness regarding floods and prioritizing flood damages are important for DRR policy and flood control measures. To communicate flood early warning, the loud speakers in mosque is considered as an effective mean in the study area. The importance of television and radio are in decline in disseminating the warning regarding flood threat, which are now replaced by mobile phones. Local communities are in medium level preparedness indicating the need for improving preparedness. Females have more concern for flood threats than males requiring additional flood control measures in study area. It is suggested that proper drainage facilities, disposal of wastes, protection of water points, building evacuation roads and building community shelter are main activities for reducing flood hazards, which can be implemented by the local government in Oluvil. The findings of this study provide certain insights for policy measures for flood DRR.

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