

The Cost of Improving Vulnerable Housing

Recommendations for Investments in Housing Resilience from an Analysis of Global Project Data

January 2022



Executive Summary

The issue of vulnerable housing requires urgent action and massive investment. By 2030, three billion people—about 40% of the world’s population—will be living without adequate housing.¹ Inadequate or vulnerable housing is disproportionately inhabited by the poor, putting those who are already vulnerable most at risk when earthquakes, windstorms, floods and pandemics strike. Investment in better, safer housing must be prioritized if we are to protect people and assets against future crises.

However, most people do not need a new home, but a more resilient home, and the majority of homes can be made safer using relatively simple, inexpensive solutions that already exist: for example, improving sanitation, lighting, ventilation and meal preparation facilities in a house can make a home healthier to live in, while strengthening the walls or improving the connections from the roof to the foundations can make the house safer in earthquakes and windstorms. Investing in upgrading existing housing is an efficient, effective way to reduce housing vulnerability, while enabling people to remain in the homes and communities they already live in. At the same time, home improvement programs can also provide families with opportunities for growth (e.g., through home expansion). This combination of benefits makes home improvement an optimal response to the qualitative housing deficit observed in most countries today.

One of the common barriers to homeowners, governments, funders and others who could invest in improving vulnerable housing is a lack of information or misunderstanding about the associated costs. This home improvement cost study was undertaken by Build Change in order to share key information and trends about the costs of improving vulnerable housing to make it more resilient.² It is based on detailed design and cost information³ representing 1,484 home improvement designs in fourteen countries over an eight-year period (2013–2020), across a range of contexts and programs in Asia, the Pacific, Latin America and the Caribbean.

Key Findings and Recommendations



Improving vulnerable housing is a cost-effective strategy to reduce the qualitative housing deficit, especially when compared to new construction.

On average across the data analyzed, the cost of improving vulnerable housing was 23% of the average cost of building new housing in the same locations. The average total cost of home improvement was \$133/m², with the majority of total costs falling below \$100/m². The average cost of new construction in the corresponding locations across the data analyzed was \$588/m².⁴

✓ Investments in improving existing housing should be prioritized as a cost-effective means to


¹ UN-Habitat, “Housing,” accessed July 15, 2021, <https://unhabitat.org/topic/housing>

² Resilient housing is defined as being disaster resistant, healthy and secure, locally appropriate, sustainable, affordable, a financial asset, adaptable and scalable. Refer to *The Build Change Guide to Resilient Housing* (Build Change, 2021) for more information.


³ Cost information used are the direct construction costs for materials and labor including structural, non-structural and other work, either estimated or actual.

⁴ All costs stated are in US Dollars.


address the gap in the global supply of adequate housing as well as to combat increasing threats due to climate change.

 **In many cases, investments in improving vulnerable housing can be further leveraged to safely densify housing and cost-effectively create new housing units.**

Overall, the cost of improvements that included upgrading the house to safely receive an additional story in the future were on average 35% of the average cost of building a new house of the same size in the same locations. In cases where the ground floor of a house was improved and a second floor was added as part of the work, the average cost for preparing for and adding the new space (per square meter of new space) was less than the average cost of new construction of the same size and in the same location, when the additional costs of land and site development for new construction were considered. ✓ *Investments in improving and expanding vulnerable housing should be prioritized as a cost-effective means to support densification and address the gap in the global supply of adequate housing, particularly in urban areas.*

 **Home improvement investments address multiple challenges: Homes can be made more resistant to disasters, while supporting other goals linked to increased household resilience.**

For the purpose of this analysis, all home improvement spending was assigned to one of the following categories: i) Structural Condition Repairs, ii) Habitability Upgrades, iii) Disaster Mitigation Measures and iv) Finishings and Growth. All the sample designs in this study started with disaster mitigation as the initial and predominant objective. However, while almost 60% of spending was on Disaster Mitigation Measures, on average more than 40% of spending was in the other three categories. ✓ *There is demand from homeowners for a range of interventions beyond disaster mitigation, and investments in these other categories should be accounted for when increasing the resilience of housing against disasters.*

 **Improving housing before—rather than after—a disaster, is a smarter, more cost-effective investment.**

Taking preventative action to improve housing is essential to mitigate losses in disasters, but it also enables the same investment to go further than it would in a post-disaster context. Construction costs to improve vulnerable housing were about 1.6 times lower in a Prevention context than in a Post-Disaster context, on average. The amount spent specifically on structural repairs was almost six times less before a disaster than after. For a post-hurricane housing recovery project in Sint Maarten, an average added investment of 30% helped to ensure the entire house was more disaster resistant, instead of only repairing the severely damaged roofs. ✓ *Investments in improving vulnerable housing before a disaster are more cost efficient, and enable more of the investment to be directed toward non-structural and forward-looking interventions, rather than repairs. In post-disaster settings, investments should go beyond repairing damage, to make preventative home improvements that will protect the investment against future threats, for a low additional cost.*



The cost of improving housing varies greatly depending on the level of performance that is targeted.

The targeted level of performance for the design interventions included in this study varied, from minor improvements that would reduce risk in the next disaster (“Risk Reduction”), to life safety upgrades for the hazard level specified in the building code (“Life Safety”), to life safety upgrades plus preparing for and/or building a vertical expansion (“Life Safety + (Future) Vertical Expansion”). If we consider only countries where examples from all three performance targets were available, on average, Life Safety interventions cost 17% more than Risk Reduction interventions, but 55% less than interventions for Life Safety + (Future) Vertical Expansion. ✓ *Plan improvement goals to fit the level of investment available (through grant, loan or other financial incentives).*



Home improvement can be tailored according to the available level of investment.

A range of performance targets and costs for home improvement supports greater flexibility with regard to funding and affordability. In the Philippines, incremental Risk Reduction improvements (average cost of approximately \$72/m²) were found to be affordable to clients of microfinance institutions who are primarily in the low to lower-middle income level brackets. However, for more significant interventions, or to reach even lower income brackets, subsidies or grants for the homeowner are needed to make the improvement affordable. ✓ *Ensure that needed subsidies or grants can be provided to low-income and poor households for improvement that might not otherwise be affordable.*



Relative to the corresponding costs of new construction, there was no significant difference in overall costs when improvements were designed for both earthquakes and high wind versus only earthquakes.

In locations exposed to both seismic hazard and high wind, home improvement costs were on average 2.8 times higher than those in locations only exposed to seismic hazard. However, the cost of new construction in the locations exposed to both seismic hazard and high wind were approximately three times higher than those in locations only exposed to seismic hazard. This indicates that the apparent cost increase for making homes resilient against multiple hazards, rather than against a single hazard, is likely due to the generally higher cost of construction for the markets in those locations. Relative to new construction costs, preventative improvements for resilience against multiple hazards were the most cost efficient (20% of the cost of new construction, on average), while post-disaster improvements for resilience against multiple hazards were the most expensive (29% of the cost of new construction, on average). ✓ *Housing improvement programs and interventions should take advantage of the high efficiencies of mitigating against multiple hazards to ensure that all applicable hazards are addressed when making improvements to reduce disaster risk. Further, investments to improve the safety of housing should be made before a disaster, especially in locations exposed to multiple hazards, due to the relatively high increased cost of improvement after a disaster.*