

# Housing Quality Assessment

LOLC Micro Credit Ltd (LOMC), Sri Lanka

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# Background

- LOMC, a MicroBuild (MB) investment and the biggest microfinance institution in Sri Lanka was partnered with to pilot Housing Quality Assessment (HQA). 3 branch locations were used for tool testing and field interviews. Habitat's MicroBuild Fund is the first housing-focused microfinance investment vehicle dedicated to helping low-income families. The fund lends to microfinance institutions, which in turn provide small loans to families to build safe, decent and durable homes as their finances allow.
- **Project team – Habitat for Humanity International**
  - Naeem Razwani –Associate Director, Financial Inclusion, Asia Pacific
  - Nurlan Moldosherip – Associate Director, Housing, Asia Pacific
  - Jim Kendall –Appropriate Construction Technology, Asia Pacific
  - Ryan Smith – Organization and Program Effectiveness, Global
- **Objective**
  - Create a HQA tool for global application
  - Identify areas of improvement and document experience
  - Test various hypothesis linked to quality of housing of MicroBuild investment clients
- **Sample:**
  - Housing Microfinance (HMF) / MicroBuild (MB) clients – 30
  - Non-HMF / non-MB Clients – 30
  - Total – 60

# Scope & Hypothesis

**Housing Quality Principles:** Assessment of housing structure based on quality, durability and condition of:

- Foundation
- Walls (exterior and partitions)
- Flooring
- Roof
- Finishing
- Sanitation
- Water
- Electricity

## Hypothesis

1. Overall House Comparison between MB Clients and Non-MB Clients
2. Improvement Comparison between MB Clients and Non-MB Clients
3. MB Clients' Improvement Compared to Non-MB Clients' Overall House

## Sample / Branch Profile

Consistent socio economic situation

## Enumerator / Engineer Profile:

Jim Kendall- Appropriate Construction Technology Specialist

***Note: MB Clients are the clients who received a HMF loan from the institution***

# Statistical Method

In all hypotheses, an independent Samples T-Tests was used for analysis. A t-test utilizes the mean, standard deviation and sample size to suggest whether a difference between two groups' means is unlikely to have occurred because of random chance in sample selection. A difference is more likely to be meaningful, or "significant", if the p-value or significance level is below .05. If the significance level is higher than .05, it can be assumed that the difference in samples can be attributed to random chance

# Hypothesis 1: Overall House Comparison between MB Clients and Non-MB Clients

## Finding

Sixty households were reviewed for an overall house score, between 1 and 5. Thirty households had microbuild loans and thirty were selected from proximity to a microbuild household. On average, the non-microbuild homes score slightly higher (3.61 compared to 3.55).

Scope	MB Client	N	Mean	Std. Deviation
Overall House	Y	30	3.5511	.34044
	N	30	3.6156	.32949

## Conclusion

The difference was not found to be statistically significant, (p-value .458). Therefore, the difference between the samples cannot be attributed to the independent variable (microbuild loans). In other words, the results suggest the microbuild loan did not affect the overall house score.

# Hypothesis 2: Improvement Comparison between MB Clients and Non-MB Clients

## Finding

Thirty non-MB households were surveyed, but only twenty had recent improvements. Therefore, the non-MB clients sample size is twenty for hypothesis 2. Similar to hypothesis 1, in all four categories, the non-MB homes had a slightly higher mean. However, it is worth noting that in all cases the standard deviation scores for the non-MB homes were higher than the MB-homes

Scope	MB Client	N	Mean	Std. Deviation
Improvement Materials	Y	30	3.8462	.35788
	N	20	3.8774	.51930
Improvement Quality	Y	30	3.7115	.38098
	N	20	3.7984	.53081
Improvement Condition	Y	30	3.9353	.32355
	N	20	4.0417	.41048
Improvement Score	Y	30	3.7630	.34525
	N	20	3.8709	.48055

## Conclusion

In all four cases, the differences were not found to be statistically significant. The closest was condition and overall improvement score (p-value .337 and .393 respectively). Therefore, in all cases, the differences between the samples cannot be attributed to the independent variable (microbuild loans). In other words, the results suggest the microbuild loan did not affect each components' scores.

# Hypothesis 3: MB Clients' Improvement Compared to Non-MB Clients' Overall House

## Finding

This hypothesis compares MB clients improvement scores (used in hypothesis 2) and non-MB household's overall score (used in hypothesis 1). Both samples had a size of 30 households. On average, the MB improvement score was higher than the non-MB overall house score (3.76 compared to 3.61).

Scope	MB Client	N	Mean	Std. Deviation
MB Improve vs. Non-MB overall	Y	30	3.7630	.34525
	N	30	3.6156	.32949

## Conclusion

The difference was not found to be statistically significant, although it was the closest compared to the other hypotheses (p-value .118). Therefore, the results suggest the microbuild loan did not create a quality in the MB-improvements above the non-MB homes overall quality.

# Hypothesis 4: MB client improvement vs overall housing quality of MB Client

## Finding

The hypothesis compares MB clients' improvement scores (used in hypothesis 2) and MB household's overall score (used in hypothesis 1). Both samples had a size of 30 households. On average, the MB improvement score was higher than the MB overall house score (3.76 compared to 3.55).

Scope	MB Client	N	Mean	Std. Deviation
MB Improve vs. Over all MB Improvement	Y	30	3.7630	.34525
	Y	30	3.5511	.34044

## Conclusion

The .212 mean difference between the score did reveal a statistically significant result (p-value .002). Therefore, we can assume a causal effect on quality of the MB-improvement compared to the existing quality in the MB clients' homes. While this is promising, the confidence interval for the difference in quality scores (.0856-.3449) is only a 2.5% to 9.7% improvement above their overall house score

## Field Observations & Limitations

- Having HMF is not an indicator of economic capability. Non-MB households can be better off and may have access to more institutional lending sources (banks) or can be worse off, not able to meet requirements for MFI loans either. This could help explain why MB financed quality was not found to be consistently better or worse than non-MB financed construction—some cases were better, some cases were worse.
- On a household level, quality of improvement was related to quality of other conditions (construction completed more than 3 years ago). For instance, families that were found to have better other conditions generally also had better quality improvements. Several reasons for this could be access to technical capacity and/or access to financial resources. Unfortunately, the survey did not ask questions which would help determine the causes of them using better construction practices.
- Many of the improvements surveyed were new houses for younger families who were currently living with relatives. Thus the new houses were not being built to replace older houses in poor condition, but rather to expand housing capacity. This might help explain why the difference between old construction and new construction was negligible.

## Continued

**HQA Tool** The survey tool developed uses a scoring guide to try to keep scoring consistent across the contexts of different countries, which will allow comparison between the different contexts in the future. The scoring guide requires best construction practices for scores of 4 or higher—this includes multi-hazard resistant construction—to have lateral reinforcement and strong connections. At an average, an interview would require between 15 to 20 minutes.

**Sample Selection** While the partner MFI can assist with arranging interviews with existing HMF clients, it was difficult for them to arrange non-HMF clients from the communities surveyed. As an alternate, the HMF clients in the field were requested for introduction with non-HMF clients, which helped building trust and allowing a unfamiliar enumerator to evaluate housing condition of non-HMF client.

**Enumerator** for HQA has to be a person having engineering / architecture background to be able to evaluate the quality of construction. A guide has been prepared with the tool to provide necessary understanding to enumerators on scoring system and survey tool application.

**Field Interview** A considerable time was used to commute from one client to another. It required 5 days to interview 60 clients. Due to this limitation, it is recommended to use local enumerator to reduce logistic cost.

## Conclusion & Next steps

1. While the first three tested hypothesis suggest that the housing loans through MB partners may not have directly impacted the overall quality of housing construction, it can be concluded that the loans may have helped in bridging the financial gap for MFI clients which resulted in them having similar quality of home improvement when compared to non-HMF clients. However, comparing the quality of MB improvement versus non MB improvement in the same house, MB investment proved to have a better quality.
2. For impact evaluation, a hypothesis comparing the quality of improvement of MB client with the quality of construction not financed by MFI of the same house seems to be the most relevant. This may also assist in reducing the sample, where non clients may not be interviewed.
3. TCIS-AP also plans to test the HQA approach in Cambodia in 2017, using a local engineer.

# Annex – Construction Observations

Earthquakes and cyclones are not considered to be major hazards in Sri Lanka thus construction very rarely included adequate multi-hazard structural elements—while many houses did include lintel beams, most houses:

1. Lacked steel reinforcement in the foundations
2. Lacked anchors tying the walls to the foundations
3. Lacked lateral reinforcement in the walls or ring beams at the top of walls
4. Lacked safer roof structures using trusses to eliminate lateral loading, lacked sufficient anchorage to the walls; instead they often used rafters that transmit lateral loads to the unreinforced tops of the exterior walls or truss like structures without sufficient bracing focusing most of the load in one place which could cause the member to fail.
5. Utilized heavy masonry gable infill without using methods to adequately anchor these materials in place.

Cement Asbestos roof sheets are common and are legal to be produced locally until the end of 2018. There is no safer Fiber Cement alternative available in the market, thus while people said that they knew the material was hazardous, many continued to use it because of its lower cost and lower probability of leakage (larger sheets mean less joints where water can get it, also it is fastened down unlike clay tiles that can be shifted by strong winds or animals such as monkeys or birds).