Living With Pervasive Hazards: Place-Based Approach for Identifying Vulnerability and Coping Strategies in an Island Community in Cebu, Philippines

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Studies about disasters have focused on large-scale and extreme weather events. However, slow-onset hazards such as drought-like seasons and monsoons also pose challenges since they are dynamic and experienced differently from place to place. This paper shows how difficulties in livelihood of the agricultural sector can be made evident using a place-based approach for identifying vulnerability in an island setting. A household survey was conducted to gather perceptions of hazard impacts and coping strategies for extreme weather events and pervasive hazards. Results show that the perceived impacts of hazards differ by events, and respondents cope with extreme weather events and pervasive hazards in almost the same ways. The coping strategies include diversification of livelihood and mutual help, a common tradition among Philippine villages. Community-based disaster risk management strategies through indigenous ways also enabled the island community to bridge the interventions of the national government to the local context in terms of reducing risks. In conclusion, a place-based approach adds value to the current way of assessing vulnerability as it shows that social vulnerability is more dynamic in the local context, and social bonding is crucial for coping during difficult times.

Keywords: Community-Based Disaster Risk Management; Coping Strategies; Island; Philippines; Vulnerability

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INTRODUCTION

Studies about disasters have focused on large-scale and extreme weather events such as those that have measurable and distinct, observable effects (Boin et al., 2020; Delfin & Gaillard, 2008; Hore et al., 2018; Wisner & Gaillard, 2009). Taken out of the picture are risks from the stresses and shocks of daily life, especially for the marginalized sector. These *everyday* risks, or extensive risks as defined by United Nations Office for Disaster Risk Reduction (UNISDR, 2015a), include situations

where people face the slow onset of pervasive hazards such as drought or coastal erosion, or for those who live in flood-prone urban slums, polluted or industrial areas, proximity to active volcanoes, river deltas or conflict zones, or whose livelihood is in hazardous locations (Gaillard, 2011; Reyes & Lavell, 2012; UNISDR, 2015a; Wisner & Luce, 1993). Some authors call these pervasive hazards, characterized by being "widespread, diffuse in impact, long, gradual, [and] … more accurately predicted" (Kates, 1976, p. 139; Wisner & Gaillard, 2009). While the mainstream media concentrates on sudden-onset disasters such as earthquakes, volcanic eruptions, and coastal storms, the impacts of pervasive hazards manifest through the livelihood of the people (Wisner & Gaillard, 2009).

Disaster cannot be defined by mere measurement of damaged properties and lives, but by the social structure of norms and values and human interactions (Perry, 2007). As such, an approach that tackles vulnerability to slow-onset hazards at the local context is necessary since such hazards are dynamic and experienced differently from place to place, and their social impacts are difficult to specify and may not be evident at first occurrence (Wilhite, 2003). Examining the everyday lives of the vulnerable sector, such as farmers and fisherfolks directly affected by drought-like seasons and monsoon winds, can provide context regarding communities' experiences and coping strategies. However, identifying the impacts of risk and coping strategies of vulnerable populations, including the agricultural sector, can be a challenge as reports about disasters typically highlight extreme events, such as tropical cyclones (Emergency Events Database [EM-DAT], 2021), even though pervasive hazards such as drought can also affect a considerable number of people (Asian Disaster Reduction Center, 2018). Therefore, livelihood support and disaster management strategies may be inconsistent with the actual local needs and contexts, which are a prerequisite for understanding disaster risk as mentioned in the Sendai Framework[1] (UNISDR, 2015b).

The objective of this paper is to examine the vulnerability and coping strategies of a marginalized sector in terms of their livelihood using a place-based approach. Such an approach elicits the impacts of pervasive hazards, particularly their spatial and temporal aspects, including the adaptive strategies of the marginalized sector, in this case, an agricultural sector in an island setting. The analysis draws on concepts related to the notion of place, which consider risk as socially constructed based on the experiences and social activities of people (Chakraborty et al., 2020; Cutter, 1993; Perry, 2007; Relph, 1976; Tuan, 1977; Versey, 2021). The main contribution of this paper is its application of a place-based approach for assessing vulnerability and identifying coping strategies, which recognizes that vulnerability is not static and that vulnerable sectors emphasize social bonds in coping with difficulties.

REVIEW OF LITERATURE

Pervasive Hazards and Vulnerabilities

Environmental location, economic status (Porio, 2011), and even exclusionary political constructs (Chmutina et al., 2016; Curato, 2018) magnify the vulnerabilities of

1 The Sendai Framework for Disaster Risk Reduction 2015-2030, which was enacted at the 3rd United Nations World Conference on Disaster Risk Reduction, promotes the understanding of risks at varying scales, frequency, onset, and causes to serve as a guide in multi-hazard management of disaster risk in development.

marginalized populations. Moreover, several previously unseen events felt primarily by socio-economically challenged groups, such as stress (White & Haas, 1975), threat, misery, and disruption, can be recognized by focusing on the everyday quality of disasters (Curato, 2018). In the 2015 Global Assessment Report, UNISDR (2015a) even identified low severity, persistent events as a central concern for low-income households and communities, in addition to intensive risks, which include severe, low-frequency, and catastrophic events such as tsunamis, earthquakes, and large volcanic eruptions.

In the Philippines, a study conducted by Gaillard and Cadag (2009) showed how weak and limited livelihoods had forced marginalized sectors to live at the foot of dumpsites. Such a situation demonstrates how poor livelihoods and political neglect have further impeded the people living in the dumpsite from recovering in the aftermath of the disastrous mass movement of solid wastes that led to their further marginalization. On a national scale, disasters reflect "neglect of vulnerable groups by national economic and political elites and poor governance" (Wisner & Gaillard, 2009, p. 156). Meanwhile, Gaillard's (2011) study of sudden-onset disasters, such as volcanic eruptions, indicates that risk perception matters in assessing risk. It distinguishes the underlying vulnerabilities deeply rooted in the structures influencing access to resources, history, and culture through perception. It is pertinent to look at how people experience natural hazards and how daily activities shape their risk perceptions (Dalisay & De Guzman, 2016). Considering extensive or everyday risks then means having a high regard for everyday lived experiences, particularly for the process of vulnerability assessment.

Risk Perceptions

When disruptions in the normal or everyday lives of the people are considered as a disaster, several indicators of social vulnerability may be left out, since most of these cues may already be part of their normality, as the findings of Reyes and Lavell (2012) in the Chaco Region in Bolivia show. In addition, social impacts that are absent in socio-demographic data are psychosocial in nature, including psychophysiological effects, such as fatigue, changes in behavior, and stress (Lindell & Prater, 2003; White & Haas, 1975). Extreme events require macro-economic scale interventions, while pervasive hazards may be assessed and resolved by considering the local contexts and capacities of the community. An example is deliberate risk-taking, as shown in studies in Pampanga (Delfin & Gaillard, 2008) and the Albay province (Usamah et al., 2014) respectively, where population pressure and limited access to resources cause Filipinos to settle in hazard-prone areas. People "consciously chose to face a threat" from natural hazards and discount these threats, yet expose themselves to more everyday risks related to poverty and hunger (Delfin & Gaillard, 2008, p. 196). The study by Usamah et al. (2014) in the Albay province with informal settlers highlights the role of a sense of place in building social resilience among their communities. The study concludes that resilience could exist simultaneously with vulnerability through a "strong sense of community, trust among the community members, active community involvement and respect for existing cultures and values" (Usamah et al., 2014).

Therefore, an examination of the varying experiences and practices of people living their *normal* lives while facing everyday risk can portray their vulnerability and the conditions of their marginalization across space and time (Chakraborty et al., 2020; Chambers et al., 1981; Dalisay, 2008; Peters-Guarin et al., 2012; Reyes & Lavell, 2012; Wisner & Gaillard, 2009). Such a portrayal of vulnerability may then result in a more contextualized set of interventions that are suitable for the needs of marginalized sectors.

Place-Based Strategies for Disaster Risk Management

Place-based assessments help identify places of high vulnerability at a small scale (Chakraborty et al., 2020). The role of a sense of place in disaster studies has been chiefly applied to extreme climatic events or particular hazards, such as volcanic eruption and flooding (Anacio et al., 2016; Marshall et al., 2012; Silver & Grek-Martin, 2015). However, a place can also be considered a way of understanding the world by examining the habits and actions of its people. For example, Swapan and Sadeque (2021) indicate that place attachment affects people's decisions in developing countries to stay even when the risk is high, especially if their social capital is high, and that place attachment helps communities to prepare during the pre-disaster period.

It is important to note that experience can be studied not solely at the individual level but also at a community level (Manzo & Perkins, 2006). Furthermore, Masterson et al. (2017) note that the nature of social experiences differs systematically, including social interactions that are place-based. Chakraborty et al. (2020) show that social vulnerability is geographically stratified and that a place-based, differentiated perspective on vulnerability enables the identification of places that are more disadvantaged.

Each organization or unit of society manages risk differently by balancing social justice and economic interest (Rayner & Cantor, 1987). These socio-economic factors have been shown to strongly affect actions or hazard behavior (Cutter, 1993). Hence, risk can have two attributes: (1) social context of risk, including attitude, culture, values, and norm; and (2) social fabric of risk or how people live and how their daily activities influence their perception and behavior (Cutter, 1993). In addition, international and national agencies have recognized traditional knowledge and practices to inform and complement scientific knowledge, policies, and strategies for disaster risk management (Allen, 2006; Cheng & Kim, 2019; Housing and Land Use Regulatory Board, 2015; UNISDR, 2015b). Community-based disaster risk reduction and management strategies hold their value in using the local capacities of the people and in recognizing their role in gathering information for their community plans. Acknowledging local knowledge and adapting indigenous coping strategies may be a better counterpart of the dominant way of understanding disaster risk (Gaillard & Jigyasu, 2016).

Disaster Risk Management at the Local Level in the Philippines

The localization of disaster risk management in the Philippines began in 1978 and was reinforced through the Local Government Code. Based on the suggested procedures for risk assessment by the Supplemental Guidelines on Mainstreaming Climate and Disaster Risks in the Comprehensive Land Use Plan (2015), climate and disaster risk assessment (CDRA) is accomplished by two different but integrative activities:

The first one is Climate Change and Vulnerability Assessment (CCVA) where potential exacerbation of vulnerability is objectively measured, and the second one is disaster risk assessment in which potential areas at risk are mapped out. In CCVA, five exposure units, including urban areas, population, resource production areas, critical points, and lifeline utilities, are examined through varying degrees of disaster thresholds based on the criteria for declaring a state of calamity. These thresholds are paralleled with acceptability ratings from 'highly unacceptable' to 'acceptable'. Vulnerability, therefore, is reduced into numbers and is interpreted based on a risk scoring matrix. Afterwards, areas in the municipality or the city are assigned to three colors, reflecting a risk category: red being high risk, violet moderate, and yellow being low risk areas.

While the organizational structure of disaster risk reduction and management ends with the *barangay*[2] (Fernandez et al., 2012), a traditional practice of mutual help in the community was used to mobilize people at a sub-*barangay* level, called *purok*, in San Francisco, Cebu, which resulted in zero fatalities during the wrath of Typhoon Haiyan. When Super Typhoon Haiyan hit the Philippines on November 6, 2013, it left a total of PHP 95 Billion-worth (USD 1,9 Billion) of damage, and 6,300 people died primarily due to storm surge and flood (National Disaster Risk Reduction and Management Council [NDRMMC], 2013). Among the regions that were greatly affected were the Eastern and Central Visayas. However, the municipality of San Francisco, Cebu, which is the largest among the Camotes group of islands, reported zero casualties due to immediate actions taken by the local government and the residents hours before the estimated landfall of the super typhoon (Ranada, 2014).

Even before the super typhoon, the municipality of San Francisco had already achieved recognition for its disaster risk reduction and management efforts, both locally and internationally. In 2011, the local government of San Francisco received the United Nations Sasakawa Award – a prestigious award that recognizes individuals or institutions who are active and advocates of reducing disaster risk (UNISDR, 2013). Part of their disaster risk management mechanism is the Philippine indigenous way of community organizing and mobilization called the *purok* system – a microstructure of municipal governance at the sub-*barangay* level that is rooted in the idea of *bayanihan* or *pintakasi* (mutual help) (Ang, 1979; Cheng & Kim, 2019; Curato & Calamba, 2020; Matthies, 2017). A study conducted by Noguera (2011) in Sultan Kudarat described *pintakasi* or mutual help as an indigenous approach in responding to community concerns that can be used to plan, implement, and evaluate community-led activities.

Several studies document the achievements of the *purok* system for disaster risk reduction and management (Cheng & Kim, 2019; Fernandez et al., 2012; Matthies, 2017; Ranada, 2014; UNDRR, 2013). The *purok* system follows an existing indigenous social organization for mobilizing local resources in creating local and practical solutions to address community needs. A better model of disaster risk governance can be developed by understanding the local context of disasters and the kinds of established relationships or networks among the affected communities (Lin & Chang, 2020). This "invisible local knowledge", including social relations and experiences, builds capacities to respond to natural hazards (Lin & Chang, 2020, pp. 4-5). "Hazards-of-place

2 *Barangay* is the smallest administrative division in the Philippines and is the native Filipino term for a village.

models" are vital for an intersectional climate agenda because they can represent the difficulties of managing and adapting to climate change among vulnerable groups (Versey, 2021, p. 71). Applying a place-based approach to identify patterns of vulnerability and coping strategies recognizes multiple, latent risks in the community. Figure 1 shows the conceptual framework used in the present study, which highlights the experiences of people towards various hazards and the social interactions encompassing the kinds of coping strategies that people implement in times of difficulties.

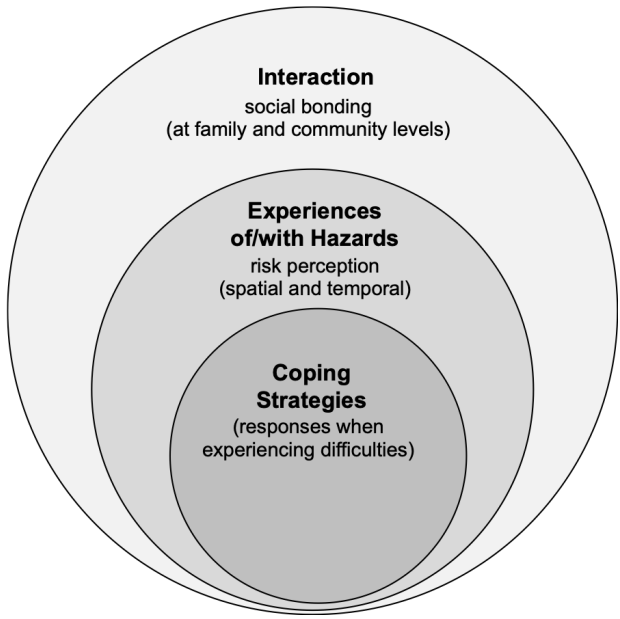

Figure 1. Coping strategies in times of difficulties are influenced by experiences and social interaction.

By assessing vulnerability through the notion of place, which uses the lens of everyday experiences and social interactions, the impacts of hazards across time and space and coping strategies in difficult times become distinguishable. This paper provides evidence in recognizing the value of using a place-based approach for assessing vulnerability and identifying coping strategies. This paper then concludes with some recommendations for future research and policy making.

METHODOLOGY

Study Site

In order to apply a place-based approach for identifying vulnerability and coping strategies, the island of San Francisco, Cebu was selected as a study site. San Francisco is an island municipality in the Camotes Sea, east of mainland Cebu (Table 1). Three *barangays* were selected to capture the geographical settings from the mountainous to the coastal areas of the municipality (Figure 2). These are *barangays* Sta. Cruz,

Montealegre, and San Isidro. Barangay Sta. Cruz represented the north district and is the third most populated *barangay* next to Esperanza and Consuelo. The north district represented the municipality's flat area and coastal area, together with Barangay San Isidro, for the south district. Finally, Barangay Montealegre represented the mountainous area and the central district. It is also the second least populated *barangay* in the municipality. As of 2018, there are 1,406 people in Barangay Montealegre, while Barangays San Isidro and Sta. Cruz have 4,688 and 6,222 people, respectively (Barangay Profiles, 2018). There are 120 functional *purok* in the municipality where each *purok* covers approximately 250 people, or 50 households.

CATEGORY	DETAIL
Land Area	9, 742 ha
Population	55, 180
No. of Occupied Housing Units	12, 212
Class	Third class municipality
Annual Income	PHP 83.5 million (USD 1.8 million)
Number of *Barangays* (Villages)	15

Table 1. Profile of San Francisco, Cebu (Barangay Profiles, 2018; Philippine Statistics Authority, 2015).

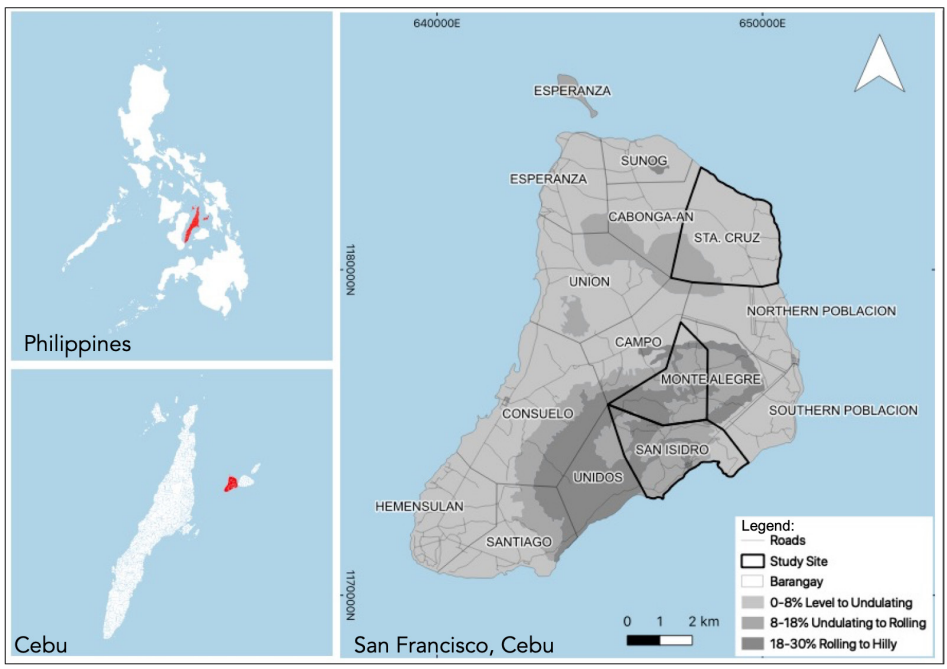

Figure 2. Study sites represented the topography of the island: Sta. Cruz (north, coastal, and flat), Montealegre (central and mountainous) and San Isidro (south and coastal).

Most of the families on the island are involved in crop farming and fishing. Their agricultural products are corn, coconut, fruits, vegetables, salt, freshwater fish, and livestock. At least 28 fish species are thriving on the coasts of the island, including *danggit* (*Singannidae* sp.), *pangan* (*Apogonidae* sp.), *talakitok* (*Carangidae* sp.), and *mangsi* (*Clupeidae* sp.). In addition, individual households raise farm animals such as cattle and carabao as an alternative for crop production (Municipal Planning and Development Office, 2015).

Household Survey

To gather the experiences and coping strategies of farmers and fisherfolks in the island, a household survey was conducted. A survey questionnaire was devised to generate the relevant information from the respondents, such as their socio-economic characteristics (i.e., age, sex, migrant or non-migrant), experiences of hazards, and level of place attachment. The first part of the survey questionnaire asked for the demographic profile of the respondents followed by a set of open-ended questions to document their past and recurring risk experiences and their particular coping strategies regarding the risks they identified.

The household survey was administered using stratified random sampling to represent the geographical settings and living conditions of the municipality. A total of 399 respondents were surveyed with an even proportion from the three sites, as 35% of the total sample size came from Barangay Sta. Cruz, 33% from Barangay San Isidro, and 32% from Barangay Montealegre. The survey was conducted in the Cebuano and Tagalog languages, transcribed and translated in English. A group of local enumerators was trained to conduct the household survey using the Cebuano language one week before the actual data gathering. The training also included orientation and a workshop for data encoding.

Short interviews with local farmers and fisherfolks, and local government officials, including the agriculture officer, social welfare officer, and disaster risk reduction officer aimed to identify the general situation of the agricultural sector to supplement the survey results. Secondary data including the comprehensive land use plan and local disaster risk reduction and management plans were used to triangulate and validate the data gathered from the survey and supplemental interviews.

Data Analysis

Responses from the household survey regarding events, impacts, and coping strategies were analyzed using frequency counting and tabular analysis through the data analysis tools of Microsoft Excel. The hazards and events indicated in the survey were pre-identified from the Local Disaster Risk Reduction and Management Plan of the municipality. A blank space for unlisted hazards and events was also added to include those that are not found on the survey questionnaire. Analysis of the open-ended questions in the survey used a summative type of content analysis where keywords and themes were predefined as concept choices to focus on specific subject matters (Carley, 1993; Hsieh & Shannon, 2005). The coding framework used in the study focused on two themes based on community-based approaches for disaster risk management: place-based experiences of hazards and coping strategies of the community.

The experiences of the participants with regard to weather and seasons were cross-validated with secondary data including climate observations from national agencies and existing reports on municipal profile and disaster risk management plans.

RESULTS

Spatiality and Seasonality of Hazard Impacts

Most of the respondents were female (71.93%) and married (82.71%) and had resided in San Francisco for an average period of 38 years; farming, animal raising, and fishing were the primary sources of livelihood (Table 2). San Francisco is an agrarian community where one-third of the population acquires profit from agricultural and animal production, and most of them are farm and fishing workers. As of 2015, there are 19 active farmers and fisherfolk organizations on the island and two cooperatives. In addition, national agencies, civil society organizations, and private institutions have also supported the local livelihood in the municipality. Seventy percent (70%) of the total municipal land area is cultivated with corn, coconut, cassava, fruit trees, and citrus, while the remaining land is planted with vegetables, root crops, taro, and legumes (Municipal Planning and Development Office, 2015). Rainfall is evenly distributed throughout the year on the island (Philippine Atmospheric, Geophysical and Astronomical Services Administration [PAGASA], 2021). Farmers plant crops in two cycles within 12 months. The Municipal Agriculture Office documented these farming activities to start from March to May when rainfall is less. Farmers prepare the land and wait for the crops to grow until the last week of August or the first week of September. Farmers start harvesting from September to November until the crop cycle repeats.

CHARACTERISTICS	F	%
Total	**399**	
Gender		
Male	112	28.07
Female	287	71.93
Age		
18-30	32	8.02
26-35	98	24.56
36-45	73	18.30
56-65	71	17.79
66-75	74	18.55
75-85	41	10.28
> 85	10	2.51
Sources of Income		
Farming, Fishing	249	62.41
Non-Farming, Non-Fishing	146	36.49
None/Retired	4	1.00

Table 2. Socio-economic profile of the survey respondents.

Harvesting for the second crop season would happen between December and February of the following year. However, the crop cycle might change in the future with the climate projections for 2050. Based on PAGASA projections, the months of September to October have the highest seasonal rainfall for the province of Cebu, while March to May will gain the highest average mean temperature (PAGASA, 2018). The local farmers already feel this delay in rainfall (Municipal Agriculture Office, personal communication, September 12, 2018). On the other hand, coconut farmers are in the field every day as they harvest daily to make coconut wine. The mountainous areas like Barangay Montealegre benefit from its topography by growing coconut, making them the largest coconut wine producer on the island. They harvest 30 liters of coconut wine per day.

As of 2015, 60% of the total household population lives below the poverty threshold compared to 21.1% at the national level. Agricultural households earn an average amount of PHP 15,000 (USD 330) per year from farming and fishing alone without subsistence crops. With this, the role of a farmworker also doubles during the dormant periods in the farm from June until they start harvesting in August. So, while waiting for harvest, farmers also do hook-and-line fishing for subsistence. Similar observations were documented by Dalisay (2008) regarding the influence of the changing seasons on the eating or food pattern of people in Batangas and Mindoro. If harvesting is on time and plenty, farmers and workers can buy white rice instead of corn grits since they can now afford the former. However, with the delay in the rain and issues with low fish catch, they usually serve corn grits instead.

Meanwhile, most respondents frequently experienced typhoons (82.96%) and drought-like seasons (68.17%), as shown in Figure 3. However, drought-like seasons were more intense for the respondents than when they recalled the last time that they had experienced a typhoon. Typhoon Haiyan was the most remembered event for them, even though a much more recent event happened during the conduct of

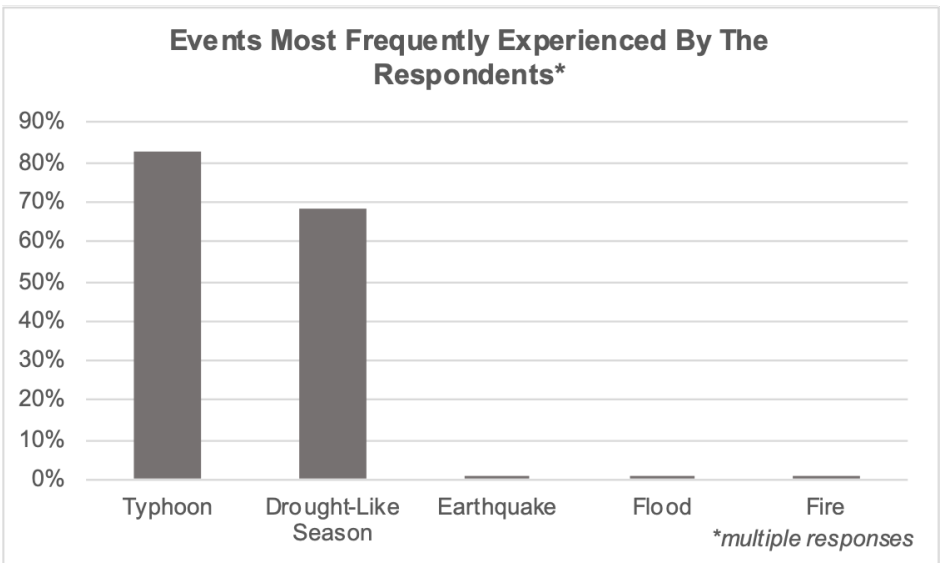

Figure 3. Events most frequently experienced by the respondents.

the study – Tropical Storm Urduja, which killed 27 people in the nearby province of Biliran (Andone & Faidell, 2017). Perceptions on the impacts of hazards at individual and community levels were gathered, as shown in Figures 4 and 5.

Both typhoons (60.65%) and drought-like seasons (50.38%) affect the respondents physiologically at the individual level (e.g., fatigue). Psychological impacts, including anxiety, depression, and grief were higher for typhoons (52.88%) than for drought-like seasons (44.61%). The behavior of one-third of the respondents (30.58%) was

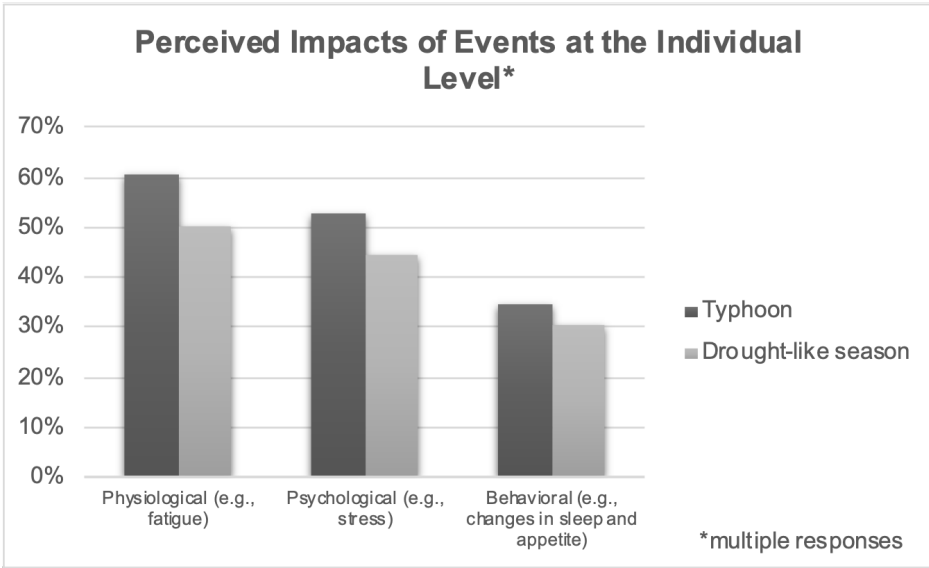

Figure 4. Perceived impacts of events at the individual level.

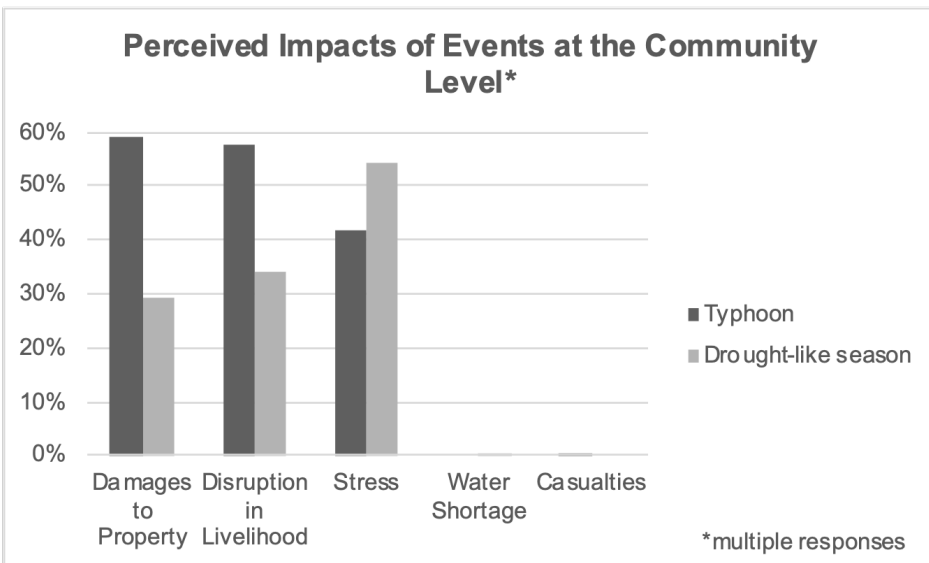

Figure 5. Perceived impacts of events at the community level.

affected during drought-like seasons, while 34.34% were similarly affected – including changes in sleep and appetite – during typhoons as well. The impact of drought-like seasons at the community level is higher in psychological terms, as it causes stress (54.14%). Stress is defined through manifestations of being too anxious and getting sick due to imbalances in health status. In contrast, typhoons impair the properties of the community (59.15%), disrupt the livelihood at the community level (57.64%), and damage their property (29.32%). Respondents also noted water shortage (0.25%) during drought-like seasons and casualties (0.5%) during a typhoon.

Another attribute of disaster highlighted during the data collection was the spatiality of the events. According to the fisherfolks, the impacts of monsoon winds on the municipality are location-dependent. Typhoons affect the entire municipality (PAGASA, 2018), while monsoon winds induce challenges to the residents depending on the orientation of their *barangay* and the direction of the wind. Barangay Sta. Cruz, which is located in the northern part of the municipality, experiences huge sea waves during the northeast monsoon (*amihan)* from September to February, while Barangay San Isidro is affected by the southwest monsoon (*habagat)*, which occurs from June to September. Fishing activities are immensely influenced by monsoon winds. According to the Municipal Agriculture Office, low fish catch was also observed during the past years due to climate change.

Moreover, fisherfolks shared that they struggle to lose potential harvest due to illegal consignees who deal with big commercial fishing vessels to share the total revenue from the fish catch. Some local fisherfolk get involved with these illegal activities because environmental policies limit them to use non-destructive fishing gears and techniques only, such as fishnet, hook-and-line, and fish aggregating devices. Big commercial fishing vessels communicate with local fisherfolk to gather fish caught by the community's improvised fish aggregating device called *payao*, which bypasses the formal communication among the fisherfolk's organization and reduces the total potential fish catch for the community. Consequently, fisherfolks lose potential revenue from fish catch, which they could have acquired, if not for the monsoon winds inhibiting their small boats from sailing far. Only the big commercial fishing vessels can navigate across huge sea waves. The locals then rely on the fish catch of these commercial boats, hence, illegal consigning. On the other hand, farmers are also affected by the delay of the rainy season, which sets back the harvest period and the second crop cycle. For the fisherfolk, the hardship period starts from June, and

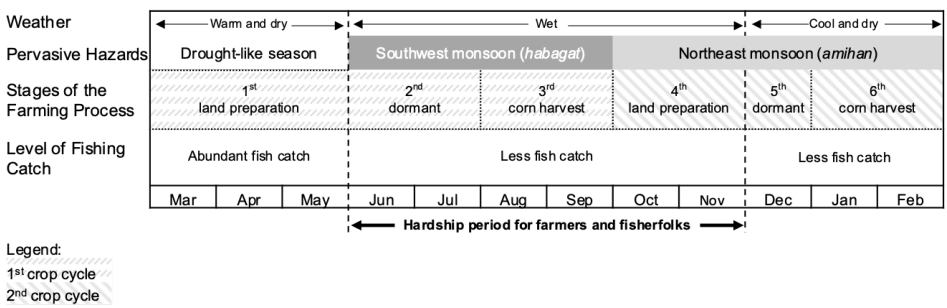

Figure 6. Impacts of weather patterns and pervasive hazards to local livelihood activities in San Francisco, Cebu, based on experiences of the agricultural sector.

recovery begins towards the end of November. During these months, the southwest monsoon affects the fishing activities in the south district.

Figure 6 illustrates the events and experiences of the agricultural population in 12 months based on the household survey and interviews from the municipal agriculturist, *barangay* chieftains, and local farmers and fisherfolks. The diagram was validated with municipal officials and local coordinators.

Mutual Strategies in Times of Difficulty

As for coping strategies, most respondents (51.63%) look for an alternative livelihood, such as animal raising, selling food, gathering firewood, and doing laundry (Figure 7). They also ask for help (9.27%) from relatives, neighbors, employers, or the government. Only 2% of the respondents preferred to have an architectural intervention in their house, while the other 2% preferred to transfer to another place. Architectural intervention includes rehabilitating a decaying segment of the house or constructing additional support beams for the roofs and house repairs. Bankoff (2003) noted that architectural intervention is a practical coping mechanism as it seeks to minimize risk impacts and losses instead of transferring or moving away from the hazards themselves.

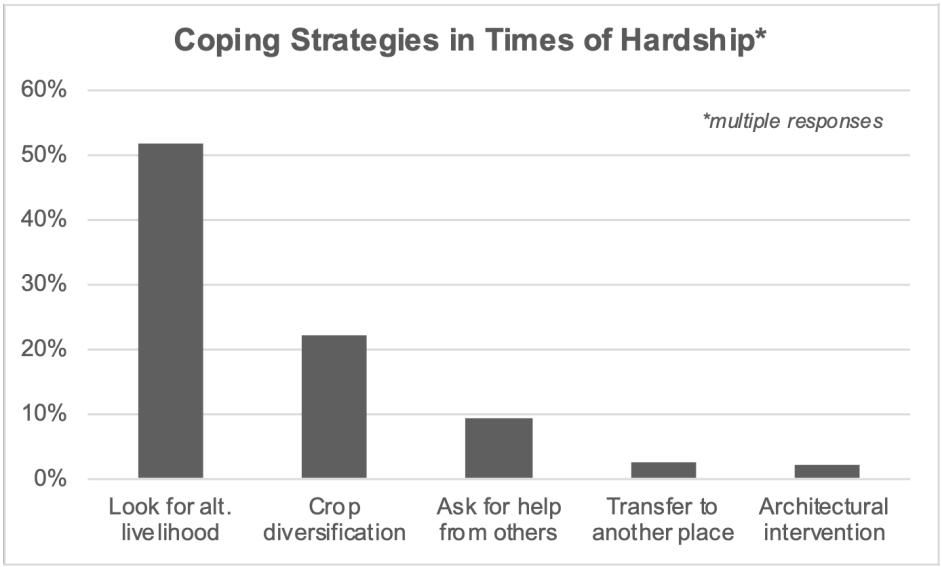

Figure 7. Coping strategies of households in times of hardship.

For extreme events, such as typhoons, the community implements an "adopt-a-family scheme" as a crisis response or evacuation strategy. This scheme utilizes the capacity of the sturdier house structures, usually owned by upper-income families, to be used as a temporary evacuation site during a typhoon event. Families living in dwellings built from light materials are assigned and listed as evacuees to specific sturdier houses. An average of 20 people fit in such houses.

As for livelihood, farming goes together with fishing, particularly for residents living near the coast. Full-time farmworkers catch fish to acquire additional income while waiting for their crops to be harvested, while fisherfolk apply for jobs requiring construction skills or additional workforce. In addition, the women of the households usually engage in selling by-products from crops and fish. Some also opt to diversify their crops (22.31%) by planting cassava between the corn stalks and other profitable vegetables to sustain their food needs during the lean months from June to August.

Mutual help manifests in both seeking help from relatives and through the *purok* system. Although the *purok* system could be improved in terms of organization and institutional anchoring (Braga, 2016; Matthies, 2017), the system's core value is *pintakasi,* or *bayanihan* in Tagalog, which roughly translates as 'mutual help'. Community members can assess their disaster risk through the *purok* system, which is more granular and detailed – for example, through the maps they use for their local climate and disaster risk assessment. The municipal government utilizes the risk assessment at the *purok* level to create a local climate change action plan and a municipal disaster risk reduction and management plan.

Table 3 summarizes the comparison between extreme events and pervasive hazards based on the household survey and supplemental interviews. For the perceived impacts of the hazards, respondents shared that they are emotionally affected by pervasive hazards, while their coping strategies for extreme events and pervasive hazards are both embedded in the level of their social relationships with others. During times of extreme events and pervasive hazards, a diverse set of government support is provided, such as the availability of cash transfer, crop insurance, and irrigation system construction.

One particular government intervention for the vulnerable sector that received varying perceptions among the respondents is cash transfer. While the local social welfare officer thinks that it has some success, most respondents believe it makes the people dependent on external support when proper social preparation needs to be done instead. According to a long-time resident of the island, people need to be resourceful and not just rely on cash transfers: "People easily forget because they have their priorities in life. They should look into the opportunities around them, focus on what they have and not on what they lack." (key informant, personal communication, 2018).

IMPLICATIONS

There are several theoretical and practical implications from the results of this study. Crossing a bridge is a useful analogy in understanding the benefits of looking at vulnerability through a place-based approach. The one end of the bridge represents the 'hazards', while the other end, or the destination, stands for 'survival'. The struggles or difficulties, portrayed by the bridge, that people go through manifest in their daily experiences at a given time and place. Although post-disaster situations occupy most of the news and data reports, they screen out people's daily struggles. Addressing disasters as battle situations puts less weight on daily concerns, such as safety, well-being, and equality (Delfin & Gaillard, 2008). Hence, integrating the everyday practices or habits of people with disaster management is necessary.

CATEGORIES	EXTREME EVENT (such as typhoon)	PERVASIVE HAZARDS (such as monsoon winds, drought-like seasons)
Onset	• sudden	• slow
Arrival	• typhoons landfall around September to November	• all year round (monsoon winds, warm and dry months)
Perceived Impacts	• damages to property	• stress due to lack of income
	• disruption in livelihood	• disruption in livelihood
Exposure (including urban areas, population, resource production areas, critical points and lifeline utilities)	• municipal-wide	• site-specific
Coping strategies	• look for an alternative livelihood	• look for an alternative livelihood
	• ask for help from relatives and friends	• ask for help from relatives and friends
	• adopt-a-family	• utilization of *purok* system
	• utilization of *purok* system	
Government (national and local) support	• conditional cash transfer	• conditional cash transfer
	• distribution of relief goods	• insurance coverage for farmers
	• improvement of road condition and road construction	• construction of irrigation system
	• provision of pump boats	• improvement of road condition and road construction
	• provision of typhoon shelter	• provision of typhoon shelter
	• conduct of emergency response trainings and drills	• conduct of emergency response trainings and drills
	• organizing livelihood programs	• organizing livelihood programs

Table 3. Comparison of experiences and coping strategies between extreme events and pervasive hazards based on household survey and supplemental interviews.

Farmers and fisherfolks 'cross' or survive difficulties through mutual help from the other members of the community. Incorporating a place-based approach for vulnerability assessment therefore contributes to the identification of varied difficulties faced and coping strategies used by the agricultural sector on the island. The results of the study indicate that contextualization is essential to parallel interventions to the varying experiences of hazard impacts by the community. A "calendar of difficulties" can help decision-makers to define the relevance of their programs to improve the livelihood conditions of the agricultural sector. Hardship periods may differ since the climate is changing. The hardships resulting from seasonality also differ across socio-economic groups, even if they are affected by the same environmental conditions. Nevertheless, the concepts of seasonality and locality can guide the timing of (government) support for specific hazards and their impacts. With such a system, local communities could also analyze their own vulnerabilities and capacities (Adger et al., 2011; Peters-Guarin et al., 2012).

Lastly, social interactions influence coping strategies. The residents of San Francisco cope with crises by looking for alternative livelihoods with the help of their relatives and extended family networks more than the government and other

organizations. As Allen (2006) noted for the Philippine context, kinship networks act as "safety-net support to resist shocks and stresses" (p. 85) because these provide access to opportunities that can improve one's standard of living. Moreover, the residents' insularity from the mainland influences the kind of social bonds and adaptive strategies implemented in times of hardship. Social bonds have proven as useful, especially in the existence of the *purok* system. However, with the varying needs and contexts of community members, local decision-makers need to be conscious about how activities and projects are supported in the *purok* and are given priority as one goes up the hierarchy of authority (i.e., municipal and provincial). If left unchecked, the vulnerable sector may be pushed back in the participatory process (Allen, 2006; Mohan & Stokke, 2000). The use of community-based disaster risk reduction and management strategies, like the *purok* system, over other disaster risk reduction approaches, such as engineering-based, ecosystem-based, and restrictive planning, emphasizes net social benefits with long-term sustainability (DasGupta & Shaw, 2017).

CONCLUSION

Several studies have pointed out the periodic struggles of marginalized sectors particularly with pervasive or extensive risks. This paper examined the vulnerability and coping strategies of farmers and fisherfolks with extreme weather events and pervasive hazards in San Francisco, Cebu, using a place-based approach. This approach uses the context of place to understand people's daily experiences in the agricultural sector and their coping strategies in times of difficulties. The results showed that social vulnerability is not static, as hazard impacts vary spatially and temporally. Meanwhile, social relations affect the coping strategies of farmers and fisherfolks with natural hazards.

Understanding human interactions and social experiences lies at the core of a place-based approach towards identifying vulnerability and coping strategies. Qualitative methods for validating objective risk assessment become more relevant in addition to the current guidelines of assessing climate and disaster risk in the Philippines. As vulnerability is reduced to figures or risk scores in the current process of risk assessment in the country, a hazard may pose more harm to the marginalized sectors in terms of who and which risk areas should be prioritized in disaster risk management. It is necessary to consider the social contexts of risk, including the people or places at risk, based on the knowledge, practices, and values of the community.

The local government of San Francisco needs to contextualize their sectoral developmental projects across a given space and time. Programs could be set to be implemented on a season-based manner. The focus of livelihood programs should depend on whether a specific district experiences the negative impacts of a monsoon wind. However, programs for disaster risk management need to be flexible and adaptive to the changing environment.

Local leadership and governance are an important element in implementing community-based initiatives such as the *purok* system. A simple strategy might be to allow all existing community organizations, including farmers and fisherfolks, to assess their vulnerability and adaptation. The outputs could be cross-evaluated with the assessment of the stakeholders, which are the local leaders and technical experts.

The results could provide qualitative information as to how and why the local people show particular vulnerability scores. Another recurring hazard that was not included in this study but that can be considered a "creeping crisis" (Boin et al., 2020) is the rise of the sea level. Future research could also map the daily activities or practices of the people so that they are geographically located and better utilized in terms of risk mapping. Likewise, documenting experiences in the agriculture sector for both cropping seasons can refine the systematic recording in contrast to a limited period of data collection.

Ultimately, community-based approaches for disaster risk management must be seen as a broader aspect of planning and disaster prevention (Allen, 2006). Still, gathering people's experiences of place can be a practical and relevant pursuit to achieve the Priority for Action I of the Sendai Framework, which is understanding risk in all its dimensions.

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