



Terwilliger Center for  
Innovation in Shelter

# Bahay, Buhay

A survey of owner-driven housing construction practices, financing modalities and aspirations for a resilient home in disaster-prone areas in Cebu Province, Philippines

November 2018





## About Habitat for Humanity's Terwilliger Center for Innovation in Shelter

The Terwilliger Center for Innovation in Shelter, a unit of Habitat for Humanity, works with housing market systems by supporting local firms and expanding innovative and client-responsive services, products and financing so that households can improve their shelter more effectively and efficiently. The ultimate goal of the Terwilliger Center's market systems program is to make housing markets work more effectively for people in need of decent, affordable shelter, thereby improving the quality of life for low-income households.

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# Executive Summary

- Disaster-resilient<sup>1</sup> housing is a **pressing need** for the people of the Philippines – one of the most natural disaster-prone countries in the world. In the aftermath of disasters, housing reconstruction is often the largest recovery expense for affected households and governments.
- Habitat for Humanity's Terwilliger Center for Innovation in Shelter survey of housing quality and housing experiences in Cebu province found that **most households surveyed were economically secure but still low-income, and thus very resource-constrained.**
- Almost all homeowners aspire to improve their homes, but are constrained by lack of funds. To date most have **relied on savings and money from family members and relatives** to pay for home repairs and improvements. Only one in five accessed home improvement financing from microfinance institutions, cooperatives, or non-governmental organizations.
- The majority of the homes surveyed were rated in **poor condition** (i.e., in need of immediate repair or upgrade) or in need of continuous upkeep. Overall construction quality was poor, due to inferior design and workmanship.
- **None of the homeowners sought professional design advice or project oversight** from an engineer or architect when undertaking repairs and reconstruction.
- **Most homes are unlikely to withstand a natural disaster** such as a severe typhoon – an event the majority of respondents had already personally experienced.
- Most survey respondents were **unfamiliar with safe building practices** for disaster resilience, such as the “Build Back Safer” practices developed in the aftermath of Super Typhoon Yolanda, which devastated parts of the country including the survey area in 2013.
- **The poor quality of workmanship was a reflection of households wanting to save money on labor costs** by managing their own home construction, or relying on unskilled neighbors, friends, and family members, rather than hiring skilled laborers.
- Although the survey found that households typically value quality over cost when making decisions on home repair or construction, this is not reflected in the outcome of their efforts to repair and maintain their homes. Masons were sometimes invited to give ideas and suggestions for rebuilding or repairing houses, but decisions about materials and construction were taken by the family. Usually **the decision is made by both husband and wife, with the husband having the final say.**
- To break this cycle, Habitat recognizes that **behavioral change is required at many points for sustainable owner-driven construction**, including households, financial institutions, and market suppliers of construction labor and materials.

<sup>1</sup> Resilience: The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform, and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.  
(2 Feb 2017 <https://www.unisdr.org/we/inform/terminology#letter-r>)



# Living on the Ring of Fire

The Philippines, an archipelago of over 7,000 islands situated on the Pacific Ring of Fire, is one of the most natural disaster-prone countries in the world, and at the same time is being particularly impacted by the effects of climate change.<sup>2</sup> The Philippines' exposure to seasonal hazards such as monsoon rains and typhoons, as well as less predictable events like earthquakes, creates a pressing need for its people to be able to construct and maintain disaster-resilient housing.

In November 2013, Typhoon Haiyan, known as Super Typhoon Yolanda in the Philippines, devastated parts of the country, killing at least 6,300 people, and leaving thousands more struggling to recover, especially in terms of housing. In the aftermath of disaster, housing reconstruction is often the largest recovery expense for affected households and governments.

Despite the critical role that housing plays in recovery, traditional humanitarian efforts meet only a fraction of shelter assistance needs. Typically, a small proportion of total household reconstruction needs are met by traditional humanitarian and government aid, leaving most homeowners to self-recover. More than 1 million homes were damaged or destroyed by Super Typhoon Yolanda, but only 24 percent (240,000) households were assisted by agencies reporting to the Shelter Cluster (including via temporary shelters such as tents).<sup>3,4</sup> Owner-driven construction is therefore the predominant way that most families improve or repair their shelter in a post-disaster context.

<sup>2</sup> World Risk Report 2016. United Nations University. [http://collections.unu.edu/eserv/UNU:5763/WorldRiskReport2016\\_small\\_meta.pdf](http://collections.unu.edu/eserv/UNU:5763/WorldRiskReport2016_small_meta.pdf)

<sup>3</sup> The Global Shelter Cluster is an Inter-Agency Standing Committee coordination mechanism that supports people affected by natural disasters and internally displaced people affected by conflict with the means to live in safe, dignified, and appropriate shelter. <https://www.sheltercluster.org/about-us>

<sup>4</sup> Maynard V and Parker E. Lessons from Typhoon Haiyan. Supporting shelter self-recovery in the Philippines. CARE, Habitat for Humanity. [https://reliefweb.int/sites/reliefweb.int/files/resources/Lessons-from-Haiyan-research-report\\_CARE\\_Habitat-for-Humanity\\_2018.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/Lessons-from-Haiyan-research-report_CARE_Habitat-for-Humanity_2018.pdf)

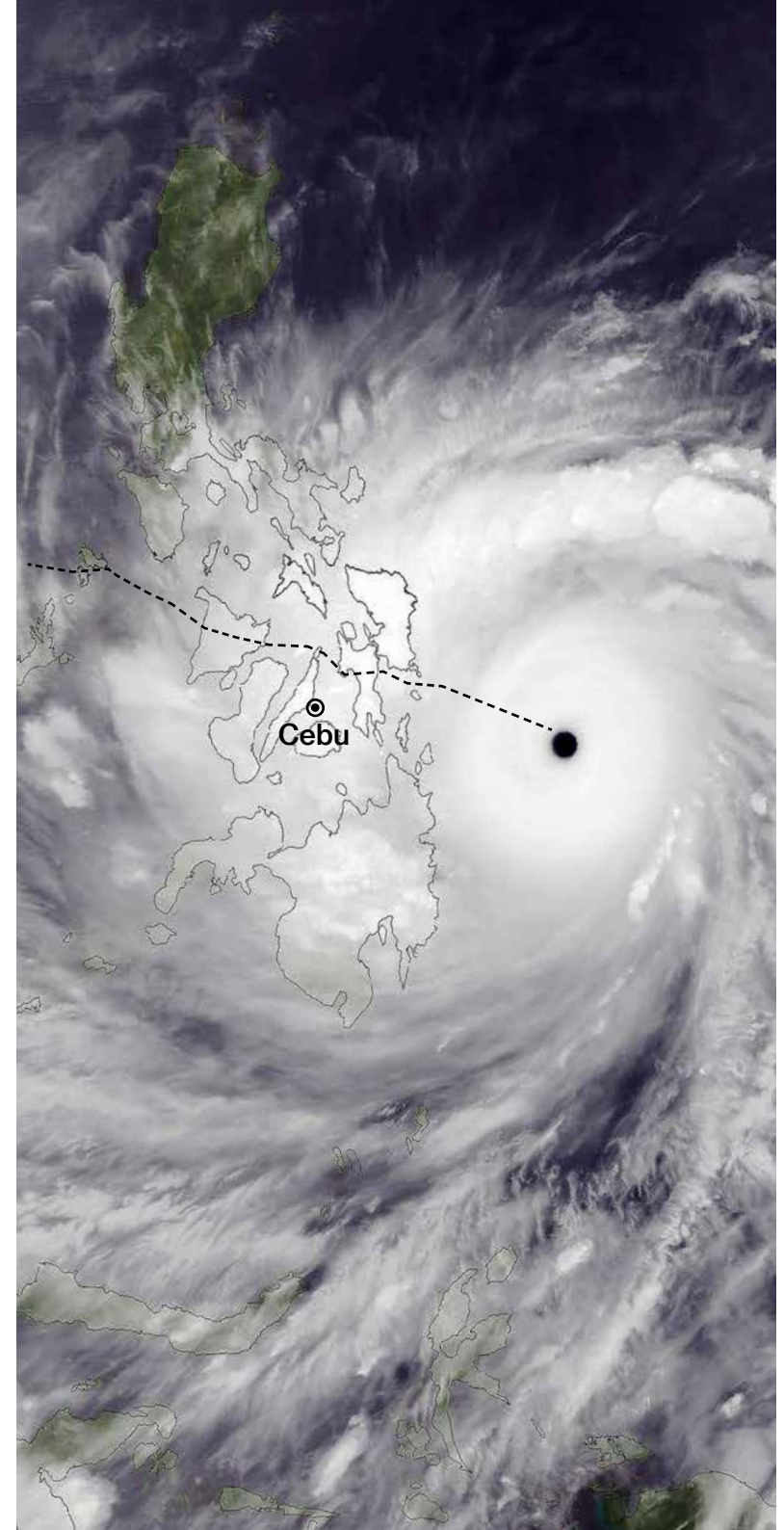


Photo: NASA, November 7, 2013, Storm Path: adapted from MapAction

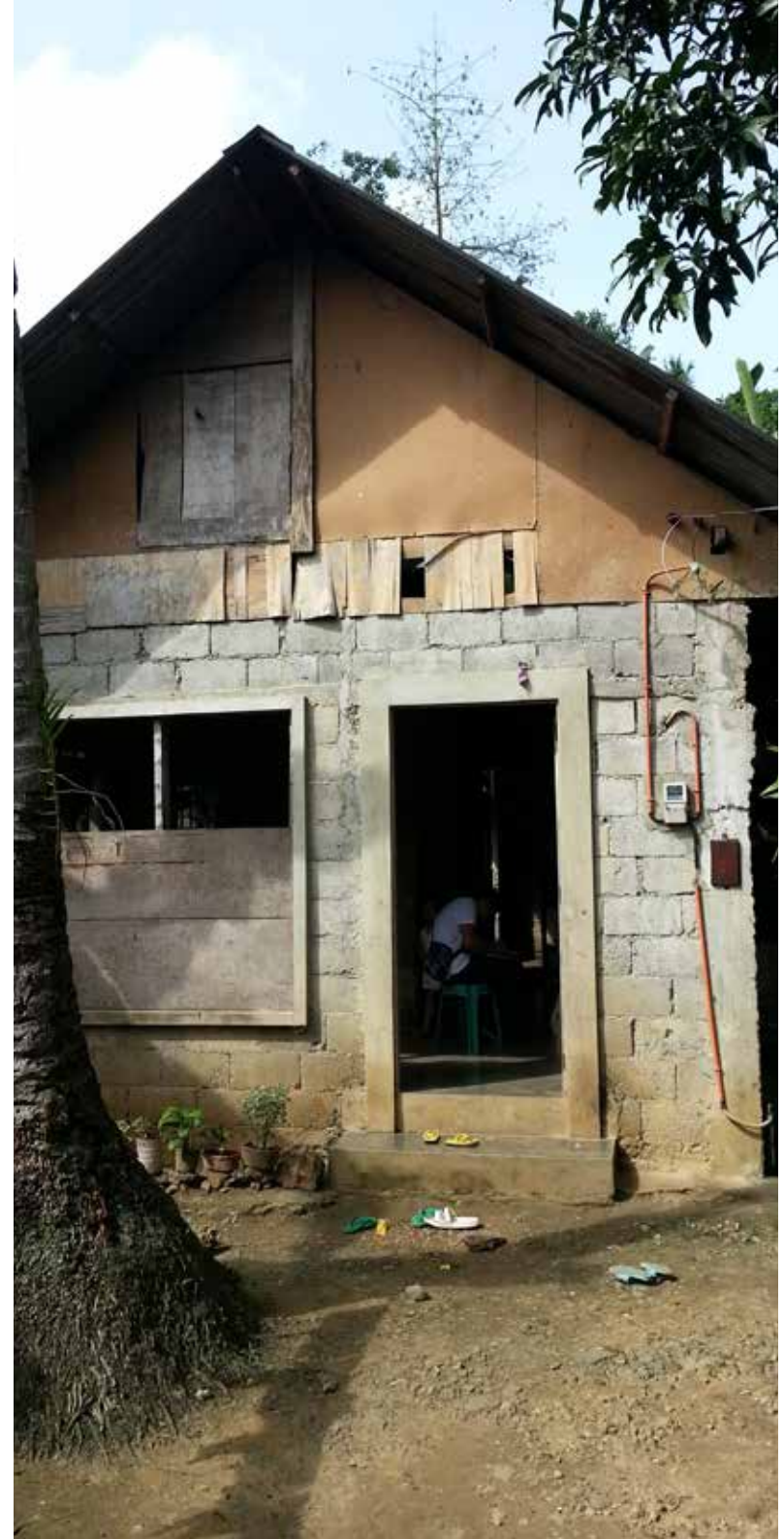
# Cebu Province housing survey

In early 2018, the Terwilliger Center for Innovation in Shelter, together with a partner researcher, conducted a detailed household survey in targeted areas of Cebu province to assess the existing low-income housing stock. Both communities surveyed were in the path of Super Typhoon Yolanda, and focus group discussions with residents focused on its impact and aftermath. The study also evaluated current and future efforts to be more resilient to natural disaster threats – at the house, household, and community levels.

This consumer research captured participants' housing experiences and profiled in detail the existing housing stock in the project areas. The main aim of the research was to give the Terwilliger Center a better understanding of the needs and aspirations of the economically active poor. By more fully understanding the challenges and constraints faced by households, the Terwilliger Center is better able to support market actors to design and test market-based approaches to increase access to resilient housing.

In all, 128 household respondents, comprising 62 from Boggo City and 66 from the municipality of Pinamungajan, shared their experiences through a detailed housing profile study. To provide more in-depth information on how low-income families obtain improved shelter, 47 respondents also participated in focus group discussions. In August 2018, in an effort to triangulate the results of the earlier study and zoom in on particular themes that had emerged, additional focus group discussions yielded the insights of 59 people from Boggo City.

The housing survey revealed in detail how people financed, constructed, and maintained their homes, and their access to basic services such as water, sanitation, and electricity. It detailed how vulnerability to natural disasters affects their housing, and the constraints they face in accessing finance, technical support, and materials for home building and maintenance. Through the focus group discussions, the researchers were able to unpack some of the survey answers to understand the decision-making processes, aspirations, and concerns of the households. This market intelligence forms the basis for developing a client-responsive market systems program in Cebu that addresses the complex challenges that families living in disaster-prone areas face in obtaining adequate, durable shelter.



# Profile of low-income households in Cebu Province

The families included in the survey have very limited incomes, and thus are constrained by the lack of resources. Most of the survey respondents fall outside of the World Bank definition of economically secure, i.e., earning between US\$5.50 (298 pesos) per day and \$15.00 (814 pesos) per day based on 2011 purchasing power parity. Families are living in close quarters, with often five or more family members in homes. Just over 44 percent live in houses of 28–55 square meters, and have a ground floor area of 55 square meters or less. Their communities usually have electricity and piped water, but are often without safe drinking water on tap. They almost never have access to community drainage, and the majority of survey respondents lack an indoor toilet.

The poorest segment of society will more likely rely on grants or government assistance to meet their housing needs, but the working poor typically turn to the market, patchworking multiple income and borrowing sources to build, improve, or repair their homes in stages over time. This low-income group uses the market to buy materials and hire labor to meet their housing needs. To date, most have relied on their savings and money borrowed from family members and relatives to pay for repairs and improvements. Only one in five people access financing MFIs, cooperatives or NGOs.

## Housing quality rating

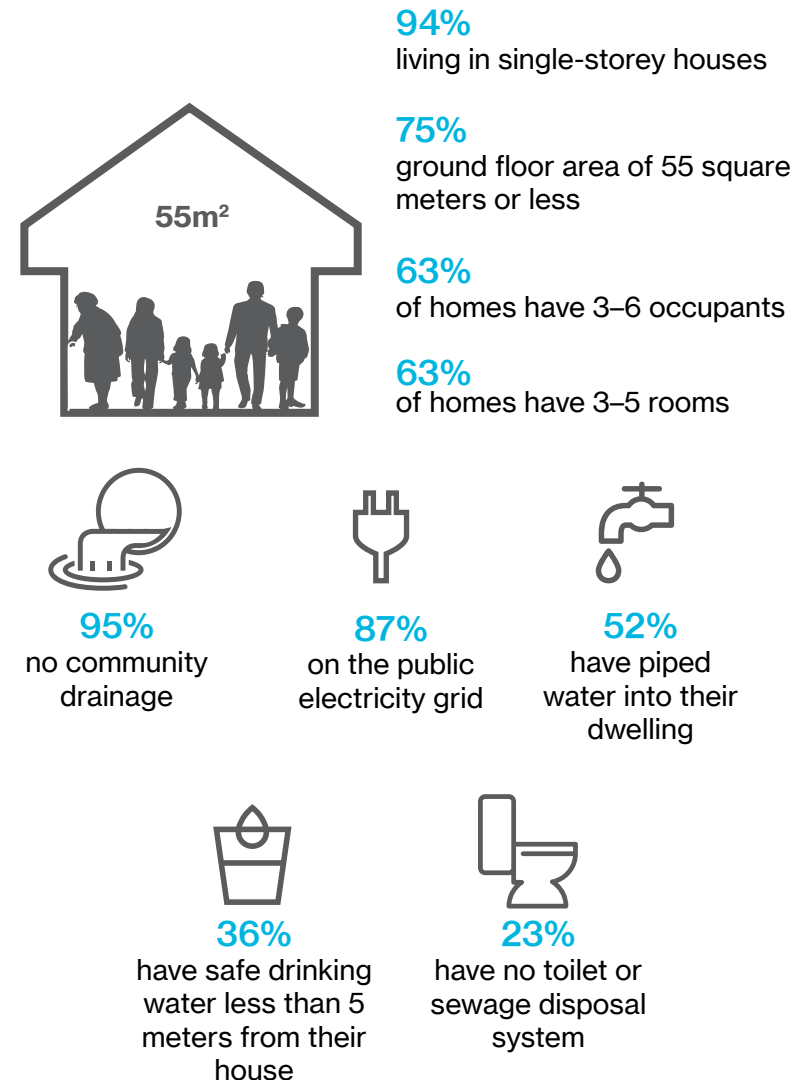
Using assessments of housing condition, durability, and workmanship, each respondent was assigned a housing quality rating, with a minimum score of 1 (poor) and a maximum score of 37 points (good) (Table 1).<sup>5</sup>

**Table 1. Housing Quality Score by Category**

Score range	Number of respondents	%	Quality of housing
1–14	35	44.9	Poor
15–25	30	38.4	Medium
26–37	13	16.7	Good
Total	78	100.0	

<sup>5</sup> The housing quality rating is an unweighted composite of individual scores (1=poor, 2= medium, 3= good) for self-assessed quality, durability, and workmanship of the respondents' home foundations, roof, exterior walls, floor, doors and windows, i.e., the higher the score the better the housing quality. The items included in the HQR are reliable for analysis, according to their Cronbach's Alpha value. This survey was developed and used by Habitat for Humanity to create a baseline profile of housing conditions in a defined geographic area.

## Living conditions for low-income households








# Housing profiles in Cebu Province

Housing in the Cebu province can be broadly categorized into three profiles: permanent, semi-permanent and temporary, based on the materials used (Table 2). Each type of housing structure has a different degree of resilience to typhoons and other natural disasters. Housing profiles are a reflection of both housing tenure and source of income.

Most of the homes surveyed were rated either in poor condition, defined as a danger to household members' safety and in need of immediate or short-term repair or replacement, or in medium condition, defined as in need of continuous repair and upkeep.

While the durability of exterior walls, roof, and floor are rated medium, the overall construction was rated poor due to inferior workmanship. The majority of respondents had personally experienced housing damage due to natural disasters, including 80 percent who have experienced typhoons and 53 percent who have been through an earthquake (Table 3). Flooding was also a common hazard faced by inhabitants of the survey areas in the previous 5 years. Households such as those surveyed know they are unprepared for another super typhoon. They feel helpless and do not know the steps needed to achieve resilient housing.

**Table 3. Disasters experienced by households**

Disaster experienced	Number of respondents (%)
Typhoon 	63 (81%)
Earthquake 	41 (53%)
Flood 	12 (31%)

## Cebu housing: Typical materials

(% of survey respondents use)

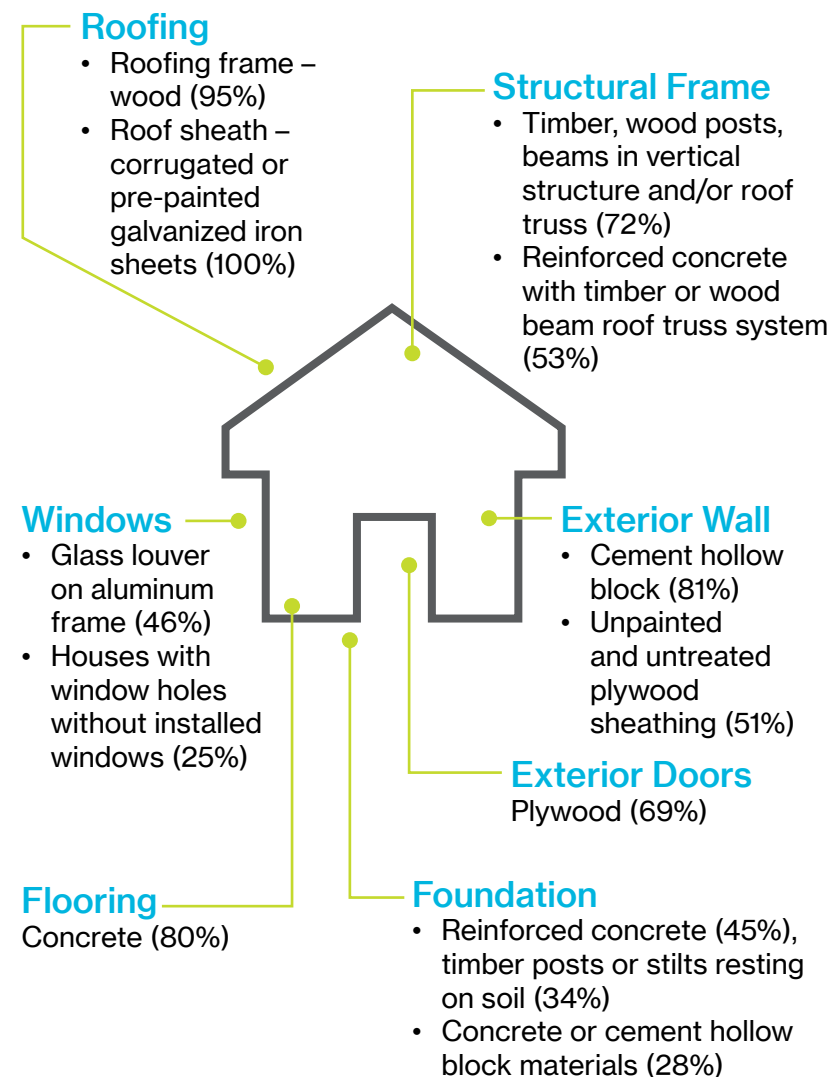


Table 2. Types of Housing



Housing type	Temporary	Semi-Permanent	Permanent
<b>Materials used</b>	Made with predominantly light materials (bamboo, sawali, cogon, nipa, anahaw), Salvaged/makeshift materials	Mixed but predominantly strong materials (i.e., walls up to flood line is made of concrete blocks and woven bamboo or sawali above the flood line)	Made with strong materials (galvanized iron, aluminum, tile, concrete, brick, stone, wood, plywood)
<b>Labor</b>	Homeowner, sometimes with assistance of unskilled workers	Skilled or semi-skilled construction workers	Skilled or semi-skilled construction workers, possibly with a foreman  Follow the building code  Acquire a building permit when building new
<b>Typhoon resilience<sup>6</sup></b>	With storm signal no. 1, some houses may be partially unroofed	With storm signal no. 3, there may be considerable damage to structures of light to medium construction	With storm signal no. 4, most residential buildings of mixed construction may be severely damaged
<b>Likely sources of household income</b>	Seasonal employment	Regular employment, seasonal employment (fishing, farming)	Regular employment, overseas remittances
<b>Tenure security</b>	May have right to use or have no ownership of land and/or house itself	Has ownership of or at least has the right to use the land	Has ownership or at least right to use the land

<sup>6</sup> Typhoon signals: 1 - Tropical cyclone winds of 30 kilometers per hour (19 miles per hour) to 60 km/h (37 mph) are expected within the next 36 hours. 2 - Tropical cyclone winds of 61 km/h (38 mph) to 120 km/h (75 mph) are expected within the next 24 hours. 3 - Tropical cyclone winds of 121 km/h (75 mph) to 170 km/h (110 mph) are expected within the next 18 hours. 4 - Tropical cyclone winds of 171 km/h (106 mph) to 220 km/h (140 mph) are expected within 12 hours. 5 - Tropical cyclone winds greater than 220 km/h (140 mph) are expected within 12 hours (super typhoon). Source: Philippine Atmospheric, Geophysical and Astronomical Services Administration <http://bagong.pagasa.dost.gov.ph/learning-tools/public-storm-warning-signal>



# Building and maintaining a house: Sources of labor, materials, and finance

The poor quality of workmanship is a reflection of respondents' decision to save money on labor costs by managing their own home construction. Although the quality of owner-driven construction can be high, this was not observed among survey respondents. They tend to rely on their immediate network of family, friends, or neighbors to provide labor. Skilled laborers charge 450–550 pesos a day, while unskilled laborers charge 250–300 pesos a day. Thus, if neighbors, friends and family do the work, families can save up to 550 pesos a day. This practice could be considered cultural (a debt of gratitude) or part of familial relationship dynamics.

Fully three-quarters of the respondents rely on their own skills and those of friends, family, and neighbors to build and repair their homes. If they hire labor, it is typically semi-skilled labor, such as masons and carpenters. Formal and licensed contractors are not used for either construction or repair. Rather, 53 percent of respondents said they trusted a mason or carpenter to provide technical and design input, while 31 percent relied on their own knowledge and 20 percent consulted a family member or close friend. Improvements are made bit by bit, based on what can be paid for in cash. Materials were typically bought locally from hardware stores in the neighborhood or nearby city or town center, by the homeowners themselves.

Almost all respondents (94 percent) aspire to improve their homes, with just over half wanting to rebuild parts of the house, but their aspirations are constrained by lack of funds coupled with the cost of construction materials. Most people rely on savings and money from family members and relatives to pay for repairs and improvements. Only 20 percent accessed loan financing from MFIs, cooperatives or NGOs. With little disposable income left after meeting basic needs – food, education, utilities, transportation, medicine, and for urgent house repairs – respondents reported that they are unable to cover repayments on short-term loans from such institutions. The likely source of funds for future home improvements is cash (61 percent), with only 34 percent of respondents citing loans from an MFI, co-op, or NGO as likely funding sources.

## Influence and decision making – quality vs cost, and who decides

Although the survey found that households typically value quality over cost when making home repair or construction, this is not reflected in the outcome of their efforts to repair and maintain their homes, which rate at best mediocre for durability, quality, and resilience. While masons were sometimes invited to give ideas and suggestions for rebuilding projects, decisions about materials and construction were typically taken by both husband and wife, with the husband having the final say.

## Types of labor



### Skilled laborers:

- >5 years experience
- Multi-skilled
- Often called a foreman if they are able to handle resources and manage small to medium construction work



### Semi-skilled laborers:

- 1–5 years consistent construction labor experience
- Often have a specialization, such as mason work or carpentry
- Often consult a foreman for any critical construction decision



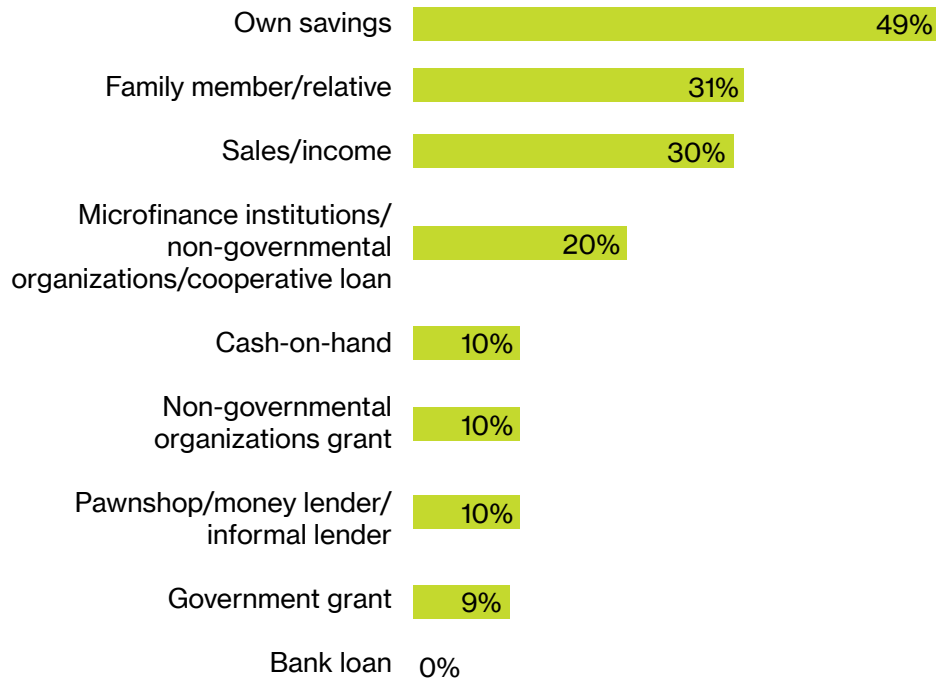
### Unskilled laborers:

- 0–1 year construction labor experience
- Provide labor assistance
- Mentored by a skilled mason
- Often have secondary jobs

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## Sources of financing

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# Housing in a disaster-prone region






Most households experienced either partial damage, such as the roof being blown off, or complete destruction of their homes during Super Typhoon Yolanda. The Department of Social Welfare and Development Emergency Shelter Assistance fund disbursed grants to most participants (10,000 pesos for partially damaged houses and 30,000 pesos for fully damaged houses). Some also received funds from the DSWD Pantawid Pamilyang Pilipino Program (a conditional cash transfer program, also known as the 4Ps), or from NGOs. However, none of this funding was adequate to cover the cost of repairs, and loans, savings, and income were used to make up for the difference, participants said.

The majority (68 percent) of respondents want to improve the roofing on their homes for disaster resilience, such as by tying down with cables, using bracing, and having roof nails spaced closer, or when affordable, switching to a stronger roof type. While masons, carpenters, and foremen commented that it was the foundations that should be given priority, less than half of respondents (47 percent) intend to improve or upgrade them for resilience to future disaster.

The DSWD's 4Ps program includes homeowner education sessions on disaster preparedness and response, providing tips on preparing the house for strong winds and typhoons such as using bracing. Participants who were 4Ps recipients said that they had attended such sessions but most got information on how to make their houses stronger from carpenters and masons, through word-of-mouth or common knowledge of practices such as using rope bracing and roof ties, extending the roof, and swapping coco lumber with good wood.

In all focus group discussions in all barangays during the triangulation, aside from those who were 4Ps recipients, no one had seen or even heard of any information-education materials related to building more disaster-resilient houses. None consulted an engineer for advice on repairs and reconstruction.

## Priorities to increase disaster resilience of houses

-  1 Build reinforced concrete foundations
-  2 Apply corner bracing at walls
-  3 Use wire straps and/or trusses plates for roof structure connections
-  4 Use wire, timber cleats or metal straps to tie down the house
-  5 Strengthen the joints of the house using nail screws, interlocking joint and nail, cleats, fishplates, or bolts



# Survey key findings and recommendations

## 1 Quality gaps exist across the board, from the roof to the foundation

Specific areas of focus that affect disaster resilience of housing include:

### Roofing

Respondents identified strengthening the existing roof or installing a new one as a priority area of improvement to make their homes more disaster-resilient. The survey showed households knew that roofing – specifically the way by which a roof was installed and attached – was important. However, homeowners did not express awareness that the foundation is equally important, nor did they seem to know that many safer building practices cannot be effectively used in isolation.

### Exterior walls

Unpainted plywood was the second most common material after cement hollow block used for exterior walls of the surveyed houses and showed significant deterioration. Some respondents were still using the plywood and materials distributed during the Yolanda response almost five years ago. These materials are not meant to be used in the long term.

### Foundations

Foundations play an essential role in the disaster resilience of a house. Thirty-four percent of the surveyed households have timber posts installed directly on soil as opposed to concrete footings for foundations, which is significantly sturdier.



## 2 Construction practices need to change to improve housing quality

To improve owner-driven construction, it is essential to address the role of social norms across the spectrum of construction, including labor as well as households.

### Reliance on unskilled or free labor

The overall high percentage of houses surveyed showing poor workmanship suggests a high correlation to the households' preference for managing their own home construction, often using underskilled friends, neighbors, or family members to help save money on construction costs. Low-income families must adopt improved construction practices and must be well-informed about the importance of safe building practices to help them make resilient housing a priority when money is available to invest in shelter.

### Lack of knowledge on resilient design

Labor must be knowledgeable of and skilled in implementing resilient design practices. More training of construction workers will not affect change in construction practices unless social norms are also changed.

## 3 Barriers to accessing finance must be addressed

Although respondents identified quality as a priority over cost, this is not reflected in the results of the housing survey, with the majority of the houses in need of immediate repair or improvement.

### Shortage of cash

The results of the research showed that the inability of households to mobilize lump sums, either through loans or savings, was a barrier to achieving better quality housing or choosing higher quality materials. Low-income households, i.e., those that were ineligible for government subsidies or NGO support, were left to self-recover after Yolanda. Those who did receive funding from the government in many instances could make only small improvements and used whatever funds they had on hand to rebuild.

### Reluctance to incur debt

While there was a shift in upgrading of structures from timber to more mix-material cement construction in the aftermath of Yolanda, the research revealed many were hesitant about using even MFI loans to finance better home reconstruction.

### Attitude barriers

Research into lending dynamics is needed to determine whether reluctance to take housing loans stems from stigma associated with debt, affordability constraints, or other reasons.





### Aspirations for a better, safer home

Although a strong, disaster-resilient house can be built incrementally, by retrofitting with the right technical expertise, this is not often the result of standard incremental construction processes. Across all barangays, most participants said that their houses could probably withstand a signal number 2 typhoon, but not another Super Typhoon Yolanda. Most do not feel that their houses are strong enough, that they have not fully recovered, and the pace of recovery is slow. Respondents had strong aspirations to move from temporary to permanent housing, and to go beyond the minimum requirements for a decent house to include incremental aesthetic and security improvements.

### Moving forward

The disaster-prone environment of the Philippines, scale of the housing deficit and complexity of the owner-driven construction process make a compelling case for using a market systems approach to help the housing market be more responsive to low income household needs.

Habitat's Terwilliger Center for Innovation in Shelter works with housing market actors to expand products, services, and financing to low-income households. Over the last decade, Habitat has worked with more than 78 financial service providers and mobilized more than \$800 million in housing finance capital for 3 million low-income households worldwide.

Habitat is complementing that work through a market systems approach supporting local firms and expanding innovative and client-responsive services, products and financing so that households can improve their shelter more effectively and efficiently. The ultimate goal of the Terwilliger Center's market systems program is to make housing markets work more effectively for people in need of decent, affordable shelter, thereby improving the quality of life for low-income households.







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For more information, visit [habitat.org/tcis](https://www.habitat.org/tcis) or email [ap-tcis@habitat.org](mailto:ap-tcis@habitat.org)



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