What Matters for Household Resilience?

Lessons from Recovery in Western Leyte after Typhoon Yolanda

Johns Hopkins SAIS – Mercy Corps Practicum

Daniel Hudner

Grace Harter

Joanna Van Asselt

Meredith Kummings

5/15/2015

Executive Summary

In November 2013, the Philippines and much of Southeast Asia was devastated by Typhoon Yolanda. Mercy Corps' TabangKO project was intended to speed recovery and promote household resilience to future natural disasters in the region. The project provided cash transfers through BankO, a mobile banking program, and was designed under the assumption that access to formal financial products and livelihood diversification would increase households' resilience. This study used a mixed methods approach consisting of multivariate regressions, focus groups, and interviews, to test these assumptions and further understand how these and other critical household characteristics contributed to households' response and recovery after Yolanda.

Formal loans were positively associated with recovery from Yolanda, while the analysis suggests that informal loans had both benefits and some negative effects. Savings before the typhoon were also associated with better recovery, although only a small portion of households had saved. Livelihood diversification before Yolanda was not shown to improve recovery, and the type of livelihood households engaged in also did not affect their recovery outcomes. However, households that began a new income source after the storm performed significantly better, suggesting that the ability of the local economy to provide jobs in the wake of a disaster was important.

Greater social capital was associated with better recovery, although community associations appeared to replace local governments as the distributors of assistance. Further research might examine how the inflow of aid in times of a disaster may bypass pre-existing power structures, and the long-term effects of such a shift. The gender of the financial decision maker did not play a significant role in household recovery. However, there was a consensus in the qualitative data that women's roles within households and community had changed somewhat as many began to take work outside the house in order to deal with the aftermath of Yolanda, and as many community organizations offered resources specifically for women.

Table of Contents

List of Acronyms

COMSCA - Community Managed Savings and Credit Association

CSI - Coping Strategy Index

FDM - Financial Decision Maker

PVA - Participatory Vulnerability Analysis

ROSCA - Rotating Savings and Credit Association

Section I: Introduction

Context

Building resilience to recurrent crises is critical to helping communities mitigate, recover and adapt to climate-based shocks. There is a growing recognition that natural disasters, and particularly the increasingly frequent and destructive extreme weather events associated with climate change, have reversed the gains of development interventions. This awareness has brought the theme of resilience to the forefront of international development discussions and programming, in particular for sub-Saharan Africa and Southeast Asia. The Philippines is no exception. Located along the Pacific Ocean's "Ring of Fire," the country is subject to a range of natural disasters, including an average of 20 typhoons per year. The extreme strength and high concentration of such events poses a significant threat to a range of livelihoods in the Philippines, in particular the 30 percent of the population that generates an income from the agriculture sector.

Typhoon Haiyan (locally known as Yolanda) made landfall in the Visaya's region of the Philippines on November 8, 2013, immediately becoming both the strongest and deadliest recorded storm in Philippine history, with over 6,500 killed, more than 4 million displaced, and approximately 14 million citizens affected. Following the event the Climate Change Commission (CCC) acknowledged the shift in the countries' typhoon belt from the northern Luzon region to the Visayas, further highlighting a need for greater attention and resilience building activities. Leyte was especially hard struck, with rural farmers being identified as a particularly vulnerable population (Mercy Corps 2014).

In the wake of the typhoon, Mercy Corps has initiated the TabangKO program, aimed to meet emergency and recovery needs as well as build resilience to future disasters. For the purposes of the program, and this study, resilience was defined as "the capacity that ensures adverse stressors and shocks do not have long-lasting adverse development consequences." Using this definition, families may suffer property damage and other losses to natural disasters, but in the aftermath the more resilient will be able to carry on without sacrificing investments in productive assets, education, or their own health. As a result, they will be able to recover assets and restore their livelihoods more quickly, without extensive humanitarian intervention. The TabangKO project provided cash transfers to severely affected households through BankO, a mobile banking program. It was designed under the assumption that financial inclusion and livelihood diversification both contribute to a household's resilience.

Study Purpose

Beyond the implementation of these transfers, Mercy Corps, in collaboration with Johns Hopkins University's School of Advanced International Studies (SAIS), set out to further understand how these household characteristics, as well as other critical factors, contributed to households' response and recovery after Yolanda. This research will fill an important knowledge gap needed to inform future humanitarian interventions in the Philippines, and similar contexts that experience recurrent natural disasters. It is intended

to build on previous research conducted by Mercy Corps and others that explore the connection between financial inclusion, livelihood diversification, social capital, and women's role and recovery outcomes.

The SAIS group consisted of four graduate students in the International Development Practicum program. The team made use of survey data collected by Mercy Corps in Western Leyte, supplemented by relevant secondary data sources. Additionally, the students conducted primary, qualitative data collection to further explore the links between household and community characteristics and resilience.

Research Questions

The study seeks to answer the question: *What are the main determinants of resilience to natural disasters in the Philippines?*

The practicum group addresses this question by exploring the following sub-components, which are considered to hold the most potential for Mercy Corps' future programming:

- ***Financial Inclusion****: How does access to and use of financial services affect household resilience? What types of financial services (formal versus informal, savings versus loans) appear to make the greatest contributions?*
- ***Livelihoods Diversification****: How does a diverse set of income-generating activities, with different risk profiles, affect household resilience?*
- ***Social Capital****: How do the social networks amongst individuals and groups affect household resilience? Which types of social capital (bonding, bridging, or linking) do individuals draw upon after a disaster, and for what purposes?*
- ***Gender****: How does women's participation in community and household-decision making as well as access to and control of resources impact household resilience?*

Section II: Literature Review

A literature review was undertaken at the inception of the study, in order to incorporate existing evidence which addresses the research questions. In particular, for each assumption to be tested, common findings were identified to be tested within the particular context of Western Leyte. In some cases, there is not yet an extensive body of evidence between household characteristics such as social capital and resilience, and the literature review served to identify these gaps. The sections below present the findings of the review for each research question.

Financial Inclusion

Academic research has focused on the effects of formal and informal financial services on disaster resistance and recovery. Access to savings, credit, and capital-generating services mitigates loss from a shock. However, the poor often do not have savings or access to credit, which leads to an inability to supplement or regain incomes, as well as rebuild after a disaster. Financial inclusion is seen as a means to an end for resilience, and is delineated in two ways: access and regularity of use of financial services (Demirguc-Kunt 2015).

Access to services such as savings accounts and microcredit is measured differently than continued use of services. Only with a full use of services (such as savings, access to credit, insurance, and investment) is a community designated as having full financial inclusion.

Community savings and credit groups have been shown to facilitate access as well as to develop social networks for members, further strengthening social capital and community resilience (Dlamini et al. 2014). This plays into the development of the financial resilience of populations, defined as the way people access, build, and preserve their financial assets and limit their liabilities (Jacobsen et al. 2009). The financial resilience of a population supports both household and community resilience. Many researchers and NGOs have looked at how specific financial services can withstand shocks, and how these services provide a means to broader community resilience.

Recent Mercy Corps policy has been to examine the relationship between supply and demand of financial resources. Restriction to access of credit and savings can be culturally-based (such as limited access for women) or based on the fact that the poor may not have credit history or the documents needed to apply for loans (Mercy Corps 2014). Because of this, the poor may be reliant on just informal financial services, or a mix of formal and informal that fails to meet their needs.

World Bank research on community driven development and resilience has focused on microfinance services and cash transfers as a means to mitigate damage and facilitate recovery after a storm (Arnold et al. 2014). In particular, programs that provided these services for women in pastoral Kenya and Ethiopia found that their participants were able to preserve assets, increase food security, and generate income after a natural disaster.

Access to services and then adoption of services can be thought of as two different steps to financial inclusion; while there may be financial services available, their usage may be too low to provide full benefit to a community (Jain et al. 2014). One of the primary reasons that the poor do not use formal financial services is due to the lack of education and awareness (Jacobsen et al. 2009). They may become trapped by bad moneylending schemes or may be unaware that there are services to help them service their debt. Knowledge of various packages is key to more widespread use. In particular, a MasterCard study charts a path to financial inclusion that begins with a transactional bank account and graduates to successively more complex financial transactions (Jain et al. 2014). Good policy by national governments and donors alike can eliminate barriers (such as exorbitant fees, distance, and low education about a service) and increase financial inclusion (Demirguc-Kunt 2014).

This literature on financial inclusion guided the research in that questions were focused on knowledge of and access to resources and use of financial instruments in recovering from Yolanda. This research attempted to delve deeper into the level of financial inclusion in the Philippines and its impact on recovery and resilience.

Livelihoods Diversification

Research suggests that more resilient communities use a diversity of natural and commercial resources sustainably. Ta Thi Than Huong's research on resource access and

livelihood resilience in Vietnam demonstrated that following multiple typhoons in the 2000s, the main factor contributing to resilience was diversification of livelihoods (Huong 2011). Likewise, the USAID study, Market Systems for resilience states that there is a clear consensus that diversification is an important strategy to reduce risk and strengthen absorptive and adaptive capacity, and thus increase resilience

Research also suggests that communities with different livelihood options have greater adaptive capacity to natural disasters. Hanazaki and Peroni's research on relationships between local livelihoods and vulnerability to food insecurity in Brazil found those who have access to a greater diversity of assets have a greater range of options and the flexibility to shift their livelihood strategies' as needed (Hanazaki et. al., 2013). However, each village tended to have their own distinct livelihood diversity portfolio. The author finds that resilience is therefore more about the community you live in than the family you come from.

Research also suggests that livelihood diversification alone may not be enough. It may be important to diversify across risk groups. The Mercy Corps TANGO study on resilience to food security shocks in Southern Somalia finds that contrary to expectations, having multiple household income sources was not strongly linked to greater resilience to food security shocks. To contribute to resilience, livelihood diversification needed to go beyond increasing the number of income sources to promote more independent income sources, which spread risk across different types of hazards (Mercy Corps, 2013).

The literature points to the dangers of becoming overly diversified, especially for poorer families. In rural communities, poor households have limited non-agrarian skills, means of transport, and essential contacts to markets. Therefore, their diversification will generate few returns and result in only small increases in income generation. Deborah Fahy Bryceson' study of livelihood diversification in Tanzania, produced findings that diversification was dominated by petty trading of cheap goods, which increasingly led to the ability of women to work and seek work; albeit, it did not result in a change of intra-household relations, and therefore added to the work load of women (Fahy Bryceson, 1999). The author indicated that rural dwellers' ability to cope was based off of their existing asset holdings, and that non-agriculture earnings are more restrictive for the rural poor. In this way, although livelihood diversification can help families cope with crisis, following the disaster the strategy may no longer be a decisive step forward, but a weak attempt to make due.

There are also studies that show that livelihood can have no effect on resilience in certain communities. The Save the Children Study, Livelihoods at the Limit, finds that when modeling a drought across a variety of communities in Kenya, Zimbabwe, Burkina Faso, Mali and Ethiopia that actually those communities with the most diversified livelihoods end up being the worst off after the drought (Save the Children, 2013).

Social Capital

Recently, researchers and humanitarian actors have begun to focus on the role of social capital in immediate coping with the aftermath of natural disasters, as well as longer-term

recovery. The term social capital was originally coined by L.J. Hanifan to describe "goodwill, fellowship, mutual sympathy and social intercourse among a group of individuals and families who make up a social unit" (Hanifan, 1916). Modern scholars have elaborated on this concept, dividing social capital into bonding capital, describing the strength of connections within a community; bridging capital, or lateral connections across communities through professional or social organizations; and linking capital, expressing the relationship between community members and elites (Aldrich and Meyer, 2014). Although these concepts remain somewhat nebulous, and are difficult to capture precisely as they vary across contexts and individuals, their importance in the recovery of disaster-struck communities has been well documented.

Aldrich and Meyer review empirical studies which show the relationship between the various forms of social capital and community recovery after a disaster. Bonding capital is perhaps the easiest to understand as it can affect individuals during the event: in a heat wave in Chicago in 1995, where communities with little public space experienced higher death rates among isolated elderly individuals in comparison to communities with similar income but more communal space (Aldrich and Meyer, 2014). However, communities with more trust also fare better recovering from disasters – after an earthquake in China in 2008, households with larger Spring Festival networks were more likely to rebuild their homes rather than migrate.

The other two forms of social capital can also play a key role in recovery by allowing one affected community to draw upon resources from those outside the area of the disaster. After earthquakes in Gujarat, in 2001, and Kobe in 1995 communities with high bonding *and* bridging capital were able to rebuild faster than others, in part by creating a common voice for the community, and in part by expressing their needs to the government (Nakagawa and Shaw, 2004).

However, social capital is a nuanced concept, and simple accumulation does not always prove beneficial. After Hurricane Katrina struck New Orleans, a Vietnamese community in New Orleans East was able to use church organizations to gain support from churches outside New Orleans – an example of linking capital. The equally tight-knit Ninth Ward community was also able to provide support to its members, but was unable to access support from *outside* New Orleans – limiting its recovery in comparison to the Vietnamese community (Aldrich and Meyer, 2014).

In some cases, capital, and particularly bonding capital, can actually worsen the effects of a disaster. In Baton Rouge, individuals who were more connected to the community also suffered higher levels of stress in the wake of Katrina, as they felt more pressure to support the worst-affected. However, this stress did decline faster for individuals with higher bonding capital than for others (Weil et. al., 2011).

Gender

Women's choices and actions can contribute to enhancing household resilience to shocks such as natural disasters, but their roles tend to be overlooked, inhibiting opportunities to utilize their unique capacities and skills in recovery processes (Brookings, 2013). The Hyogo Framework for Action 2000-2015, focuses on building resilience of states and communities to disasters, and emphasizes the need for a gender perspective to be

integrated into all disaster risk management policies, plans, and decision making processes (UNISDR, 2010). Developing women's capacity to reduce and manage risk is viewed as an essential step for building more disaster resilient communities, in particular because women, who have different preferences regarding consumption then men, make different decisions about resource use. The relevant literature highlights the fact that women tend utilize resources in a manner that can affect human capital, through greater allocation of funds to food as well as children's health and education (Fiszbein and Norbert 2009). Increasing women's control over resources can increase their bargaining power, thereby contributing to decision-making that fosters greater resilience.

Mercy Corps' research in the Sahel highlights understandings of how gender roles are influential in the level of household vulnerability. Findings show that gender influences the degree of sensitivity to disturbances felt by households, as individuals experience shocks and stresses in different ways depending on their familial and societal responsibilities, and their control over resources. For instance, some household members had to allocate additional time to resource collection, which detracted from time that otherwise would have gone to education, income generation or household food production, all of which are defined as critical components for resilience (Mercy Corps 2014).

Men, women, boys, and girls differ in their perceptions of the impact of shocks based on the types of resources they control. Gender also influences the skills, strategies, and mechanisms individuals use to cope with and adapt to disturbances. For instance in Niger, threats to poultry were viewed with greater urgency by women, as chickens were one of the few resources they controlled. Moreover, selling or consumption of poultry was often an immediate coping strategy. Small livestock, typically owned by women and youth, is sold first in hard times. Gender-differentiated coping mechanisms often have both direct and indirect consequences that place individuals and their households at greater risk to future shocks (Mercy Corps 2014).

Research demonstrates that women activate their collective social capital to find solutions to challenges faced in natural disasters, and women's groups are often involved in providing relief services and recovery efforts following disasters. The Pan American Health Organization, cited how following Hurricane Mitch in 1998, women in Guatemala and Honduras were directly involved in the reconstruction activities, through community organizing and participation in the informal sector as an additional income-generating activity. Elaine Enarson indicates that such initiative can be attributed to women being the primary users and managers of threatened natural resources in developing countries, and thus they are motivated to organize around environmental and health concerns (Enarson 2002). Different forms of networking, including working collectively in sharing household responsibilities are illustrative of women's coping strategies, which can be focused into resilience building (Acosta-Belen and Bose 1990). In different regions women have been seen to embrace the more communal perspective to address challenges in a collective way. Collective coping strategies can foster greater social capital, which in turn lends itself to increased resilience within the community.

Lambrou and Piana highlight how natural disasters can offer opportunities for women and other marginalized groups to take on new roles and increase their influence, challenging

traditional gender norms and power dynamics (Lambrou and Piana 2006). They are often willing and able to take an active role in activities normally delegated to men (ranging from construction, agriculture, etc.). Women tend to be some of the most effective in mobilizing the community to respond to disasters. As a result of women's relief efforts they can develop new skills that can strengthen resilience.

Access to information and control over resources have a great bearing on women's capacities to prepare, mitigate, manage and respond and recover from natural disasters (UNISDR 2008). Strengthening women's access to and ownership over resources (financial, property rights, productive assets, livestock, etc.) facilitates female empowerment through increased decision-making power and leadership in community and household activities. Karlan, Ashraf and Yin's study on *Female Empowerment: Impact of a Commitment Savings Product in the Philippines*, highlights how access to and control of a microfinance savings tool was shown to increase female household power (Ashraf et al. 2010) Again, increasing females bargaining power in the house, can result in them having greater ability to make decisions that can shape household vulnerability.

Section III: Research Methodology

This study uses a mixed methods approach, drawing on both quantitative and qualitative data to identify generalizable relationships among the population of Western Leyte, Philippines, while also addressing the underlying pathways by which those relationships operate.

Quantitative data was collected via two household surveys, a baseline and endline, administered by Mercy Corps staff to randomly selected beneficiaries of the TabangKO program. The baseline survey was conducted immediately after the registration process, before project implementation began. The endline survey took place in January 2015, after the completion of the project. The same respondent from each household was used for both survey waves, and both contained questions addressing the characteristics of the household and the financial decision-maker. The original sample size at baseline was 1738 respondents, with 1640 respondents surveyed in the final round. From the original 98 respondents were lost, giving an attrition rate of 5.6 percent. An impact evaluation of the TabangKO project found that the group of respondents not found at endline did not differ from the rest of the sample on control demographic variables.

Potential beneficiaries were identified using a list compiled by the Department of Social Welfare and Development (DSWD), which catalogued various levels of damage experienced by households. Households that resided in the pre-selected areas and were categorized as having been "totally damaged" by DSWD criteria were chosen for program enrollment. Mercy Corps staff and community partners verified that damage was sustained in target areas and assessed the level of damage in order to select beneficiaries. Priority was given to households that used lighter and less stable building materials. As a result, the data used in this study reflect a population most affected by Typhoon Yolanda.

Qualitative data were collected through focus groups and key informant interviews conducted by the practicum team in January 2015, with facilitation and translation by Mercy Corps staff. Focus groups, both mixed gender and divided into female and male groups, were held with community members invited by the barangay captains. The team also held group interviews with the officers of community associations, and conducted individual interviews with government officials at the barangay and municipal level, and NGO staff members. The total number and type of discussions are given below in Table 1.

Table 1: Qualitative Data Collection

Type	Respondent Category	Number of Groups
Focus Group Discussions	Community Members	5
	Association Members	4
In-depth interviews	Barangay officials	4
	Municipal officials (DSWD)	4
	NGO and Cooperative Staff	3
	Leaders of community organizations	3

Quantitative Models

Regression models were used to independently test the relationship between the explanatory variables - livelihood diversification, financial inclusion, social capital, and gender equity - and household recovery, which was our main proxy for resilience. Each model contained several distinct measurements of the relevant explanatory variable, described in the respective sections below. Additionally, these models controlled for the level of storm damage to the house, and household demographics such as number of family members, income, and the financial decision maker's gender and level of education. The models also included a control for each barangay (village), which allowed for comparisons between households within the same institutional, economic, and physical environment.

An expanded form was used for the financial inclusion model. This included gender-interactions in order to compare the effects of the key explanatory variables across male and female financial decision makers. These results are addressed in the Gender section when applicable.

In all cases, robust regressions were used to correct for heteroskedasticity.

The results of the models are given in their respective sections below. Blue cells show statistically significant estimates, with positive correlations in black text and negative correlations in red text. As is standard, *'s are also used to indicate significance, with one * indicating significance at the 95% level. Coefficients which are not highlighted are not statistically different from 0.

Outcome Variables

This study built upon Mercy Corps' previous research into the determinants of short-term coping in the aftermath of Typhoon Yolanda, by examining indicators of longer-term recovery as the outcomes of interest. Recovery is considered more critical than coping, as it reflects a household's ability to recover its living standards and economic well-being in the aftermath of a shock. Coping ability is important in as much as avoiding short-term negative coping strategies can enhance a household's long-term recovery prospects. Adaptation to future shocks is considered an important element of long-term resilience, but this study does not address it; a longer timeframe would be needed to examine households' responses to multiple shocks in order to truly assess adaptation.

Four outcomes were used to represent different aspects of a household's recovery at the time of the endline survey, 14 months after Yolanda. The first was the Coping Strategy Index (CSI) at the time of the endline, which demonstrates the stability of the respondent's access to food. The CSI is composed of a series of weighted strategies to maintain food consumption. A higher value on the CSI indicates the use of *more* undesirable coping strategies to obtain food, such as reduced portions and skipping meals. The full list of questions included in the CSI is given in Annex I.

The second was the change in strength of housing materials from the baseline, 2 months after Yolanda, to the endline survey 14 months after the storm. Values for the strength of housing ranged -2 to 2, with each point indicating the addition or loss of a roof or walls made of durable materials.

Two other outcomes were used to assess broad recovery in the wake of the typhoon. The first was a simple count of durable goods owned by the household at the endline (no data were available at the baseline), intended to capture the general material well-being of the household. Additionally, the Progress out of Poverty Index (PPI) was used to assess the change in households' likelihood of poverty from the baseline to the endline. This outcome also addresses economic well-being, but in a broader sense than material belongings.

Financial Inclusion

How does access to and use of financial services affect resilience?

Measurement

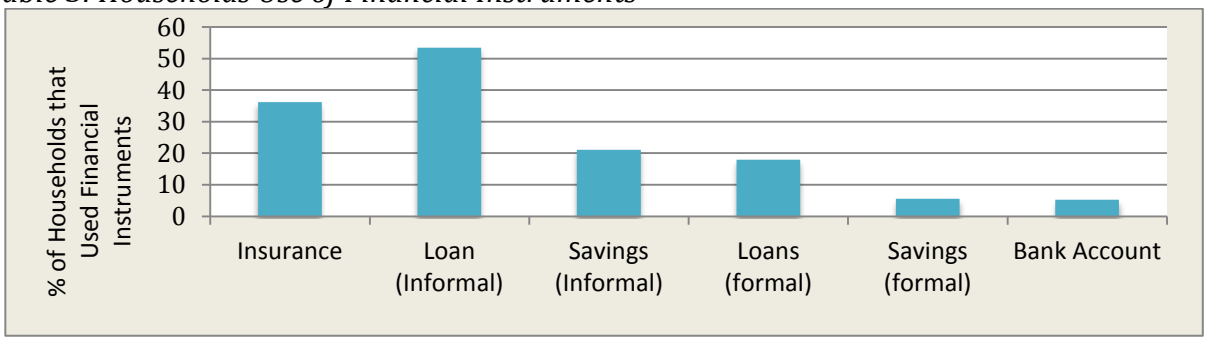
For the purposes of this research financial inclusion is defined as the use of and access to financial services.[1] Quantitative data for household use of instruments was collected in the baseline and endline surveys, which addressed households' use of formal and informal savings, loans, insurance, and bank accounts. This was measured at three points in time: prior to Yolanda (through recall questions at the baseline), at the time of the baseline, and at the endline. Qualitative data on use of and access to financial instruments was collected by the research team, in focus groups with community members and interviews with NGO's, government officials, and officers in formal cooperatives. Table 2 shows how savings, loans and insurance were categorized in terms of financial inclusion for the purpose of this report.

Table 2: Financial Inclusion Categorization for Savings, Loans and Insurance

Formal Savings	**Informal Savings**	**Formal Loans**	**Informal Loans**	**Insurance (all formal)**
Bank	Rotating Savings and Credit Association (ROSCA)/ Community Managed Savings and Credit Association (COMSCA)	Formal institution– Banks (commercial and public), non-bank financial institutions	Employer	Health/Medical Insurance (government or private) or Life Insurance
Credit Union	Home	Microfinance Institution (MFI)[2]	Neighborhood/Community	Home owner's insurance
Savings Association	Community Welfare	Pawnshop	Store Credit	Education Insurance
	*None report saving by investing in assets	Daily Bank	Moneylender	Travel/Accident Insurance
			Community Welfare Scheme	Vehicle/Asset Insurance

Table 3 provides a summary of financial instrument use, and shows that informal loans were widely utilized. Few respondents possessed bank accounts, and formal savings and loans were only used by approximately one-fifth of respondents. Possession of insurance was confirmed by a larger number of participants, but this was primarily health insurance provided through the government.

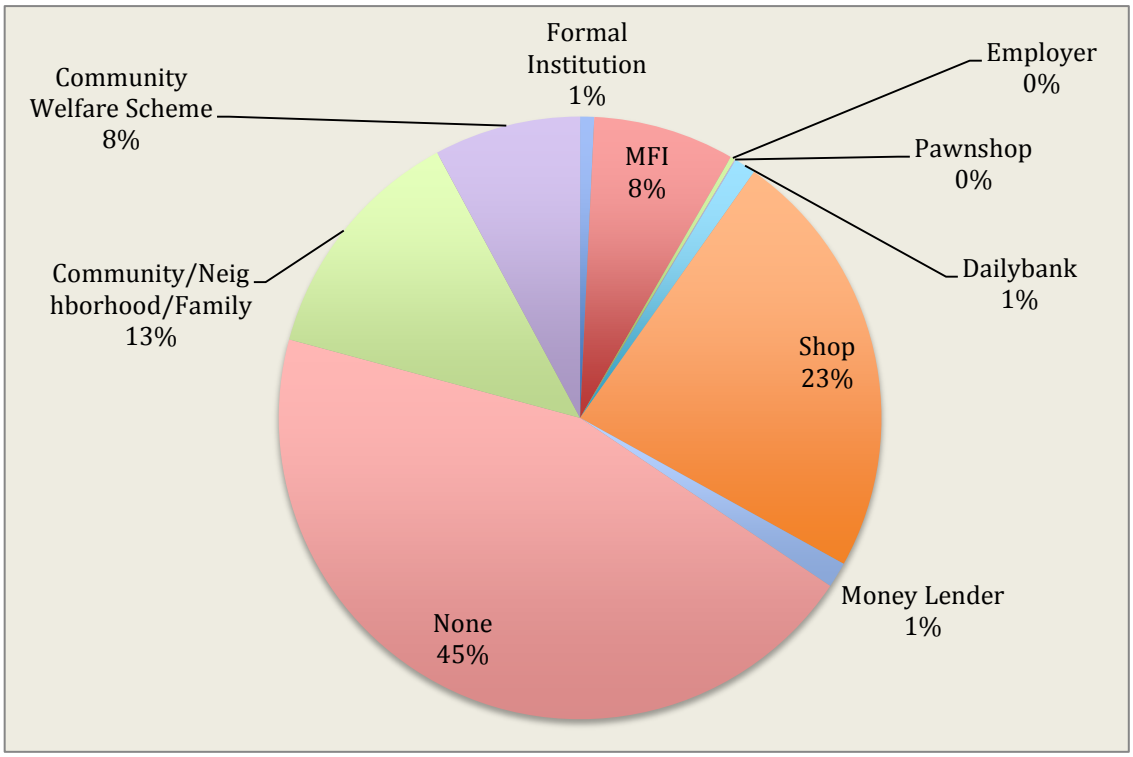
Table 3: Households Use of Financial Instruments



[1]World Bank. Global Financial Development Report: Financial Inclusion. 2014.
[2] Regulated MFIs in the Philippines cannot collect deposits.

Further breaking down formal and informal loan sources illustrates the range of mechanisms through which households obtained loans. In particular, credit through local shops was one of the most common sources of loans, followed by community, neighborhood and family members, as can be seen in Table 4.

Table 4: Loan Sources



Financial Instruments and Recovery Outcomes

Using both qualitative and quantitative survey data, we analyzed the relationship between households' use of and access to different financial tools (informal and formal) and recovery outcomes. The quantitative results showed that use of formal financial instruments generally helped households more easily maintain their food supply in the aftermath of the typhoon, while use of informal instruments helped in home repair and strengthening. The qualitative data showed mixed perspectives on access to financial capital. Both males and females frequently cited lack of capital as a barrier to business creation and development. However, focus group participants clarified that people had multiple forms of access to savings and loans, though their level of access greatly depended on their location. The data indicated that in a number of cases multiple types of financial instruments were used.

The results of the regression of resilience outcomes on use of financial instruments are below in Table 5:

Table 5: Regression of Resilience Outcomes for Financial Instruments

	Distressful Coping Strategies	Change in House Strength	Durable Good Count	Poverty Likelihood Change
Formal Savings Pre-Yolanda	-0.349*	0.155	1.028	-4.175
Informal Savings Pre-Yolanda	-0.0547	0.187***	-0.0644	0.0996
Bank Account Pre-Yolanda	0.234	0.129	1.505*	-0.831
Insurance Pre-Yolanda	0.0263	-0.00982	0.0545	-0.770
Formal Loans after Yolanda	-0.299**	0.0815	1.513***	-6.467***
Formal Loans Pre-Yolanda	0.165	-0.0651	0.392	0.811
Informal Loans after Yolanda	0.115*	0.174***	0.243	-0.677
Informal Loans Pre-Yolanda	-0.0421	-0.0464	0.357	0.688
Female FDM	0.111*	-0.0503	-0.358	0.0934
FDM Age in Years	-0.00233	0.00283*	0.0352***	-0.130***
FDM Years Education	-0.00763	0.00257	0.317***	-1.019***
Financial Literacy Score 0-6	-0.0959***	-0.0374**	0.684***	-0.828*
Pre-Yolanda Poverty Likelihood	0.00214	0.00294***	-0.0380***	-0.452***
Yolanda Damage to Home 1-5	0.458***	0.0113	-0.494*	1.799
Constant	0.582	0.00310	9.439***	16.69*
Observations	1469	1591	1591	1591
Adjusted R-squared	0.109	0.049	0.280	0.237

Savings

Qualitative and quantitative data indicated that savings did help households following the typhoon, but did not have a notably strong impact on recovery. Both formal and informal savings impacted different aspects of the recovery process. Most focus group respondents said they did not have informal cash savings or savings in a formal institution. Survey data reinforced this claim as a small portion of respondents confirmed possession of savings, with the savings amount generally being low. Furthermore, focus group participants indicated that while savings was helpful for those in possession of it, most people still had to resort to other recovery strategies. For instance, one focus group explained that they kept some money at home, and felt loans had been important for material recovery after Yolanda, particularly to fund repairs to houses.

Households where survey respondents confirmed saving through formal financial instruments prior to Yolanda scored 34.9 percent lower on the CSI at the endline when compared to similar households. Formal savings showed no effect on any other recovery outcomes of concern. Informal savings, on the other hand, was shown to have a statistically significant association with the strength of building materials for housing. Thus, those with informal savings were more likely to have a house constructed out of stronger materials at

endline. Informal savings showed no effect on CSI, durable good count, or poverty likelihood

Qualitative data collected through focus group discussions highlighted individuals' attitude toward and understanding of savings. One male focus group emphasized how they were now actively trying to save a little more after Typhoon Yolanda, to be prepared for future weather shocks. A number of focus groups indicated that while they were not able to save, they were trying to spend their money more wisely, so that in the case of future crises they would have a little more cash at hand for immediate use. When asked about other informal forms of saving, such as livestock, respondents did not appear to see animals as a savings mechanism. Small livestock, such as poultry were viewed as being of little consequence, but of having the benefit of being able to generate quick cash through sale if needed.

A number of beneficiaries indicated they had savings through cooperatives, and this service was in many cases automatic once one received financing. The majority of people who saved said this was done through informal means, which is confirmed by the survey data represented in Table 3. Savings and lending groups were used, and NGOs appeared to play a role in encouraging and facilitating the creation of a number of such groups. Many savings groups were composed of women. Focus group respondents alluded to savings groups in one or two locations, but none were members. In one all female focus group discussion, the participants stated that they could not afford to participate in the women's savings group in their community. The savings group was perceived by focus group participants to be exclusive in nature as most members were considered to be wealthy women whose husbands had jobs.

Having a bank account – a specific type of formal savings – prior to Yolanda was associated with having more durable goods, holding all else equal, but showed no significant relation to other recovery outcomes.

Loans

Findings on loan use from qualitative and quantitative research varied depending on the respondents. In general, loans were more widely used than other financial instruments, and proved to be an important instrument in recovery. Following Yolanda, approximately 64 percent of households indicated utilization of loans. The majority of the loans, 53 percent, proved to be informal loans, and less than 20 percent of survey respondents obtained a formal loan. Overall formal loans demonstrated a strong positive impact on recovery outcomes. Meanwhile, informal loans were shown to have both positive and negative associations with recovery outcomes following Yolanda.

The percentage of formal loan use is somewhat less than expected based off the qualitative data, which indicated higher knowledge of and access to formal institutions that provided loans. In general, conversations with NGOs and municipal leaders indicated that people used multiple financial instruments, and that use of multiple loans for recovery was detrimental. However, focus group respondents reported that people primarily used one loan. Quantitative data supports the NGO and government's claim to an extent in regards to

the use of multiple financial instruments, and it is evident that a notable proportion of individuals used more than one type of loan instrument.

Those who took out formal loans after Yolanda scored 29.9 percent lower on the CSI, meaning they also were able to stabilize food consumption in part, indicating improved recovery relative to those who did not take out loans. Use of formal loans had positive effects on other indicators of household recovery such as more durable goods at the endline, in comparison to households that did not access loans. Compared to similar households, they also had a decrease in likelihood of poverty of 6.5 percentage points between the baseline and endline. Formal loans taken out pre-Yolanda were shown to have no association of significance with any of the recovery outcomes, likely because the capital associated with them may have been invested or spent before the storm, and was not accessible afterwards.

A few focus groups cited cooperatives as beneficial because of low interest loans, and reported avoiding private moneylenders because of their high interest rates. These responses seem to be supported by the data as only a small (1 percent), noted obtaining a loan from a moneylender. In general people seemed to be conscious of the interest rates and the risks entailed by high interest. However, interviews with government officials and NGO workers showed a perception that many people were taken advantage of by predatory loan sharks and took out multiple loans, sometimes to finance previous debt. DSWD directors interviewed emphasized the dependence on capital was a hindrance to recovery. While only a minute fraction of households in the sample indicated use of moneylenders at endline, a much larger component (23 percent) confirmed use of local shops for credit, which may have similar predatory loan features as the traditional moneylender.

The data showed that use of informal loans after Yolanda helped households rebuild and strengthen their homes. Households that obtained informal loans were more likely to use more durable materials in their houses at endline. Focus group participants emphasized the need to rebuild their houses as one of the immediate priorities and linked this to a need for capital. Aside from informal savings, discussed above, no other financial instrument was correlated with strength of housing material. This suggests that informal loans and savings helped households not only recover to their pre-Yolanda state, but improve their preparedness for future disasters through houses that were better built.

While taking out informal loans after Yolanda was linked to more positive recovery overall, it was also correlated with an 11.5 percent increase in households' CSI score, indicating greater food insecurity, at the endline. It is possible that one coping strategy was to cut down on consumption in order to pay back loans. This could be attributed to the informal loan having stricter repayment terms or higher interest, causing people to feel tied down and more in debt by these loans. Qualitative data indicated that those who had to take out loans saw it as a necessity, and although it may have helped them rebuild, it was still an undesirable strategy.

Insurance

Having insurance prior to Yolanda proved to have no effect on recovery outcomes. While approximately 36 percent of the people surveyed had insurance, the majority were in possession of health or life insurance provided by the government, which would not help to address loss in assets or property as a result of the storm. Few respondents possessed home-owner, accident, asset or disaster insurance options, which could be considered more relevant in influencing coping and recovery outcomes.

Education Level

Heads of household with higher financial literacy, demonstrated through stronger mathematical skills and understanding of financial concepts, largely but not exclusively experienced better coping and recovery outcomes. Greater financial literacy was associated with a lower CSI and more durable goods at the endline, and a reduction in poverty likelihood from baseline to endline. However, it was also correlated with a weaker house at the endline. In general it is expected that greater financial literacy will be associated with increased use of financial services, as the educational component and factual awareness about the range of products will be higher. This is discussed in the earlier literature review. Informational limitations and understanding of different financial products commonly function as a barrier to use of financial services.

Overall, and as expected, households which made greater use of financial services and products before Yolanda were able to better maintain their level of expenditure and material quality of life 14 months after the storm, indicating their recovery. However, this result was not clearly driven by formal financing; in particular, only informal financial tools were associated with greater house repair, a stated recovery objective of many community members. Qualitative data highlighted the importance of loans in recovery, and community focus group discussions, where participants' assertions on low use of moneylenders was re-affirmed by the quantitative data. However, credit from shops was shown to be a main source for informal loans. Savings was shown to be useful to purchase supplies, food and building materials in the immediate recovery, but as community members noted, most people's savings were low, so its role was not substantial.

Livelihoods Diversification

How does having a diverse set of income-generating activities, with different risk profiles, affect resilience?

Measurement

Quantitatively, this question was addressed through both baseline and endline survey questions which recorded the self-reported income sources for each household. The researchers also discussed livelihoods, changes in income sources, and diversification during community focus groups and interviews with municipal leaders and NGOs.

Livelihoods Summary Statistics

During focus group discussions, most respondents reported engaging in one dominant activity (either farming or fishing) as their primary source of income. Few reported engaging in livelihood diversification across multiple economic sectors, though some wealthier and land-owning households in coastal barangay earned income through both fishing and farming. It is noteworthy that community members did not report intentional diversification as a means of building resilience to storms. This lack of cross-sector diversification is backed by the quantitative survey data, which shows that just under 75 percent of households reported only one or no sources of income before Yolanda.

Table 6 shows the separate variables for farmers and fishers, as well as combined variables for non-professional, and professional income-generating activities. Another variable specifying whether or not the household received a money transfer, such a pension, is also included. Prior to Yolanda the majority of households were farmers. After Yolanda, however, the number of households engaged in agriculture decreased by 19 percent, reflecting reports by community members that damage to land and crops in some cases prevented them from continuing to farm. By contrast, the second most frequent source of income prior to Yolanda was daily labor, and this number more than doubled after Yolanda to become the most common household income source. Fishing was the third most common profession before Yolanda, with a slight increase after Yolanda. Professional work was infrequent pre-Yolanda, but also increased slightly after.

Table 6: Income Sources

Source of Income Prior to Yolanda	Prior to Yolanda (% of the population)	After Yolanda (% of the population)
Agriculture	565	459
Animal Husbandry	93	76
Fishing	152	204
Non-professional		
Small Business	79	88
Trader	22	31
Daily Labor	232	501
Driver	117	152
Food Cart	18	33
Wood Processing	61	84
Tailor	9	8
Handcraft	4	7
Other	124	294
Professional		
Skilled Labor	113	100
Large Business owner	2	1
Professional	2	4
Salary	121	186
Money Transfer		
Pension	7	21
4Ps	20	69

In addition to variables representing income from each livelihood before Yolanda, a binary yes/no variable was used to indicate whether a household had income from more than one sector prior to Yolanda. This variable was interacted with farming and fishing to differentiate the effects for the sectors deemed most vulnerable to Yolanda, and can be seen in Table 7.

Table 7: Diversified Livelihood

Diversified livelihood	Prior	End-line
Agriculture and animal husbandry	53	24
Agriculture and fishing	24	24
Fishing and nonprofessional	51	59
Agriculture and nonprofessional	153	182
Fishing and professional	17	29
Agriculture and professional	51	18

In addition to these pre-Yolanda income variables, variables for losing a livelihood, losing a livelihood but gaining a new one, and gaining a new livelihood after Yolanda were also included as shown in Table 8.

Table 8: Livelihood Count

Livelihood count	Number of Households Prior to Yolanda	Number of Households at End-line
0	534	29
1	734	1,025
2	406	476
3	65	99
4[3]	-	11

Livelihoods and Recovery

The analysis showed that the type of livelihood a household engaged in prior to Yolanda was not significantly related to their recovery afterwards – although all were affected, none was relatively better or worse. Diversification across multiple livelihoods was also not related to recovery, although this may reflect its infrequency among the population. However, the ability of a family to start a new livelihood afterwards was correlated with better recovery outcomes, and adopting a new job or income-generating activity was a recovery strategy cited by many respondents in focus groups. This suggests that, within the context of Typhoon Yolanda, the capacity of the local economy to provide work opportunities is more important than a household's specific occupation or diversification status prior to the storm.

The results of the quantitative analysis are shown below in Table 9.

[3] This was not applicable prior to Yolanda, as a maximum of three income sources was reported in the baseline survey.

Table 9: Quantitative Results for Livelihood

	Distressful Coping Strategies at Endline (Log)	Change in House Strength Baseline to Endline	Durable Good Count (Endline Only)	Poverty Likelihood Change Baseline to Endline
Farming pre-Yolanda	-0.104	-0.00572	0.239	2.752
Fishing pre-Yolanda	-0.126	0.0442	0.625	2.942
Nonprofessional Work pre-Yolanda	-0.0474	-0.0381	0.852*	0.779
Professional Work pre-Yolanda	-0.0247	0.0188	1.548**	-1.324
Received Money Transfer pre-Yolanda	-0.234	0.247	0.127	-4.926
Added Effect of Multiple Livelihoods pre-Yolanda	-0.0445	0.102	0.547	-2.748
Loss of Income from Any Sector since Yolanda	0.184*	-0.0410	-0.707*	1.106
Earn Income from New Sector since Yolanda	-0.204**	0.0214	0.870**	-0.686
Female FDM	0.0968	-0.0513	-0.275	0.124
FDM Age in Years	-0.00164	0.00239	0.0374***	-0.124***
FDM Years Education	-0.00796	0.00393	0.335***	-1.010***
Financial Literacy Score 0-6	-0.106***	-0.0390**	0.742***	-1.014**
Pre-Yolanda Poverty Likelihood	0.00286*	0.00250**	-0.0443***	-0.430***
Yolanda Damage to Home 1-5	0.470***	-0.00832	-0.645**	2.088*
Constant	0.569	0.260	9.688***	12.75
Observations	1469	1591	1591	1591
Adjusted R-squared	0.104	0.026	0.266	0.229

Pre-Yolanda Livelihood Strategies

There was a surprising lack of relationship between a household's livelihood before Yolanda and the recovery outcomes. No specific livelihood sector, including fishing, farming, non-professional, and non-professional work, was significantly correlated with a majority of the recovery outcomes. Households that farmed, fished, or received money transfers before Yolanda were no different than others on *any* outcomes, controlling for demographics. Those which earned income through non-professional or professional work had more durable goods at the endline, but were no different on the measures of recovery.

Although this equality of recovery between livelihood sectors is surprising, it matches descriptions given by community members and leaders. When asked which livelihoods were affected the most, the majority of respondents reported equal devastation across the

board. “All were affected,” said one respondent, a barangay councilor in San Juan, summing up the responses from focus groups and government officials. However, there was some differentiation between the way livelihoods were affected: fishermen reported losing nets and boats, while farmers reported losing entire harvest or having fields that suffered from major erosion. Coconut trees in particular were said to be broken and no longer bear fruit, and while rice and other field-based crops could be quickly replanted and grow within one season, new trees would take five years to mature. It is possible that coconut farmers only would be significantly more affected, and have lower recovery outcomes than others, but the quantitative analysis addressed livelihood sector instead of specific types of crops.

Beyond the relationship between individual sectors and recovery, it was hypothesized that diversification across multiple sectors would reduce risk and allow for a smoother recovery. However, there was no added benefit to having multiple income sources for any of the recovery outcomes. It was suspected that the key to risk reduction was specifically diversifying out of agriculture and fishing, both of which depend upon physical land-use activities. An alternate model was used to test this hypothesis, which examined specifically the added effect of having both a farm and non-farm/fishing source of income, or a fishing and non-farm/fishing source. However, this model also showed no significant correlations between diversification and recovery.

This lack of benefit to diversification may simply be due to the fact that not many families engaged in this strategy prior to Yolanda. However, households may also have engaged in multiple livelihoods out of necessity to make ends meet, suggesting greater vulnerability. As has been discussed, focus groups pointed towards diversification as infrequent, and the motivation was more due to income rather than risk reduction.

Post Yolanda Livelihood Strategies

The quantitative analysis shows a positive correlation between adding a new income source after Yolanda and two of the recovery outcomes. Households which began earning income in a new sector had a reduction in the use of distressful coping strategies at endline, relative to other households, and also had 0.9 more durable goods holding all else equal. However, they performed no differently in terms of strength of house construction materials or poverty likelihood. Losing an income source, on the other hand, had directly opposite results: households which ceased earning income from a particular sector used more distressful coping strategies to maintain food consumption, and had 0.7 fewer durable goods at the endline, relative to others. These results suggest that new income sources weren’t as profitable or desirable as original ones, so those that were either able to go back to old income sources or were able to maintain an old income source and add a new one recovered more easily.

The positive relationship between starting a new livelihood after Yolanda and recovery matches the sentiments expressed by focus groups. Availability of *new* income sources after Yolanda was perceived as more important than diversification prior to Yolanda in supporting households’ recovery. Survey results showed that a majority of households had started one new income source, which they did not use prior to Yolanda. However, most

reported they were trying to get back towards their initial and more profitable, primary livelihood, and had only adopted other income streams as a way of coping after the storm.

Overall, the results showed that neither the source of income prior to Yolanda, nor diversifying across risk profiles prior to the storm led to greater resilience. Although there were qualitative differences in the way that different livelihoods were affected, such as the loss of a harvest compared to a damaged boat, or fewer customers, the long-term effect of these differences seems to be negligible. In contrast, a household's actions *after* Yolanda did affect their recovery. Adding a new income source while maintaining an existing one, or simply being able to maintain an income source, was positively associated with recovery outcomes.

The lack of relationship between livelihood status pre-Yolanda and a household's recovery suggests that an economy with the capacity to allow for more workers and new labor opportunities is more important for disaster recovery than is a specific occupation or diversification strategy. However, it must also be noted that Typhoon Yolanda was an extensive and destructive event; in the case of more localized or limited disasters, it is possible that particular livelihoods would be affected very differently.

Social Capital

How do the social networks amongst individuals and groups affect resilience? Which types of social capital (bonding, bridging, or linking) do individuals draw upon after a disaster, and for what purposes?

Measurement

Social capital is a multi-faceted and complex topic, which made it difficult to measure precisely. The endline survey included a series of questions on households' interactions with the larger community, associations, and the government. These questions examined different facets of social capital, generally working within the framework of bonding, bridging, and linking capital, but also reflecting the context-specific details of social capital's role in recovery from Yolanda. Qualitative discussions of social capital were primarily addressed during community focus groups and interviews with barangay-level government officials, as well as with officers of formal associations.

The suite of endline survey questions related to social capital were explored through computerized factor analysis, to better identify latent variables which were expressed through multiple questions behaving in a similar manner. Guided by theory and this analysis, *bonding capital*, or connections among community members, was further divided into trust of others and social cohesion, or the feeling that others were concerned for one's welfare. No latent variable emerged which exactly represented *bridging capital*, or connection to other communities. However, membership in a variety of community and cross-community organizations was used as an approximation of involvement in groups which were able to access resources from outside the community. *Linking capital*, connection to authority figures, was represented through questions on influence with the

barangay captain. Lastly, a composite measure of self-reported ability to borrow from community members, associations, and the government was created. This variable represents one mechanism through which social capital can lead to tangible resources, particularly financial resources.

While it is difficult to compare across the three categories of social capital, the quantitative data suggests that most households felt close with their community members and the local government, but were not heavily involved in associations. Of the bonding indicators, on a 1-5 scale of trust (1 being the lowest and 5 the highest), the average score was 3.4, and on a 0 to 1 measure of social cohesion (1 indicating strong cohesion) the average score was 0.87. The average score on the measure of linking capital, a 0 to 1 measure of connection with the barangay government, the average score among households was 0.80. However, only 19.5% of households reported membership in any type of association. The final indicator, confidence in the ability to borrow from community sources, consisted of a 1-5 scale (1 being the lowest and 5 the highest), with the household average at 2.2.

An analysis of covariance was also used to assess the correlation between these different explanatory variables. This was intended to identify whether the different forms of social capital were positively associated with each other or served as exclusive categories that might be invested in to the detriment of others. The results are shown below in Table 10.

Table 10: Correlation between Explanatory Variables

	Community Trust	Social Cohesion	Links to Barangay Govt	Ability to Borrow Money in Times of Need	Membership in Organization
Community Trust	1				
Social Cohesion	0.0547	1			
Links to Barangay Govt	0.0942	0.2091	1		
Ability to Borrow Money in Times of Need	-0.0881	-0.0366	-0.1051	1	
Membership in Organization	0.0343	0.0932	0.1361	0.1343	1

All but one of the variables were positively correlated, meaning the categories were not generally exclusive; households did not give up closer bonding with their community for better ties with the government. The one exception was the ability to borrow money from community sources, which was surprisingly negatively correlated with other types of social capital. However, no correlation was greater than 0.2, showing that the factors were not strongly inter-related.

Social Capital and Recovery

The results of the quantitative analysis of the relationship between a household's social capital and resilience outcomes are below, in Table 11. The regressions showed that bonding capital had a predominantly positive relationship with recovery outcomes including ownership of durable goods, use of stronger housing materials, and decrease in likelihood of poverty - although this varied between trust in the community and reported social cohesion. However, both measurements of bonding capital were correlated with a higher CSI score, meaning households with more bonding capital made more use of distressful coping strategies. The ability to borrow money from community sources was also generally associated with better outcomes, including fewer harmful coping strategies, and more durable goods.

Linking capital, identified as influence with the barangay government, was correlated with smoother food consumption patterns but no other material outcomes. Association membership was positively correlated with three material outcomes, the increased strength of housing materials, ownership of more goods, and a decrease in poverty likelihood. Qualitative data suggested that this may be a result of associations taking the place of the local government in accessing the flow of official external resources.

Table 11: Quantitative Results on Household Social Capital and Resilience Outcomes

	Distressful Coping Strategies at Endline (Log)	Change in House Strength Baseline to Endline	Durable Good Count (Endline Only)	Poverty Likelihood Change Baseline to Endline
Community Trust	0.0798**	-0.0623***	0.255*	0.529
Social Cohesion	0.213**	0.323***	0.863*	-6.765***
Links to Barangay Govt	-0.222**	0.0456	-0.468	-0.0514
Ability to Borrow Money in Times of Need	-0.0894*	-0.135***	0.895***	-1.175
Membership in Organization	0.108	0.108*	1.082**	-4.147**
Female FDM	0.107*	-0.0543	-0.298	-0.122
FDM Age in Years	-0.00283	0.00244	0.0285***	-0.112**
FDM Years Education	-0.00662	0.00350	0.308***	-0.956***
Financial Literacy Score 0-6	-0.117***	-0.0290*	0.732***	-1.219**
Pre-Yolanda Poverty Likelihood	0.00299*	0.00255***	-0.0418***	-0.440***
Yolanda Damage to Home 1-5	0.404***	-0.0300	-0.573*	2.058*
Constant	0.737	0.545*	7.638***	20.89**
Observations	1469	1591	1591	1591
Adjusted R-squared	0.114	0.072	0.284	0.241

Bonding Capital

Overall, trust in the community had a mixed but generally negative association with a household's recovery. Households with a higher level of trust in the community scored higher on the CSI, suggesting that they made use of more distressful coping strategies. These households also had less strengthening of their homes between the baseline and endline surveys, comparable to others, and they were more likely to report a decline in well-being since Yolanda. However, they did have slightly more durable goods at the endline, suggesting some benefit to trust within the community. There was no correlation between trust and change in poverty likelihood.

On the other hand social cohesion, the second measurement of bonding capital, had a predominantly positive correlation with recovery outcomes. There was one negative association - households who felt the community was more cohesive did score higher on the CSI than other comparable households, meaning they used more distressful coping strategies to maintain their food supply. However, feeling that the community was more cohesive and concerned about the respondent was also positively correlated with three of the outcomes: an increase in the strength of housing materials from baseline to endline, possession of more durable goods at the endline, and a 6.8 percentage point decrease in the likelihood of poverty from the baseline to the endline.

Discussions with focus groups of community members elaborated on the mechanisms by which social cohesion influenced a family's recovery. Many respondents touched on community help while describing personal safety during the storm itself, citing instances of sheltering from the storm at neighbors' stronger homes, or of welcoming others into their own homes. They also reported that families and neighbors assisted each other in repairing their houses in the aftermath. However, households which were unable to provide their own labor, such as those without adult males, reported having to pay for labor; it was not given unconditionally.

Beyond shelter, most respondents said they did not provide material or financial assistance to other people in their areas, mainly because they were unable to help themselves. By the time of the endline survey 14 months after Yolanda, this was certainly true – only 2.9% of respondents had paid for a friend or relative's urgent need in the past 6 months, and 7.7% had paid for a social event held by friends or relatives. Additionally, both quantitative and qualitative analyses supports the notion that households were not able to support each other in terms of food supplies, and possibly even gave up some of their own supplies in order to maintain close ties within their communities and assist those with even fewer resources, as bonding capital was related to *more* harmful coping strategies.

Overall, the relative importance of cohesion over trust as a form of accessible social capital is noteworthy. Closeness to the community was related with markedly better recovery outcomes than trust, particularly a substantial reduction in poverty likelihood. Discussions with focus groups supported this differentiation – when describing the role of community assistance in recovery, respondents focused on their relationships and interactions with others as individual units, rather than a collective atmosphere of community trust. The single exception to this pattern was the barangay of Cambinoy, which was cut off from the

main road by numerous fallen trees. Over the course of several days unpaid volunteers self-organized to clear them and restore the connection to the road. However, even this example reinforces that it was action on the part of community members, and not underlying trust, which led to recovery.

Bridging Capital

Membership in associations, taken as an indicator of bridging capital, was shown through quantitative analysis to be correlated with stronger recovery outcomes, particularly material outcomes. While members of organizations had no more or less difficulty accessing food than others, they were more likely to strengthen the materials used in their housing between the baseline and endline. They also owned more durable goods at the endline, and had a 4.1 percentage point decrease in the likelihood of poverty between baseline and endline, relative to comparable households which were not members of organizations.

The specific means by which bridging capital influenced recovery appears to be access to external material resources, made available by NGO's and the government for organized associations. Interviews with association officers supported this, and suggested that many organizations had either formed or become more active after Yolanda because of the perceived availability of such resources. This was further reinforced in interviews with government officials and Save the Children, who stated they tried to encourage group formation (such as COMSCA groups) to encourage income generation within communities.

It deserves clarification that the mechanism for accessing resources, from the household perspective, was membership in the organizations. This could lead to material handouts of housing materials and productive assets – none of which extended beyond the members. "We did not extend help. We want our group to be helped," said the head of a Senior Citizens Association in the barangay of San Juan during an interview. Associations are often considered to be a form of bridging social capital, as local chapters of a single organization can channel resources to each other, and unaffected chapters can thus support their fellows in need. However, in this context it appears that association membership instead assumed a role closer to that of linking capital.

Linking Capital

Linking social capital, exemplified by influence with the barangay government, was also correlated with smoother food consumption. Households with links to the barangay government scored lower on the CSI than comparable households without influence with the government. However, linking capital was not correlated with other material outcomes, and connections to the government had no effect on the strength of housing materials, ownership of durable goods, or a change in poverty likelihood. It did exhibit one negative effect, as households with stronger linking capital were more likely to feel that they were worse off since Yolanda, compared to others.

Assessing linking capital through qualitative methods was more difficult, in part because of a possible reluctance to admit to receiving beneficial treatment from the authorities. However, there was widespread mention of material assistance, obtained from NGO's and

the Philippine government, playing a role in coping with the immediate aftermath of Yolanda. Focus groups universally mentioned being aware of or receiving such assistance, generally in the form of housing materials or food, channeled through the barangay government. Interviews with each level of government also included mention of support from the level above; barangay from municipality, and municipality from provincial or national government.

This hierarchical system suggests a possible role for linking capital as a key means of accessing humanitarian aid, but the process for allocating assistance and selecting beneficiaries may have been removed and autonomous enough that even well-connected individuals were unable to influence it. Community members expressed an awareness of beneficiary lists created by NGOs, but both barangay and municipality officials reported an inability to influence these lists or direct resources to particular areas. One DSWD director in the Tabango municipality said many people approached her about not receiving housing materials from NGOs, and she was unable to answer why organizations chose certain households over others. When asked if she understood the process, she answered, "Different NGOs, different guidelines, different criteria."

While this study was not intended to determine how aid was delivered, these reports from both community members and officials do suggest that a particular household's influence with authority figures did not play a strong role in accessing resources. The quantitative analysis largely bore this out; households with more influence over government officials had smoother food consumption, but for other indicators of material recovery were no better off than comparable households. As discussed in the previous section, associations seem to have superseded the local government as a means of accessing external aid and channeling it to their members.

Ability to Borrow from Community Members

The ability to borrow from various sources such as community members, government, and associations was a cross-cutting indication of social capital that had a mixed relationship with recovery outcomes. Households who could obtain financial resources from the community used fewer harmful coping strategies and had more durable goods at 14 months after Yolanda. However, these households were less likely to strengthen or repair their homes between the baseline and endline. Nonetheless, the consistency of these results likely reflects the importance of being able to access concrete resources from others in the community, whereas cooperation and cohesion which may require giving resources as well as obtaining them.

Gender

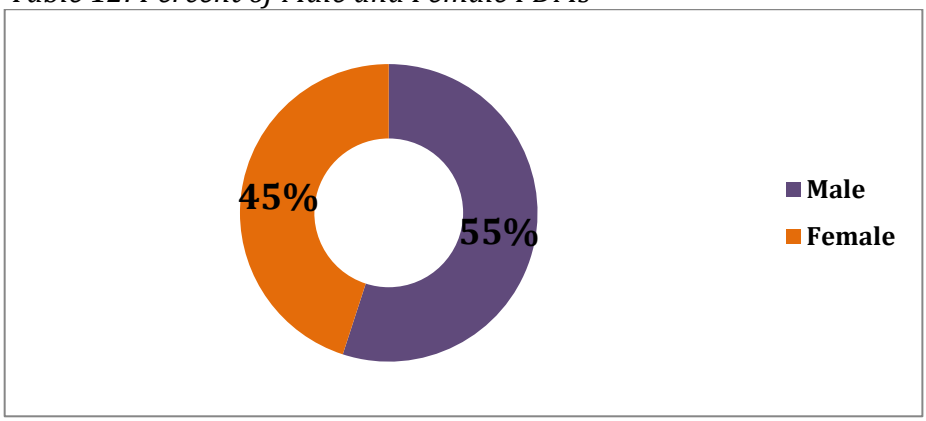
How does women's participation in community and household-decision making as well as access to and control of resources impact resilience?

Measurement

The endline survey included a series of questions on whether the primary financial decision maker is male or female, and on whether household decisions are made exclusively by the male head of household, female head of household, or jointly. In addition, a separate question addressed women in each household's level of participation in bayanihan.[4] The research team addressed gender and decision-making power within the household during community focus groups and interviews with government officials, NGO workers, and association officers. Two of the focus groups conducted consisted of all females, to ensure there was no discomfort or inhibitions in sharing due to male presence.

The data shows that in 22 percent of households, women participated in the community's bayanihan. Approximately 45 percent of households identified the financial decision maker as female, and 55 percent as male Table 12. The qualitative research substantiates the high level of female financial decision makers.

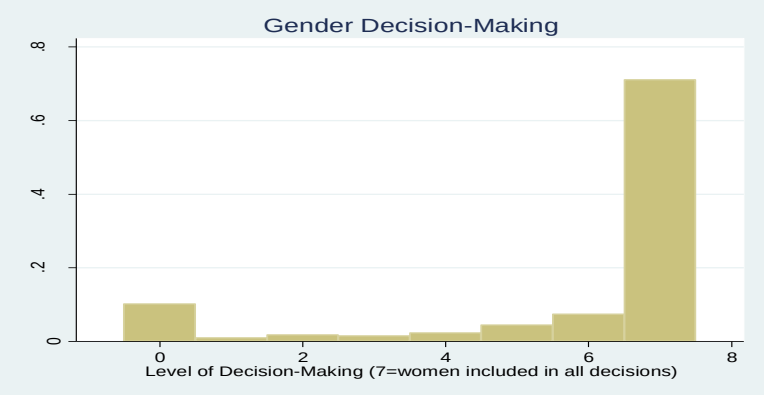
Table 12: Percent of Male and Female FDMs



The summary statistics for the household decision-making index indicate a high level of joint decision-making in the household between men and women. The scale goes from 0, in which women make no decision, to 7, in which men and women make all decisions together, or women make them alone. Approximately 67 percent of respondents indicated that both males and females made all household decisions together, as seen below in Table 13. Qualitative reports about household decision-making were also varied, with many respondents reporting that all decisions were decided jointly, while others stated that men had domain over the farm and women had domain over the household.

[4] The term bayanihan refers to community work groups.

Table 13: Female and Male Decision-Making



Women and Recovery Outcomes

The results of the quantitative analysis of the relationship between women's role in a household and recovery outcomes are below, in Table 14:

Table 14: Women's Role and Recovery Outcomes

	Distressful Coping Strategies at Endline (Log)	Change in House Strength Baseline to Endline	Durable Good Count (Endline Only)	Poverty Likelihood Change Baseline to Endline
Women Participated in Bayanihan	0.0533	0.0954*	0.906**	-2.782*
Gender Decision-Making Matrix	0.0190	-0.00106	0.308***	-0.399
Female FDM	0.0767	-0.0566	-0.781**	0.701
FDM Age in Years	-0.00187	0.00247	0.0368***	-0.129***
FDM Years Education	-0.00940	0.00436	0.327***	-1.069***
Financial Literacy Score 0-6	-0.109***	-0.0414**	0.701***	-0.934*
Pre-Yolanda Poverty Likelihood	0.00274*	0.00262***	-0.0454***	-0.432***
Yolanda Damage to Home 1-5	0.459***	-0.00517	-0.650**	2.101*
Constant	0.404	0.286	9.680***	14.79*
Observations	1469	1591	1591	1591
Adjusted R-squared	0.100	0.027	0.278	0.230

By all indications, in general neither male- nor female-headed households faced specific obstacles related to their gender in recovery, although female-headed households without adult males were sometimes mentioned as more reliant on hired labor for house repairs after Yolanda. Household decision-making on the majority of matters was shared, and women were said to participate in community work and meetings. In some cases it was indicated that women had access to certain resources that men did not, such as credit and loans provided by both cooperatives and NGOs.

Qualitative data indicated that women participated in community activities through such

things as community assemblies, communal projects, and membership in the barangay council. The quantitative measure of women's community participation level was through the bayanihan, discussed above. Households in which women participated in bayanihan were slightly more likely to have repaired or strengthened their house between baseline and endline. Participation by women in the bayanihan was also correlated with a further 0.9 durable goods count, as well as a 2.8 percentage point reduction in likelihood of poverty between baseline and endline.

In terms of differing roles within households, one of the key distinctions between genders was type of livelihood. Men generally reported engaging in farming, fishing, and livestock, while women worked in more household related activities, but also a number managed small shops/sari sari stores. In many cases these sari-sari stores were run out of the home, and thus fell within the traditional domain of women. In other focus group discussions women, in particular wives of fisherman noted assisting their husbands through selling their catches at the market. The Fisherfolk associations in the communities were composed of both men and women; albeit in most cases the women did not engage in the physical labor of fishing.

After Yolanda, qualitative data indicated that there was an increase in women working in/running small shops, as well as an increase in women leaving the house to work as domestic helpers in other areas. A female barangay council member said it was common for women to find short-term work outside of the community until the family had obtained a loan. One community leader indicated that she believed women were becoming the primary income earners as the traditionally male occupations were damaged by the typhoon. In a focus group discussion male and female participants both highlighted a slightly new occurrence of women taking on responsibilities or engaging in occupations that traditionally were previously dominated by men. In general, this seems to be accepted by communities and there was no criticism of the growing role of women. This acceptance may be the result of a general attitude that this was done because they had to and there were no other options. The freedom of women to start new income generating activities could also be attributed to what was perceived as greater balance in household decision-making, which could also speak to a higher level of female empowerment.

The quantitative decision-making data points to a high level of joint decision-making between males and females. These findings also indicate that households where women were more involved in decision-making had more durable goods at the endline. This trend was countered somewhat by the negative correlation between having a female FDM and durable good count, but the magnitudes of the former far outweighed the latter. Each additional point on the 0-7 gender decision-making matrix was associated with 0.3 more durable goods, with the majority of households having a full 7 points (for 2.1 more goods) – while the negative effect of the female FDM was only 0.8 fewer goods.

Interestingly, in some communities it was mentioned that as women's earnings and resources increased relative to men, they gained more financial decision-making power. In barangay Cambinoy, there were five different lending institutions, all of which only loaned to women. Members of this community stated that women were generally in charge of

finances. When asked if female-headed households faced particular challenges recovering from Yolanda, a female barangay counselor there responded that it was actually easier for women, since they weren't tempted to spend money on vices like smoking, gambling, and drinking. By contrast, there were no reports of women *losing* decision-making power or income relative to men – the effect may have been heterogeneous across communities and households, but it was one-directional. However, as the nuanced decision-making matrix was only captured at endline, data were not available to quantitatively test this change.

Findings on women's access to and control over financial resources were mixed. Households where the FDM was female and had used informal and formal loans showed no significance in terms of loan use effecting recovery outcomes. According to qualitative data gathered from focus group discussions there weren't significant differences in experience for a female to obtain a loan in comparison to a male; albeit, some focus group participants mentioned that a number of financial service organizations conditioned their loans on the recipient being female. This was the case in barangay Cambinoy, discussed above. The reasoning for this was because the women were considered better at managing the money responsibly.

Cambinoy focus group members stated that women usually controlled household finances. "Women are less likely to use the money badly," said one male respondent in a mixed focus group. "Men may drink or waste it." The men in the focus group said that it was routine for them to give the money they earned to their wives to hold and use for household needs. However, in another community, the main cooperative was composed of rice and livestock farmers, who stated that men controlled household resources. This same focus group had commented that most families only obtained one loan; however, they said that in the past there was an option for women to obtain loans at another organization, that no longer existed, and these loans were obtained as secondary loans.

Multiple respondents noted that many community groups and NGO programs were targeted at women. "No men groups [in the community]," one respondent in barangay Buena Vista said. "Only girls think of starting groups." Similarly, a mixed gender focus group of Fisherfolks members in barangay Parilla referenced a women's organization in the past that had organized to sell crafts. While the organization went defunct because of lack of funding, all of the women in the group said they would join again if given the opportunity. When asked if men wanted to join a similar group, they were dismissive. "Men don't have time for groups," one man answered. "They don't need them." In general, the men seemed uninterested in other groups or any activities or resources they may provide. One respondent also indicated that men may not have time for groups because they are supposed to work, whereas women may have more free time, but this was not a belief that was shared by all respondents.

Overall, the study showed that women's participation in the community and household did play some role in household recovery, although it was not overwhelmingly positive or negative. Women's participation in the bayanihan appeared to contribute to household recovery, which is in keeping with the benefits from bonding social capital. The quantitative results support the impression provided during the qualitative research of

equal recovery trajectories for both men and women, and a general equality including female community participation and high levels of joint decision-making. It is notable that, by endline, there was no difference in home repair or consumption smoothing for households with female FDM's versus those with male FDM's. The effects of financial instruments also showed some additional positive effects for women.

Section IV: Limitations

This study is non-experimental, and reflects pre-existing factors, which are believed to influence household resilience. As there is no comparison group, the results of the analysis show correlation between household characteristics and resilience, rather than causation. Reverse causality is not a large concern, as the explanatory variables were generally from the time-frame prior to or immediately after Yolanda, while the outcomes were primarily the change in a characteristic from immediately after Yolanda to the endline. The largest exception to this is social capital, for which no information was collected at the baseline. However, there is a possibility unobserved variables, including intelligence and ability, responsibility, and risk aversion affected both the explanatory variables used and the recovery outcomes.

Some characteristics of interest, particularly use of formal financial tools, were also not prevalent prior to the program implementation, and their effects may be understated as a result. The marginal benefits could vary when promoted at a large scale through development interventions. This analysis should therefore be combined with program impact evaluations and qualitative, participatory research methods to fully understand how resilience programming is received by targeted communities.

As discussed in the Methodology section, the sample of respondents for quantitative surveys was drawn from beneficiaries of TabangKO in Western Leyte. The results are those of a heavily-affected population living within a heavily-affected region, and may not be indicative of households which suffered only minor losses in the typhoon or other regions of the country. Additionally, while the respondents were informed that the survey would not affect their participation in the TabangKO program, some may nonetheless have felt a pressure to overstate their need in the hopes of receiving more assistance.

Likewise, the community focus groups consisted of individuals invited by barangay officials. These individuals may also not be representative of the community as a whole – although it is for this reason that the qualitative analysis with combined with the more generalizable quantitative analysis in order to not rely on individual anecdotes. As with the survey, participants in all qualitative data collection, from focus groups to interviews with barangay and association officials, were told that their participation would not affect the provision of aid or materials, but they may nonetheless have felt pressure to overstate their need in order to encourage more programming by NGO's.

Section V: Conclusion and Recommendations for Future Research

Financial Instrument Use: Qualitative and quantitative results both confirmed the importance of loans and access to capital. Unsurprisingly, formal loans demonstrated a strong positive impact on recovery outcomes, in particular through poverty likelihood, level of harmful coping strategies and durable good count. While informal loans contributed positively both to house repair, they also were shown to have detrimental associations with well-being following Yolanda. Use of savings demonstrated a minor impact on coping and recovery outcomes; however, most respondents noted having a very small amount of money saved. While money lenders were pushed as a problem by local NGO and municipal actors, few households indicated utilization of these informal loan types.

One area for future research could include credit offered by shops, which appeared through quantitative data to be a big source of informal loans, and by nature could hold similar predatory effects often attributed to money lenders.

Livelihoods: The study suggests a surprising lack of correlation between livelihood and recovery outcomes like poverty likelihood or strength of house. The type of livelihood pre-Yolanda did not have a significant impact on recovery, so professionals or non-professional laborers were not generally better off than farmers or fishermen. There was no added benefit to multiple sources of income prior to Yolanda, even when diversified between different risk profiles such as land-use and non-land-use activities. However, engaging in a new livelihood after Yolanda was associated with recovery, in terms of fewer coping strategies to maintain food security and more durable goods. Thus, it appears that household's ability to find new jobs *after* Yolanda was more important than their particular livelihood status before the storm.

Future research might examine the underlying conditions in the economy which allowed many people in Western Leyte to begin new livelihood activities after Yolanda. Furthermore, the details of Yolanda's effects on the local economy as a whole appeared to be more complex than a simple negative shock. Understanding how such disasters interact with the economic system as a whole may give NGO's and other development actors an opportunity to bolster communities' resilience.

Social capital: Greater social capital was, for the most part, associated with better recovery, although for linking and bridging capital the comparative strength was unexpected. Bonding capital generally played a positive role in house strengthening and poverty reduction, but was detrimental in its relationship with less smooth food consumption. Linking capital, by contrast, was associated with smoother food consumption but no other outcomes. However, bridging capital, as represented by association membership, had a positive relationship with three material outcomes: home strengthening, more durable goods, and a reduction in poverty likelihood.

Further research might address the costs of social capital, and examine it as an investment with some payoffs but downsides as well. Additionally, it may be valuable to examine the relationship between linking and bridging capital, and how pre-existing "stores" of linking capital may become less effective as the power dynamics shift with the inflow of aid after a disaster. Any NGO or development actor engaging in relief efforts should be aware of the potential for "social market" distortions, in addition to the more widely understand economic market distortions.

Gender: Results from focus group discussions and the quantitative analysis affirmed a common equality between the genders on a range of recovery outcomes. Generally speaking, women's participation in the community was beneficial to a household, likely as a means of building and investing in social capital. There weren't many significant differences between whether the FDM was male or female, or whether decision-making was equitable between the two on a variety of household topics.

While this study examined the relationship between women's role and a household's recovery, it was notable that the qualitative data suggested that the typhoon itself had a transformative effect on women's role within the community. Therefore, future research might attempt to understand this interaction.

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Annex I: Formulation of the Coping Strategies Index (CSI)

The CSI is created through combining responses to the following questions regarding respondents' access to food, which are weighted to reflect the level of distress associated with them:

Activity	Weight
Rely on less expensive or less preferred foods	1
Limit/reduce meal portion sizes subsequent	1
Reduce number of meals eaten per day	2
Skip entire day without eating	4
Reduce adult consumption so children can eat more	2
Borrow food or rely on help from friends or relatives	1
Rely on begging for food	2
Gather unusual types or amounts of wild food/hunt	2
Consume seed stock to be saved for next season	2
Take children out of school to work	4

Respondents chose from the same set of responses for each activity, which were scored from 0 to 4, with 0 indicating highest and 4 indicating lowest food security:

Score	Response
4	Daily
3	3 or more times per week
2	1-2 times per week
1	Less than once per week
0	Never