

Household Preparedness for Natural Disasters in Flood-Prone Areas of Misamis Occidental, Philippines

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Abstract

Natural disasters continue to devastate lives and properties despite the tremendous and joint effort of societies all over the world. A greater percentage of the area and population in the Philippines are vulnerable to natural disasters making the country a natural disaster hot-spot. This paper looked into the disaster preparedness of the households located in flood-prone areas in the province of Misamis Occidental. The coastal cities and towns in the province are prone to flooding while some rivers are highly susceptible to overflowing. This study employed the descriptive design and survey method. Questionnaires were administered to 631 households in a total of six identified flood-prone barangays of Ozamiz City and Oroquieta City. Results showed that disaster preparedness of households in flood-prone areas varies. Overall, the households are moderately prepared for natural disasters. However, looking into each preparedness activity, results showed that the households are less prepared for life safety and property protection, and initiation of recovery. This study may help identify vulnerability and strategies to adequately prepare the households from the adversities of floods and other natural disasters. The findings of this study may be used in policy-making to ensure that the approaches to disaster control are properly implemented.

Keywords: adversities, coastal, hot-spot, rivers, vulnerability

Introduction

Despite tremendous and concerted efforts, natural disasters continually pose threats to societies all over the world. The meteorological and hydrological events related to climate change have caused the occurrence of natural disasters to increase at an alarming rate each year (Birkmann & von Teichman, 2010). The severity of natural disasters is associated with the escalation of extreme weather events related to climate change (Field, 2012; Mason & Agan, 2015; Etkin et al., 2012). The occurrence of tropical typhoons and extreme rainfall lead to flooding causing loss of lives, damage to property and livelihood (Lansigan et al., 2015; Mason & Agan, 2015).

Flood is the most frequent natural disaster under climate change and the most devastating next to storms and earthquakes (Wilby & Keenan, 2012; Ugwu & Ugwu, 2013). The global risk of flooding is expected to increase as the climate becomes warmer than before. Through the course of global warming, up to 20% of the world's population is likely to be affected by increased flood hazard by the year 2080 (Field, 2012). A sharp increase in flood hazard would be in South Asia and Southeast Asia as Hirabayashi et al. (2013) projected. In 2012, massive flooding affected 72.7 million people in Asia, 15.6% of the occurrence was in the Philippines. With an estimated 50.3% of the total area and 81.3% of the population being vulnerable to natural disasters, the Philippines is considered a natural disaster hot-spot (Dilley, 2005).

Recent history shows an increasing occurrence of deadly typhoons and flood disasters in the Philippines with high human and environmental impacts (Guha-Sapir et al., 2010). An average of 20 typhoons or tropical storms hit the Philippine archipelago of more than 7,100 islands each year which kill thousands of people (Vila, 2014). Typhoon Ketsana, locally known as 'Ondoy', was the most devastating typhoon in 2009 with the highest volume of rainfall in a single day since the 1960s that caused massive flooding in the capital (Mghendi, 2010). Typhoon Haiyan, locally known as 'Yolanda' that struck the Central Philippines in 2013, was one of the strongest typhoons to strike land on record. It killed about 7,300 people, injured 28,689

individuals and caused nearly 1,000,000 residents to evacuate (Cranmer & Biddinger, 2014; Lagmay et al., 2015; Schott et al., 2012; David et al., 2013). The typhoon also caused devastating damage to the vegetation and infrastructure (Esteban et al., 2015). An estimated 1.1 million houses were destroyed, nearly 5.6 million people required food assistance, and power, telecommunications, and water supplies were cut off particularly in coastal communities in Leyte and Eastern Samar (Lum & Margesson, 2014). The tropical storm Fung-wong, known as ‘Mario’ in the Philippines caused flooding in most Manila cities that took the lives of 12 people, affected 183,188 families in other regions, and caused severe damage to roads as well as to fisheries and agriculture (Galvez & Depasupil, 2014).

The tropical storm Washi, locally known as ‘Sendong’ caused torrential rains that brought a flash flood to Northern Mindanao killing 1,292 people in 2011 (Rasquinho et al., 2013) particularly in Cagayan de Oro City. ‘Sendong’ was the most destructive tropical cyclone in the Philippines with regard to dead casualties while Typhoon Nesat, known as ‘Pedring’ in the Philippines was the most destructive with regard to property damage in the same year (National Disaster Risk and Management Council, 2012). Typhoon Bopha, known in the country as ‘Pablo’ was the strongest tropical cyclone in 2012 to ever hit and caused substantial damage in Mindanao (Garot et al., 2015).

With the occurrence of typhoons in Mindanao, the province of Misamis Occidental in the northern part of the island also suffered damage in infrastructure, properties, and agriculture due to flooding. There are no reported casualties, but the province has many disaster-prone areas. Mines and Geosciences Bureau (MGB) in Region 10 has identified some rivers in the province as very vulnerable to flooding. The flood risk of the province is considered medium-high (Chinci, 2011) and most coastal cities and towns in the province are prone to flooding. On February 10, 2012, heavy rain flooded several areas in Misamis Occidental, including Ozamiz City (Rosauro & Alipala, 2012). No casualties had been reported, but many houses were destroyed and washed out to sea. Bridges were also destroyed, and roads in few places were blocked due to landslides.

In recent years, increasing casualties and damage due to natural disasters reflect society's growing vulnerability to natural hazards (Kovacs & Kunreuther, 2001). A disaster occurs when a natural hazard affects a vulnerable human population (Uitto, 1998). Vulnerability is defined as the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard (United Nations Office for Disaster Risk Reduction [UNISDR] in 2009). Hence, rapid population growth, rising rates of poverty and homelessness, aging infrastructure, and climate change bring vulnerability to the community (Baker, 2012; Cannon, 2002). Increased globalization and urbanization force people to live in hazard-prone areas making them vulnerable to flooding and other natural disasters. People are unequally affected by extreme weather events with regard to mortality, morbidity, and financial losses (Werg et al., 2013). Hence, the need to assess hazard exposure and social vulnerability of the human community thereby provides valuable information to mitigate flood risk (Koks et al., 2015).

According to Falkiner (2003), most deaths, losses, and damages caused by disasters cannot only be mitigated but can also be prevented. Mileti (1999) stressed that disaster preparedness is one of the most important means to prevent the adverse effects of natural disasters. The UNISDR (2009) defines preparedness as the knowledge, capabilities, and actions of government, organizations, community groups, and individuals to effectively anticipate, respond to and recover from, the impacts of likely, imminent or current hazard events or conditions. It includes anticipatory activities such as planning, resource identification, warning system, training, risk communication, public awareness, and education (Simpson, 2008). It also includes exercising the activities to improve the safety and effectiveness of a community's response to a disaster.

Household preparedness in response to natural disasters is critically important. According to Kapucu (2008), if individuals are not ready, then nobody is ready. Sutton and Tierney (2006) identified key dimensions of household preparedness. These dimensions include hazard knowledge, formal and informal response plans and agreements,

supportive resources, life safety and property protection, and initiation of recovery. Levac et al. (2012) also conducted a literature review of disaster preparedness and found that socioeconomic and demographic factors influence the ability and desire of individuals and families to prepare for emergencies.

Adequate household preparedness could significantly reduce the adverse impact of disasters (Diekman et al., 2007). Strengthening local preparedness is viewed as an essential element in effective response and recovery (Levac et al., 2012). It is therefore important to look into the preparedness of households when dealing with natural disasters. Families have to be primarily responsible for themselves and their neighbors when a disaster strikes (Simpson, 2008). Preparedness is not static, but dynamic, requiring revisions and modifications as social contexts change (Perry & Lindell, 2003). This study looked into the disaster preparedness of the households in flood-prone areas in Misamis Occidental. The findings may help identify vulnerability and strategies to adequately prepare the households from the adversities of floods and other natural disasters. The findings of this study may be used in policy-making to ensure that the approaches to disaster control are properly implemented.

Materials and Methods

The study used the descriptive research design and survey method. Sampling was done in identified flood-prone areas in Ozamiz City and Oroquieta City in Misamis Occidental province (Figure 1). The lists of the flood-prone barangays were obtained from the respective City Disaster Risk and Reduction Management Council (CDRRMC) offices in the two cities. Three barangays with the most number of puroks or sitios that had the highest risks of flooding were drawn from each city as the study sites. In the list, Aguada, Lam-an, and Bañadero were the top three flood-prone barangays in Ozamiz City. Tabok Norte, Lower Loboc, and Canubay were the mostly flooded barangays in Oroquieta City.



Figure 1. Maps of the Philippines, Ozamiz City and Oroquieta City (Source: <https://wego.here.com/>) with pictures of the actual study sites (Source: Field Survey).

The survey was done in 631 households (334 in Ozamiz City, 287 in Oroquieta City) randomly selected from these barangays. This sample size was calculated using the Sloven's formula (Olatunde & Joshua, 2012) and the households were selected using random numbers. Majority of the households were located in the coastal areas or near the rivers. The communities were congested, and many of the houses were made of light materials.

The questionnaire developed from the established framework of Sutton and Tierney (2006) and Levac et al. (2012) was used for the survey. Part I of the questionnaire includes sections to determine the socioeconomic profile of the target respondents. The profile includes the gender, age, marital status, number of family members, and estimated household monthly income. Part II has 18 items of preparedness activities for the respondents to determine their level of preparedness. These activities are categorized into hazard knowledge (6 items), formal and informal response plans and agreements (3 items), supportive resources (3 items), life safety and property protection (5 items), and initiation of recovery (1 item). The responses were categorized using the Likert scale: 0 - never completed the preparedness activity, 1 - have completed the preparedness activity more than three years ago, 2 - have completed the preparedness activity within the last two to three years, and 3 - have completed the preparedness activity within the last year.

Data gathering was done in April and May of 2015 after obtaining from the barangay heads the permission to conduct the study. The respondents of the survey were the heads or members of the selected households of legal age. Informed consent was secured from each respondent after discussing the purpose and scope of the study, and the anonymity of the identity and responses. The questionnaire was distributed to the target respondents who agreed to participate in the study. Replacements were made for those household members not available during the conduct of the study. Interviews were also carried out with the respondents and other key informants such as the officials to obtain additional information.

The weighted mean computed per item was the descriptive statistics used. The values were interpreted using the following scales: 2.25 - 3.00 – Well prepared; 1.50 - 2.24 – Moderately prepared; 0.75 - 1.49 – Less prepared; 0.00 - 0.74 – Not prepared. All activities were ranked based on the weighted mean. The sample standard deviation (SD) was computed to obtain the coefficient of variation (CV) which was interpreted as the percentage of variability of the responses. The standard value is at most 10% which assures that the responses are comparable.

Results and Discussion

Table 1 presents the socioeconomic profile of the respondents. A high percentage of the respondents were women, between the ages of 41-50 and married with four to six household members. These married women dominate the number of respondents because they are most likely the ones left at home to take care of the household. Most households have an income below five thousand pesos. The family income suggests that many of these households are living in poverty. The socioeconomic profile of the respondents could serve as an indicator of their vulnerability and resilience to natural disasters. Rufat et al. (2015) pointed that the processes involving gender, age, and income are principal drivers of a population's ability to prepare for, respond to, and recover from damaging flood events.

The result that women dominate among those living in flood-prone areas can reflect some extent of their vulnerability. The study of Arora-Jonsson (2011) in the South documented that women are more vulnerable to climate change than men. The profound impact of gender on the vulnerability and capacity to cope with natural disasters is the result of inherent constraints of the social status of the individuals (Behrman et al., 2015). In Nigeria for example, women are more vulnerable than men because they have reduced access to sources of emergency intervention and they lack the power to decide in disaster prevention and preparedness programs (Ugwu & Ugwu, 2013). Differential access to resources, employment, income, rights,

opportunities, gendered roles, and power results to gendered vulnerability. This situation is apparent both in developing countries (Vincent et al., 2010; Rofi et al., 2006) and developed nations (Vinyeta et al., 2015; Steinführer, 2007).

Table 1. Socioeconomic profile of the respondents.

Profile	Category	Frequency	Percentage
Gender	Male	181	28.7
	Female	450	71.3
Age	20-30	91	14.4
	31-40	134	21.2
	41-50	262	41.5
	51-60	93	14.7
	61-70	35	5.5
	71-80	16	2.5
Marital Status	Single	126	20.0
	Married	485	76.8
	Widow	20	3.2
No. of Family Members	1-3	109	17.3
	4-6	367	58.1
	7-9	128	20.3
	10- above	27	4.3
Estimated Household Monthly Income	Less than 5, 000	418	66.2
	5, 001-10, 000	38	6.0
	10, 001-15, 000	1	0.16
	15, 001-20, 000	2	0.32
	20, 000 above	2	0.32
	No Response	170	26.9

Source: Field Survey, 2015

Women as a group tend to experience more negative impacts from natural disasters than men (Mason & Agan, 2015; Blaikie et al., 2014). In the study of Liang and Cao (2014), women are more vulnerable because they are poorer and have higher health risk than men. Ajibade et al. (2013) also showed greater impacts of flooding and slower recovery on women due to their poverty. Women often work with a

lower wage than men while suffering from the lack of opportunity to diversify their economic activities (Rofi et al., 2006). Women disproportionately also accept family care responsibilities during a natural disaster (Walker & Burningham, 2011) making them more vulnerable than men. The tendency of women to stay in their houses during flooding due to their emotional attachment with their belongings places their lives and the whole family at risk (Hyder & Mahmood, 2015).

However, the effect of gender on social vulnerability to floods is not straightforward (Rufat et al., 2015). The study of Kuhlicke et al. (2011) found that gender had no impact on social vulnerability during flooding. Most women in Nigeria even perceive flood impacts as gender-neutral (Ajibade et al., 2013). In fact, women are ascribed more coping-capacities and greater commitment to knowledge of risk and social relations (Steinführer, 2007). Hence, within this context, gender alone is not a predictive of social vulnerability because women's everyday living conditions vary across socioeconomic status, household structures, and geographic locations (Ajibade et al., 2013). Despite the difficulty in making generalizations about women's vulnerability to natural disaster, the dominance of women living in flood-prone areas should be considered by planners in enhancing their preparedness.

Taking into account in this study that most women with very low-income have four to six household members to take care, their capacity to become resilient to flooding and other natural disaster is therefore limited. The study of Ajibade et al. (2013) showed that low-income women were the ones who experience the worst effects of flooding and gendered impacts in the disaster context. Hence, the provincial government of Misamis Occidental and other organizations need to give full attention to this concern to ensure the safety of women in flood-prone areas.

Age is the leading demographic driver of social vulnerability based on the number of citations within the literature (Rufat et al., 2015). Age affects the mobility of an individual and the extent of care following a devastating event. Very old and very young tend to be more vulnerable because of their dependency status and limited mobility

during a natural disaster (Kuhlicke et al., 2011). In this study, most respondents are within the middle-age group which suggests less vulnerability. Since the majority of the respondents in the present study are married women, so most men are also middle-aged. In the paper of Doocy et al. (2013), middle-aged men are also vulnerable due to their risk-taking behavior as they tend to do rescue activities during flooding. Hence, closer attention to middle age men in the area should also be given to ensure awareness of their vulnerability to natural disaster taking into account their age group.

In this study, aside from living in flood-prone areas, the socioeconomic condition of the respondents is poor with a household income of less than ₱ 5,000.00. The respondents are among the marginalized groups living in flood-prone areas which Gaillard (2015) also described as those individuals with limited or deprived access to resources and are more vulnerable to natural disaster than others who have the financial means to choose safer dwelling places. The capacity of these people to adapt to climate change is limited because they cannot afford the disaster risk-reduction measures. These poor people may have fewer economic damages during flooding than those households with more assets, but the relative negative impacts on their lives during the post-flood recovery phase are relatively greater than the wealthy people (Rufat et al., 2015). As the data imply, the income of the respondents in this study is not sufficient to afford reconstruction, repair, or relocation of their houses in a very short period so disaster recovery for the households would be tough. This situation happened even in developed countries (Masozera et al., 2007).

Furthermore, access to timely and adequate assistance from the government and other organization during the rebuilding process could also be beyond the reach of the poor and marginalized respondents. In many cases in developing countries such as the Philippines, access to external support is influenced by socio-political situations (Ferris, 2010). In Thailand, the industrial areas were given the flood protection, public and private assistance, and social services but those poor people living in the vicinity were neglected (Chomsri & Sherer, 2013). Similarly, the respondents may find it difficult to access economic and social

resources from the government or other agencies for their preparedness or mitigation activities, and for them to evacuate before the onset of the flood.

The household income of the respondents in this study and their poverty can also be coupled with other indicators of vulnerability to flood. Their low-income leaves them no option but to live in houses made of low-quality materials along the coastal areas, riverside or estero. Increased human settlement along the riverside or esteros in Ozamiz City is identified as one of the reasons why the area floods as wastes dumped from the households impede water flow during heavy rains (Enguito et al., 2013). A similar problem is identified in Metro Manila where many people, due to the rapid increase in population, live along the waterways in substandard houses that are easily washed out during flooding (Boquet, 2015).

Hence, the situation of these marginalized people in flood-prone areas in Misamis Occidental calls for ample readiness and preparation for any possible natural calamities that they might encounter. The local government, policy makers, civic organizations, academic institutions, researchers or practitioners in these areas should not overlook the economic condition of these households when it comes to disaster risk-reduction measures. Adaptation options should be made available to these communities, and economic analysis of these options has to be carried out. The study of Ame et al. (2014) in Cagayan Province in Northern Luzon was a participatory resource assessment in selected flood-prone coastal communities of the province that identified strategies for disaster preparedness.

Household preparedness begins with knowing the facts about disasters. Table 2 presents the level of household preparedness with regard to hazard knowledge. The activities include the gathering of information about the types of disasters, on how to prepare and on how to respond appropriately. The overall weighted mean indicates that the households are well prepared for these measures. It is only about learning the resources for animal care that they are moderately prepared. The responses are comparable based on the computed coefficient of variation.

Table 2. Household preparedness for hazard knowledge.

Preparedness activities	Weighted mean	Interpretation	Rank
1. Gathered information as to what types of disasters are most likely to happen in the place.	2.86	Well prepared	2
2. Gathered information from emergency managers on how to prepare for hazards common to your communities.	2.84	Well prepared	3
3. Learned about disaster plans in the workplace, school or child care centers, and other places where you spend time.	2.75	Well prepared	4
4. Learned about resources available for animal care after the disaster.	2.22	Moderately prepared	6
5. Identified what you need to do to prepare for special needs within the family.	2.69	Well prepared	5
6. Learned how to respond appropriately before a disaster, during a disaster, and after a disaster to preserve life and property.	2.93	Well prepared	1
Overall Weighted Mean	2.72	Well prepared	
SD	0.2568		
CV	9.46%		

The result of this study supports the findings of Murphy et al. (2005) which most the participants showed interest in obtaining more information about emergency preparedness. Interviews with some officials revealed that the City Disaster Risk and Reduction Management Council (CDRRMC) in both cities were conducting activities and programs to increase the level of awareness and capacity of the community in dealing with the impacts of natural disasters. Through these activities, the households would be able to learn the ways to prepare for disasters as well as the disaster plans in their barangays. The high level of the household preparedness could be attributed to the successful implementation of the programs carried out by their respective CDRRMC units, particularly on hazard knowledge. Moreover, a majority of the respondents also claimed that they were able to obtain information about natural disasters from television, news and other sources.

The households' preparedness with regard to formal and informal response plans and agreements is presented in Table 3. The overall weighted mean shows that the respondents perceived they are well prepared. Their responses are comparable based on the computed CV. The finding implies that the households are well prepared with regard to orienting and preparing the family members how to protect themselves in times of disasters and on how they may be able to rejoin by identifying a contact outside their area. The result is not surprising since, a majority of the respondents claimed that they already experienced natural disasters in the past, especially floods. Their experiences may have led them to believe that natural disasters could still be encountered in the future and thus, motivated them to be more cautious. This finding finds support in the study of Murphy et al. (2005) which contends that households and localities with more experiences will tend to be more aware of potential dangers and better prepared for any disaster events. The study of Falkiner (2003) also inferred that the hazard perception of respondents is likely shaped by their experience with natural disasters.

Table 3. Household preparedness for activities on formal and informal response plans and agreements.

Preparedness activities	Weighted mean	Interpretation	Rank
1. Talked to family members about the hazards they face and what they will do to protect themselves.	2.74	Well prepared	1.5
2. Directed family members to communicate with one another, and to rejoin each other after the disaster.	2.74	Well prepared	1.5
3. Identified a family friend outside the potential disaster area who will serve as a point of contact for family members to reconnect.	2.58	Well prepared	3
Overall Weighted Mean	2.69	Well prepared	
SD	0.0924		
CV	3.43%		

The result can also be attributed to the greater commitment of the women respondents to the knowledge of risk or hazard and social relations which are in concordance with the study of Steinführer (2007). Their commitment to obtaining information about hazard may have made the respondents well prepared in this context. Besides, gathering information about hazards does not require many financial resources. Their strong social relations with emergency managers and other people in their area or workplace who have adequate knowledge about hazards or flood risk may have contributed to their preparedness. Moreover, household preparedness as to hazard knowledge can be attributed to the innate characteristic of women to provide family care particularly on identifying their special needs which Walker and Burningham (2011) found in their study.

Table 4 presents the level of household preparedness for activities on supportive resources. These activities include acquiring equipment and supplies to support response activities like disaster supply kit and emergency food. The overall weighted mean indicates that they are well prepared for these activities. Their responses are comparable based on the computed CV. This finding is similar to the results of the study of Diekmann et al. (2007) in which many of the homeowners claimed to have completed basic preparedness recommendations regarding stocking supplies like food and water. However, this contradicts with the findings of Kapucu (2008) showing that only about 8% of all the respondents have a disaster supplies kit that contains enough food, water, and medication for a family to shelter in place for three days.

The claims of the respondents with regard to their preparedness on supportive resources can be explained by past experiences with the flood in their area as well as the recommendations provided by the DRRMC. The disaster risk management units play a significant role in controlling floods, and their mechanism has to be proactive and holistic in approach that includes the greater community and other stakeholders' participation (Chan, 2015). After having experienced flooding in the past, the respondents are now more vigilant. In fact, some of the respondents claimed that they had to stay awake during

rainy nights to prepare for possible flooding. There are always specific lessons from past disasters, and they are relevant towards resiliency (Dückers et al., 2014).

Table 4. Household preparedness for activities on supportive resources.

Preparedness activities	Weighted mean	Interpretation	Rank
1. Assembled a disaster supply kit (flashlight, first aid kit supplies, tools, sanitation and important papers).	2.74	Well prepared	2
2. Updated the disaster supply kit on a regular basis (replacing items in the disaster supplies kit that may expire).	2.55	Well prepared	3
3. Obtained food and water for emergency use by the family members in a disaster.	2.80	Well prepared	1
Overall Weighted Mean	2.70	Well prepared	
SD	0.1305		
CV	4.83%		

Table 5 presents the level of household preparedness for activities for life safety and property protection. These activities are essential in protecting the lives of the family members to avoid losses during disasters and to preserve their homes and properties. The overall weighted mean shows that the respondents are less prepared. Their responses are comparable based on the computed CV.

Identifying the evacuation routes, for example, entails several variables to consider but modeling evacuation route that represents the entire city would be more helpful (Lim et al., 2015). The current capacity of the community and healthcare system to provide first aid in the event of floods and other natural disasters is also very important to reduce casualties (Minh et al., 2014). The level of household preparedness to respond to the health issue with floods in this study should be taken as essential input for policy making in the two cities assessed. The electrical system is another infrastructure that is subject to damage from natural disasters. The frequency of flooding and severity of extreme weather events will subject the electric grid to higher levels

of risk (Yates et al., 2014). Hence, enhanced preparedness for these risks could help reduce the negative impact of natural disasters to life and property. However, being less prepared for life safety and property protection implies potential threat and danger to lives when disaster strikes. The casualties brought by ‘Sendong’ to Northern Mindanao in 2011 (Rasquinho et al., 2013) may also be attributed to less preparation of the households for life safety.

Table 5. Household preparedness for activities on life safety and property protection.

Preparedness activities	Weighted mean	Interpretation	Rank
1. Identified a safe spot to shelter in place.	1.23	Less prepared	4
2. Determined evacuation routes.	1.28	Less prepared	1
3. Taken a first aid and CPR class.	1.21	Less prepared	5
4. Elevated the furnace and electric panels in the house.	1.25	Less prepared	3
5. Constructed barriers to stop floodwater from entering the house.	1.27	Less prepared	2
Overall Weighted Mean	1.25	Less prepared	
SD	0.0286		
CV	2.29%		

Some of the houses in this study are built in areas where sea or river water could reach during high tides or floods. Taboc Norte, for example, is a coastal barangay in Oroquieta City and the risk of flooding is relatively higher. People find it difficult to stay in the area if the tides are high. It can be recalled that in the coastal communities in Leyte and Eastern Samar, typhoon ‘Yolanda’ caused devastating damage to properties and infrastructure (Lum & Margesson, 2014). The Carangan Creek in Brgy. Lam-an in Ozamiz City overflows quickly during heavy rain causing floods in few narrow streets with no proper drainage causing health risk and disturbance to work. With ‘Yolanda’, storm surge and river overflow flooding both occurred particularly in Tanauan, Leyte causing 822 people to die (Carine et al., 2015). If people in Ozamiz City and Oroquieta City, especially those living near the coast

or rivers, remain less prepared, the severity of extreme weather events may threaten the community. Improving the drainage system and installing technical measures such as flood barriers using the modern technology may help control floodwaters and reduce the risk (Loh & Pante, 2015).

Most of the households in this study are in crowded spaces and are made of light materials. With these conditions, it would be impossible for them to identify a safe spot to shelter when a natural disaster happens. Levac et al. (2012) found that the socioeconomic factors influence the ability of the families to prepare for emergencies. Rapid population growth and rising rates of poverty bring vulnerability to the natural disasters (Baker, 2012).

Being prepared with hazard knowledge implies that they could be knowledgeable about disaster hazards and as to what is supposed to be done. However, their knowledge seemed not enough for them to take the necessary steps to protect their lives and properties. Diekman et al. (2007) expressed that one possible explanation why individuals do not observe household preparedness recommendations is that their beliefs, and not merely their knowledge, may not support taking these actions. It could also be that they do not find the urgency to carry out these preparedness activities because this study was conducted during the hot season. According to Kapucu (2008), one reason for the low-level preparedness could be the fact that the survey was not conducted in the most active part of the disaster season, but rather in a period of relative weather stability.

Despite their previous experiences with calamities, particularly floods, the households are still complacent about their safety. Attending first aid training, elevating furnace and electric panels and constructing flood barriers could be bothersome for them. Aside from the time that they have to allocate to do such preparation, the respondents may have been limited to their low income. Constructing flood barriers is relatively expensive and providing food for the family is the priority for low-income people. The capacity of these people is limited because they cannot afford the disaster risk-reduction measures. Neumayer et al. (2014) stressed that individuals often underinvest in natural disaster

prevention and mitigation. This situation is also reiterated in the paper of Rufat et al. (2015) that the socioeconomic status is one of leading empirical drivers of social vulnerability to floods.

Being less prepared on life safety and property protection could also be attributed to the dependence of the respondents on government’s support and initiative. They could be expecting the emergency management agencies to provide such emergency necessities for them. This behavior is similar to the situation in Metro Manila. Hence, the government exerts effort in the area in eradicating “bad” attitudes or habits that could not develop flood resiliency, while nurturing behavior regarded as civic-minded and socially responsible (Loh & Pante, 2015).

Table 6 presents the level of household preparedness on initiation of recovery, particularly obtaining insurance coverage for their properties. The overall weighted mean reveals that the households are less prepared on this aspect. The result is attributed to the low-income of the respondents. Only few might have afforded to acquire insurance coverage for their properties. The most difficult situation is their household location and the type of dwellings that may not qualify for the provisions of insurance companies. Those from commercial-industrial sector may have great losses with floods, but they can immediately repair their buildings because they have insurance (Porio, 2014). When typhoon ‘Ondoy’ hit the Philippines, most people had no insurance and not flood-prepared (World Bank, 2009). Worsening the situation that time was the majority of the typhoon victims with insurance were not allowed to file claims because ‘Ondoy’ flood, being regarded as a fortuitous event, could not be covered by the insurance they purchased (Porio, 2014).

Table 6. Household preparedness on initiation of recovery.

Preparedness activity	Weighted mean	Interpretation	Rank
Obtained insurance coverage for properties.	1.16	Less prepared	-

Based on the overall weighted mean obtained from all the preparedness activities, the respondents are moderately prepared for natural disasters (Table 7). Their responses are not comparable based on the computed CV. The result implies that the overall perceptions of the households vary with regard to their preparedness for natural disasters. They claim they are well prepared in hazard knowledge, formal and informal response plan and agreements, and supportive resources. However, they are aware that they are less prepared for life safety and property protection as well as in initiation of recovery. Perhaps, their preparedness is only limited to gathering information, learning how to respond, directing family members and organizing disaster supply kit. The households fail to take the necessary steps to protect their lives and their properties and to recover from the catastrophe.

Table 7. Overall household preparedness for natural disasters.

Preparedness activities	Weighted mean	Interpretation	Rank
A. Hazard Knowledge	2.72	Well prepared	1
B. Formal and Informal Response Plans and Agreements	2.69	Well prepared	3
C. Supportive Resources	2.70	Well prepared	2
D. Life Safety and Property Protection	1.25	Less prepared	4
E. Initiation of Recovery	1.16	Less prepared	5
Overall Weighted Mean	2.10	Moderately prepared	
SD	0.8213		
CV	30.0%		

Disaster preparedness may vary with the resources available at hand, past experiences associated with calamities, and attitudes. The overall results of this study support the findings of other studies (Muttarak & Pothisiri, 2013; Sagala et al., 2015; Al-Rousan et al., 2014). Households may have acquired hazard knowledge, developed a disaster plan and prepared for supportive resources because these activities are easy to initiate. However, when it comes to activities that are expensive like the construction of flood barriers and purchasing disaster insurance,

people find it difficult to undertake because they are financially limited. Different lessons from past disasters may also explain why their disaster preparedness varies. In most instances, actions of some people may be more responsive rather than proactive.

Conclusion and Recommendations

People living in flood-prone areas are vulnerable to natural disasters. Household preparedness to calamities such as floods due to the severity of extreme weather events is therefore essential. Disaster preparedness of households in flood-prone areas of Misamis Occidental varies and is very limited with regard to life safety and property protection, and initiation of recovery. This limitation could be attributed to low income and complacency. Being moderately prepared only for natural disasters in its overall context, households in areas exposed to several potential flood hazards have to improve their preparedness with the support of the government or other sectors of the society.

A collaborative and more effective action should be formulated by the City Disaster Risk and Reduction Management Council, other crisis-relevant institutions, and the people living in flood-prone areas in improving the household preparedness to natural disasters. Identifying evacuation routes, providing first aid training and encouraging the households to create safety measures in their homes should be intensified. Relocation should also be considered an option for the low-income households. The findings of this study may be used in policy-making to ensure that the approaches to disaster control are properly implemented.

Acknowledgment

The authors are grateful to the Misamis University for funding the research. The barangay officials and all the residents involved in the data gathering are also acknowledged.

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