COMMUNITY OUTCOMES

SUMMARY OF SURVEY:

THIRTEEN TACLOBAN CITY RELOCATION SITES

OCTOBER **2018**

GLOBAL PROJECTS AND ORGANIZATIONS

Life at relocation sites

From the perspective of relocated community members

In 2013, Typhoon Haiyan decimated informal settlements clinging to Tacloban City's coastline. In response, the government elected to relocate thousands of households to a previously undeveloped section of the city, Tacloban North. Dozens of housing projects commenced, ranging from small non-governmental sites to large-scale National Housing Authority sites. Thousands now call Tacloban North home, yet recovery remains an on-going process at relocation sites.

From November 2017 through April 2018, members and local assistants of the Global Projects and Organizations research team surveyed over 900 relocated households at 13 different relocation sites within Tacloban City, Leyte, Philippines.

This research project aims to find what is working at Tacloban City's relocation sites—and what needs remain unfulfilled. Five years after the storm, we present perspectives from relocated community members themselves, with the hope that survey data will serve to catalyze experiences into improved policy.

The following report is targeted towards relocated community members and decision makers active in relocation implementation. We assume readers have a basic familiarity with Typhoon Haiyan and Tacloban City relocation efforts.

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The **Global Projects and Organizations (GPO) Research Group** works to improve lives by enhancing the resilience of communities through the study of complex infrastructure challenges, producing transformative research at the interface of the social and built environments.

The **Mortenson Center in Engineering for Developing Communities (MCEDC)** advocates integrated and participatory solutions to humanitarian development by educating globally responsible engineering students and professionals, promoting research on developing community issues, and reaching out to build local capacity and resiliency in developing communities worldwide. MCEDC promotes sustainable development in areas such as water supply, hygiene and sanitation, shelter, food production and processing, energy, health, transportation, communication, income generation, and employment creation.

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Table of Contents

Executive Summary

After the devastating impact of Typhoon Haiyan in November of 2013, the Philippine government elected to relocate large numbers of the affected population. In the largest impacted city, Tacloban City, Leyte, over 16,000 households have been designated for relocation. Mass relocation is unpopular among humanitarians and advocates for the urban poor but a common post-disaster strategy of the Philippine government (and governments globally). Decision makers in Tacloban City, cognizant of the critiques of relocation, planned to do things differently. The city would relocate households, but they would create a new township complete with comprehensive services.

This report is a part of a larger multi-year project striving to better understand relocation, both processes and challenges throughout implementation as well as comparative outcomes at relocation sites. Building off of relationships established for five months in 2016, including in-depth interviews with over 100 relocated community members, in late 2017 we continued our research and returned to Tacloban City to administer a survey across 13 sites. Key findings include:

- **Relocation, especially infrastructure, takes longer than promised:** Mass relocation takes time well beyond both the designed lifetime of many interim solutions as well as the promises heralded throughout early recovery. Most detrimentally, developing utility infrastructure at distant relocation sites is more complex and drawn out than housing construction alone. In Tacloban City, the slow progress of permanent water infrastructure contributed to significant delays in household transfers. While respondents reported decent access to water, the current solution is untenable. At the time of writing, the long-term plan for a piped water supply was just closing the bidding phase.

- **Partial services are partial solutions:** In providing health, education, and government accessibility, there is a need to address both proximity and comprehensive service. For instance, the nearby health clinics can diagnose, but not provide the prescriptions to treat. Temporary, and now permanent, schools were built to meet the demand, but parents worry about quality and many with the means to send their children to downtown schools, do.

- **Poor construction quality plagues most houses:** Over 70 percent of households reported either minor or major construction defects. Among households identifying defects, severe wall cracks and roof issues leading to leakage were the most prevalent issues.

- **Far from the coast, relocated households remain near to natural hazards:** In December of 2017, a passing tropical storm flooded several relocation sites and pushed dozens out of their homes. Many survey respondents believe future storms will flood their homes and communities. In interviews, city officials lamented that some sites were built atop floodplains or with inadequate draining. Preparing for and responding to hazard events is likely to remain a considerable issue for relocated households.

Survey

Design, administration, and analysis

After conducting interviews with relocated residents throughout 2016, we recognized there was often a wide range of recovery experiences within a single community. As such, we were driven to elicit many more perspectives by administering a multi-site survey. Deploying a comparative survey allowed us to perform cross-case comparisons and determine site-specific differences. Below, we address thematic cross-cutting issues. A supplemental of summaries for each site accompanies this main report. Both the main report and site supplemental can be found online at https://www.colorado.edu/lab/gpo/publications.

Tacloban City had numerous in-situ and relocation housing projects. In this report, a relocation project is defined as one of the 29 official resettlement projects being tracked by the City Housing and Community Development Office as of October 2017. Each of these sites are socialized housing developments where the beneficiaries are Haiyan-survivors and the vast majority previously lived in coastal barangays. Thirteen sites were selected for their diversity in project development, location, and expected outcomes based on information from key informants.

In all, 976 surveys were administered across the thirteen relocation sites. Table 1 presents a summary of the occupancy and surveys collected at each site. We use the distinction "NGO" broadly to mean non-NHA site, but recognize non-NHA sites varied in their connections to the government. Readers intimately familiar with Tacloban North may notice our occupancy numbers are slightly different than dominant government sources circa October 2017. Prior to survey design, we retrieved occupancy numbers from both the Regional National Housing Authority and City Housing and Community Development Office. However, numbers differed significantly so we conducted our own visual inspection of occupancy and determined appropriate survey sample size accordingly. Overall, surveyed sites were 79 percent occupied at the time of data collection.

Table 1. Occupancy and survey size at each of the thirteen selected relocation sites

Site	Type	# Surveyed	Occupancy at Survey*	Planned Occupancy	Percent Occupied
GMA Kapuso	NGO	110	394	403	98
Guadalupe II	NHA	82	737	1000	74
Habitat for Humanity (4428)	NGO	81	450	503	89
Lion's Village	NGO	39	52	52	100
New Hope	NGO	107	914	1000	91
North Hill Arbours I	NHA	80	923	1000	92
Operation Blessing I	NGO	44	76	100	76
Ridgeview I	NHA	76	830	1000	83
SM Cares	NGO	86	495	600	83
St. Francis I	NHA	73	300	1000	30
UNDP	NGO	40	55	55	100
Villa Diana	NHA	78	378	409	92
Villa Sofia	NHA	80	488	584	84

**Based on data provided by CHCDO, Region VIII NHA, and GPO-conducted visual site occupancy validation*

Prior to survey administration, the research team met with both the Tacloban City government and relocation site leadership, dubbed community coordinators, to introduce the research. After this courtesy call, the team notified coordinators of their schedule when visiting sites. Households were selected independent of coordinators via a mix of cluster and convenience sampling. Using site maps, the team divided each site into geographic clusters and determined the proportional number of surveys necessary per cluster to achieve a confidence level of 95 percent and acceptable sampling error of 5 percent. On-site, the team used convenience sampling within clusters to solicit participants. Assistants administered the survey in Waray-Waray, the local language, and used visual aids to explain the various question types and tablets to record responses digitally. We took care to explain that we were independent researchers from a foreign university, without any affiliation with an NGO or government office; that participation was voluntary, confidential, and without direct benefits (i.e. we did not provide gifts); and that no questions were mandatory (respondents occasionally felt they did not have an opinion or did not feel comfortable answering).

Survey topics and questions were developed after a review of relevant literature and grounded in knowledge gained interviewing over one hundred relocated community members. Question types included yes-no, multiple choice, and Likert-type questions (i.e. "Strongly agree", "Agree", "Disagree", and "Strongly disagree"), with some short answer questions for clarification. In the following, results of Likert-type items are visualized using a divergent stacked bar chart, such as in Figure 1. In a divergent stacked bar chart, the response types are color-coded, and the average is layered overtop. As a reference, "Strongly agree" is coded as dark teal and given a value of 4. Conversely, "Strongly disagree" is dark orange and has a value of 1.

Figure 1. Example of Likert-type data, shown in a divergent stacked bar chart

In Figure 1, respondents were asked how much they agreed with the sentiment of being satisfied with how decisions were made for their community and their specific house. Given that many beneficiaries were not involved in any construction and development decisions, it might seem surprising that the responses are generally positive. In truth, while we incorporate numerous ways to ease participants' hesitation, we struggled to capture satisfaction in an objective sense because respondents worried a lack of satisfaction would be perceived as ungratefulness, and thus answered gratefully.

The research team noticed a reluctance to make a strong assertion by selecting the options on either extreme, i.e. Strongly agree or Strongly disagree, as well as a tendency to select Agree over Disagree. This is consistent with research that shows a tendency towards middle values and acquiescence bias in highly collective and hierarchical societies (Harzing 2006). We point it out because it is worth noticing where respondents did select disagreement or noted that they felt strongly either way. In Figure 1, for instance, respondents at GMA Kapuso and Operation Blessing (named by the NGO as Community of Hope) had high rates of strong agreement with "I am satisfied with how decisions were made for the planning and construction of my house."

Figure 2. Household construction of a front porch

Respondent cross-section

76.4 percent of respondents identified as female (men were overwhelming absent from relocation sites during the day). All participants were over the age of 18, and the average reported age was 40 years old.

89 respondents, nearly 10 percent in all, identified as "caretakers" instead of the original family. We defined "original family" as the household officially selected by the government or implementing non-governmental organization to occupy the house. In contrast, "caretaker" can refer to a spectrum of arrangements, from the sister of the homeowner there to watch the house during the work day, to an entirely informal illegal squatter. We were not on a mission to identify squatters however and, given the sensitive nature of tenure security, did not want respondents to suspect we were there to enumerate legitimate occupancy. We elected not to push the issue further. Given the possibility of eviction if "caretakers" are revealed, we expect self-identification of caretaker status to be under-reported. We limited questions regarding the relocation process, community participation, social cohesion, and ongoing community organization to respondents identifying as the original family.

The majority of the respondents moved to their relocation site in 2016, roughly three years after Typhoon Haiyan, although there were notable differences between sites. Cumulatively, 50 percent of respondents at NHA sites had moved by the end of 2016, compared to 73 percent at non-government sites at the same time.

Table 2. Move-in year of respondents by relocation site

	2014	2015	2016	2017	2018
GMA Kapuso	27.5%	49.3%	15.9%	5.8%	1.4%
Guadalupe	-	-	22.2%	76.4%	-
Habitat for Humanity (4428)	-	17.8%	39.7%	41.1%	-
Lion's Village	-	27.3%	72.7%	-	-
New Hope	-	1.3%	23.7%	75.0%	-
North Hill	-	-	54.3%	42.9%	-
Operation Blessing	-	9.3%	65.1%	25.6%	-
Ridgeview	8.8%	32.4%	44.1%	14.7%	-
SM Cares	-	2.5%	87.7%	7.4%	1.2%
St. Francis	-	-	-	82.3%	17.7%
UNDP	-	-	-	100%	-
Villa Diana	-	23.9%	64.2%	11.9%	-
Villa Sofia	1.4%	2.8%	68.1%	27.8%	-
Total	3.2%	12.6%	43.6%	38.6%	1.6%

Comprehensive Findings

Implementation and before transferring

Few Tacloban City relocation sites relied on integrated community participation throughout site planning and development. In interviews, respondents stated decisions happened to them; they described themselves as recipients of information rather than active collaborators in decisions. For some respondents, the lack of opportunities to participate felt dehumanizing. Others, such as three women we conversed with from Ridgeview (Box 1, all names changed) were not bothered by the process, highlighting diverse desires for involvement. However, the women noted their (rare) opportunity to visit and inspect the houses was important for them, suggesting perceived transparency and oversight contributed to their comfort with the process.

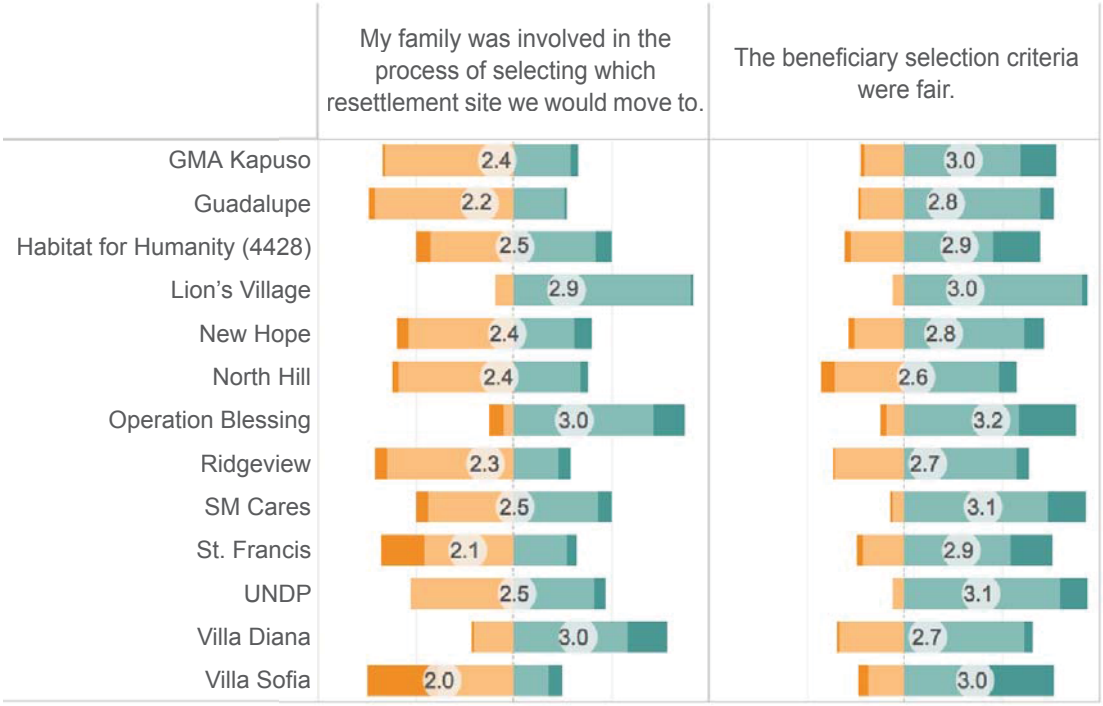

Figure 3. Disagreement and agreement with aspects of participation and beneficiary selection

Numerous respondents did attend pre-relocation meetings, yet meetings were often characterized as forums of dissemination rather than discussion. A common pre-move topic was social preparation—the discussion of rules and changed behavior expected of relocation beneficiaries:

"What was discussed at the pre-relocation meetings?"

"About the rules and regulations. Like that, when we already transferred here we have to follow their rules, what will be good and what is not good, and we have to change our attitudes, not like the old attitudes" (Habitat for Humanity resident; 2016).

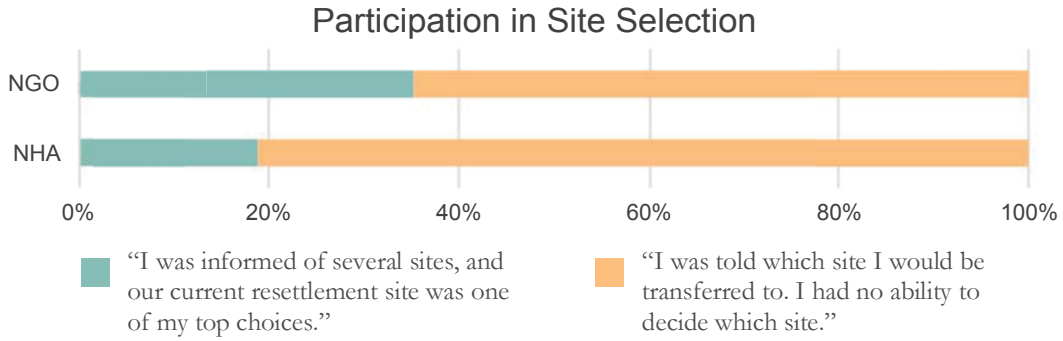

Figure 4. Percent of respondents, by grouped NHA vs. NGO sites, stating they had a choice in site selection

In the survey, we asked respondents to differentiate between whether they were told about their site or if they were, at a minimum, consulted about their preferences and transferred to one of their preferred sites. 26 percent of respondents stated they were informed and their current site was one of their top choices, while the remaining stated they were not involved in the decision. A greater percentage of NHA respondents, over 80 percent, were told rather than consulted.

Box 1. 2016 interview with residents of Ridgeview I

Interviewer:	But it is okay to you that you didn't contribute ideas of where would you like to move or what kind of house would you like to live in?
Grace:	For me this is okay now.
Interviewer:	For you ma'am is it okay for you?
Analyn:	Yes, it is okay for me because they showed us. They said "you check your units, if it is okay for you."
Grace:	Yes, they show us first all the units.
Interviewer:	So, it is okay for you that they make the decision of where they will put you.
Grace:	They were the ones who moved us to safer area.
Interviewer:	Ma'am Alice, do you know how City Housing decided where you will be relocated or not? Or they just told you directly?
Alice:	They just tell us directly, what was disseminate was from City Housing and DSWD to the sites.
Interviewer:	For example, Ma'am Alice, they will give you a chance to change the process of relocation to decide where you will be moved or what will be the type of your house. Do you have something to change, or no?
Alice:	For me, no. I forgot the processes of our relocation because all was disseminated to the people.
Interviewer:	How about you Ma'am Grace, are you contented? You will not change, like if they say "okay you decide where and what do you want to live in"?
Grace:	I am okay with this now.
Interviewer:	What about you Ma'am Analyn?
Analyn:	We are okay here.

Community organization

We asked a series of questions regarding community leadership in an attempt to drill down to how familiar respondents were with their local leadership structure. First, we asked if the site had a community leader (emphasizing *site*) and then, if yes, whether the respondent knew the leader personally. After conducting 31 surveys in New Hope, we realized respondents were often meaning *block* leader, instead of *site* leader, despite our clarified focus on the site-level, and, if they did recognize a site leader, there appeared to be confusion on the leader's affiliation and legitimacy. We then inserted additional questions to clarify exactly whom respondents meant.

As a consequence, we ended up with a mountain of seemingly contradictory data. For example, 97 percent of GMA Kapuso respondents stated they knew their site leader, but when pressed to clarify who that person was, 65 percent restricted their answer to block leadership alone. However, while the data seems unclear, it reveals where the heart of community organization and leadership lie: at the block or site level. Respondents in Lion's Village and UNDP were highly familiar with their site-level leadership. In contrast, Villa Sofia respondents overwhelming recognized leadership at the block-level.

The data also indicate household-level awareness of formal ties between the city government and their community leadership. At the time of the survey, each of the thirteen sites did have a community coordinator affiliated with the city government, but few respondents seemed to be familiar with that designation.

Table 3. Perspectives on *site*-level community leadership

	Does your site have a *community* leader?	If yes: Do you know him or her?	*When you say community leader, who do you mean?*			
			Comm. coordinator	Other elected site leader	NGO appointed	Block leader
GMA Kapuso	100%	97.1%	4.3%	27.5%	1.4%	65.2%
Guadalupe	100%	94.4%	-	33.3%	-	66.7%
Habitat for Humanity (4428)	100%	91.8%	-	8.2%	-	91.8%
Lion's Village	100%	100%	39.4%	57.6%	-	3.0%
New Hope	79.0%	70.0%	-	2.6%	-	56.6-97.4%
North Hill	100%	81.4%	-	17.1%	-	75.7%
Operation Blessing	100%	88.4%	2.3%	11.6%	65.1%	18.6%
Ridgeview	100%	91.2%	4.4%	7.4%	-	86.8%
SM Cares	100%	87.7%	-	25.9%	-	74.1%
St. Francis	92.0%	93.0%	-	-	-	91.9%
UNDP	100%	100%	-	97.0%	6.1%	-
Villa Diana	100%	91.0%	13.4%	4.5%	-	82.1%
Villa Sofia	100%	86.1%	1.4%	5.6%	-	93.1%

Social capital and protection

Those familiar with relocation in Tacloban City may have heard worrisome cases where social capital is weak and social protection minimal. In our own qualitative interviews and discussions with community coordinators, disclosures of upsetting events darkened our expectations of social outcomes. We could also feel palpable differences between sites, our visits to North Hill Arbours and St. Francis were undeniably eerie. However, in contrast to the few, but nonetheless alarming, accounts (which, given their highly sensitive nature, we did not seek to verify), our survey results reveal that most respondents feel their community is tight-knit and safe. Figure 5 depicts respondents' perceptions of how close they are with their neighbors, ranging from "not at all" to "extremely close," where they are actively engaged in each other's daily lives.

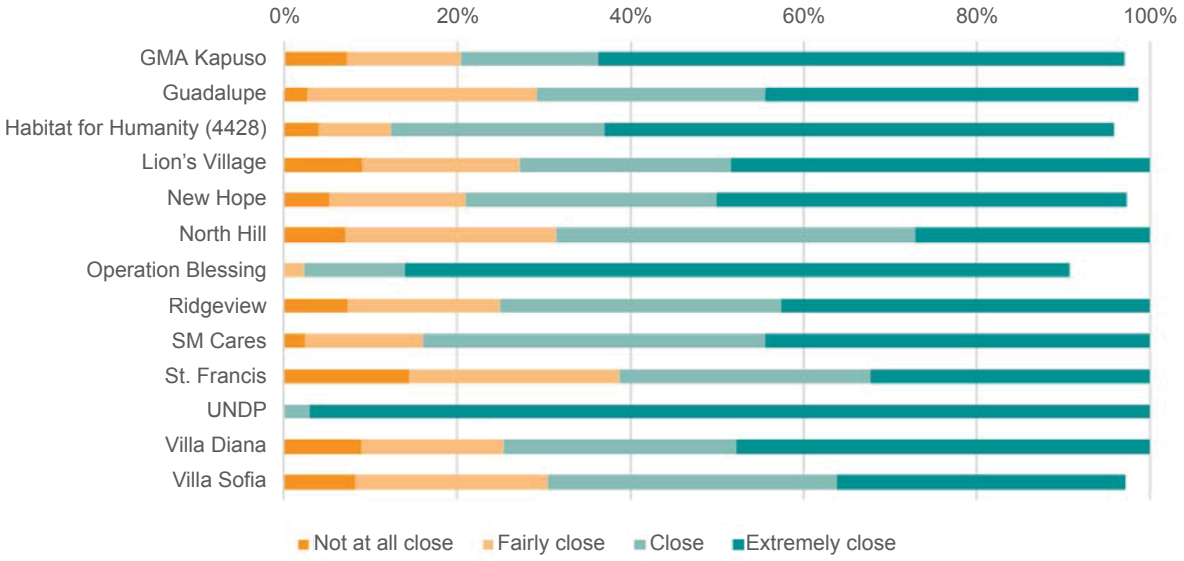

Figure 5. Results of neighborhood closeness: "Not at all close" (I am not at all close with my neighbors: we never watch each other's' children or share meals.), "Fairly close" (We watch each other's' children or share meals less than once a week and I do not think I could borrow money from them.), "Close" (We watch each other's' children or share meals at least once a week. However, if I suddenly needed to borrow a small amount of money I do not think my neighbors would try to help me.), "Extremely close" (We watch each other's children or share meals nearly every day. If I suddenly needed to borrow a small amount of money, my neighbors would do their best to help me.) Note, not all respondents elected to answer this question, resulting in less than 100% coverage in some cases.

Similarly, respondents largely stated that they trust their neighbors. Inter-community trust is a dynamic of social capital, but also of protection. Despite high rates of reported trust, as presented in Figure 6, community members have shown significant concern about the physical security of their homes. None of the houses come with metal bars, and families are quick to install them. In some cases, a key for one house actually unlocks many more, and many families prefer to change their doors or locks as well. With so many modifications devoted to security, it appears the standard relocation house design fails to address basic expectations of protection for beneficiaries.

Figure 6. Measures of social capital bonds between community members

Another protection issue, emerging from qualitative interviews, is a lack of in-house partitions. There is a concern that a lack of privacy within homes will lead to sexual assault by other house occupants (family member or otherwise). After news of such an assault spread, we expected many participants to disagree with the idea of their community as a safe place for young women, yet it appears not to have affected the overall perception of community safety (reflected in Figure 7). 29 percent of respondents did list adding rooms and partitions to their homes however, making it the most common modification to relocation houses.

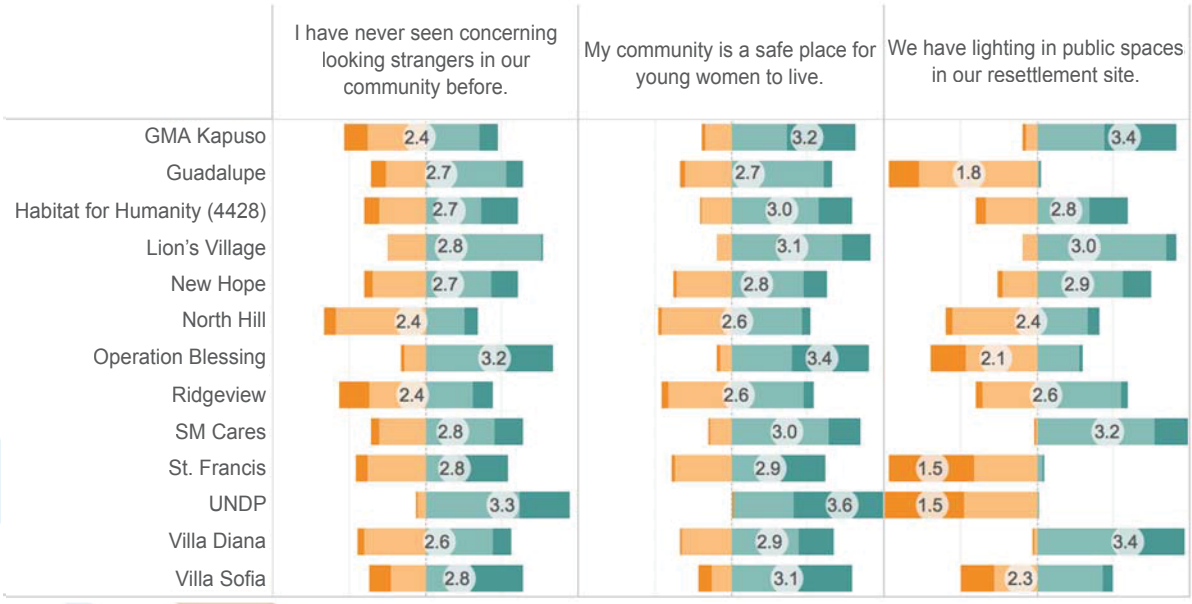

Figure 7. Status of safety and protection issues across relocation sites

Accessibility

Key accessibility issues include reliable and relatively convenient access to schools, healthcare, employment opportunities, and basic goods. Of all the sites, residents at Villa Sofia reported the lowest rates of accessibility. Not only were schools and health services unavailable locally, residents reported needing to travel downtown frequently for other necessities. Like Villa Sofia, respondents at St. Francis also reported significant accessibility difficulties. Residents at Operation Blessing (Community of Hope), arguably the most difficult to access site (it is a considerable, and often muddy, walk from the jeepney drop-off at the nearest barangay center, Palanog), reported decent access to a local school and health services, but limited access to basic goods. In contrast, the entrance road to GMA Kapuso and Habitat for Humanity has developed into open-air market over the years, and residents at those sites reported the best access.

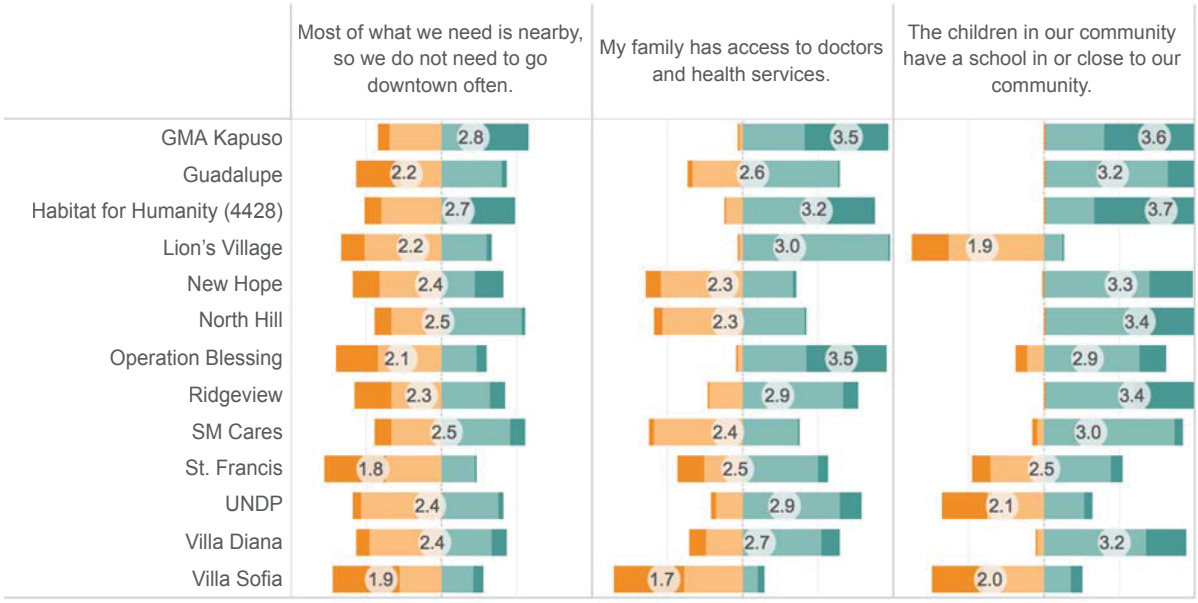

Figure 8. Disagreement and agreement with key accessibility measures

The final question item in Figure 8, "The children in our community have a school in or close to our community" reveals there's a gap in schools in the southern part of Tacloban North, not far from San Juanico bridge, near St. Francis and the combined Lion's Village and UNDP site. The other sites benefit from in-community temporary learning shelters and expanded barangay schools. Interviews revealed respondents view access to schools as essential, and, in addition to a lack of livelihood opportunities, a potential motivating factor to abandon relocation houses and return to previous barangays.

Economic well-being

Access and economic health are inextricably linked. Of respondents reporting employment outside of the site, few felt the daily commute was affordable. However, simultaneously, most felt that their family could afford transit into downtown, suggesting the cost is not a prohibitive burden unless the trip must be made daily.

Ideally, relocated households would experience not only a decrease in geographic vulnerability but also in economic vulnerability, with an improved ability to meet their daily needs. The data reveals that just over half of all households agree they have the resources to meet their basic needs.

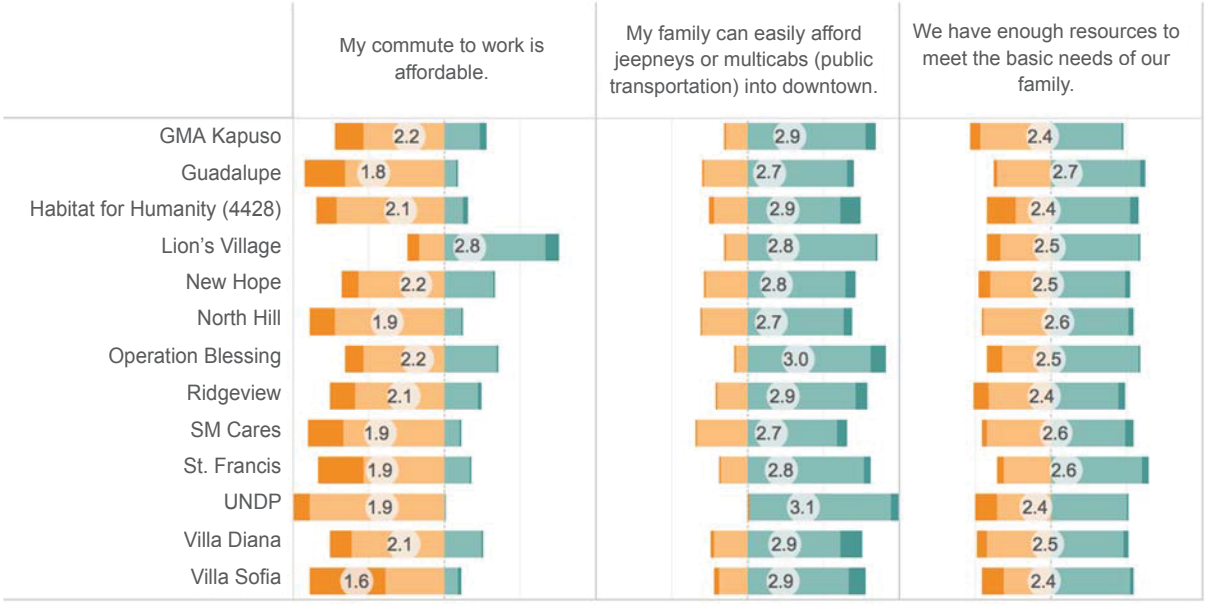

Figure 9. Disagreement and agreement with key measures of economic well-being

In qualitative interviews, respondents shared difficulties with the team in finding consistent livelihood opportunities. In a 2016 interview, when asked what he was scared of, one respondent articulated the financial trouble he witnessed his neighbors face:

> "Of course, the poverty here, because the livelihood really is far. For me, because I found a place to have my livelihood, it's okay; but for other people, I'm sure they are not okay. Let's say [the employers] are paying the minimum wage of 250 pesos, then they will eat and travel here. It is not enough. Others are just drivers of pedicabs and they were driving at the back of Robinson's [before]" (Resident of SM Cares; 2016).

Relocated households are stretched extraordinarily thin financially, evident in reported weekly income (weekly household income divided by number of members; Figure 10). We see significant income differentials in several neighborhood-pairs—GMA Kapuso and Habitat for Humanity, SM Cares and Villa Diana, and Lion's Village and UNDP—indicating opportunities to revisit internal site regulations and support systems regarding livelihood. For instance, respondents at

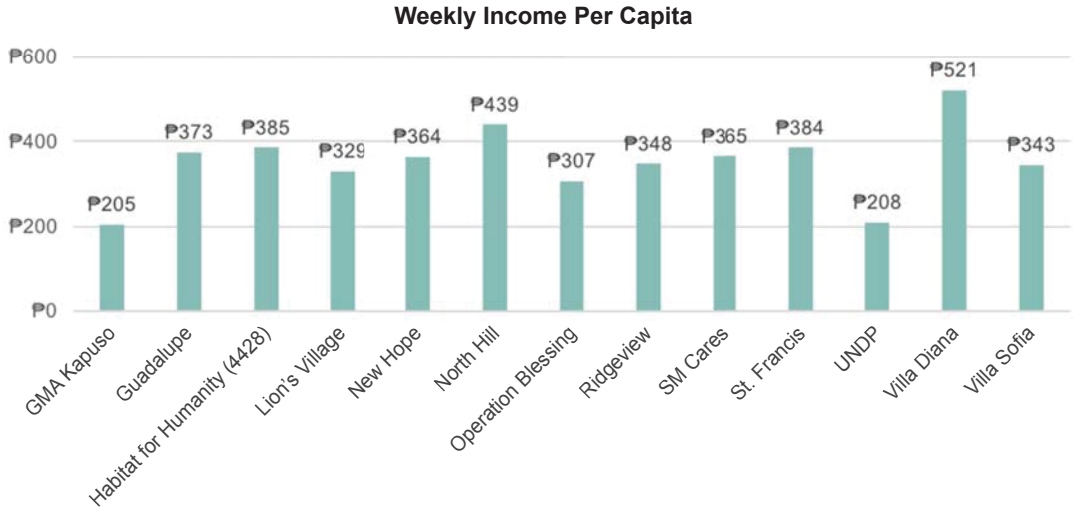

Figure 10. Weekly income per person across sites

Villa Diana, more distant than all but just a few sites, reported the highest weekly income per capita, more than 100 pesos more per person per week than SM Cares, which is right next door but under the guidance of different community rules. Respondents at GMA Kapuso reported the lowest income per capita, which may seem surprising given the site seems comparatively well connected to Tacloban North services and a vibrant market has emerged at the entry way. However, GMA Kapuso targeted larger families, and it appears the site's longevity and embeddedness have not compensated for above-average household sizes.

Figure 11. A trike parked outside of a house while the driver takes a break

Land security

Some community members, particularly those in leadership positions, have taken to discussing tenure status with the terminology of land *insecurity*, emphasizing the tenuous nature of occupancy. Tenure is about both security and identity. 36.5 percent of survey respondents (self-identified as "Original Family"; see discussion of caretakers in Respondent Cross-Section) reported having a certificate for their house, although this varied dramatically across sites (Table 4), while less than 1 percent stated they had a certificate for the land their house is on. To community leaders, dual housing and land certificates are critical for secure tenure. Without dual certificates, they argue, people remain subject to threats of eviction and intimidation from government officials. Some families told us they worried they would lose their house if they violated strict community rules or occasionally left to find work by the coast. As an identity issue, several advocates lamented that without certificates for both the house and the land "we are still squatters". They believed that valuing and taking care of the home as if it were theirs begins with full legal ownership.

Table 4. Occupancy certificates and payment structures for land tenure

	Certificate for the house	Certificate for the land	Making payments for either house or land	Informed of a future payment plan	#
GMA Kapuso	36.2%	1.4%	1.4%	39.1%	69
Guadalupe	23.6%	-	-	83.3%	72
Habitat for Humanity (4428)	83.6%	-	-	43.8%	73
Lion's Village	97.0%	-	3.0%	81.8%	33
New Hope	14.5%	1.3%	6.6%	64.5%	76
North Hill	8.6%	-	-	90.0%	70
Operation Blessing	60.5%	2.3%	20.9%	95.3%	43
Ridgeview	19.1%	1.5%	-	89.7%	68
SM Cares	9.9%	-	-	4.9%	81
St. Francis	21.0%	-	-	85.5%	62
UNDP	12.1%	-	-	48.5%	33
Villa Diana	70.1%	-	-	86.6%	67
Villa Sofia	50.0%	1.4%	1.4%	91.7%	72
Total	36.5%	0.6%	2.1%	68.0%	819

Disagreements over what defines squatting, and what enables squatting practices, are at the heart of the certification dispute. The government's hesitation to provide land certificates stems from the fear that it will enable beneficiaries to become "professional squatters." Professional squatters are those that either sell or rent out their donated house and then return to their previous informal

settlement. Community coordinators and government officials alike stated that professional squatting is an issue at the sites, some are even referred to as "ghost cities" with few occupants living there consistently.

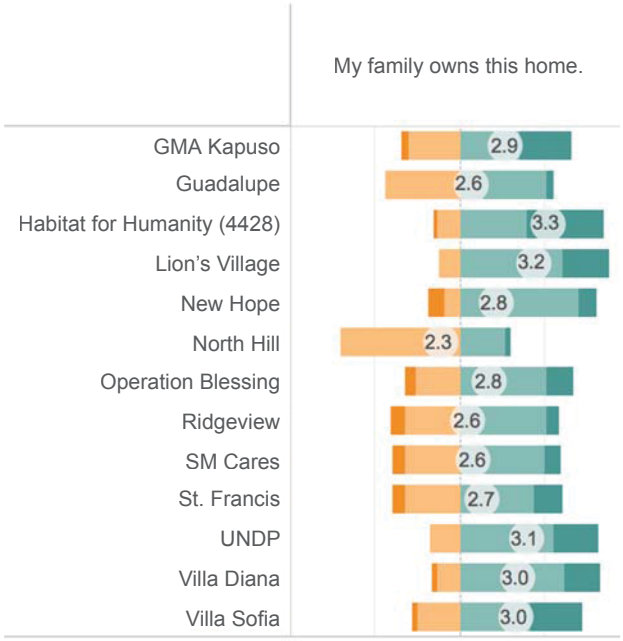

Figure 12. Disagreement and agreement with "My family owns this home"

Only 2.1 percent of respondents stated they were currently making payments for their home, but there was clear confusion about future payment expectations. At GMA Kapuso, Habitat for Humanity, New Hope, and UNDP roughly 40 to 60 percent of respondents stated they were aware of a future payment structure. Hovering near a 50/50 split, these divides indicate severe information gaps not only just between sites, but within them. The community members at Operation Blessing (Community of Hope) largely knew they would make future payments, which mirrors the intention of the NGO leadership. The nearly 30 percent gap between New Hope and Villa Sofia, two NHA sites, is curiously wide and overall high—in 2016 the President declared government homes would be free.

As Homeowners Associations (HOA) continue to mature at relocation sites, it's possible that land-right information dissemination will improve and inconsistencies will smooth out. Follow-up interviews with community leaders in 2018 (on-going at the time of writing) suggest community organizations are becoming increasingly formalized (i.e. HOA registration through HLURB), earning communities a bureaucratically recognized platform to campaign for land rights. However, new players and policies continue to enter and potentially add confusion, at least momentarily. For instance, in 2018 the Presidential Commission for the Urban Poor (PCUP) revamped their engagement with Tacloban City's relocation sites, adding new organizational advocates (and possibly, new bottlenecks) to the discussion of house and land tenure.

Housing

Over 70 percent of houses reported construction defects. We categorized defects into minor and major. Major construction defects are those that disrupt the structural integrity of the house or have the potential to degrade structural strength over time. We saw houses with severe defects such as walls bowing out, foundation cracks, and rebar exposed to the elements. Minor construction defects range from issues that affect functionality, such as pipes misaligned with walls, to aesthetic finishing, such as floors with splattered and unsmooth concrete. Our findings regarding high rates of construction defects are consistent with others' findings of donor and contractor-led reconstruction (Karunasena and Rameezdeen 2010; Oliver-Smith 1991). The four sites with the lowest rates of construction defects (UNDP, Operation Blessing (Community of Hope), Lion's Village, and GMA Kapuso) did not follow a conventional contractor-led model. GMA Kapuso, for example, required sweat equity, while Operation Blessing incorporated preferential hiring of beneficiaries as skilled and unskilled labor throughout construction.

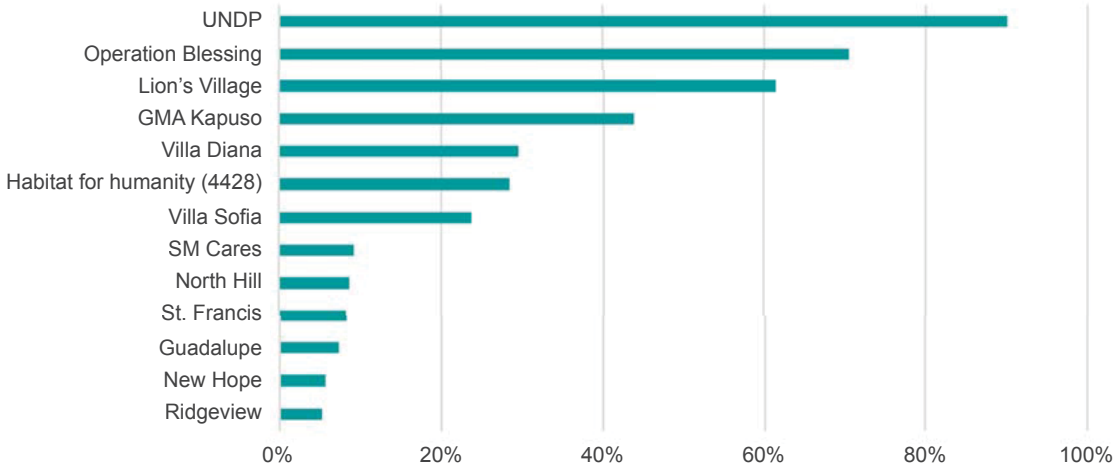

Figure 13. Percent of all respondents reporting no housing construction defects (i.e., 90 percent of respondents at UNDP reported no construction defects)

The most common minor construction defect were roof issues, either holes or gaps between the roof and wall, that cause leakage during rainstorms. 80 percent of respondents reporting minor construction defects identified roof issues (57 percent of all respondents). The second most common minor defect was unsmooth concrete floors due to poor workmanship, reported by 38 percent of households with minor defects (27 percent of all respondents). A surprising minor defect was "Broken windows". Several interviewees voiced their windows were destroyed when they took over the house, particularly at Lion's Village and UNDP, where 20 and 33 percent with minor defects, respectively, noted broken windows. This is likely a consequence of an extended timeframe between construction completion and formal occupation. At many sites, houses laid dormant awaiting civil infrastructure services, particularly water. In the interim vandalism, weather, and vegetation growth deteriorated everything from windows to exposed septic tanks.

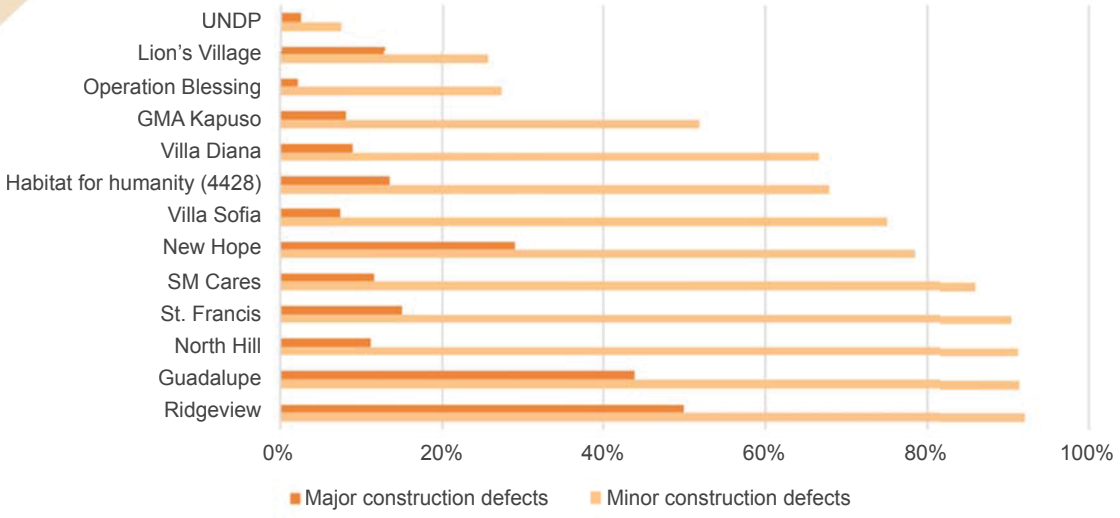

Figure 14. Percent of all respondents reporting minor or major construction defects, ordered from least to most defects (i.e., 79 percent of respondents at New Hope reported minor construction defects)

The most common major construction defects were severe wall cracks (57 percent of respondents reporting major defects; 10 percent of all respondents), roof joint connection issues (23 percent; 4 percent), and settling foundation (15 percent; 3 percent).

Figure 15. (clockwise) Houses under construction at Guadalupe; Broken window at dormant New Hope house

Infrastructure

Water: Access to water has been a central issue in Tacloban City's overall relocation effort. While all of the houses are built with in-house plumbing (albeit often poorly constructed or clogged with concrete), none of the sites are connected to the municipal water system. The system did not extend to Tacloban North originally, and the process of extending access has been marred and delayed by bureaucratic and political issues. The city stalled relocation transfers to completed houses in 2016 because of severely limited capacity to provide water via the short-term system of truck delivery. In 2016, qualitative interviews with households indicated that many were struggling with both the cost and accessibility of water, as many sources limited withdrawal allowances. In response the government worked to fund additional trucks and deliveries.

Despite the difficulty of establishing formalized water provision at relocation sites, access seems to have stabilized. 94 and 75 percent of respondents stated their drinking and domestic water, respectively, is available daily, unregulated, and accessible within a ten-minute walk or less.

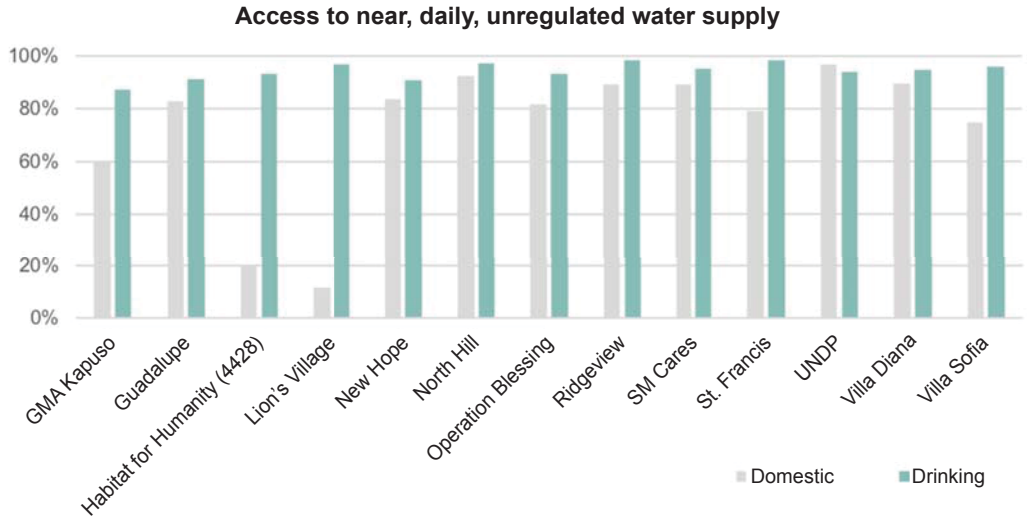

Figure 16. Percentage of respondents indicating they have water (1) available within a 10-minute walk with (2) daily and (3) unregulated access

Most families, 93 percent, pay for their drinking water, but only 30 percent pay for domestic water. Except for the provision of domestic water at Lion's Village, respondents across all sites reported unregulated access. In November 2016, President Duterte pushed for quick and dramatic progress at relocation sites and the national government has since ramped up their financial and technical support of the medium and long-term water supply plans. We also noticed private industry rising to meet demand, as numerous potable water suppliers are emerging near relocation areas.

Wastewater: 85 percent of respondents reported their septic tank was well constructed, but 29 percent have experienced septic tank problems (regardless of perceived construction quality). Among those experiencing complications, 46 percent stated the issue was beyond their technical and financial capacity to fix and 64 percent stated problems had occurred more than five times, indicating potentially systemic construction issues. Comparatively, Guadalupe residents reported the worst septic tank construction (70 percent believed it appeared to be well constructed) and have had the most septic tank issues (50 percent of respondents).

The research team witnessed several possible contributing factors to wastewater complications. At sites where construction was ongoing, we inspected exposed septic tanks and found several to be cracked, undersized, partially filled with dirt, or improperly installed, for example, misaligned pipes or concrete blockage. However, many of the issues evident during construction are covered and nearly impossible to detect during pre-occupancy evaluations. While it was beyond our scope to conduct an inventory of all septic tanks throughout construction, we observed enough questionable construction practices to surmise septic tanks are commonly damaged or ill-installed.

Road infrastructure: Internal site roads are visibly deteriorating due to stress from the weight and frequent passes of water trucks. 26 percent of respondents indicated either the roads to or within their site were of poor quality. In some cases, road quality affected respondents' ability to smoothly access the site, 79 percent had never been hindered due to poor road quality, although 7 percent reported the defects are severe enough to cause them accessibility issues at least once a month. Such issues were largely isolated to Operation Blessing (Community of Hope) and UNDP, with 88 and 42 percent, respectively, noting monthly access limitations due to road quality.

Electricity: Construction of power infrastructure has not been as prolonged and difficult as construction of water infrastructure, although there are remaining issues. Across all sites, 78 percent of respondents reported access to daily electricity, with only 18 percent reporting faulty or damaged wiring and 13 percent limited by restrictions on electrical usage. We found significant differences between NGO and NHA sites. 83 percent of respondents at NHA sites reported access to daily electricity compared to only 70 percent at NGO sites, suggesting inter-government relations supported the development of electrical infrastructure at NHA sites. However, 22 percent of NHA respondent identified faulty wiring compared to only 11 percent at NGO sites. There was one site outlier, an astounding 70 percent of St. Francis residents reported electrical limitations, and in interviews respondents shared that limited electricity was motivating decisions to abandon the site and return to previous barangays.

Hazard exposure

The major hazard relocation is intended to guard against is storm surge, the hazard the city was most unprepared for and which ultimately caused the most damage and death during Typhoon Haiyan. By geographically separating houses from the coastline the relocation projects reduce exposure to storm surge but the sites remain, in varying degrees, exposed to high winds, earthquakes, landslides, and flooding. Survey questions categorized into "hazard exposure" are those requesting respondents to reflect on past experiences; questions asking respondents to predict performance in future events were categorized into "risk perception" in the next section.

Positively, most respondents stated their house have weathered winds and withstood the 6.5 magnitude earthquake that struck Leyte in July of 2017 (see Supplemental).

In contrast, flooding has been problematic (Figure 17). The communities are large, ranging from 50 to 1000 households, and therefore how families experience a flood event can vary throughout the community. During a rain event, respondents with homes on higher ground may not realize homes on lower ground or near the convergence of drainage pipes have flooded. This contributes to in-site variation and a wide spread of agreement and disagreement.

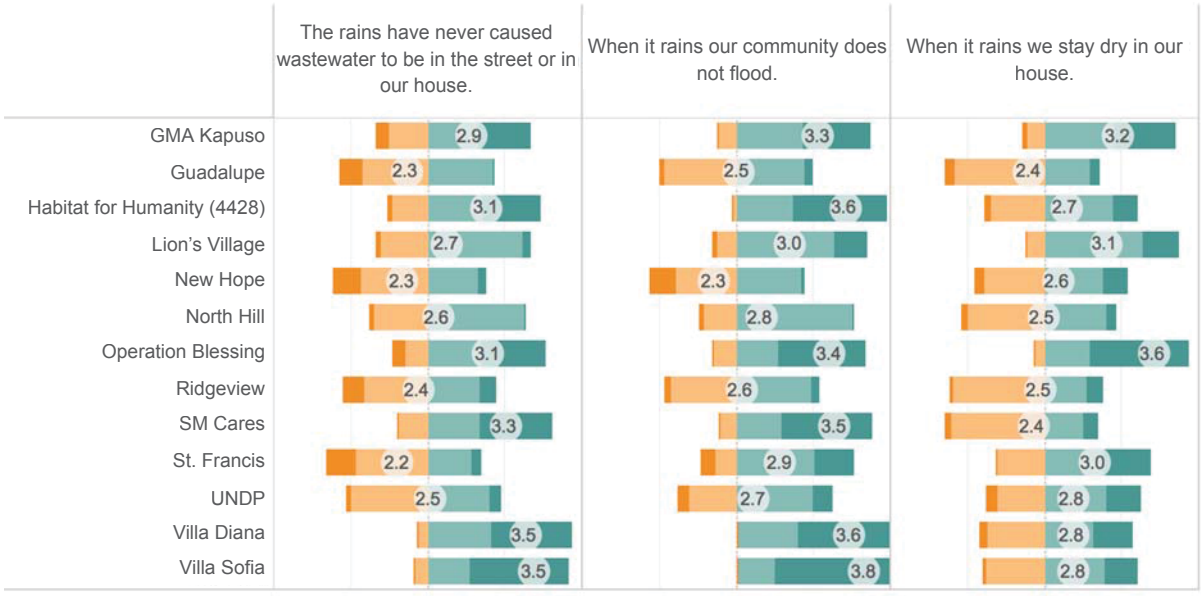

Figure 17. Disagreement and agreement with effects of past rain events

At most relocation sites, septic tank discharge is connected to the storm drainage system. Without dedicated pipes for wastewater separate from storm runoff, a heavy flood can clear out community septic tanks. Additionally, whether due to undersized tanks or simply damage and weathering during construction, the septic tanks are not providing adequate treatment. When coupled with an undersized and interconnected drainage system, the lack of proper treatment and propensity to flooding ultimately expose households to sewage. In response, the City has initiated designs and pursued funding for decentralized secondary wastewater treatment and retrofit drainage systems.

Site development concerns have resulted in not only drainage issues but also direct structural damages to houses. One city official relayed that insufficient soil compaction during site development has contributed to differential site settling and foundation damages at at least one site. Affected households were relocated (for the second time). The official had a plan to be on guard for additional hazards emanating from faulty engineering, "these are the risks that are coming out. I want to work with the homeowners. I am training people so that they really watch their own community and report possible hazards and risk assessment" (2017).

In December of 2017, while administering the survey, a severe tropical storm passed over Leyte. We paused the survey to allow for recovery time, and in the interim added questions directly pertaining to Tropical Storm Urduja. Respondents at New Hope and Guadalupe experienced the most severe impacts, with respondents reporting widespread flooding across the community (99 and 85 percent, respectively) and in their homes (51 and 38 percent). Despite such high rates of flooding at each site, most respondents did not receive notice of an evacuation warning (14 percent at New Hope and 16 percent at Guadalupe; see Table 5). Villa Diana and Villa Sofia emerged as the least affected NHA sites.

Many NGO sites also experienced community flooding. The gap between reported flooding at GMA Kapuso (92 percent) and Habitat for Humanity (20 percent) illustrates how inadequately sized the GMA Kapuso drainage is to handle run off from adjacent, uphill, sites.

Table 5. Household experience during Tropical Storm Urduja

	House flooding	House damage	Septic overflow	Evacuation warning	Evacuated	Changed opinion
GMA Kapuso	10.3%	-	58.6%	6.9%	3.4%	17.2%
Guadalupe	37.8%	18.3%	70.7%	15.9%	9.8%	52.4%
Habitat for Humanity (4428)	12.7%	1.4%	35.2%	-	-	19.7%
Lion's Village	20.0%	-	40.0%	-	10.0%	40.0%
New Hope	51.4%	10.8%	90.5%	13.5%	32.4%	55.4%
North Hill	11.3%	5.0%	61.3%	5.0%	1.3%	13.8%
Operation Blessing	-	-	13.0%	-	-	17.4%
Ridgeview	19.7%	13.2%	65.8%	3.9%	6.6%	26.3%
SM Cares	5.8%	-	20.9%	2.3%	3.5%	24.4%
St. Francis	12.3%	2.7%	39.7%	6.8%	11.0%	21.9%
UNDP	-	-	-	9.1%	9.1%	18.2%
Villa Diana	-	4.7%	-	-	2.3%	16.3%
Villa Sofia	6.3%	1.3%	2.5%	-	3.8%	17.5%
Total	16.6%	5.4%	44.7%	5.5%	7.3%	26.6%

All yes or no questions. ***House flooding:*** Did your house flood? ***House damage:*** Was your house significantly damaged? ***Septic overflow:*** Did the wastewater system (septic tanks and community drainage) overflow? ***Evacuation order:*** Was there an evacuation warning? ***Evacuated:*** Did you evacuate? ***Changed opinion:*** Do you feel your opinion of the risks in your community has changed since Vinta and Urduja?

Risk perception and reduction

Some of the most polar responses ("Strongly agree" and "Strongly disagree") emerged in answers to questions about resilience to future hazard events. As depicted in Figure 18, respondents nearly ubiquitously felt their sites were beyond the reach of storm surge during future typhoons, yet—almost as unanimously—felt a future earthquake is liable to destroy houses. In one respect, we can't read too much into the negative predictions regarding earthquakes—there's a general "well…it depends on how big it is" attitude about earthquakes that makes estimating impacts fickle. On the other hand, variations between sites, for instance between UNDP and Lion's Village, reveal that there are difference in respondents' evaluations of the structural integrity of their houses. Notably, respondents at Ridgeview, where residents have expressed concern over housing technologies that deviate from standard concrete masonry unit designs, disagreed the strongest with the statement "future earthquakes will not destroy my house."

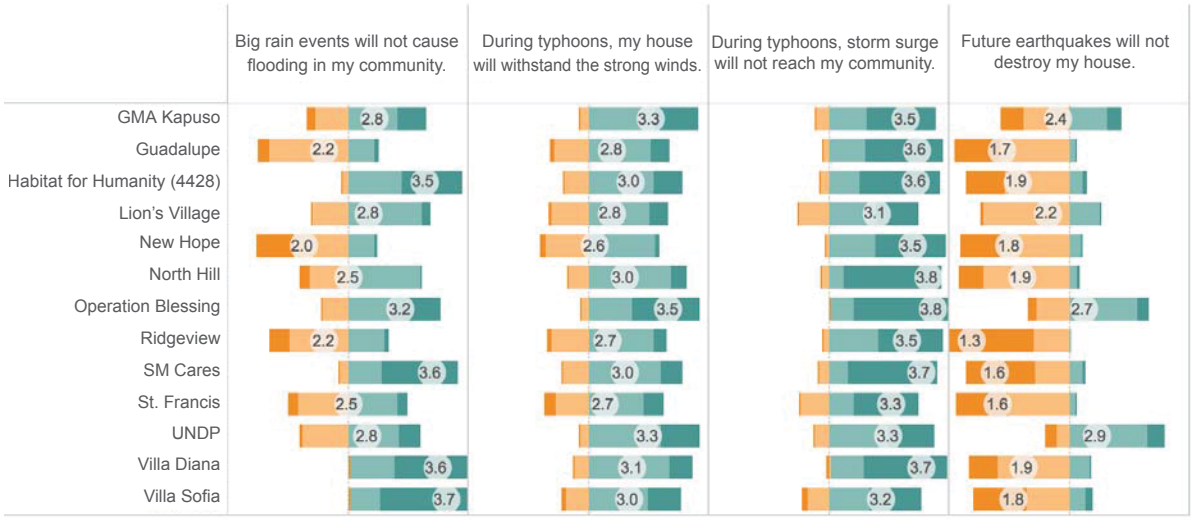

Figure 18. Disagreement and agreement with perceptions about house and community performance in future flood, typhoon, and earthquake hazard events

To be successful, risk reduction must involve not only lessening geographic exposure but increasing community resilience through active preparation and planning. At the community-level, questions we focused on to better understand the social aspects of risk reduction include: gender equality in disaster prevention; the perception that community leadership act benevolently and are equipped with the right knowledge; and the awareness and existence of disaster action plans (Figure 19). Respondents at Lion's Village and UNDP state the most agreement with each indicator, both small sites where site-level community organization has been highly effective. The average for each question item was also high at Operation Blessing, another small site, but more respondents disagreed with each statement than respondents at Lion's Village and UNDP, suggesting possible differences between the emphasis placed on disaster preparation by implementing organizations and concomitant support in building community plans. Respondents at large NGO sites and NHA sites expressed less agreement with preparedness indicators.

Figure 19. Disagreement and agreement with measures for community preparation and planning

Looking forward

Listening to residents, inadequate access to reliable livelihood is the most critical issue facing Tacloban North. Yet, while a lack of employment or entrepreneurship opportunities is arguably the biggest driver motivating households' decision to abandon their house (and forego future assistance), it's not the only. Flood events are discouraging and frustrating; the commute to town is costly and—when waiting in long lines during peak hours—tiresome; many houses have severe construction defects that threaten future headaches. Tacloban North residents without sufficient water and electricity are managing waiting in lines or curbing consumption, but their patience is underpinned by a sense of hope. Perhaps the greatest threat to site viability is the deterioration of hope that things will improve.

There are also reasons to stay. In many sites, Homeowners Associations are maturing, formalizing, and improving both in-community participation and external advocacy. Women, perhaps initially driven to community roles by default of frequently being home, hold empowered leadership positions across all sites and make up the majority of HOA boards. The government has committed funding and resources for improved infrastructure, schools, and health services, and, for now, it appears likely to follow through.

In Tacloban City, we hope survey results will provide an opportunity to celebrate successes and keep pressure on remaining issues. Additionally, we hope the data will motivate long-term changes in post-disaster relocation policies. Relocation should always be the last resort, selected only when previous areas are truly dangerous. When governments and communities do decide to implement relocation, our findings warn that infrastructure and services take years, ensuring construction quality is onerous, separation from hazards is as much about adequate development as retreat from the coast, and that immediate post-disaster zeal (and funding) for ambitious recovery projects is hard to maintain—leaving households in limbo between disaster and recovery in the interim.

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