



Habitat  
for Humanity®

Terwilliger Center for  
Innovation in Shelter

# Preparing for the Worst: How Low-Income Household and Mason Attitudes on Home Construction Affect Disaster Resilience

July 2019

# Key messages



**1** External appearance dominates household decision-making,

leaving little room for disaster-resilient building practices. For masons, appearances also matter more than good disaster resilience, because this is in part how they attract new clients and business.



**2** The cost of materials and risk aversion

on the part of households toward adopting an untested product or building method are significant constraints on the adoption of disaster-resilient practices.



**3** Households' access to information flows about disaster-resilient materials and methods is limited

in both the India and Peru study sites, with family and friends providing the main source of advice.



**4** A fatalistic attitude to both poor-quality housing construction and vulnerability to damage from natural disasters is common in both the India and Peru study sites.

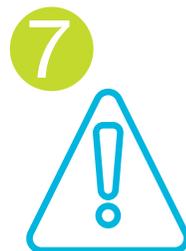


**5** Environmental factors related to safety and security still influence building practices among low-income households, even in locations that are not highly disaster-prone, such as the Kenya study site.



**6** Educational campaigns on disaster-resilient housing,

aimed at both households and masons, present a potential area of intervention, but they must be able to reach communities directly.



**7** Incorrect use of materials and inadequate application of construction techniques are the main reasons why homes are not disaster resilient,

rather than a lack of access to quality materials. Changing this requires a focus on behavior change, on the part of both households and masons.



**8** Focusing solely on capacity building and knowledge transfer will be insufficient for this purpose,

as it targets only the household domain of the social norms framework, leaving the social, governance and material domains untouched.

## Introduction

Habitat for Humanity's Terwilliger Center for Innovation in Shelter 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.

Understanding the forces at play in the construction of low-cost housing is key to promoting positive change. With this in mind, the Terwilliger Center commissioned a study to understand how low-income households make decisions on housing design and construction and what actors and social norms influence these decisions in three diverse settings: Kenya, India and Peru. The study focused on norms – the informal rules that govern collective behaviors and expectations of behavior – governed by empirical expectations (“What I think others do”) and normative expectations (“What I think others expect me to do”).

The studies covered both homeowners and the masons who work with them. The research specifically investigated the role of masons and how they interact with both clients and suppliers, because understanding their social norms, networks and information flows is key to knowing where and how to exert positive influence over the low-income housing market.

### Study locations

Each country study had its own orientation, tailored to its particular market context.

In India, the research focused on understanding the preferences of and influences on households and masons in two different districts in Tamil Nadu: Kancheepuram, a peri-urban inland district on the outskirts of the capital, Chennai, that is less likely to be influenced by natural disasters, and Cuddalore, a coastal peri-urban district selected because of its greater record of disaster damage.

In Kenya, most urban dwellers wish to build incrementally, more likely in a rural area that is the husband's town or village of origin. The first phase of research was carried out in an urban area to explore this dynamic. The site was Korogocho, an urban slum in the northeast of Nairobi. The second phase of research took place in two areas to trace the different pathways that some residents of Korogocho took to build homes. This took researchers to peri-urban areas of Nairobi, and Siaya County in western Kenya, where several former residents of Korogocho and other informal settlements in Nairobi have relocated.

In Peru, the study site was the informally constructed neighborhood of La Florida in San Juan de Lurigancho. The research focused on understanding the preferences of and influences on households and masons in the transition from a semipermanent wood structure to a permanent concrete-, iron- or steel-reinforced building with flooring. This transition was selected because it is the stage in which the most significant financial investment begins and in which the foundation for any future structural plan is established. Suboptimal decisions in this stage of construction determine the future shelter upgrades and extensions that may be required or feasible; they also generate additional costs during extensions and increase exposure to structural insecurity in the face of environmental risks and disasters.

# Introduction

## Research methodology and methods

The individual country studies were based on three change objectives:

**Change Objective 1:**

Increase agency for women in housing decision-making.

**Change Objective 2:**

Ensure households use more disaster-resilient construction techniques (Mainly India and Peru).

**Change Objective 3:**

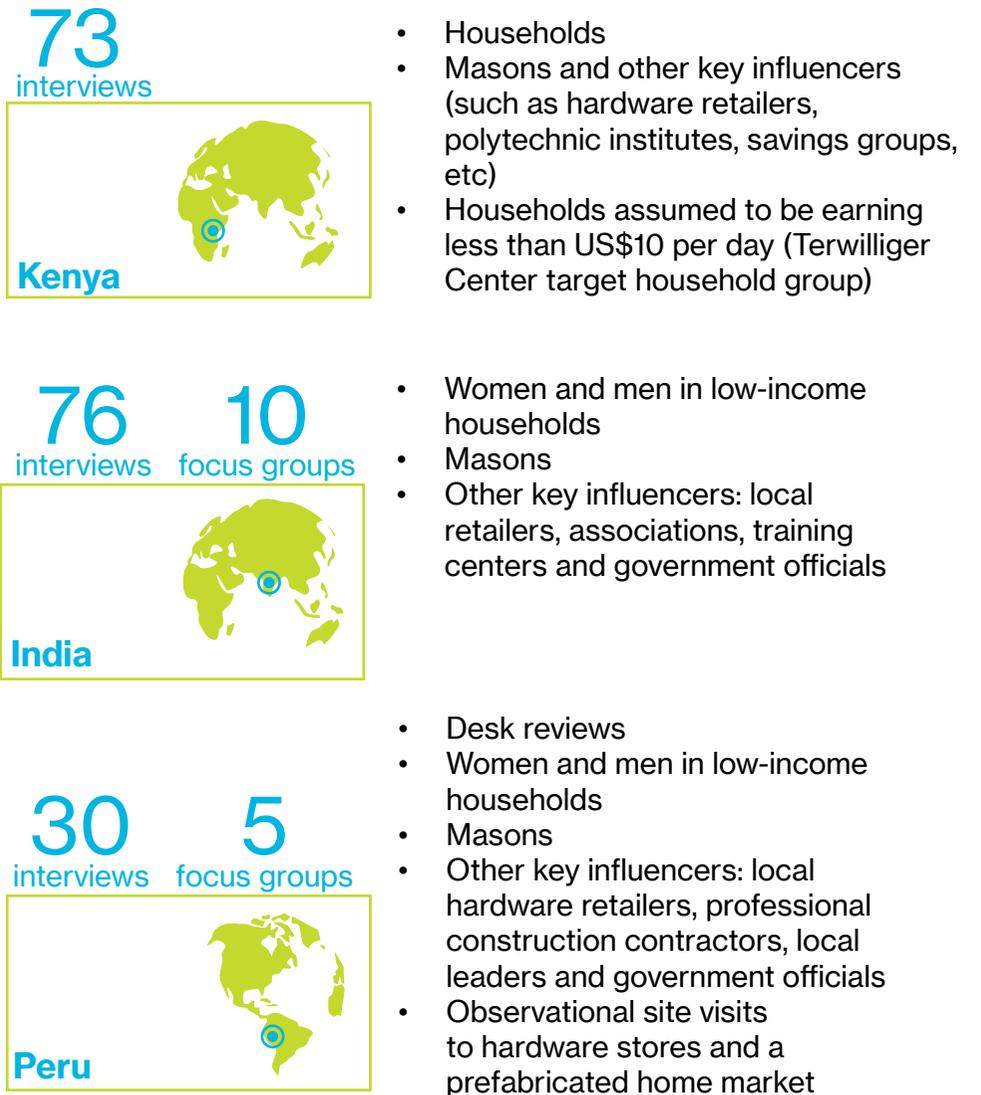
Improve masons' ability to change their practice, leading to better services for low-income homebuilders.

More detailed information about the study findings across all three change objective domains can be found in the individual country reports at [habitat.org/tcis](http://habitat.org/tcis).

This report consolidates and examines the findings under Change Objective 2: Ensure households use more disaster-resilient construction techniques. It focuses on India and Peru, with a short section on Kenya, and presents a consolidated review of the social norms and construction practices that affect the ability of low-income homebuilders to withstand natural disasters and extreme weather events.

The report describes current attitudes toward disaster-resilient construction at the household level, and also among masons and construction workers. It details the current disaster-resilient construction techniques used and looks at how information about disaster-resilient techniques and materials flows to and between masons and low-income homebuilders. It concludes with recommendations to increase the use of disaster-resilient construction practices and materials.

**Figure 1: Research methods**



1

# Current attitudes toward disaster-resilient construction



# 1

## Current attitudes toward disaster-resilient construction

### Appearances above all

In both the India and Peru study sites, homebuilders are primarily focused on the appearance of what they can afford to build, and there is an overall reluctance among households and masons to adopt disaster-resilient construction practices. Households lack knowledge about disaster-resilient building techniques and may resist trying a new technique if they cannot see a structure where it has been tested first.

Masons are similarly risk-averse about new materials and are also reluctant to adopt disaster-resilient practices, taking the attitude that the client's budget restrictions set the template for the quality of materials used. They also may be skeptical about the need to learn more.

Risk is also seen as inevitable for low-income homebuilders, and there is a prevailing attitude of fatalism toward natural disasters. Defects and construction failures are seen as normal and unavoidable.

### A blend of disaster resilience and fatalism in India

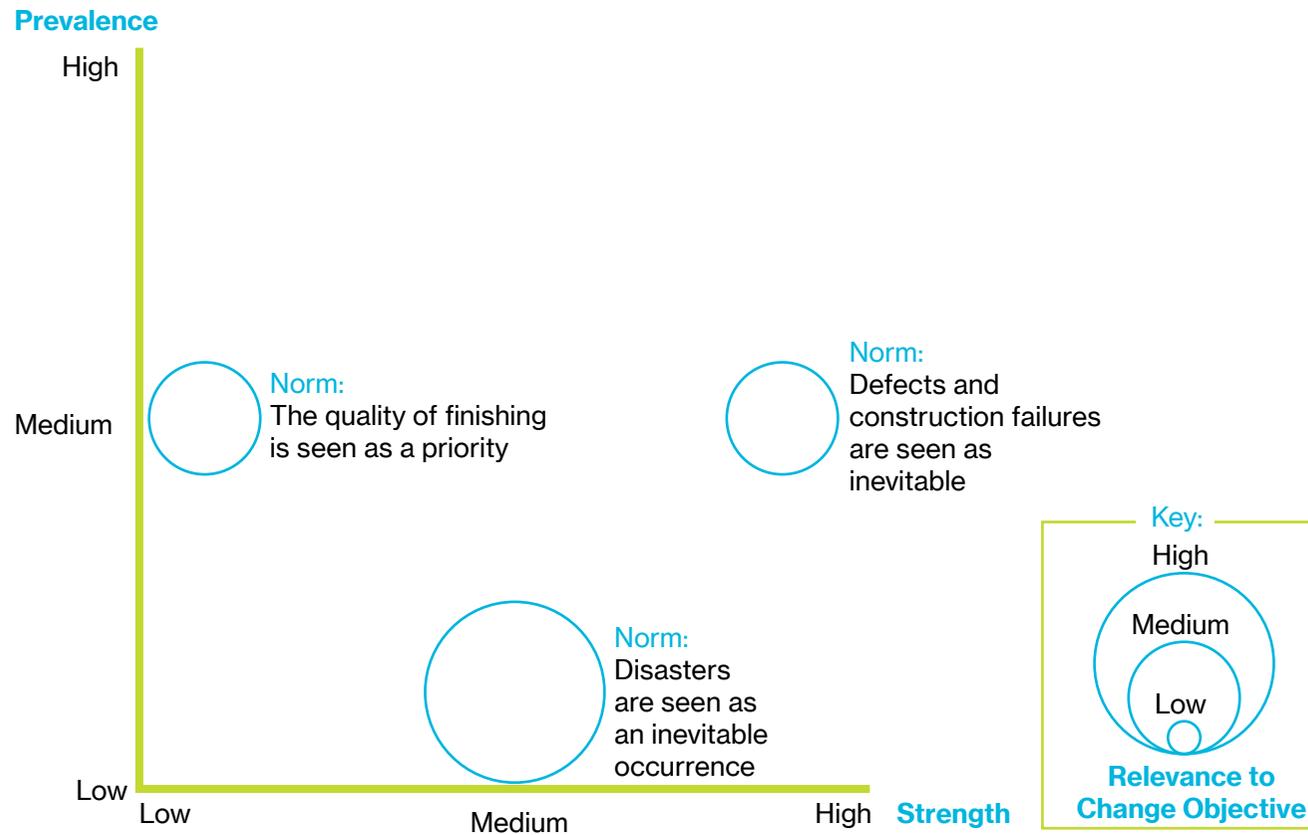
Although major natural disasters such as cyclones and flooding are infrequent in the India study site – occurring on average every five to six years – when they strike, they hit hard, displacing communities for long periods and causing substantial damage to infrastructure. As with households interviewed in Peru, the overwhelming feeling among the interviewed Indian households is that disasters are inevitable, and there is a sense of powerlessness against their force.

Most of the interviewed households and masons rely on the same disaster-resilient techniques: raising the foundations of the house to at least 1 foot above the top of the road, making heavier use of columns and floor beams, and reinforcing columns with iron rods. Use of reinforced cement concrete, considered strong enough to withstand any weather-related disaster, is seen as a best practice in disaster resilience.

There seems to be a quiet acceptance, especially among masons, that some harmful mistakes are inevitable, especially in the case of waterproofing. While retailers note an increase in demand for waterproofing products, there are conflicting opinions about the use of waterproofing in low-income housing construction. Many of the interviewed households seem to prefer the use of waterproofing products such as Dr. Fixit, whereas the interviewed masons – and even engineers – prefer to rely on more traditional methods. In general, masons seem to believe that if concrete is laid out using the right techniques and avoiding the creation of air pockets, leaking will not occur.

That said, poor waterproofing techniques have likely led to a collective acceptance across households that waterproofing is ineffective, meaning that masons and contractors are not held accountable for their mistakes and have little incentive to learn how to improve.

**Figure 2: India – norms that influence the use of disaster-resilient construction techniques**



# 1

## Current attitudes toward disaster-resilient construction

### Price sensitivities in Peru

In Peru, families tend to be extremely price-sensitive, not least because of their unsteady source of income. They buy materials incrementally as they can afford them. They are more willing to spend on attractive finishings and the final touches both inside and outside than on structural features for safety and durability that may not be apparent on the surface. Nice finishings also can mask poor construction.

For masons in Peru, social recognition is worth more than formal education and training, and this limits opportunities for them to be exposed to new and better building techniques for more disaster-resilient construction. Working for clients who are extremely price-sensitive and typically offering below-market rates to get work create strong disincentives for masons to propose better building products and practices. One of the prevailing norms that emerged from the research was: “It does not matter what you do, as long as it’s cheap.”

### Risk mitigation in Kenya

Although resilience in the face of natural disasters was not a theme that emerged from the research in Kenya, the decision to build homes up-country or outside the city was motivated in part by a perception of safety.

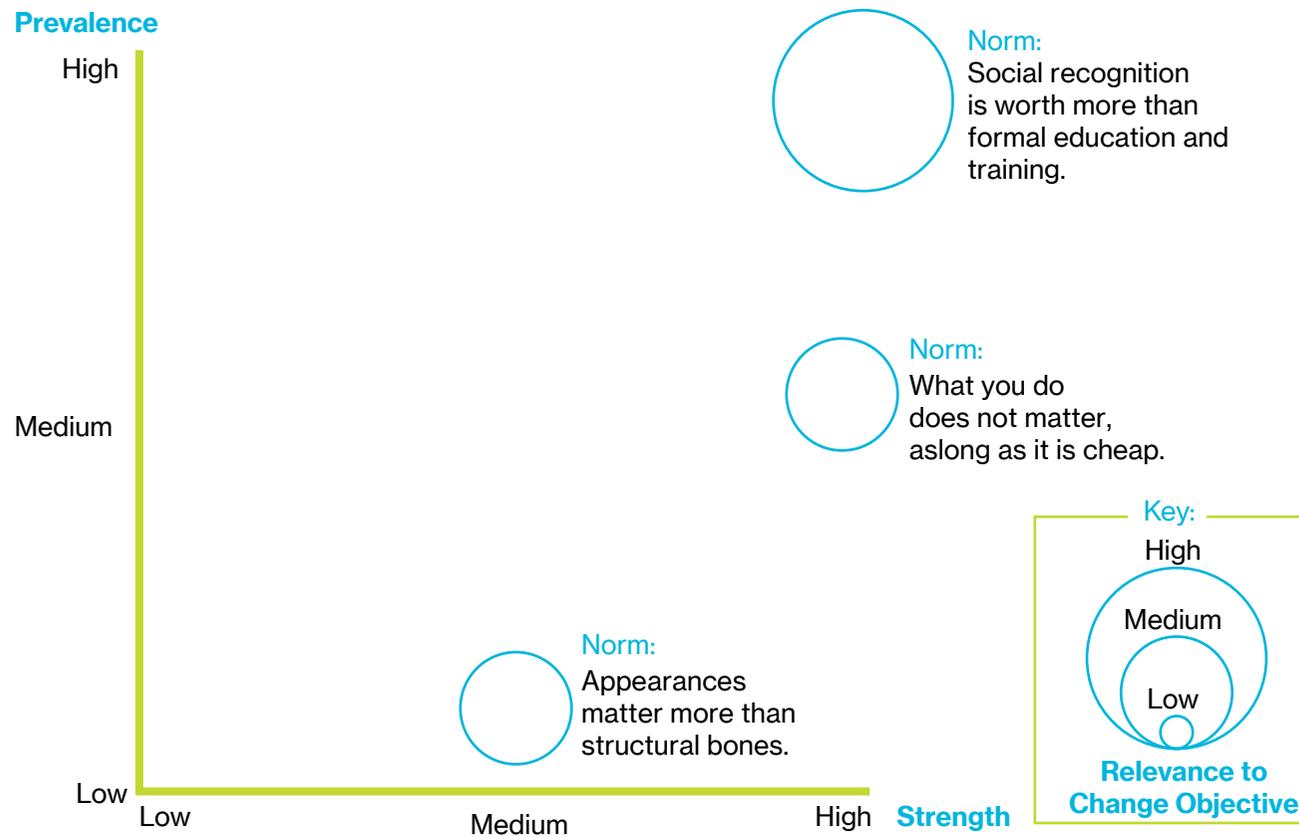
The threat of surprise eviction from urban dwellings and difficulties securing land tenure made the prospect of building there unfavorable. Informal settlements in cities also have an air of “moral impurity,” interviewees said, and the desire to protect children from risks such as drug use and dropping out of school was another motivation for building elsewhere.

Another important norm shaping the desire to build is the perception of rural areas that are tribally or ethnically homogenous as being more secure than “mixed” areas, which are usually urban. In Siaya, people moved back from Nairobi because of post-election violence and the resulting economic downturn in 2007-08. Even in subsequent years, people have continued to come back and build in Siaya because they view urban areas as more prone to ethnic violence.

Both men and women of Somali descent from northern Kenya expressed little desire to build in their counties of origin. Instead, the norm in this community was to build a life in urban neighborhoods with others from their community. The time and financial cost of traveling “home,” the harsh conditions there (e.g., weather, insecurity), and the perceived lack of economic opportunities back home deterred their desire to return.

# 1 Current attitudes toward disaster-resilient construction

**Figure 3: Peru – norms that influence the use of disaster-resilient construction techniques**



# 2

## Information flows about disaster-resilient construction



## 2 Information, influence and social norms

Low-income homebuilders may turn to friends and family members for advice about construction, but they are less trusting of the artisans they hire to do the construction work. Masons have more access to information about disaster-resilient techniques and materials from the hardware suppliers, but they also rely on the support and knowledge of their peers.

### In India, masons/suppliers are info gatekeepers

In India, the flow of information to households, including on matters related to disaster resilience, is low. House construction decisions are made primarily within the households, with limited external influence. Households do seek the advice of family and friends, but decisions are made jointly between husband and wife.

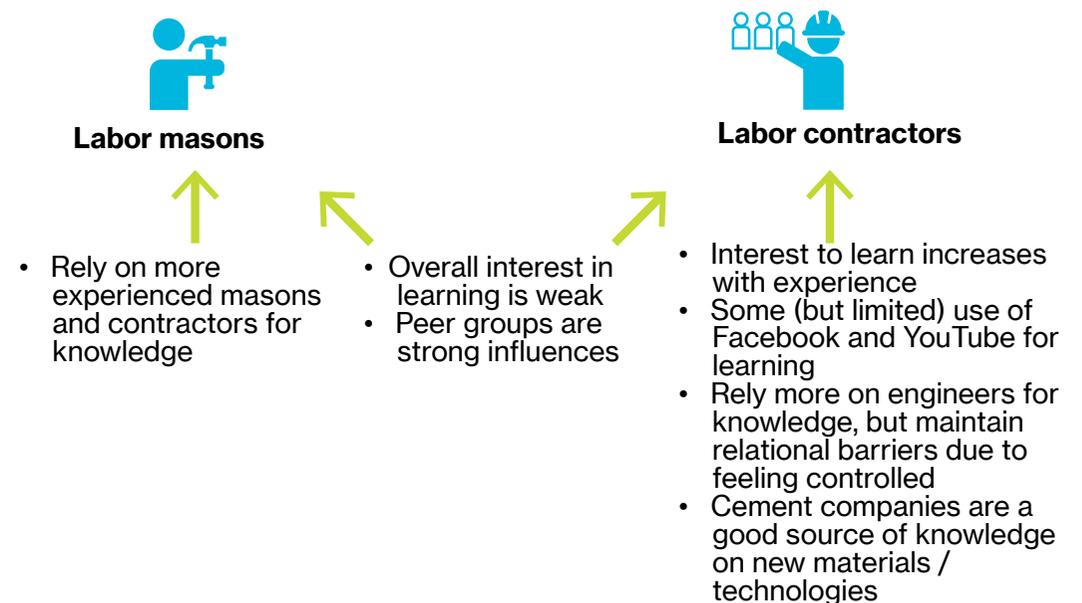
Low-income households are also influenced by masons, but unless the household seeks their advice directly, masons and contractors are rarely able to influence construction preferences. Rather, households seek masons' advice primarily on basic structural issues, such as the number and the width of columns, and masons are less able to influence households on the adoption of new materials or changes to the layout of the house that would make it more disaster-resilient.

Masons in turn get their information from their peers and from hardware stores and engineers. But overall, masons' interest in learning is weak. Many of the interviewed masons said they know everything there is to learn in the construction sector. This is driven partly by the fact that there has been little innovation in the sector, limiting masons' exposure to change and the need to learn new practices. Even so, masons are unwilling to accept that they have gaps in knowledge or that they could be at fault.

Collaboration within the construction community is strong. Contractors share information with each other on prices, on how to manage

conflict with clients, and on best practices and technologies. Experienced masons are a key source of knowledge for more junior masons, and their advice is sometimes valued even more than that of engineers and architects. Cement companies are also a good source of knowledge on new materials and technologies for most masons and contractors, especially those who are more experienced.

**Figure 4: India – factors influencing masons' preferences**



## 2 Information, influence and social norms

### Two levels of influence in Peru

In Peru, by contrast, households are subject to two levels of influence: friends, community leaders, neighbors and providers of basic services, who live in the same neighborhood and exercise a slight influence, and the extended family, who exercise moderate influence on construction decision-making.

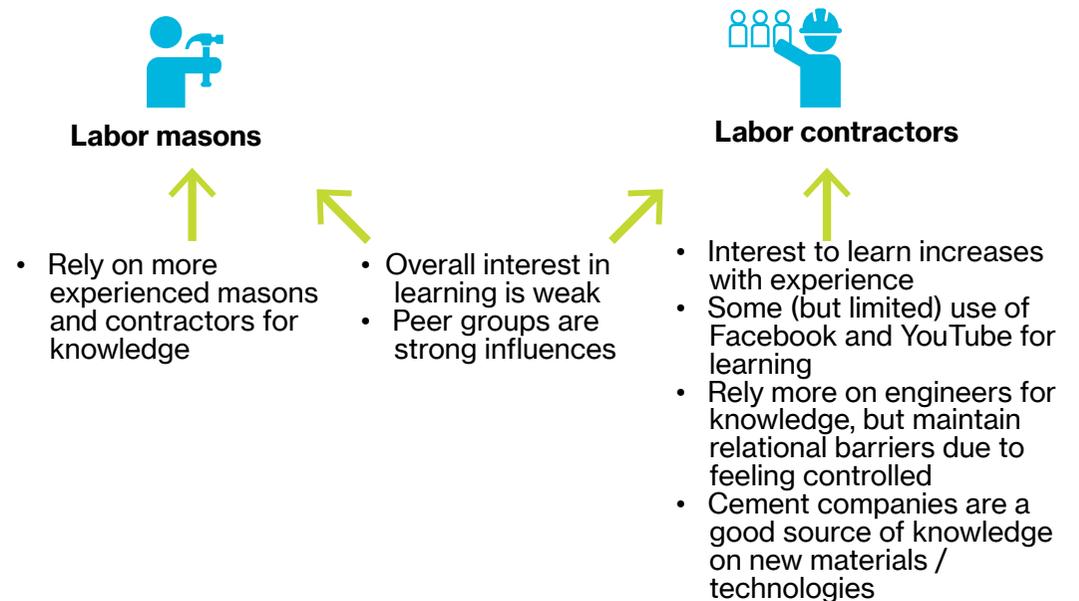
Masons and the hardware store owners also strongly influence the decision to start construction or the process of transitioning from low-cost to better quality housing. Men are influenced more directly at the time of making the contract and the purchases, and the hardware store owners exert greater influence over the women at the time of monitoring the housing construction. However, the influence of hardware stores is tempered by the fact that price will dominate much of the decision-making about materials.

The male householder has only a moderate level of influence on the mason, in part because the masons who offer services to the low-income homebuilders are few. At the same time, each mason has his way of building, based on his own experiences and practice, and not necessarily according to construction guidelines. These masons may attend the training services provided by the material providers, but only if offered at no cost and if they have time on their hands.

Influence also flows from the mason to the hardware dealer. The hardware dealers understand the logic and importance of relying on market information from the masons and use this to determine which

products to offer. Information provided by the hardware store owners to the masons, such as the prices, types of material, new technologies and techniques, is considered relevant but not vital. This is mainly because the market for the masons' services is not defined by their ability to offer innovative services.

**Figure 5: Peru – factors influencing masons' preferences**



# 3

**Recommendations  
to increase demand  
and uptake of  
disaster-resilient practices**



Following on from this research, the Terwilliger Center facilitated a human-centered design workshop in each study country to design draft intervention concepts for quick field validation. Below are a few examples of how the Terwilliger Center seeks to translate these findings into actionable interventions in Peru and India.

### Opportunity in India: Roofing loan products from microfinance institutions

Microfinance institutions could develop a lending product specific to the upgrading of roofs – and provide information on roofing options and technical information – through partnerships with roofing providers. Insurance cover for the loan would be embedded in the lending product.

Thatched roofing typically requires replacement every two years and costs approximately 30,000 Indian rupees (about US\$425). Families raise the money for this large expense through informal money lenders or loan sharks, as they do not have a steady income. The repayment process can last up to six months at INR7,000 (about US\$100) a month, with interest payments equivalent to 20 percent of the loan principle. Given the option, households would rather take larger loans over a longer repayment time frame with repayments in the range of INR3,000-3,500.

Because of their closer relationship with masons, households trust the recommendations of masons over those of architects and engineers. If something goes wrong with the house, it is easier for households to take this up with the mason. However, if someone else in the village takes a loan from a microfinance institution and builds a house following an engineer's guidance, it will make the process more

attractive to others in the village. The demonstration effect is a strong incentive.

The next steps are to engage with microfinance institutions to assess their appetite for developing a new loan product and the feasibility of having them collaborate with masons as agents.

### Opportunities in Peru: Certification and education

Greater recognition for quality, self-directed construction by professionals or governmental bodies could help create more awareness about future risk and the impact of disasters.

Promotion of appropriate materials and techniques toward households by construction material suppliers and hardware stores could increase demand from households for better construction services and more innovative practices.

Modeled on a mobile library, a “construction mobile” could visit low-income informal housing communities to showcase quality earthquake-resistant materials. This could incentivize households to make modest but smart investments to improve the longevity and quality of their home.

This report was developed by staff members of Habitat for Humanity's Terwilliger Center for Innovation in Shelter and MarketShare Associates, including Adriano Scampi, Meghan Bolden, Raksha Vasudevan, Ashley Aarons, Scott Merrill, Sheldon Yoder, Mallory St. Claire, Jennifer Oomen and Jane Otima. In addition, Terwilliger Center country personnel and MarketShare consultants in India, Kenya and Peru dedicated themselves wholeheartedly to the research summarized in this report.



Written by Jane Parry.

Layout and graphic design by Keisuke Taketani.

Photography by Annalise Kaylor, Terwilliger Center Peru, and Jason Asteros.

The report was produced with support from J. Ronald Terwilliger, the Hilti Foundation and IKEA Foundation.



Habitat's Terwilliger Center would like to express its gratitude to each of the households who participated in the household interviews and focus groups for this research. Their lives are at the core of the work Habitat does so that one day, everyone will have a decent place to call home.

#### **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.

To learn more, visit [habitat.org/tcis](http://habitat.org/tcis).



**Terwilliger Center for  
Innovation in Shelter**

[habitat.org/tcis](http://habitat.org/tcis)