SELF CONSTRUCTION

Enabling safe and affordable housing in India

mHS

micro Home Solutions

Supported by

Michael & Susan Dell FOUNDATION

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Published by
micro Home Solutions
C-35 Pamposh Enclave
New Delhi 110048, INDIA

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Executive Summary

The urban opportunity

India is now on the brink of exponential urban growth. The urban population is on a path to nearly double from 340 million in 2010 to 590 million by 2030. Indian cities are vibrant centers of growth that provide employment and offer the vision of a better quality of life for millions of Indians. This urban growth, if managed properly, can be seen as India's greatest opportunity to make a meaningful impact on poverty and for the country to truly embark on socially inclusive growth.

However, urban India is underprepared for this rapid rate of growth, which places immense pressure on space and infrastructure. As a result, whilst the urban poor may be better off with respect to economic security, they live in increasingly sub-standard conditions, without access to basic amenities and in poorer health than their rural counterparts.

Many low income settlements, like this resettlement colony at Mangolpuri, Delhi are expanding vertically at a rapid pace

The urban housing challenge

India's expanding cities have been unable to meet the rapidly growing demand for housing, especially from its low-income population. Official estimates from The Ministry of Housing and Urban Poverty alleviation indicate that urban India has a housing shortage of 24.7 million units. Over 90% of this demand comes from the economically weaker sections (EWS) and low-income groups (LIG). Solving this urban housing challenge is an essential part of building socially inclusive cities in India.

At mHS, we strongly believe that the urban poor need to be offered a more diverse portfolio of housing solutions. The options need to take into account the variety of circumstances in which they live, from varying incomes, to family sizes, to place of work and desired level of flexibility and transience. These may include night shelters, dormitories, rental housing units, and a greater ability to upgrade their current living space.

Self-construction: An opportunity to develop low-income housing in existing settlements

The majority of India's urban poor live in low-income settlements that vary hugely in terms of their legal status and access to amenities. In these low-income settlements, families have nowhere else to expand their homes and are adding second and third floors to their single story dwellings.

This type of self-construction (also referred to as "incremental housing", "self-build" and "home improvement") is defined in this report as a process in which the homeowner is closely involved in every aspect of building, extending or refurbishing his unit, by undertaking the building work himself or by contracting a mason under close supervision. Self-construction is not usually guided by safety design standards or building norms and is influenced by word- of-mouth and informal knowledge of construction practices and technology.

Self-construction is rampant across all low-income settlement types and is where a large stock of affordable housing and rental housing is being made available in comparison to the new developments. The self-construction process works with the poor to upgrade their living situation in communities where they are already rooted and feel comfortable. It supports a thriving local construction industry that provides significant employment for the community, either as masons, laborers, or material suppliers. And perhaps most importantly, it is fundamentally self-led, which maintains dignity and personal choice.

At mHS, believe that enabling safe and affordable incremental self-construction in existing settlements is an untapped opportunity to increase the quantity and quality of low-income housing.

A status quo situation

While self-construction fulfills an important need for the supply of low-income housing, critical aspects like safety and health are ignored. At the same time, many families are unable to build because they do not have access to finance.

a. Access to construction finance

Construction is expensive and families are investing from Rs 25,000 (USD 670) for minor repairs to over Rs 500,000 (USD 11,345) for multi story rooms. However, most families do not qualify for formal loans, especially if they have temporary or no tenure over their land. As a result they either borrow from friends and family or they must rely on a moneylender at exorbitant rates, with the risk of losing their homes if they are unable to pay.

b. Access to safe and quality construction

Even if finance is secured, a multitude of challenges await during the construction process. Self-construction in India is an informal and self-led process, where design and technical expertise are dependent on local knowledge. The local mason is the cornerstone of the self-construction process—he plays the role of architect, builder, engineer, contractor, and in some cases of the materials supplier. Yet he typically has little to no formal training. As a result, without access to professional technical assistance, unsound structures are built that put the family in danger in case of natural disasters, heavy rains and require them to spend even more money on maintenance. Furthermore, with little light or ventilation, these homes often do not meet basic requirements for health and hygiene.

The DHS concept to improve self-construction

micro Home Solutions (mHS) therefore conceptualized Design Home Solutions (DHS) as a product that combines an affordable home construction financing with customized technical and design assistance, thus enabling safe self-construction. The households pay a technical assistance fee to avail the services.

The DHS pilot project

In the fall of 2009, mHS set out to test DHS on ground. The primary goal of the pilot was to design and test a service that enables the homeowners to build structurally sound homes. By testing our theory on the ground, we hoped to:

a) Demonstrate a meaningful impact on the low-income client and begin to identify a path to scale
b) Learn about the nature of the market, especially the customer's receptivity and preferences

The lessons from the pilot were vast and varied. Any effort to influence the design needs to cater to the household's priority to maximize space and minimize costs. Therefore, any attempt like DHS to meaningfully influence self construction must cost the same or less than constructing the home without DHS, while adding substantial value in terms of design, usage of space, etc. Innovative and practical technical solutions that can be implemented in this scenario are key.

We also learned that a qualified mason is the most important part of the construction process, and it is essential to engage him more actively in the construction processes and increase his skills. Similarly, the role of other stakeholders in the process like material suppliers also needs to be leveraged.

Finally, site monitoring needs to be outsourced to competent local engineering teams. This will ensure economies of scale and operational viability for the project.

We completed the DHS pilot sobered, energized, and committed to build on the lessons and move into a second phase to test out the new technical design as well as an improved and efficient delivery mechanism.

The market study

We are convinced that there is not only a larger than expected opportunity to meaningfully improve the self-construction process, but especially given the lack of any law or regulation, there is a social obligation to intervene in a responsible way. Yet many stakeholders who are beginning to see the potential that lies in this market underestimate the risks associated with providing cheaper finance without providing the homeowner the means to build safe homes.

mHS commissioned a survey of 1500 households in three resettlement colonies in Delhi to study the self construction market. The survey demonstrated that the demand for housing construction and finance is even larger than expected—in fact, the majority of families who are indebted are so for housing related purposes.

According to our estimates, there is the potential to add at least 350,000 more low-income units through self-construction in Delhi's resettlement colonies alone. Given the variety of self-construction needs and challenges, it is not difficult to imagine the ways in which many different stakeholders could intervene. While financing institutions will be the first to take advantage of this business opportunity, other stakeholders will also have roles to play in order to enhance livelihood security, improve security of tenure through policy interventions and invest in research and development that will improve the quality of construction.

The way forward

Enabling the self-construction process is a way to rapidly increase the supply of low-income housing in cities.

DHS is essentially a market-based approach to increase the supply of low-income housing. However, big questions remain on how to best scale up DHS. It will probably be done through partnerships between various private sector players with support from the government, especially in facilitating the appropriate regulatory environment that will mandate financial institutions to be pro-actively involved in financing technically sound construction.

Acknowledgements

We would like to acknowledge and extend our sincere thanks and gratitude to the following persons and organizations that contributed immensely to the experiences in the pilot project and have made the completion of this report possible:

Anoop Kaul, Financial Inclusion Head of BASIX who has been our mentor and the project's staunch supporter since its inception.

Ranjana Ray at the Dr. AV Baliga Trust who openly extended the trust's offices and team in Mangolpuri and provided outreach to their community members.

Professor Jurina and his team for pro-bono architectural and engineering advise. The studio took on the challenge develop an innovative solution that has promise to be a winner with the low-income home owners and our future clients.

Engineer Albertini and his office in Italy provided our first structural engineering solutions adopted in the pilot project.

Kanhu Pradhan, Researcher at Centre for Policy Research for providing quick and ever ready support with data analysis.

Gayatri Singh, PhD candidate in Sociology at Brown University for assisting in developing the socio-economic survey material.

Our friends, Matias and Rahul Srivastava from Urbanology for conducting the exciting and intense week-long evaluation of the pilot. Their insights that will influence the future shape of the concept.

Bijal Bhatt from Mahila Housing Trust (MHT) for the opportunity to conduct the study "Re-thinking Resettlement colonies" in Savda Ghevra that enabled us to do a deep dive into lives and livelihoods of this community's residents.

Ellen Chen from Berkely University for her work on this study

Salil Payappilly, Yale School of Management and his team for working hard and patiently with us on developing the DHS operational model. The YALE SOM Global Social Enterprise program that gave us the opportunity to present our work both in New Haven and Mumbai and workshop participants that provided honest and constructive feedback.

Alberto Mazza for developing our graphic design material and assisting with the technical section of this report.

Ambika Behal, journalist at Bloomberg, HK for timely and critical editing support.

Interns and volunteers Jan Davis Dentz from The Netherlands; Karan Nagpal from St. Stephen's College; Varun Mann from Sushant School of Architecture; Susan and Jorge Colon from Graduate School of Design, Harvard University; Aditi Sen from Cornell University and Suniti Thapa from Harvard University for time for assisting with field visits, process documentation, research and analysis.

Henri Fanthome, Tej Dhami and Ravneet Mann, friends who spent time with mHS during our start up phase and contributed to the work on DHS.

Finally and most importantly, the Michael and Susan Dell Foundation (MSDF) for sponsoring a young and eager team to take the self-construction concept from an idea to an on-the-ground reality!

Project Scope

This report is the culmination of an Action Research Project funded by the Michael and Susan Dell Foundation (MSDF) and carried out by micro Home Solutions (mHS).

mHS thesis on the home improvement market

In thousands of slums and unauthorized settlements across urban India, incremental construction is already rampant. Low-income families are spending hard-earned money adding a second floor to their single story dwellings or retrofitting their homes. mHS saw an opportunity to influence the incremental construction market in a unique manner.

Harnessing the outreach of micro housing finance with technical design assistance can empower slum dwellers not only to improve their housing structure but also their living conditions. Converting the home from a place of shelter into an asset will help them achieve livelihood security over the course of their lives. In addition the expansion of new living spaces will, in many cases, add to the stock of low cost rental housing providing shelter options for greater numbers of the urban poor.

To this end, Design Home Solutions (DHS) was conceptualized my mHS to offer low-income housing solutions to address the dual needs of finance and access to high quality construction/design practices in an attempt to tap the incremental housing market.

Objective

To explore the overall market opportunity for DHS in settlements housing the urban poor

Scope of work

The action research project was intended to be a comprehensive assessment of the incremental construction market within low-income urban communities. The study was designed to examine the positive impact a well functioning market could have on the immediate community and how this could be used to address longer term issues of urbanization and housing for the poor. All market drivers including issues around access to finance and the provision of technical design assistance were part of the scope of study.

Simultaneously, a pilot project was implemented to test the DHS concept as developed by mHS.

Consequently there are three components to this Scope of Work:

i. Home Improvement (Incremental housing) Market Research
ii. Sustainable Design and Architectural Research
iii. Pilot Project

I. Self-construction market research

mHS approach to the self-construction market is in its proof of concept stage and requires further study and analysis. The project enabled mHS to undertake a more in-depth study of the market. The field research was undertaken in three locations in Delhi (Mangolpuri, Narela/Holombi Kalan and Savda Ghevra) and covered the following:

- Review of similar efforts, understanding models and experiences in the incremental construction market
- Deeper understanding of urban low income market for home upgradation, highlighting the needs, opportunities and challenges
- Detailed analysis of the specifics of the chosen locations:
  - Socio-economic survey: Providing data on income levels, livelihoods, legal documentation, living practices, rental options, common health problems, housing related expenditure on improvements, maintenance and access to basic services amongst other things.
  - Access to finance: Current availability including analysis of both formal and informal sources of housing finance and technical assistance, including terms, pricing and the nature of the decision making processes

- Access to basic services: Availability and access to water,electricity, waste disposal, sewage etc.
- Self-construction needs: Develop categories which may include number of households requiring 1 room, 1 floor, 2 floor or simply strengthening of the existing structure

- Stakeholder mapping: Detail the stakeholders and their roles including local government, community based organizations, masons, contractors & others functions and services existing or required for a successful home-improvement market.

Ii. Sustainable design and architectural research

Based on a broader research and analysis of upgradation of informal settlement and similar efforts by international agencies, government, communities etc, mHS worked with sector experts to research appropriate, low-cost and sustainable housing solutions. The study mapped and documented current techniques and processes adopted by communities in self-construction practices and listed key issues in housing and infrastructure.

The end-result has been the development of a technical solutions based on localized R&D effort in Magolpuri.

Iii. Pilot project

In this phase, mHS acted project managers by facilitating the partnerships with financial institutions and involving local civil society organizations. The value-proposition for the financial institutions partnering with mHS has been: responsible lending through an integrated product offering, technical assistance and monitoring, efficient use of funds and overall reduction in project risk.

For the pilot, mHS partnered with a microfinance institution (BSFL) to provide access to finance to interested households and informally worked with a local NGO, Dr. AV Baliga Trust, for the purposes of community mobilization, education and awareness, introduction to clients, data collection and other facilitation support.

The pilot was undertaken in selected blocks in Mangolpuri and covered approximately 20 households over 6 months to test the overall off-take of the product as well as an evaluation of the qualitative impact of technical assistance on the customers, households and their living standards:

- Demand and product efficacy
- Pricing and product design adoption
- Cost of delivery services & feasibility plan
- Intended impact of home-improvements on poor families

Intended impact

We believe this work could have a significant impact on creating a market for self-construction and the influence influence key stakeholders on a new approach to low-income housing

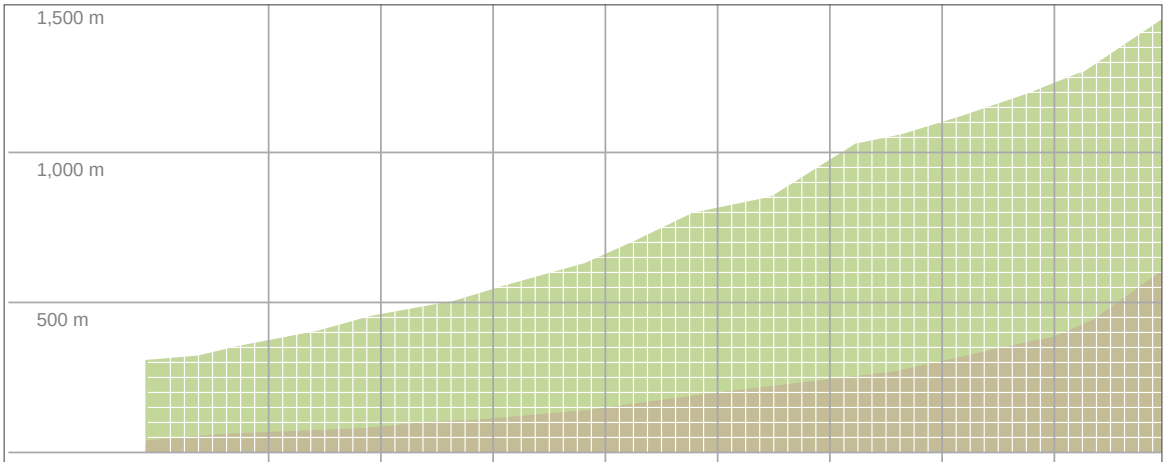
1. **Opportunity:** Report on the self-construction market will be an invaluable tool in encouraging greater participation in the home financing market and highlight the necessity of design assistance in bringing improved self-construction practices
2. **Solutions:** Comprehensive report on innovations in structural design and safety will benefit other communities and institutions active in these spheres
3. **Impact:** The families that participated in the pilot and got access to home-improvement finance will see a marked improvement in their living conditions through better ventilation, efficiency in use of space, greater privacy, reduced overcrowding, and better hygiene and sanitation conditions amongst others
4. **Influence:** Demonstrate the role of informal rental housing for poor households as a service that must be harnessed and formalized to supply one of urban India's most pressing needs; low-cost rental housing.
5. **Leverage:** Highlight the value of self-construction and its impact on poor households to policymakers and implementing bodies in government. This is to enable a favorable legal and regulatory environment and ensure appropriate investment in upgrading of common infrastructure such as sewage, roads, playgrounds, and schools and to encourage management through participation of community organizations.

1 Urbanization an opportunity
Improving lives of the urban poor

India's cities are vibrant centers of growth that provide employment and offer the vision of a better life for millions. As urban areas take center-stage in India's economy, we believe cities can play a major role in India's strategy for alleviating poverty and addressing the needs of the poor. Cities are effective in addressing poverty by developing the capacity to extend services and better living conditions to the urban poor in a more effective manner than in a more geographically dispersed rural context. However, cities are underprepared to cater to the rapid rate of population growth, and thus the influx of economic migrants into India's urban centers[1] has placed immense pressure on land, basic services and infrastructure, resulting in large-scale urban poverty[2]. In 2004-05, 80.8 million people—roughly 25.7 % of the country's urban population—lived below the poverty line and were identified as 'urban poor'. Another 40-45 million urban residents were on the periphery of the poverty line and faced the same issues of deprivation and uncertainty[3]. With these trends, India's poverty is making a shift from being a rural to an urban phenomenon. There is sufficient evidence to suggest that whilst the urban poor may be better off, with respect to economic security, they live in increasingly sub-standard conditions, without access to basic amenities, and in poorer health than their rural counterparts.

In all the talk about making Indian cities world-class, the emphasis is largely on developing infrastructure to attract the right kind of businesses and investment. However, making cities socially inclusive is equally important. Non-inclusive cities are unsustainable from both economic and social standpoints, and will ultimately become uncompetitive and unattractive to people and businesses. A part of this is a call for a more concerted effort to raise the standard of living of underprivileged urban dwellers and integrate them into the city's social fabric.

India : Urban and rural population growth



	1950	1960	1970	1980	1990	2000	2010	2020	2030
Rural	298,5 m	360,3 m	439,0 m	523,8 m	625,5 m	742,5 m	845,8 m	947,6 m	814,0 m
Urban Total	62,5 m	78,9 m	109,1 m	159,5 m	220,9 m	286,1 m	357,9 m	432,6 m	586,0 m
National Total	**62,5 m**	**439,2 m**	**548,1 m**	**683,3 m**	**846,4 m**	**1028,6 m**	**1203,7 m**	**1380,2 m**	**1400,0 m**

Source: Census 2001

India's rapid urbanization represents an opportunity to address the problems of the urban poor, among which housing is a major concern

A glaring shortage of low-income housing

Official estimates from The Ministry of Housing and Urban Poverty Alleviation indicates the housing shortage in urban India at 24.7 million housing units. Over 90% of this demand comes from the economically weaker section (EWS) and low-income group (LIG)4. Unofficial sources5 place the deficit at about 40 million, growing at 10% each year.

Where do the urban poor live

The explosive growth of slums and informal settlements

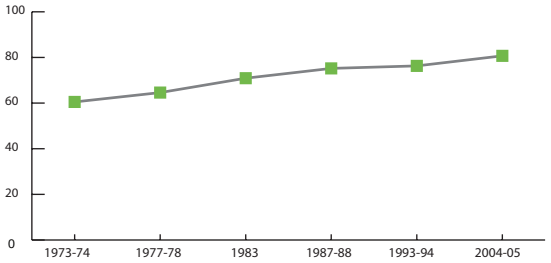
With inadequate growth in the housing stock in Indian cities and no planned spaces for the urban poor, squatter and slum settlements in the city's interstitial spaces have become their default dwelling areas. While India is urbanizing at a rate of about 3% a year, India's cities are urbanizing at 4% and slums[6] are growing at 5% per year.

It is estimated that we are adding 4.4 million people to slums every year[7] and UN-HABITAT projects that 202 million Indians will live in slums by 2020. However, the number of official slums actually fell from 56,000 in 1993 to 52,000 in 2002, clearly showing increased density and overcrowding.

- *Urban centers are taking center-stage in India's economy*
- *Will provide 70% of all new jobs in the country by 2030*
- *Will account for 70% of India's GDP by 2030*

Source: 'India's urban awakening: Building inclusive cities, sustaining economic growth'; McKinsey Global Institute; April 2010

Trends in urban poverty



Source: National Urban Poverty Reduction Strategy, OP Mathur, 2009

The urban poor are a significant and growing population. Their quest for a better life needs to be addressed by making cities more inclusive and offering them a better quality of life.

Beyond infrastructure and aesthetics Indian cities, like Mumbai, need to place inclusiveness high on their agenda

Although definitions of slums vary, Census 2001 reported that 640 towns in the country spread over 26 states and union territories reported the presence of slums. Slums are, therefore, not just a phenomenon in metropolitan[8] cities, but also a widespread feature in cities regardless of their size.

At least as many live outside officially designated slums, in other types of unauthorized settlements. Studies suggest[9] that significant numbers of the urban poor live in non-slum areas and point out that although "there is an obvious need to improve living conditions and the health of slum dwellers, it is equally apparent that programs that focus solely on slum areas will not be able to address the urgent needs of the large poor population not living in slums."

In Delhi's National Capital Territory (NCT), which is the geographical area for the purpose of this study, accommodating the urban poor has been a bitter struggle. Perhaps more so in Delhi than in other Indian cities because of its status as the nation's capital, where the city's image—an external appearance of a beautiful and ordered urban landscape—is so important to the city's political class and residents. Despite a fall in decade-to-decade growth shown for the first time[10], Delhi NCT has a growing population of 16.75 million. Delhi will continue to face the enormous challenge of accommodating its existing population while dealing with an influx of migrants each year.

In Delhi 15.72% of the city's population was living in areas identified by the government as slums[11]. However, figures indicate that the vast majority of Delhi's residents live in a wide variety of spaces ranging from squatter settlements in interstitial spaces to more urban and rural villages to unauthorized colonies, which

Slum population and city size

City size	Number of cities and towns	Slum population	% of total
above 4 million	5	11.06	26
2-4 million	8	3.76	8.8
1-2 million	14	2.88	6.8
500,000 to 1 million	42	5.81	13.7
100,000-500,000	309	13.94	32.7
less than 100,000	262	5.13	12
Total	**640**	**42.58**	**100**

Source: Census 2001

The mid-sized towns with population between 100,000 and 1 million have the largest slum population

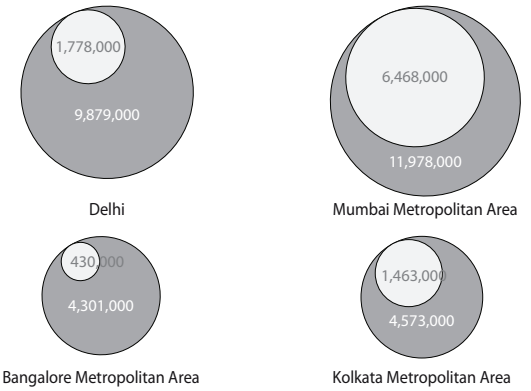
Delhi Snapshot Census 2011

Total population	16,753,235
Population growth during 2001-2011	**20.96%**
Density of population (perons per square kilometre)	**11,297**
Sex ratio	**866**
Literates	**86.34%**
Population in age group 0-6	**11.76%**

Source: Census 2001

The Delhi NCT has grown substantially in population and is facing the challenges of accomodating a growing density of people in the given space and infrastructure

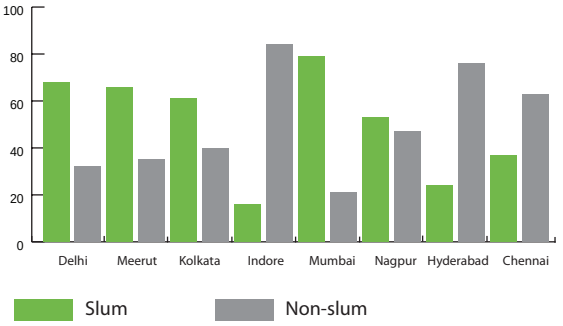
Urban And Slum Population In 4 Indian Cities



Source: Census 2001

A significant percentage of people in India's major cities live in slums, while many more live in slum-like conditions in settlements categorized differently

Distribution of poor in slum and non-slum areas in selected cities, 2005-06



Source: Health and Living Conditions in 8 Indian Cities, NFHS-3, 2005-06

Besides slums, the urban poor live in a variety of other informal settlements that need to be considered while finding housing solutions for this segment of the population

are plotted developments raised on agricultural land where residential land use is currently illegal. These settlements, while being poorly planned and with inadequate civic amenities and basic services to the city's poor are home to a majority of low income households, offering cheap rental accommodation, and serving a market not addressed by government or formal private players.

These typologies are also significant in terms of their legal status. The Municipal Corporation of Delhi (MCD) brought several slums under its purview and provided some basic services; these became *Jhuggi Jhopri*[12] (JJ) clusters. As residents become significant political constituents of Delhi, illegal colonies go through a process of becoming legal. Colonies where the urban poor live in Delhi today are in varying stages of legal sanction from unauthorized to notified (to become authorized) to authorized.

How do the urban poor live

Inadequate basic services, lack of livelihood

The urban poor, who live in slums and other informal settlements, face several issues:

- Livelihoods from informal sector: Amongst the poorest daily wage earners, lack of regular employment is a common problem
- Unsafe and unsecure lives: No safe places to live, lack of tenure, threat of eviction
- Unhygienic conditions impact health directly: Crowding, limited access to water and sanitation, inadequate light and ventilation, poor design and lack of planning of the settlements, with interventions in the form of rare one-time upgradation drives[13]

Densely populated low- and mixed-income settlements dot the landscape of India's capital city

These circumstances form a vicious cycle of poverty that further reduces chances of improving the lives of Delhi's underprivileged residents. Economic insecurity and tenure conditions mean that the urban poor have no access to financing for formal housing.

The level of income and livelihood security of the urban poor seems to have a relationship to the type of housing they find in the city. The poorest who work on day-to-day wages live on the streets and use night shelters—of which there are precious few. Those who earn small, but steady, daily incomes working as security guards or skilled factory workers can afford to live (renting or buying plots) in unauthorized colonies, urban villages or slums.

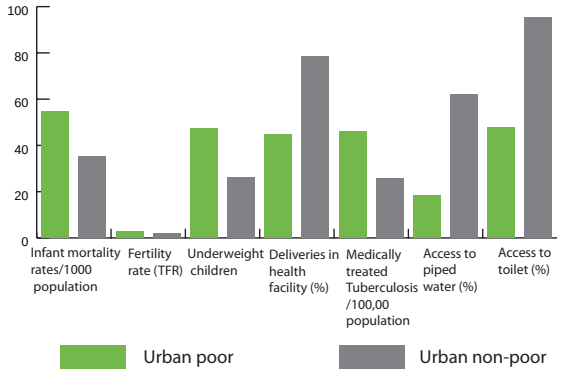
Delhi population distribution by type of settlement

Type of settlement	Approximate population in millions, 2001-Delhi	Definition of settlement type (mHS research)
JJ Clusters	2.07	Slums as identified by the MCD
Slum designated areas	2.66	Areas where living conditions are slum-like
Unauthorized colonies	0.74	Plotted on agricultural land, land use illegal
Resettlement colonies	1.77	Areas where slum dwellers from demolished slums were resettled over time by the government
Rural villages	0.74	Peripheral rural areas
Regularized-unauthorized colonies	1.77	Erstwhile unauthorized colonies that has been legalized due to provision of adequate services over time, political will and development work
Urban villages	0.88	Villages that lie within the inner city and have been identified as such
Planned colonies	3.31	Plotted housing developments

Source: DUEIIP-2021

The majority of the city's population lives in areas where planning is poor and basic amenities and civic services are piecemeal

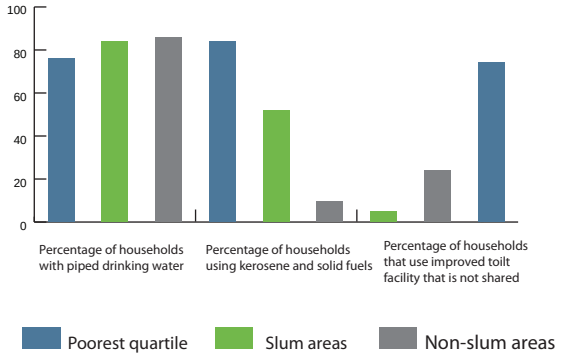
Living conditions of the urban poor vs urban non-poor



Compared to the non-poor population in India's cities, the urban poor exhibit dismal health indicators owing to poor amenities

Source: Ministry of Health, Health of the Urban Poor in India (Results from the National Family Health Survey 2005-2006)

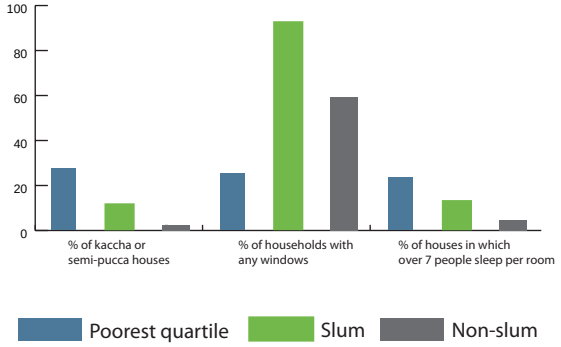
Living conditions of urban poor in Delhi



Though non-slum areas like resettlement colonies have marginally better amenities, Delhi's urban poor still struggle to maintain a decent standard of living

Source:Health and Living Conditions in 8 Indian Cities, NFHS-3, 2005-06

Housing conditions among Delhi's urban poor



Even in India's capital city, the poor live in badly built, crowded homes, with poor ventilation

Source:Health and Living Conditions in 8 Indian Cities, NFHS-3, 2005-06

Housing is critical to raise the living standards of the underserved

A report by the Planning Commission14 predicts the widespread increase of slums at faster rates, and strongly prescribes corrective action. The report warns, "serious crippling of the productive capacities of a growing number of people by the denial of basic services, shelter and security, increasing inequity and retarding the GDP potential of urban areas. Given the relentless growth of urban population and the difficult economic environment for the poor, the housing problem will further worsen unless concerted measures are taken to ameliorate the living conditions of vast majority of vulnerable sections of the society i.e. the slum dwellers/urban poor." The report also draws a direct relationship between the country's economic growth (which is increasingly dependent on its urban areas) and the need to provide the urban poor with decent housing. "If urbanization has to act as a positive force in economic development, we should avoid the past mistakes and aim at an urban and regional planning system that is inclusive and does not exclude the poor and the informal sector."

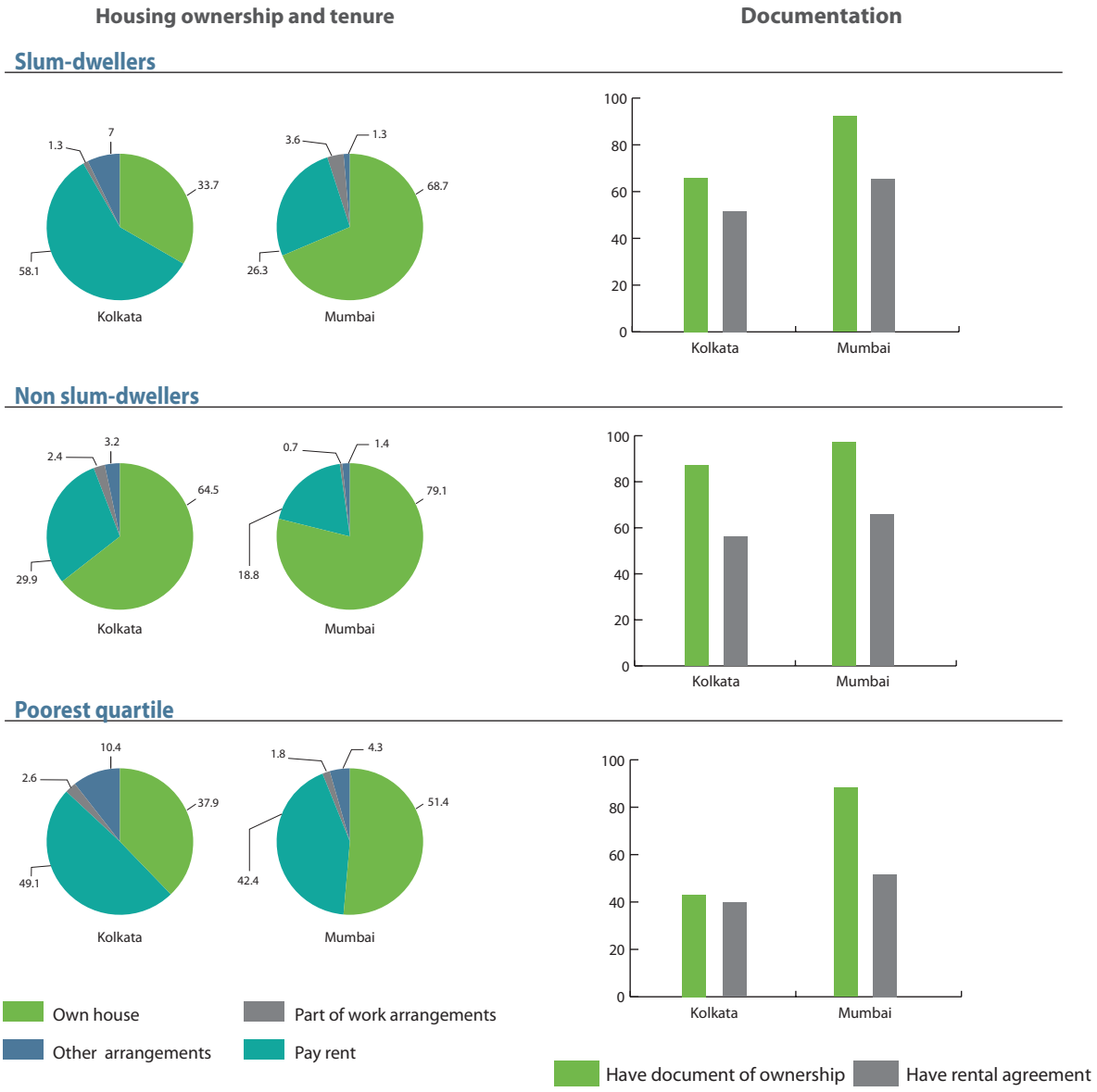
How do we create housing supply for the urban poor

Current thoughts and practices

The glaring gap in supply and demand is evident to both the public, private and civil society stakeholders.

The Government of India has recognized housing for the urban poor as an urgent issue to be addressed and has attempted to do so in a variety of ways. The central government is largely pushing funding towards

The majority of the urban poor live in unhealthy living conditions with sub-standard housing



Source: Health and Living Conditions in 8 Indian Cities, NFHS-3, 2005-06

the states and offering a direction in terms of policy. Though the schemes have achieved varying success, the policy initiatives have merely scratched the surface of this large market. Besides the problems with implementation, the government has made little attempt to look at the low-income housing market as an entity beyond the arithmetic of demand and supply. Government policies have been typically short-sighted and aimed at solving the problem by focusing on home ownership and security of tenure. However, the urban poor have a variety of aspirations and are a vital component of urban economies. Moreover, the needs of a migrant construction worker are very different from that of a working-class low income family. There needs to be, therefore, a long-term vision of inclusiveness that provides a larger portfolio of appropriate solutions to house the urban poor.

The need for a complementary effort from the private sector is obvious. However, the private sector is unable to meet the demand, especially in the EWS category. The chief incentive for the private sector to build af-

Government programs to boost low-income housing

National Urban Housing and Habitat Policy, 2007: *This is the guiding document behind the government's policies to provide affordable housing and looks at measures like reserving 10-15% land and 20-25% FAR[15] in housing projects for low-income homes. It emphasizes creation of opportunities for the private sector to assemble land within the purview of master plans and asks state governments to prepare a 10-year perspective plan for EWS and LIG housing as well as a Habitat Infrastructure Action Plan for all cities with a population of over 100,000.*

As per the policy, housing for the urban poor should be provided at their present locations or near their work-places. In-situ rehabilitation is preferred; in contrast to the Delhi government's resettlement efforts that continue to take place, even today. Additionally, providing access to finance through micro finance institutions and the creation of detailed surveys and maps are also part of the policy. Many of these principles have been part-realized in subsequent reform efforts, to varying levels of success. The implementation of the more challenging aspects of the policy is yet to be seen.

Jawaharlal Nehru National Urban Renewal Mission (JNNURM): *Launched in 2005 with the mission to invest in citywide infrastructure, the scheme is soon to complete its first 7-year phase. The program offered funding from the central government to worthy projects in 65 cities across India under a sub-mission called Basic Services to the Urban Poor (BSUP). Another sub-mission named Integrated Housing and Slum Development Programme (IHSDP) extended to a larger network of cities and towns.*

Number of housing units sanctioned and under construction under JNNURM by 2010

	Position as on 30th June 2010		Position as on 30th September 2010	
	BSUP	IHSDP	BSUP	IHSDP
Sanctioned	1022689	502935	1028503	512108
Completed	565001	225342	244247	96029
Under construction			33174	1339957

Source: JNNURN DMU Report 2010

Rajiv Awas Yojana (RAY): *With the President of India's call for a slum-free India by 2014, the central government is now preparing to launch a new policy that aims to achieve this ambitious vision. RAY is intended to bring existing slums within the formal system and provide them access to the same level of basic amenities as the rest of the city. RAY also looks at taking corrective measures to rectify the failures of the formal system, by addressing the reasons for the creation of slums like shortage of urban land, tenure, etc. It will, for instance, support states to provide property rights to slum dwellers. A Central Electronic Registry to prevent frauds involving multiple lending on the same immovable property is also part of the scheme, which is yet to be finalized and implemented.*

Mortgage Guarantee Fund: *In alignment with RAY, the government announced the intention in the 2011-2012 budget to create a Mortgage Guarantee Fund for low-income housing. Floated jointly by the central and state governments with a corpus of Rs 10 billion (USD 224 million), the fund is intended to bridge the gap between supply (builders, lenders) and demand (low income households). The National Housing Bank, which regulated and supervises all Housing Finance Companies (HFCs), will administer the fund. Once in operation, HFCs will be able to give home loans for up to Rs 5 lakh to the low-income segment without third party guarantee and without fear of bad loans. A Rural Housing Fund with an allocation of Rs 300 million (USD 6 million) is also being discussed.*

ISHUP: *An Interest Subsidy Scheme for Housing the Urban Poor (ISHUP) offers a 5% interest subsidy on housing loans up to Rs 100,000 (USD 2240) to the EWS and LIG households for both home purchase and home construction.*

fordable housing is to avail income tax benefits under Section 80IB. These projects target the income group earning INR Rs 150,000-300,000 (USD 3100-6200) and range between 300 and 600 square feet (27 and 56 square meteres) in area. They are typically located an hour or two outside a metropolitan area. For example, Tata Housing's Shubha Griha project in Boisar is an hour from Mumbai's southern end. In 2010, the apartments were selling for Rs 400,000-650,000 (USD 8,400-13,600). According to government standards, urban residents from the EWS should have access to homes that are between 300 and 600 square feet, and cost no more than four times their annual income, a maximum of Rs 300,000 (USD 6200). The apartments delivered by the private sector under the affordable tag are clearly unaffordable for the majority of the urban poor, who fall in this EWS category. Some of this supply does meet the needs of urban residents from the LIG and above, who should be entitled to homes that are 1200 square feet in size and cost no more than five times their income, a maximum of Rs 840,000 (USD 17,500).[16]

Despite the widespread discussion recognizing the mass market opportunity for low income housing and several estimates around the market size for affordable housing, there have been a handful of innovative and practical solutions for the private sector to directly supply housing to low-income households.

A 2009 study undertaken during the financial crisis[17] got many private sector developers interested when it estimated the demand for affordable housing to be over 2 million units by 2011. The study, however, pointed out that though families with an annual income of Rs 300,000-1,000,000 (equivalent to USD 6700-22,300) would fuel the demand, the largest contributors would be those earning Rs 300,000-600,000 (equivalent to USD 6700-13,500) a year. Other reports show similar trends. While the market is large, the definition of affordable is uncertain. What is also lacking is an understanding of the real income levels of urban low-income families and their actual ability to pay. As a result, middle-income housing is often touted as low-income supply and the large part of the really LIG and EWS households are still struggling to put a roof over their heads.

After the economic revival, large developers are disinterested in building for the low-income groups as a commercial proposition, yet the small- and medium-sized developers continue to see low-income housing as a commercial prospect. They do, however, need assurance that low-income households will get housing loans. Apartments that cost up to Rs 320,000 (USD 7200) and are about 200-350 square feet in size are being planned and built. Monitor Inclusive Markets, a subset of Monitor Group, has mapped access to home loans to the low-income group and is involved in such projects across cities with the support of the National Housing Bank and the World Bank[18]. The efforts have influenced some players in the developer community, however the developments are at nascent stages and are far from meeting the large-scale need.

Household income levels in India

	2001	%	2010	%
Low income (Under INR 45,000/USD 950 per annum)	65.2	**34.60%**	**41**	**18.00%**
Middle income	109.2	**58.00%**	**140.7**	**61.60%**
High income (Above INR 180,000/USD 3800 per annum)	13.8	**7.30%**	**46.7**	**20.40%**
Total	188.2		**228.4**	

Source: NCAER

Number of Households (millions)

Housing is out of reach for a vast percentage of India's population

Moreover, the experience of working in the low-income housing sector shows that a high level of community engagement is key to finding successful solutions. This is corroborated by the recently released guidelines for RAY that emphasize community interaction and buy-in as the major pre-requisite to in-situ slum upgradation.[19] The need for intense community interaction impacts the cost and mode of delivery of projects and this has also inhibited private sector players. Moreover, the overall approach to low-income housing needs to be less dependent on subsidies and evolve a market-based approach that can be sustained in the long-term.

Green-field or slum rehabilitation dominate the current thought process

Opportunity hasn't translated into numbers

The majority of the current discussion on affordable housing in India is about how to increase the supply of low-income housing, focusing on creating green-field developments. The high cost and scarcity of urban land, especially in central locations where the urban poor would be able to find

livelihood is one issue. Another issue is the competing demand for uses for the same land; hotels, malls, offices and high-income housing. Third, a sound business model for the private sector to participate in has yet to emerge. Practically, therefore, the progress of developing green-field low-income projects has been tedious; slow and without government support, they have been forced to select housing locations in urban peripheries.

In addition, green-field housing does not take into account the sheer variety of circumstances the urban poor live in—uncertain and changing jobs, larger families, relationship with rural origins, repeated migration in search for new opportunities, for instance. These varying situations mean that families needs different types of housing. Thus far, many low-income families often are unable to access the green-field housing that is being built. At other times, schemes are built in outlying areas of the city with no public transport connectivity with the central areas where the poor need to travel to for jobs. Private developers are usually unable to offer homes in the under Rs 300,000 (USD 6,600) category. Their usual offerings are in the Rs 500,000-800,000 (USD 11,000-17,750) category and there is no mechanism or desire to prevent middle-income families from buying these for purposes of investment. Once again, the urban poor get pushed out of housing space intended for them.

Green-field housing offers little choice and is often located in suburban areas

The government push for slum rehabilitation is fraught with its own challenges. Eligibility criteria that take into account the year of migration, paying capacity and current location of the family often determine whether or not families will get an allocation under the government scheme. Further the Indian government has to offer attractive incentives to private sector to redevelop slums, including giving up precious land resources. The slum residents have also become sharp in the game, negotiating their way to get subsidized free housing in cities. Given the large scale and growing need for housing and shelter, offering free housing to a selected few is a zero sum game.

By the government's own admission, the public sector is not equipped to meet this huge demand and can only, at best, act as a facilitator. Public private partnership (PPP) is a buzzword, but workable models for realizing them are yet to be developed successfully and on a large scale.

It is clear that current efforts in affordable housing—no matter how appropriate and innovative—will never be able to create adequate supply to meet the demand for housing units for low-income groups. In the face of this overwhelming emphasis on green-field development and the above evident issues, mHS is determined to propose that the urban poor need to be offered a more diverse portfolio of housing solutions from which they can choose depending on their income, family size, place of work and a number of other factors. This would include night shelters, dormitories, rental housing units, apartments and the option of incremental construction over existing homes.

Therefore, while efforts to fund, innovate and realize green-field low-income housing need to continue,

other non-greenfield alternatives to increase supply need to be explored as well.

Opportunity to develop low-income housing in existing settlements

The majority of Delhi's urban poor (and this is true of other cities in India) live in already developed low-income settlements, which are at varying stages in terms of their legal status as well as the extent of amenities and basic services that exist.

In these low-income settlements that range from illegal to formal, self-construction is already rampant. Many families are adding a second and third floor to their single-story dwellings. Others are retrofitting their homes to add toilets and kitchens. Still others are tiling their facades to lend a better look to their homes. This form of self-construction is rampant across all low-income settlement types.

Low-income families aspire to live in pukka structures, those that are made of bricks and steel and are not likely to be blown away by the big-bad wolves of government and private corporations. The urban poor aim to have more space, access to urban amenities and therefore a better quality of life. The reasons for construction may be many—to be able to rent out higher floors, to accommodate a growing family or to be able to run a home enterprise or business—what's clear is that they are investing their hard earned money on improving their homes.

There could be an opportunity to impact the rampant self-construction market to provide quality housing to the urban poor

At mHS, we believe that self construction in existing settlements could be an opportunity to increase the quantity and perhaps influence the quality of low-income housing.

1. Some 20 million people migrated from rural to urban areas in the period 1991-2001
2. Urban poverty is understood as a state reflecting the inability of an individual to satisfy certain determined basic minimum needs, which consist of factors like calorie and associated food needs, corresponding expenditures, etc.
3. 'Slum-free cities'; Om Prakash Mathur, July 2009
4. EWS, as per the Government of India, implies families with incomes below Rs. 5,000 per month and LIG families have incomes between Rs. 5,001 to Rs. 10,000 per month.
5. UN Habitat (Source it)
6. In 2002, the United Nations operationally defined slums as communities characterized by insecure residential status, poor structural quality of housing, overcrowding, and inadequate access to safe water, sanitation, and other infrastructure (United Nations Human Settlements Program, 2003).
7. Estimated by Ministry of Urban Developement, GoI
8. Metropolitan cities usually include several jurisdictions and municipalities and are larger in area and population.
9. National Health Family Survey 2005-06
10. Census of India, Provisional Estimates 2011
11. According to the Census 2001
12. Hindi terms for slums and hutments
13. 'Urban Renewal, Policy and Response', M. Ramachandran, 2009
14. The Report of the Committee on Slum Statistics/Census, 2010 headed by former Planning Commission member and former Chief Statistician of India Dr Pronab Sen predicts
15. FAR stands for Floor Area Ratio, also known as FSI or Floor Space Index that dictates how high a building can be built proportionate to the plot of land on which it stands
16. 'Urban poverty and urban planning in India: Current schools of thinking, unresolved debates, and agenda setters,' by Nithya V. Raman for the Ford Foundation, 2011
17. Knight Frank, report titled 'Affordable Housing: Understanding the Drivers', 2009
18. INDSAR Housing Finance report, October 2010
19. Rajiv Awas Yojana Guidelines for Slum-free City Planning, http://mhupa.gov.in

2 The DHS Concept
Enabling safe, affordable self-construction

mHS began working under the premise that wherever low income families are self-constructing—in slums, resettlement colonies, urban villages, unauthorized or authorized colonies—there is an opportunity to influence the current self-construction process by impacting safety, quality of life and affordability.

What do we mean by self-construction?

We understand "self-construction" (also referred to incremental housing, self-build and home improvement) as:

- A household that builds, extends or refurbishes their home and is closely involved in every aspect of the construction, either undertaking the building work himself or contracting a mason under close supervision. These home construction projects are managed and supervised by the home-owner, including design decisions and managing building material purchases, as contractors and architects are rarely involved.
- A practice commonly adopted across the developing world and certainly in India by low-income families for whom the land that they live on is their major source of wealth or security, despite varying tenure conditions.
- A kind of construction not usually guided by current safe design or building norms; it is more flexible/entrepreneurial and influenced by word-of-mouth, informal knowledge of construction practices and technology. The owner of this informal knowledge is usually the mason at the local level.
- The construction investment ranges from Rs 25,000 (USD 670) for minor repairs to over Rs 500,000 (USD 11,345) for multi-story rooms.

Resettlement colonies are expanding vertically at a rapid pace

The self-construction scenario

From experiences in a variety of low-income settlements around India, including a large-scale socioeconomic survey and a pilot project, the mHS team made significant observations about the self-construction market.

Most of the detailed research has been done in the context of slum resettlement colonies in Delhi, specifically three areas—Mangolpuri, Narela and Savda Ghevra—chosen because of their varying origins. Slum resettlement colonies are government planned, site and services schemes, where

evicted slum dwellers are resettled on tiny plots of land on license or lease basis. Currently about 2 million people live in such settlements in Delhi alone. Though distinct in some ways from slums or unauthorized colonies, our visits to a variety of low-income settlements in Delhi show us that our research in resettlement colonies can be used to understand how urban low-income communities practice self-construction in India.

Self-construction is a quest for more space, better living conditions and status

Enter nearly any low- to middle-income settlement in Delhi, and it is obvious that it is growing denser by the day. In newer colonies, most families still live in single-story structures. However, in established colonies, all those who could afford to do so have torn down their single story structures and built new, higher structures that are able to meet growing needs for a larger home. Even as the mHS team conducted research, new floors were being added to homes in the colonies at a rapid pace.

We observed that aside from the need for more space—for self-use or to rent out—households clearly view their home as a sign of social status. They aspire for housing that looks better, is better organized and has basic amenities like toilet and kitchen within the home as opposed to using community facilities. Many strongly associate a tiled façade or a stone floor with higher status. If the women and children have a toilet accessible at home, it gives them middle-income status in addition to literally changing their lives with greater privacy.

What drives self - construction

- *Meet the need for expanding families*
- *Create more units with increasing demand for rentals*
- *Create space to accommodate an income-generating activity or business*
- *Own and occupy a pukka structure with a more contemporary look, ie. tiled exteriors for social status*
- *Access individual toilets, enclosed kitchens*

These settlements are therefore getting denser over time as self-construction continues to take place regardless of formal approval or intervention. This capacity for densification offers an opportunity to positively impact these colonies as they absorb a growing number of urban poor.

Policy makers perceive the increasing density as undesirable and responsible for poor living conditions, whereas the poor conditions are in fact created primarily by inadequate infrastructure and planning. Moreover, densification of these settlements is inevitable and need not be negative. Can we evolve an approach that allows for this organic housing growth, yet addresses the problems of densification in low-income communities?

Poor quality of life as a result of unsafe, low quality construction

Health: Coupled with low access to basic services like water and sewage, poorly-lit and windowless rooms result in increased incidence of disease, especially communicable diseases like tuberculosis. The poor health conditions of the urban poor are well documented and especially affect the well being of children.

Safety: Substandard construction results in shorter lifespan of these houses. Considering that the house is often the only asset these families have, this is a factor in overall financial security. Structural collapse owing to poor construction methods is a concern for many homes. Exposed structural steel bars on a reinforced concrete slab or staircase, for instance, are commonly seen. Such exposed bars are prone to rust, and therefore decay, significantly compromising the structural integrity of the building. Roof and concrete slab collapses are common.

The collapse of a tenement building in East Delhi's Laxmi Nagar area on 15 November 2010 killed over 70 inhabitants, indicating the overlooked aspects of overcrowding and poor construction in multi-story structures in the city's low-income neighborhoods. The incident revealed also that inadequate building byelaws and corruption at the local government level created a situation where the local industry profits by building unsafe structures and making it available as affordable rentals to the poor[3].

Self-constructed homes poorly planned; technical assistance is imperative

There are two important trends that emerge from this situation. One, formal design and construction profes-

Light usually comes in only from the main door into these homes. Often, poor design means an existing window is blocked off by the neighbor's vertical expansion!

Ill-informed construction methods cause dangerous situations like sagging beams

Exposed rebar will corrode rapidly, compromising structural safety and shortening the life of the dwelling

Building vertically using brick-on-edge with little or no reinforced concrete is common, a dangerous practice

Current construction practices

Poor light and ventilation

- *Small, narrow plot sizes with other homes abutting each unit*
- *Street-facing façade is the only source of light and ventilation*

Structural safety

- *Lower strength than minimum safety standard*
- *Not designed to be earthquake resistant, even though Delhi is located in a high-risk seismic zone IV*
- *No formal design inputs or technical guidance*
- *Local mason is a figure of authority; acts as designer and constructor and may have varying capabilities, training*
- *Knowledge of building codes and awareness of structural safety or design standards play very little role*

Poor material storage, inefficiencies lead to higher costs

- *Little storage space on site*
- *Homeowners usually procure small quantities of material, which cost them higher than the bulk prices that the formal construction market would allow.*
- *Inefficient construction practices cause wastage of material*
- *Possibility of theft as materials are stored out in the open on site in most cases*

sionals are unable to appreciate and understand the requirements of the urban poor and do not see them as their primary target market. Therefore, there are precious few professionals who will serve the urban poor who has a requirement to upgrade or rebuild her home.

Two, while self-construction can respond to several local conditions more innovatively and efficiently than conventional design teams, basic factors of safety and health are often not taken into consideration. Light, ventilation, space planning and above all structural safety are all areas where technical assistance is critical.

Not everyone can afford self construction; access to finance

Not every household is able to add volume to the house through self-construction. Access to finance is a significant barrier facing low-income families. Currently, the primary sources of finance are friends and relatives, or the local moneylender. The moneylender is an integral part of the social network and economy in these communities. Moneylenders usually lend at 5-7% interest per month, which comes to over 60% per year. If families are unable to repay their installments, they are evicted from their homes and their plot is sold to the moneylender or directly transferred to a property agent. This form of financing, therefore, means that residents live in fear of losing their homes, the very asset they aspire to improve and expand.

Loss of home gives way to loss of livelihood, security and dignity. But because the moneylender is part of the social network that homeowners understand, many are more willing to borrow from a moneylender than take credit from a formal bank or financial institution.

On the supply side, formal financial institutions are only beginning to recognize low-income housing as a market. The urban poor usually have insufficient documentation about their informal income and property ownership. In many cases, they are not owners of the property at all and live in situations of uncertain tenure. Formal financial institutions find this a barrier to lending to this group. Moreover, at present, home loan products are not affordable and not designed for this income group. Accessing housing finance is therefore a formidable barrier for this group.

Recognizing the status quo; finding solutions

The self-construction market presents a peculiar situation to address. On the one hand, homeowners who can afford to do so are carrying on with self-construction regardless of considerations of long-term safety or health. On the other, several low-income families are unable to finance incremental construction on their plots even when they are in urgent need of additional space or basic improvements.

Barriers to accessing housing finance for the urban poor

Why banks & MFIs won't lend

- *Lack of collateral security*
- *Difficulty in evaluating and monitoring cash flow cycles*
- *Higher costs to the bank, e.g. processing costs are higher for small-value loans*
- *Product design a challenge due to irregular income and changing credit needs over time and space*
- *Loan recovery difficult due to temporary residences, highly migratory population, adverse security situation in slums and other such localities*

Why low-income families won't borrow

- *Inconvenient with high documentation requirements*
- *High transaction costs*
- *Lack of awareness and lack of social capital (peer pressure)*
- *Ease and convenience of accessing money lenders*
- *Indifference of the formal banking system*
- *Non-availability of ideal products (too expensive, high EMI, loan repayment time not suitable)*

How can we influence the situation?

mHS began to see in the self-construction scenario as a unique opportunity to influence self-construction by enabling safer, better homes bundled with a financial product sensitive to the needs and circumstances of low-income families. From this premise, the concept of Design Home Solutions (DHS) was born.

Why we chose to target the self-construction market? Why DHS?

We felt that DHS would achieve scale and respond more effectively if we could find a way to work within the existing processes as opposed to a contractor-led approach. We also felt that guided densification of existing settlements is a more efficient and responsible way to build low income housing than creating green-field townships. A denser settlement can bring services and amenities to large populations more efficiently (given improved infrastructure and planning, of course). Moreover, self-construction leaves the capacity within the community rather than keep the expertise and job creation out of it.

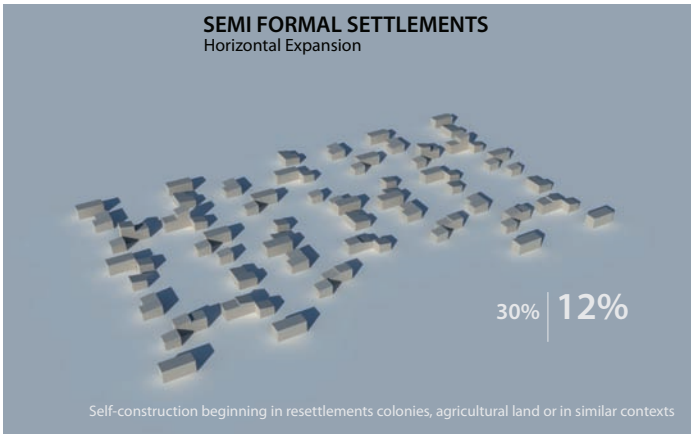
The work of mHS in resettlement colonies also indicated that substantial self-construction practices, both for ownership and rent, are adding a large quantity of new housing stock. Unlike the experience in in-situ slum rehabilitation projects where low-income families often transfer housing to middle-income ones, the supply in resettlement colonies remained within the larger low-income segment, even when possession changes hands. mHS also saw a clear possibility of applying a similar product in a variety of contexts, such as slums, unauthorized colonies, urban villages and semi-urban settlements.

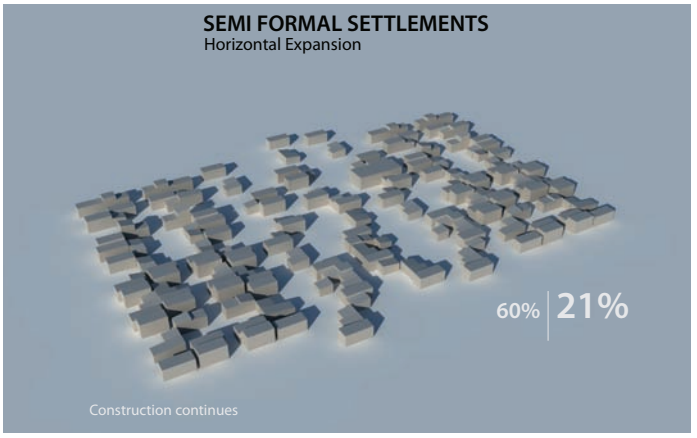
Therefore, DHS would identify families that were planning to self-construct their homes and then approach them with a bundled product (finance + technical assistance). The need for finance was intended to drive their participation into the program and the technical assistance was provided as a mandatory service that

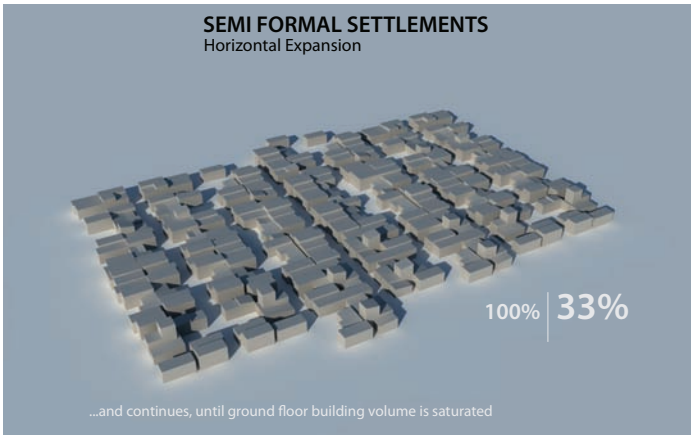
Drivers for DHS

Uncertainty over expenditure + inadequate livelihood + lack of collateral + poor titles	= No access to finance	= Need for specialized financing
Crowding + poor design and structural engineering	= Poor health conditions, unsafe structures	= Need for technical assistance

Rapid densification in Delhi's resettlement colonies



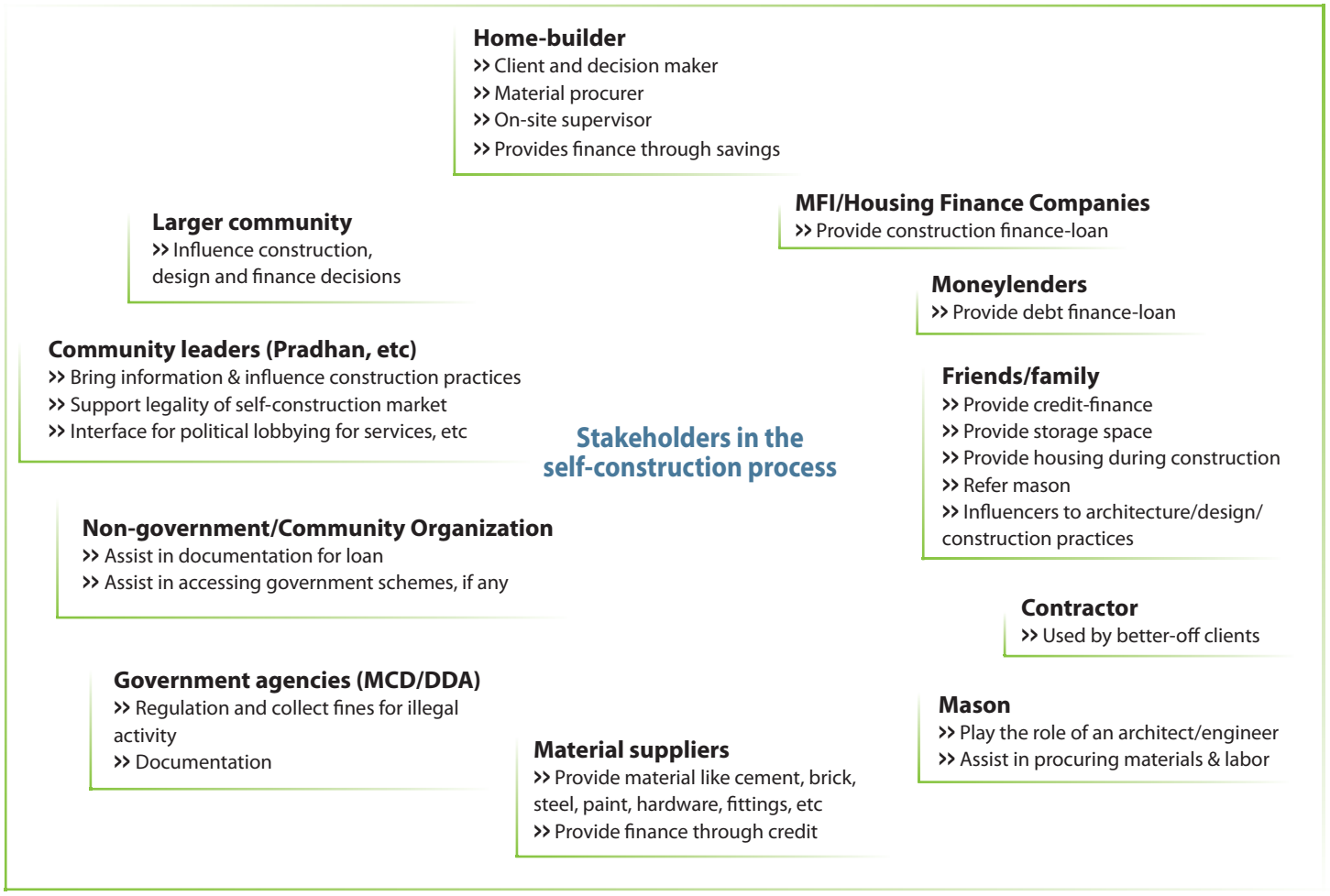




Most of Delhi's resettlement colonies like Mangolpuri are seeing rampant vertical expansion through self-construction, while the newer ones like Savda Ghevra are currently in the horizontal expansion stage and will eventually expand vertically as well

Stakeholders in self-construction

Social and economic networks in low-income communities are typically complex and intertwined. To influence self-construction successfully, DHS would need to consider the various stakeholders that are involved during the process of self-construction.



also served as a tool to monitor construction progress and control the release of loan installments to the homeowner. Overall, DHS was designed to empower the low-income homeowner with the skills and knowledge to build a higher quality home, a long-term asset that will substantially improve the quality of their lives.

DHS is addressing the self-construction market serving those seeking home upgradation and have a financing need, irrespective of income levels. Even as DHS is not targeting a specific income category, the majority of households living with such requirements earn in the range of Rs 5,000-20,000 per family (USD 100-420) and have a financing need of Rs 50,000-500,000 (USD 1,000-10,500).

DHS is a concept that looks to combine finance with technical assistance to help low-income families upgrade their housing through self-construction

Testing the concept in Delhi's resettlement colonies

mHS tested the DHS concept in the field using two strategies—a survey-based market study of three resettlement colonies (Mangolpuri, Narela and Savda Ghevra), and a pilot project in Mangolpuri to test the DHS concept on the ground.

Resettlement colonies in context

The Delhi government's Slum Clearance Act in 1956 created resettlement colonies to accommodate families whose homes were demolished. This concept began as an effort to rid the city of squatters, and slum clearances were encouraged by a middle-class aspiration for a 'clean and green' Delhi. The more recent spate of resettlement was spurred by the need to free up prime urban land for other city development purposes, such as the 2010 Commonwealth Games.

Fortunately to some extent, the policy tide has moved away in the last few years from relocation more towards in-situ rehabilitation. However, the model chosen is almost always redevelopment, as opposed to upgradation of existing spaces where possible.

Eligibility: A unique feature of resettlement colonies is the eligibility criteria used to select families that will be resettled, usually the duration of their stay in Delhi. This means that relatively recent migrants to the city, especially those without adequate documentation, were evicted from slums and forced to find homes in other squatter settlements. The promise of a free home, eligibility criteria based on household income and no affordable housing alternative, creates perverse incentives for poor and low-income households, dissuading them from moving out of slums.

Tenure and title: In the first phase of resettlement, plots were allocated on a license fee basis. In 1984, this changed to an ownership basis under a leasehold system. Later, it changed back to a license fee basis where the licensee had no right to transfer or part with the possession slip of the plot in question. Resettlers in Mangolpuri were given 99-year leases on their plots, offering substantial security, yet still with restrictive rights on construction. However, in recent colonies, the leases or licenses are as short as 7 years. Interestingly, while these short lease terms are indicative of the government's desire to control land ownership and monitor ownership, the self-construction market is still thriving.

Site and services: The resettlement approach became known as a "site and services" model, essentially meaning that eligible families were provided a plot (site) and services like electricity, sewage, water, schools, health facilities, etc. In the very early colonies, families were given plots that were completed until plinth level, along with toilet and a bath. When the change to a license fee system was made, this was stopped and only community baths and toilets were provided, with no sewage or water connections.

Quality of life: Though resettled away from illegal slums to legal and planned colonies, the resettled families have not achieved a better quality of life. With no security, only very basic infrastructure and amenities—many essential services arrived years after the families have moved there. Typically in resettlement colonies, electricity is the first amenity to arrive. Water supply by tankers is the norm in the first few years. Even sewers are laid many years down the line.

Interlinked politics: The political processes in the area determine the amount of delay before services arrive. Municipal elections usually catalyze a sea of infrastructure dole-outs. The relationship of the community with the councilor and local legislature also plays a role in how soon amenities come to a resettlement colony. In newer colonies like Savda Ghevra, informally appointed pradhans are the local leaders and formal political processes have yet to take root. The demand for infrastructure is often without political backing and basic services take a long time to arrive.

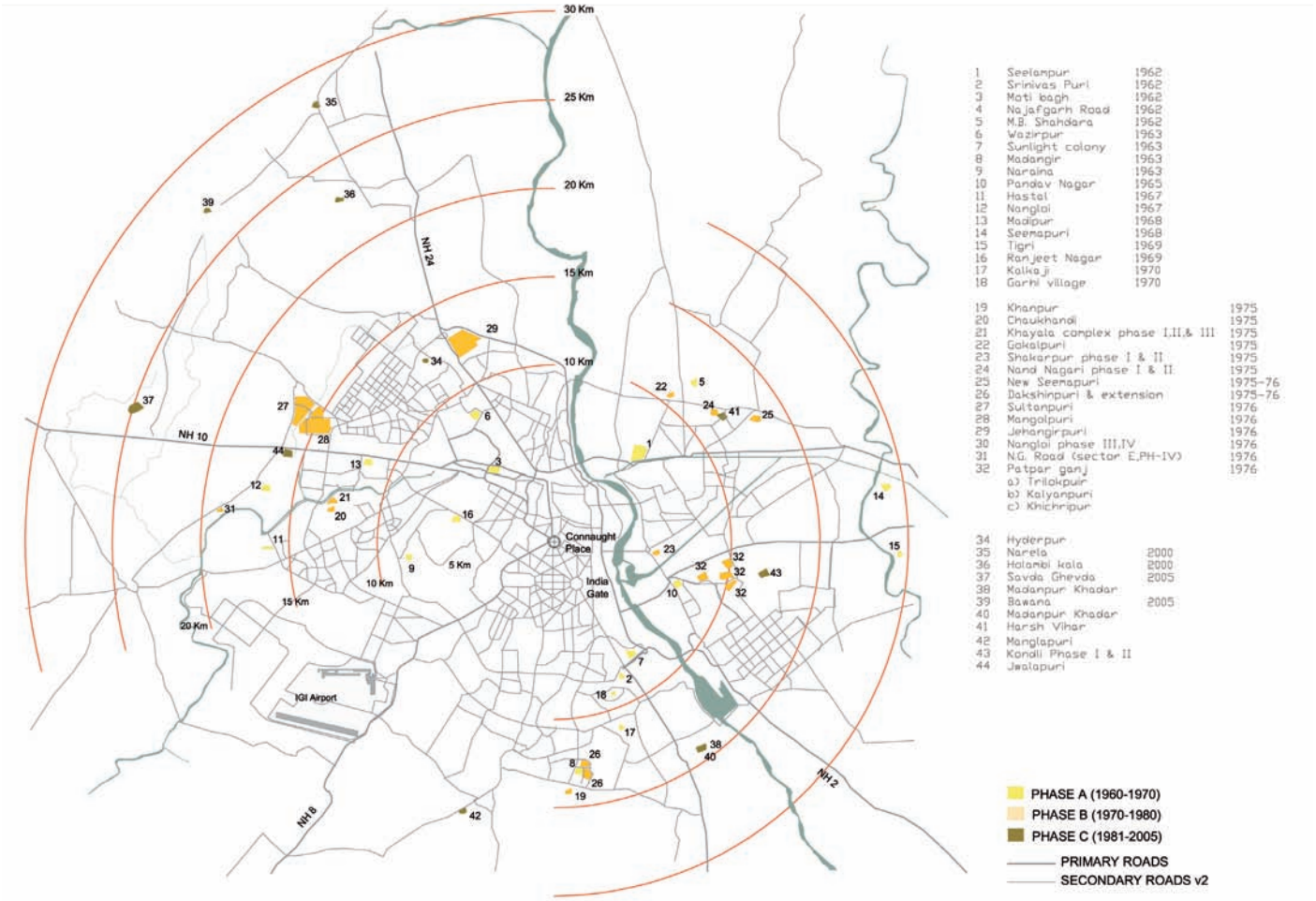
Livelihood concerns: Most resettlement colonies are located far away from the city center, with inadequate opportunities for livelihood and poor transport connections. In fact, while the earlier colonies like Mangolpuri were originally located on the urban fringes, recent ones like Savda Ghevra are as much as 30 kms outside the city centre, making job security a serious concern. No wonder then that a large number of them (50% by Delhi Development Authority's recent estimate) sell off their plots or rent in slums near their place of work.

Three waves of resettlement colonies in Delhi

	Reason for resettlement	Type of housing/ magnitude	Magnitude of resettlement	No of colonies	Implementing agency
First phase (1962-1970)	Slum clearance	Two-room tenements, 80 square yard plots and 25 sq yard camping sites	3667 households (on 80 sq yard plots) 46,090 households (on 25 sq yard plots)	18	MCD's Slum & JJ wing, which was formed at this time
Second phase (1975-77)	Slum clearance during Emergency time	25 sq yard plot	197,000 plots; 240,000 households)	26	DDA
Third phase (1990-2007)	Only slums where the land is required by the land owning agency were cleared; prime example, Yamuna Pushta slums cleared for 2010 Commonwealth Games	18 sq m plots	65,000 households	217	MCD

Source: Various, including 'Urban housing & slums', AK Jain, Readworthy Publications P Ltd, 2009, Data from Slum and JJ Wing; Dupont

With each subsequent wave, resettlement colonies moved further away from the city center



Mangolpuri

Location	Rohini West metro station
Distance from Connaught place, Delhi's city centre	15 kms
When resettled	1976
From where	Various slum settlements
Area	Mangolpuri: 177.73 ha; Sultanpuri: 150.72 ha
Size	Mangolpuri: 24 blocks- 25,000 plots; Sultanpuri: 8 blocks and 20,000 plots
Numbers resettled	Mangolpuri: 27,800 households; Sultanpuri: 16,000
Plot size allotted	7 x 3 meters
Current population	350,000
Income range	Rs 5,000- Rs 20,000 per household
Duration of lease	99 years
Basic services	Electricity, water and sewerage in place
Current built form	Dense, typically 1 to 2.5 store homes; still scope for densification and improvements; ampant construction observed

Mangolpuri and its adjoining resettlement colony Sultanpuri have been in existence for over 35 years. You feel the hustle and bustle of a thriving community as soon as you enter—vibrant street life, public parks used by the young and the old, a healthy curiosity for the outsider peeking in and plenty of neighborly banter!

Now a short auto ride from the Rohini West Metro station, Mangolpuri is one of the few resettlement colonies to enjoy great connectivity and be surrounded by industrial areas. This offers residents options for livelihood close by, and also makes it easy to travel further out to work if needed. The presence of basic services (electricity, water and sewage), a large healthcare facility and adequate schooling makes it attractive from a quality of life perspective as well. Besides the planned formal market, informal commerce is an obvious part of the community's character, with about 10% of the space already being used for non-residential purposes.

Mangolpuri residents are rapidly building vertically, and the built form along the two-tiered streets—approximately 3-4 meters or 6-8 meters in width—is changing to two or two-and-a-half store structures interspersed with the occasional single store shanty.

Narela

Location	Narela & Holambi Kalan
Location	Northwest Delhi, A-5 and A-6 blocks of Narela sub-city developed by the DDA
Distance from Connaught place (Delhi city center)	35 kms
Geographical area	Radius of 2.2 kms
When resettled	Narela: 1996; Holambi Kalan: 2001
From where	Narela: from slums of Narendra Niketan, Bapu Dham, Yamuna Pushta, etc; Holambi Kalan: from slums in Yamuna Pushta, Rohini, Badabag, Paschim Vihar, Mayapuri, Shalimar Bagh, etc.
Size	Holambi Kalan: 6 blocks; 10,000 plots; Narela: 7 blocks; 7,000 plots
Numbers resettled	Narela: approx. 60,000; Holambi Kalan: approx. 25,000
Plot size allotted	12.5 sq m
Avg monthly family income	Rs 20,000
Duration of lease	7-10 years
Basic services	Poor; sewage lines installed later are higher than the plinth levels of homes, causing significant flooding inside home
Current built form	Single or 1.5 store homes

Located in a planned sub-city by the same name initiated by the DDA, Narela resettlement colony is located on Delhi's northern-most border. Despite the original plans for the sub-city, the scheme still remains drafted largely on paper and middle-income families have not taken the government's bait to relocate here despite the housing crunch. Many of the sub-city's 8,000 flats remain unoccupied, meaning that jobs for the resettled families in these middle-income homes never materialized.

Due to poor transport connectivity, poor basic services, lack of livelihood and the lack of a mixed-income environment, residents of Narela resettlement colony and adjacent Holombi Kalan, who were moved from the central areas in Delhi like the CGO complex, ITO and Gol Market, are struggling to achieve basic quality of life miles away from the action. Most of the homes here are single or 1.5 stories high, but the quality of construction is variable. Poorer, in general, than a long-established colony like Mangolpuri, residents are struggling to be able to put decent shelter above their heads. Interestingly, leases for the plots, in most cases, have expired; but no one seems nervous about relocation and self-construction carries on each day.

Savda Ghevra

Location	Savda Ghevra
Location	North-west Delhi
Distance from Connaught Place (Delhi city center)	30 kms
Geographical area	250 acres
When resettled	2004-05
From where	Yamuna Pushta
Size	11 blocks, 8000 plots
Numbers resettled	7,500 households
Planned size	20,000 households
Plot size allotted	18.5 sq m for families with pre-January 1990 ration cards 12.5 sq m for families with ration cards post - 1990 up to December 1998
Current population	37,500
Average monthly family income	About 50% families earn between Rs 2,500 and Rs 10,000
Duration of lease	5-7 years
Basic services	Electricity available but came late, no piped water or sewage; inadequate toilets
Current built form	Single or 1.5 store houses; not yet dense but self-construction common

Totally different in character, Savda Ghevra is at this time set amidst agricultural land. As you enter through the fields, you see the beginnings of what will, in the future, become a community perhaps as densely populated and vibrant as Mangolpuri. For now, every tenth plot is still vacant land and commerce is isolated to one street in the colony. Residents are yet to get piped water supply and the nearest metro station is 9 kms away with poor last mile connectivity. The only form of tenure is a five - or seven-year lease document. Despite all these issues, most residents are unequivocal about calling this home and are willing to invest in building a house on their 18.5 and 12.5 sq m plots.

Entering the pilot phase

The self-construction market in Delhi's resettlement colonies is already thriving, with or without formal financial or technical assistance. Would DHS be an opportunity to empower, enable and influence self-construction and offer these low-income families a better quality of life within their existing socio-economic context?

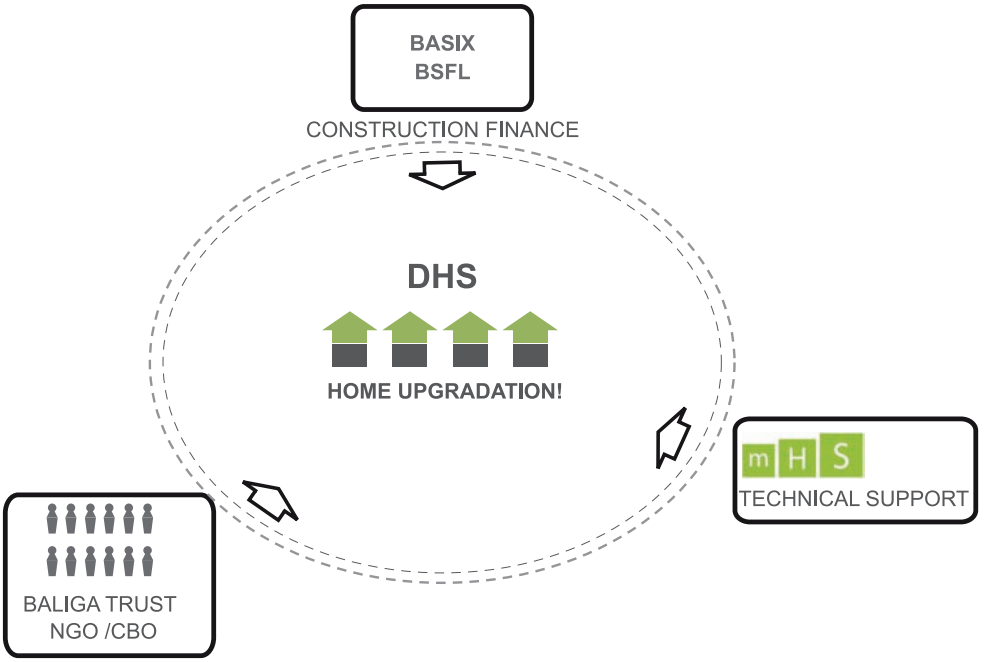
3 The Pilot
Learning lessons from the ground

In the fall of 2009, we set out to test a solution to the dual challenges of access to finance and quality of construction, faced by many low-income households with a home-improvement need. DHS was conceptualized as a product that combines an affordable home construction loan with customized technical and design assistance. As an interdisciplinary team with expertise in project design, community engagement, architecture and urban design, mHS was well positioned to conceptualize the product as well as act as the technical arm of the pilot project's implementation. All we needed was a financial partner who was willing to provide loans of USD 4,000- 7,000 to low-income households.

The search for a financial partner was not easy. Microfinance institutions (MFIs) were still riding a boom in the rural credit market and was not ready, or looking to provide loans of this size and tenure. Commercial banks saw the documentation available as too weak and the loan size too small to make it worth the risk. After a handful of conversations with financial players, mHS started discussions with BASIX, a group that owns one of the largest microfinance institutions in India.

BASIX works with 3.5 million low-income clients in 17 states around India. It is organized into the eight different entities, the largest of which is Bhartiya Samruddhi Finance Limited (BSFL), BASIX's flagship, most commercial and primary lending arm. BSFL was already providing home-improvement loans when mHS approached them, but they consisted of maximum USD 1000 for small upgrades. mHS proposed a ticket size that BSFL had yet to reach with its loans, but having done some background work[1] they were willing to take the plunge with us and test the DHS product in Delhi.

DHS MODEL DURING PILOT PROJECT



Designing the pilot

A strategic partnership between mHS and BASIX began in March 2010 to test the DHS concept in the Delhi resettlement colony of Mangolpuri with an intention to reach out to 12-20 households. After initial research across locations in Delhi, Mangolpuri was chosen because BSFL had an existing presence in the area and the residents have tenancy rights over their plots for 99 years,[2] a long enough timeframe for the MFI to feel comfortable lending.

BASIX would provide the construction finance and select financially eligible households. In conjunction, mHS would provide technical assistance directly to the households that would include improved safety standards, accurate cost estimates and monitoring of construction. This joint collaboration was meant to ensure safer, healthier living conditions and access to finance for urban households in Delhi. In addition, an informal partnership with a local NGO, Dr AV Baliga Trust was facilitated by mHS to build community awareness about the product and bring the opportunity to their membership.

What we wanted to get out of it—learning first-hand about the self-construction market

It would have been impossible to truly understand the opportunity to influence self-construction practices without putting our hypothesis to the test. The DHS pilot was designed to provide feedback to both mHS and BASIX about the value-proposition of such a product, including the pricing, marketing, communication strategy and incorporating feedback from the day-to-day operational challenges. If successful, the pilot would also assist in developing a market entry and pan-India rollout strategy for the product.

The primary goal of the pilot was to design and test a service that influences the self-construction process such that it alleviates the major pain points for the homeowner and allows them to build quality homes with basic safety standards. By testing our theory about how that product should be structured, we hoped to:

- *Demonstrate a meaningful impact on the low-income client and begin to identify a path to scale*
- *Learn about the nature of the market, especially the customer's receptivity and preferences*

In order to reach these goals, we designed the pilot to help us answer the following questions:

- **IMPACT:** What is the level of impact of DHS? How can this impact be maximized?
- **DEMAND:** What is the overall receptivity of the residents towards DHS? What are their priorities and demands?
- **BUSINESS MODEL:** Is this a financially sustainable product and service? What should be the pricing and fee structure? What are the operational parameters?
- **STAKEHOLDERS:** Who are the major stakeholders involved? How can we engage these and other stakeholders to improve the product?
- **SCALE:** Does DHS have the potential to scale? What could scale look like for such a product?

DHS—from concept to reality

The DHS product details were designed jointly by mHS and BASIX. BASIX came with deep expertise in microfinance and lending to the informal sector, while mHS brought experience in product design, architectural expertise and community engagement.

The product characteristics continued to evolve throughout the pilot through ongoing negotiation and strategizing between mHS and BASIX. After analyzing the initial bottlenecks and barriers that kept residents from becoming clients, the following represents the final form of the product:

Home Improvement Loan Product

Requirements	
Lending model	Individual lending
Documentation	Possession slip
	100% guarantor
Investment	20% upfront investment by client (prior to first installment)
Characteristics	
Amount	Rs 50,000-300,000 (USD 1,100-6,800)
Tenure	5-7 years (EMI basis)
Interest rate	21% (2% potential rebate for timely payments)
Fees	3.5% loan processing fee
	3.5% technical assistance fee
Additional requirements	Must accept technical assistance to receive loan

Technical Assistance

Requirements	Willingness to demolish/re-construct
Offerings	Customized layouts/designs
	Overall structural improvements
	Cost estimates & cost monitoring
	On-going construction monitoring
	Light & ventilation innovations
	Building materials/building technique improvement
	Masons training

The business model—making it financially attractive: It was important to both parties that DHS be self-sustaining and profitable in the long run. We designed the product in such a way to make it financially viable for both the technical partner and the lender, especially when projected in a steady state. The model would be attractive for BASIX because of the large ticket size and long-term tenure of the loan with low operational overheads.

The business model would work to cover the technical assistance delivery because there were zero capital costs. Almost all expenses were human resources, in the form of technical experts who work with the client and mason. The technical fee from the client was meant to cover all costs of providing technical assistance, while a partnership fee from the MFI was meant to cover the R&D needed to develop engineering and design solutions that could be standardized.

An overview of what we achieved: We built 12 new houses of approximately 2.5 stories each (30 individual units) and dispersed over USD 75,000 of loans. Although these numbers fit the scope of a pilot, we faced many challenges along the way. We underestimated the time needed for client selection and approval, the effort to find the appropriate technical solution for these settlements areas, and made naive assumptions about the self-construction process that initially kept us from having the level of impact that we sought. This was especially true of first few client s, which did not end up meeting the safety and quality standards for a variety of reasons described below. However, we learned a great deal with each consecutive household and continuously revised our strategy. As we did so, the quality of the homes increased, our understanding of the clients decision-making process improved, and our partnership with BASIX became more effective.

DHS Pilot Overview

Location	Mangolpuri, New Delhi, India
# Houses	12 houses built (30 units)
Individuals	Average 10 people per household About 120 individuals living in new DHS homes
Average loan size	Rs 200,000 (USD 4500)
Total $ disbursed	Rs 3,400,000 (USD 75,500)
Construction type	New Construction & G + 1.5-2.5 construction
Use of construction	Primarily family extension and/or rental

Coming out of the pilot, we believe strongly that there is a massive untapped opportunity to influence the self-construction process and make a meaningful positive impact on living standards of residents of low-income settlements. We are revising our assumptions and revisiting our business model to address the lessons from the pilot project. The rest of this chapter illuminates what went right, what went wrong, what we learned along the way and what the future may hold.

Client Acquisition → ***Pre-construction*** →

Homeowner & BASIX connect for loan → BASIX financial audit → mHS technical audit → mHS layout + design with client → Loan Snctioned by BASIX → Demolish → Materials acquisition

CLIENT ACQUISITION

The MFI staffed this pilot with four field officers to scout the neighborhood for new clients. The DHS process began when the BASIX team identified families in Mangolpuri with a desire to upgrade their homes. After explaining the product, including the technical assistance component, BASIX conducted an internal assessment of the client's creditworthiness, extremely critical for the long-term impact of the project. If the client passed the internal review, the mHS architectural team conducted an initial client visit to assess the technical feasibility of the case and provide cost estimates to the MFI. If the client passed both the technical and financial audits, and they agreed to the terms of the product, they became a DHS client.

PRE-CONSTRUCTION

The mHS technical team worked closely with the family to develop a semi-customized architectural plan and design layout that was both structurally sound and also met the needs of the family. In conjunction, BASIX sanctioned the loan so that it was ready to disburse once construction began.

Construction → ***Post-construction***

ON-GOING MONITORING →

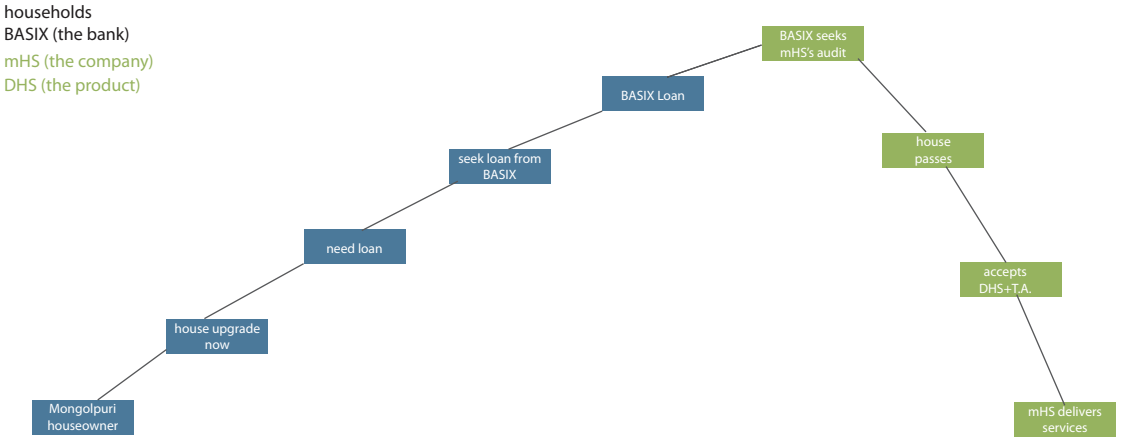
1st disbursal/ Ground floor construction → 2nd disbursal/ 1st floor construction → 3rd disbursal/ 2nd floor construction → Completed house → Client feedback → Loan repayment

CONSTRUCTION

Construction was the most intensive part of the DHS process for the technical team and came with many insights on operations. It began when the client demolished their existing structure and purchased the first round of materials. They typically funded this with their savings because BASIX required an initial investment of 20% by the client before they made the first disbursal as a sign of commitment. Following this investment by the client, the first installment of funds was released and construction of the foundation began. During the construction process, the mHS technical team was on-site every other day in order to monitor construction and work with the mason to ensure that structurally sound practices were followed. If the client complied with the technical recommendations, the last two installments were disbursed. After roughly three months for a two-storey structure, the construction was complete and the client moved into their new home.

POST-CONSTRUCTION

Immediately after construction completed, mHS collected feedback from the client. On the financial side, over the course of five to seven years, the client will repay the loan to BASIX through post-dated checks with repeated monthly reminders being made by the MFI field executives.



The client acquisition process had many stages, as depicted in this decision tree

Stage 1: Client acquistion

The process

Spreading the word: The first step in client acquisition is spreading the word. This is mostly done through a combination of traditional marketing by the BSFL team (putting up flyers around the neighborhood, marketing through the local newspaper, incentivizing lead generators, going door to door, etc) and community workshops organized by mHS and hosted by Baliga Trust to raise awareness of both the product and the importance of investing in safer housing.

Initial interaction: The BASIX field team visits the interested household and describes the combined loan/technical assistance product, including all the terms and conditions. At this point, around 60% of the households BASIX approaches decide they are not truly interested in the product. They decide not to continue for a variety of reasons. Some want to use the loans for other purposes (personal or business use, construction in another neighborhood, etc) and back out learning that there would be daily monitoring of construction, some false leads are generated, others don't agree to the terms of the loan (interest rate, technical assistance service and/or fee, documentation requirements, etc).

Initial financial eligibility: If the household decides to move forward with the process, BSFL conducts an initial financial audit. Here again, 40% of potential clients are cut if families are unwilling or unable to give their possession slip (the available documentation showing that they have tenure over the plot) or meet the credit criteria such as income level and credit history.

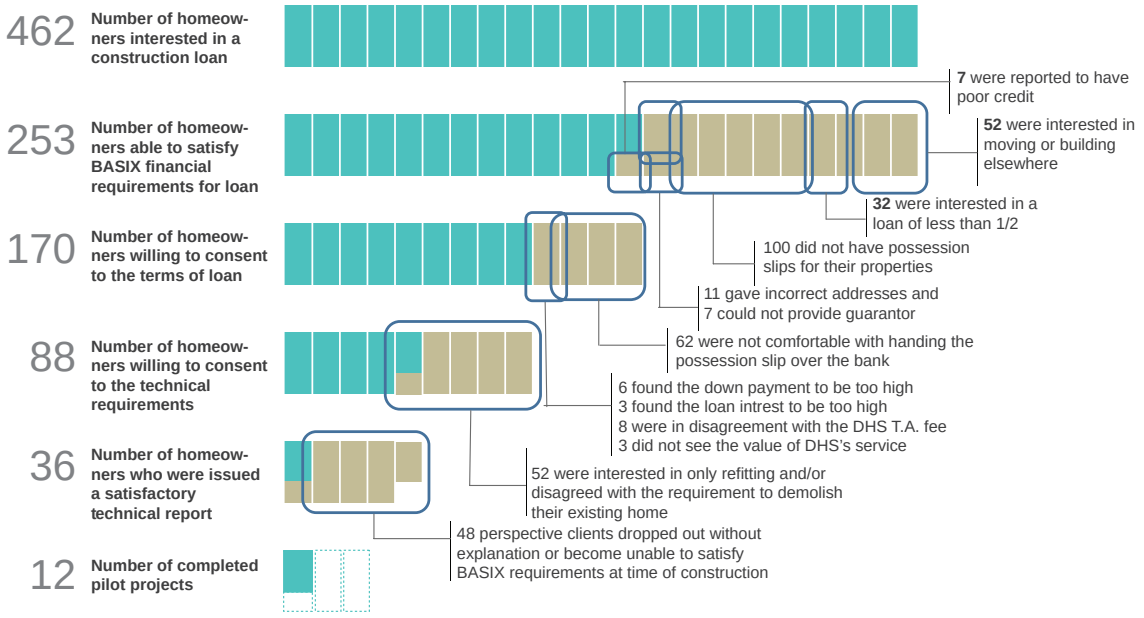
Technical eligibility: If the client meets the BASIX criteria, we come to the final step of client acquisition—the mHS technical audit. The mHS architecture team visits the home to see if they meet the technical requirements. At this stage in our technical R&D, large-scale modifications, especially vertical additions are not possible without demolishing the existing structure. This is because of the difficulties of evaluating the strength of the existing foundation and its ability to bear further load. Unless the homeowner agrees to undertake complete reconstruction of the house, we could not work with them during the pilot phase. This is clearly a limiting factor and 60% of the remaining clients are cut out during this technical audit.

Learning from the client acquisition process

Out of the 600 potential clients approached by BASIX, we chose 12 as our final clients. Roughly 220 were

Conducting community workshops helped to build awareness about the DHS product and about the value of professional technical inputs

Identifying our clients was not as easy as we thought



not interested in a home-improvement loan (most of them looking for a personal or business loan instead). The remaining 380 were attracted by the opportunity to get a larger loan, but many backed out on learning that end use would be tightly monitored. There are a variety of reasons why they did not become our clients, including that we were especially selective due to the fact that it was a pilot and we were only looking to serve 10-20 clients during this phase. Is there an untapped opportunity to serve these clients as well with a slightly modified product? However, each prospective client taught us about the preferences of the community and the potential shortcomings of the product in its current form. The majority of these reasons are reflected in the graph above. Sometimes the issue was on the client side, sometimes the financial side, and sometimes the technical side, or a combination of the three.

The pilot highlighted the significant demand for home-improvement loans, and the lessons below illuminate some of the changes that could be made to capture more of this demand and set ourselves up to achieve greater influence on the self-construction process.

Communication

Building trust: The construction and credit markets in these communities both run on social ties and trust. As discussed in the previous chapter, in the status quo scenario, people rely on local moneylenders, savings, and friends and family for finance, and they rely on themselves, their neighbors, and the local mason for engineering and architectural input. As a formal outsider in a community with a predominantly informal construction industry, relationship building and mutual trust with the client and the mason were central for both the financial party and the technical advisor.

Consistent communication: Providing a clear and consistent message to the client was a challenge, especially in the early stages of the pilot when BASIX did not yet have a dedicated field team on the product (field officers assigned to the general area simply had the added responsibility of sourcing clients for the home construction loan). In addition to mixed messages from the BASIX team, there was the added challenge of having two separate organizations interfacing with the client (BASIX and then mHS), which can easily lead to mixed messages. Beter and more consistent communications training was needed for BASIX and mHS field teams to reach out to prospec-

tive clients. When the client hears mixed messages, they lose trust, relating back to the initial lesson.

> *Insights for scale-up: Invest significant time in developing a consistent outreach and marketing plan and training field staff to communicate consistently and effectively. Additionally, there is an opportunity to develop creative communications material to change mindsets on safe building materials and increase awareness about the value-add of this combined loan/ technical assistance product.*

Sharing information between partners is not as easy as it seems: Coordination between mHS and the BASIX field team was vital throughout the entire DHS process, however it was not easy. Effective communication during the client acquisition process proved to be especially challenging. This is critical when there is a joint venture between two separate entities and the product relies on both parties being in the loop in order to market and deliver the product.

Product

Loan requirements: The documentation requirements kept many potential clients from signing up. Almost 180 out of the 462 homeowners (38%) interested in a construction loan could not satisfy the documentation requirements or were unwilling to comply. While the lessons here are many and important to think through, there is no straightforward solution. Understandably, the lending institution needs access to meaningful collateral and a guarantor in order to minimize their risk.

Documentation: BASIX required the family to give their possession slip as collateral, which is in many cases their primary, if not only, asset. A full 30% of cancellations were due to issues with giving the possession slip. Often the client was not willing to give their possession slip either because it left them in a vulnerable position or because it was not available (sometimes it was lost or they bought the plot from its original allottee and only had power of attorney, not a strong enough document to satisfy BASIX).

Guarantor: Clients were required to find one person who could guarantee the entire loan amount. However, this proved challenging since the majority of close friends and family are in similar economic situations.

> *Insights for scale-up: **It would increase accessibility to allow clients to have multiple guarantors, each guaranteeing a portion of the loan on pre-agreed terms.***

Client case study: Nisha

Nisha and her family lived in a ground floor structure in Mangolpuri. She struggled with water leakage and her foundation was so poor that the house was sinking due to settlement issues, a major problem especially during monsoons when the uncovered drains flood and sewage would flow into her home. Nisha had a double plot that she shared with her brother's family. Together, they were 12 people in the 6m x 7m plot. The family ran a small business out of the home of making traditional bags from jute fiber.

Nisha wanted improve the quality of her structure, solve the leakage and structured issues, and increase the amount of space available for her growing family. She applied for the DHS loan to build a G+2 home.

Nisha made it through the entire selection process, during which she had many different visits from the BASIX team. Each visit was from a different person, each giving her a slightly different message about the loan characteristics, documentation requirements and the process. The mHS team also visited Nisha and began the design process with her, but it was clear that she was losing trust. It was confusing to hear mixed messages.

While BASIX was in the final stages of sanctioning her loan, Nisha decided to drop out. We failed to take enough time to get everyone on board with a consistent communication strategy. As a result, Nisha did not know who she could trust, and we lost her as our client.

Overall affordability: The lower income homeowners in Mangolpuri, typically members of our NGO partner Baliga Trust, were cut out of the pilot because the effective monthly installment was too high for them. Affordability (or lack of affordability) relied on three main characteristics of the loan:

- Interest rate of 21% over a term of five to seven years on a high ticket size translated into a high monthly burden
- Upfront fees of 7% (3.5% processing fee + 3.5% technical assistance fee)
- 20% upfront investment made by the client (the client had to spend the equivalent of 20% of the loan before the initial disbursal, cutting out clients who did not have some amount of existing savings)

> *Insights for scale-up: Attempt to reduce the mounting interest rate and fees as much as possible or increase the term. Perhaps this could include structuring the technical assistance fee differently, to be spread throughout construction period. Additionally, the loan processing fee of 3.5% should be re-evaluated and alternatives to the 20% margin explored to see the client's commitment.*

Client demand

Client demand and willingness to pay for technical assistance: Potential clients do not value structural safety alone, especially if it comes with a trade-off leading to increased costs and reduced carpet area (space). Therefore, in most successful cases, it seems clients accept and pay for the technical assistance because it is a mandatory component of the loan. In later stages, once a client experiences working closely with the technical assistance team, the perspective often changes and the value proposition becomes clearer.

> *Insights for scale-up: Make additional technical assistance services available that go beyond structural safety to make technical assistance attractive upfront. There is a need to focus on these added elements when communicating the value add of technical assistance. These could include provision of cost estimates, construction monitoring, 3-D layout designs, high quality mason training, materials acquisition, access to the latest technologies, etc.*

Use of loan: Many households approached by the BASIX team wanted to use the loan for purposes that were not covered by the DHS product.

- **Home-improvement needs:** About 16% of households were unable to receive the service because they did not meet the technical requirement. The majority of these cases desired refurbishing (small upgrades such as fixing leakages, tiling, building a toilet, etc) for building additional floors without demolition (a scenario for which we hope to have a technical solution soon but which was not available during the pilot phase). Our standard was to not compromise on basic life safety and our organization did not find it acceptable to endorse and assist in construction of unsafe buildings—this is a tough but necessary stand to undertake, since we believe in the near future, further concentrated R&D will help find innovative solutions for such situations.

> *Insights for scale-up: It is important to invest in further R&D to find a technical solution that is feasible for clients wishing to expand vertically without demolishing their existing structure. Additionally, once there is a wider reach, it could become possible for families to construct for relocation to a different neighborhood with the assistance of the DHS product.*

Stage 2: Pre-construction

The process: Preparing for construction

During the preconstruction period, the mHS technical team works with the clients to develop layouts and designs and BASIX finalizes the documentation and paperwork for the loan. The preconstruction period is an essential time to build a positive and trusting relationship with both the client and the mason and set the groundwork for their compliance during the construction process.

Learning from the pre-construction period

Communication

Building a relationship with the mason: The mason is just as important—maybe even more important—to the success of the product as the client. It is essential to bring the mason on-board early and invest in building a positive and trusting relationship with him. We learned that the earlier the introduction and engagement with the mason the better. Otherwise there is not a common understanding and approach, making compliance harder. Quite understandably, the mason is often

defensive when an outside professional enters the scenario to highlight the unsafe level of current construction practices.

> *Insights for scale-up: : In order for a DHS-type product to be successful, the mason must become an ally.*

Designing with the client: The client (along with their mason and their neighbor) is used to being his or her own architect, and, as discussed previously, it is delicate and difficult to insert a formal technical advisor into that equation. We found strong cultural barriers from the clients to accept new and different designs. Much of the design and construction techniques are determined by the practices of the neighboring homes around them. For example, it is typical to see the same kind of staircase or facade all throughout a given block because residents are influenced by neighbors and apply the designs in their own construction choices. Therefore, it is important to influence the client, similarly the mason, before construction even begins.

> *Insights for scale-up: Do not underestimate the value of spending significant time with the client during the pre-construction stage to jointly craft the layout and make sure they are on-board and understand the rationale behind the structural changes. Clearly lay out the benefits of making these changes so that they advocate for it if/when the mason or neighbors tell them to do otherwise.*

Product/Client demand

The pre-construction phase began to demonstrate the handful of other services that would make the product more attractive to the client. During the process of customizing the design to the client's requirements, many of the subtle preferences became clear, the most important of which were minimizing cost, maximizing space and the priority given to social status and aesthetics, such as the tiling of the facade and using marble for flooring.

Saving cost and saving space; clear client priorities: Safety is not typically a high priority in lowincome households. They are living under economic constraints that make it difficult to make upfront investments and prioritize abstract and uncertain risks. Instead, and quite understandably, the main priorities for the majority of clients are cost and space.

Focus on the mason

The mason is the cornerstone of the self-construction process. He plays the role of architect, builder, engineer, contractor, and in some cases the materials supplier. The mason often comes from the community itself and is a trusted ally of the client. Changing his mindset and skillset has a more guaranteed effect on the quality of construction than anything else.

Barriers to getting the mason on board

We learned firsthand that there are many barriers to building a trusting relationship with the mason such that he changes his practices in the long run. Many of the barriers have to do with the pride that stems from the mason's existing experience and his reputation.

The masons typically have been doing this work for years, if not decades. When an outside "technical expert" enters the picture and tells them to change their methods because they are unsafe, it calls to question all the structures they built in the past. The reputation of a mason depends on the perception of the client, especially when the main form of marketing is by referral. If they are told in front of the client that their techniques are sub-par, it can affect their reputation and ability to get future clients. Understandably, this creates defensiveness and resentment toward the technical team.

As a result, if the relationship isn't approached delicately and as a mutual give and take, "The mason can play a great role in antagonizing the relationship between mHS and the client who selected him at the first place and trusts him." [3]

Turning the mason from the biggest barrier into the biggest ally

We underestimated the importance of working closely with the mason from the beginning. About halfway through the pilot, we tried to address this through two mason workshops that were held in partnership with mHS, BASIX and ACC Cement, a well-known Indian cement company. More than 70 masons attended the workshops, showing a high level of interest—in that regard, it was a success. However, most of the masons' methods did not seem to change afterward. Why didn't the workshops cause the masons to change their methods? Maybe because the follow-through was too little, the tone was not right, they did not agree with what they heard, or they simply came for the hat and bag and never desired to learn new techniques. Regardless of the reason, this one-off training method did not seem to be enough to win over the mason. There was a need to rethink our strategy to get the mason on-board.

Instead, there is a need to focus more explicitly and creatively on the mason to build his skills early and in a manner that does not feel threatening—there is a need to understand what makes the mason tick and cater to that. We will not as pretend we know the answer, or even that there is one answer, but we do have a few ideas:

- *Play to status by tying up with well-known brands for mason training programs*

- *Describe the techniques as **"new technology"** to help alleviate some of the issues of pride*
- *Give **financial rewards,** either in the form of guaranteed clients, or more directly as recognition for compliance*

Engaging the mason keeping these three things in mind could take a variety of forms and span a spectrum of intensity. Based on our experience, here are a few strategies which we believe are worth exploring:

***Masons training program**—there are many different possible methods to train the mason:*

- *Develop and administer our own mason training program and require all masons chosen by the clients to go through it prior to construction. It could be a multiple-day training in the upfront, which includes site visits to existing clients to demonstrate the design, followed by an "on-site training" which would continue throughout construction*
- *Partner with existing masons training organization (such as Ambuja Cement Foundation, SEWA Mahila Housing Trust, etc)*

***Preferred masons list**—based on masons who have gone through the training and/or who we worked with in the past. They are incentivized to comply and get on the list because it helps to ensure a steady flow of clients.*

- *Give clients the choice to a) choose a mason from our list, or b) choose their own mason but he must to go through our training program*

***Turn the mason into our client**—work only with masons who have gone through a masons training program (either our own or that of a future partner organization). Instead of finding the client first and then working with their mason by default, choose the masons we want to work with first, and then provide the service to their clients. In this model, the mason is the direct source of the client as opposed to the other way around. This would help to ensure quality, but would also require a fundamental restructuring of the product.*

Regardless of how it is done in the end, the bottom line is that the importance of the mason should not be overlooked. Coming out of the DHS pilot, we understood that the mason is perhaps the most central stakeholder in the self-construction process and must to be engaged in creative and even intensive ways. Any path to scale would require understanding the mind of the mason and building a relationship of mutual respect and trust, one where he truly feels we are doing him a favor by improving the quality of his skills. Any other scenario would be a constant uphill battle.

Getting the mason relationship right will not just impact the quality of that single client's home. Instead, it has the potential to spread improved construction practices much farther than a DHS-type entity could do on its own. Each mason goes on to build dozens more houses during their career. The success and scale of impact would be dramatically amplified if masons who worked with us went on to build future homes using the new techniques they learned. Instilling each mason with these new skills would shift self-construction practices at their core.

mHS architects sit with a new client to develop the design for their new home

Cost: With an average monthly household income of Rs 15,000 (USD 330) the expense for a large-scale home construction project is a significant burden. It is difficult for a client to invest additional for safety, even with the prospect of long-term benefits that result from a higher quality structure, despite that it is likely to pay off later in the form of better living, lower maintenance costs, improved health and a higher valued asset.

> ***Technical challenge:** This client priority was also a technical lesson because the initial design was 20% more expensive than the status quo. Additional R&D is required to make the product truly in line with the preferences of the community.*

> ***Insights for scale-up:** The technical assistance component of the DHS product is likely to be a push instead of pull product unless it does not require the client to spend more money than the status quo. In fact, if we could develop a technical solution that costs LESS than the status quo, many of the other challenges with compliance would work themselves out as a result. If not, costs should be cut elsewhere for the client. For example, materials suppliers could be engaged to sell in bulk to the technical assistance provider and therefore cut costs for the client on the materials side. The bottom line is that making the product attractive to the client relies on maintaining or ideally reducing the overall cost of construction.*

Space: With an average plot size of 22 sq yards, space comes at a premium. Almost all of our clients were constructing vertically primarily to accommodate family expansion. Given that space is often valued over safety, it was difficult to convince clients

that they should reduce their living space (even by amounts as small as a few inches) in order to increase structural safety.

> ***Technical challenge:*** ***Our initial designs required that the client increase the size of their columns and as a result the thickness of their wall losing some of precious corp area inside the house. Again, additional R&D is needed to develop a solution that does not require the client to encroach on any piece of their living space. We are in the late stages of developing this alternative solution and share preliminary designs of it in the technical insert in this chapter.***

A different relationship to risk: The residents of Mangolpuri have a very different relationship to risk than a typical middle or high-income family. *Urbanology*, a Mumbai-based urban design and research organization that spent a week with us to assess the DHS pilot[4] , put it elegantly when they wrote:

"Who can blame the end-user for prioritizing cost over safety in a context of poverty? Safety itself is a very relative notion when other very immediate threats are looming. Indeed, besides obvious concerns about livelihood and survival, poor sanitation and lack of basic public services often put people at risk for all kind of mosquito borne and water related diseases during monsoons and even throughout the year. Communal tension, crime, police brutality, eviction and corruption are all very tangible threats that make the threat of a natural disaster such as an earthquake seem even more remote and disconnected from reality."

They went on to recommend that: "This disconnect between DHS imperatives and the perception of the residents is an issue that needs to be confronted head-on, not only because it is a potential deal breaker for many DHS home construction projects, but also because it is at the very heart of understanding the value it can bring to urban development and improvement of low income settlements."

> ***Insights for scale-up:*** ***Speak to the client's needs both in the way we communicate about the product and the actual services included in it. This means catering to the priorities of space and cost just as much as safety. While safety and structural quality can remain central for impact, the product should include valued features that are attractive to the customer.***

The need to save space is paramount in resettlement communities

Adding to the product:
Cost estimate—Knowledge is power: Costs savings are essential for the client yet it became clear that the client consistently paid more than cost estimates provided by the technical team, suggesting that the mason or materials suppliers may take advantage of them and overcharge for materials acquisition.

> ***Insights for scale-up:*** ***Provide clients with clear cost estimates/bill of quantities for their specific construction project. This will help arm them with the information to ensure they are not taken advantage of by masons or others. This would empower them as well as help them to trust the technical expertise.***

Mason acquisition: Many clients choose their mason through social networks—relying either on family, neighbors or their own previous experience to select their mason. However, there is also a significant portion of clients who would welcome help finding a qualified mason. Greater involvement in the mason acquisition process would also help significantly with compliance and quality of construction.

> ***Insights for scale-up:*** ***Provide the client with a list of high quality masons who have gone through a training program. For those clients who do not have a mason in mind already, this service would both benefit the client directly and ease the DHS process by ensuring that the client has a mason who is likely to comply with the technical recommendations. See "Focus on the Mason" for more details on possible changes to the mason acquisition process.***

3-D designs and layout plans- the look and feel of a professional service: We learned that the client significantly values professional layouts and especially

3-D models. This value is derived as part of a status symbol of having a set of professional drawings and differentiating themselves from other residents. In the pilot, the mHS technical team shared typical layouts with the client but did not give the client his or her own copy of their customized design.

> *Insights for scale-up: There is an opportunity to use layouts and 3-D models to give the client more ownership over the design and therefore become an advocate for it when the mason and community members question its validity. Leaving the design with the client in the future could actually improve compliance.*

Relationship

A dedicated field team from the MFI: It became clear early on that it was essential for the lending agency to have a dedicated field team for the introduction of DHS. Otherwise, client acquisition slowed down and it became challenging to explain a relatively complex product, communication with the borrowers suffered, and information sharing between the mHS technical team and BASIX field officers became murky.

This is a pattern that can be seen throughout the microfinance industry. There are often challenges associated with introducing new financial product offerings because the field team was trained to market and manage a certain kind of credit. A new and different product requires different marketing and in some cases, different processes. This was true in DHS, when BASIX dedicated the field team to the development of this product the process improved tremendously, as did the communication between the client, BASIX and mHS.

Client case study: Madan

This was Madan's first large-scale construction project on his Mangolpuri house, and he was unsure where to go for a mason. He heard about an area nearby where masons in need of work hang out, waiting for clients to pick them up. He went by and picked up a mason who seemed good enough.

Unfortunately, "good enough" turned out to be not very good at all. During the course of construction, Madan was forced to fire his mason five times!

Madan told us that we could have removed many of the barriers he faced if we used our networks to recommend a high quality mason. By pointing Madan in the direction of someone whose skills he could trust, we could have alleviated the most difficult part of the construction process for him.

Stage 3: Construction

The process: Building a new home

The construction period is the stage that most directly determines whether or not the client builds a safer, stronger, more livable home than the status quo.

Construction is undertaken at a mind-boggling speed in Mangolpuri. The typical three-storey structure is complete in three and a half months! This is due partly to the client's need to speed up the process so their family can return home—they often spend valuable income to rent a space in which to live temporarily and want to minimize this time as much as possible.

Before BASIX disburses any money, the client must spend the equivalent of 20% of the loan, which they typically do by demolishing the existing house and purchasing materials (demolition was necessary in the pilot in order to ensure the basic level of structural safety). Demolition typically takes between five to ten days.

Following demolition, BASIX releases the first loan installment. With this inflow of cash, the client usually purchases any additional materials and begins work on the foundation. The structural foundation is an essential part of the construction process, as it determines whether the home continues to be structurally sound as the construction goes vertical.

Following the foundation, ground floor construction begins, and along with it, the second installment—the client has typically spent the entire first installment by this point. Around the time of the second disbursement, the client usually buys another round of materials, and it usually takes four weeks to complete the ground floor construction. The technical team monitors progress closely and advises the lending institution on payment processing.

Once the ground floor is complete, the client begins building up and spends three to four weeks constructing the second floor (G+1). Usually the client will move back into the ground floor during this time so they no longer need to pay rent to stay outside the house. In many cases, the client then constructs the third floor (G+2) and receives the third and final loan installment.

Finally, the client puts the finishing touches on the home, such as plaster on the outside and tiles on the floors. Although this step may be undertaken a few months later, it is not to be underestimated, as it is intimately tied with the home as a status symbol.

Learning from the construction process

Communication

Client as our ally: Many of the lessons we learned during the pre-construction phase extended and became more amplified once construction began. As described, we found it a challenge to meaningfully insert the technical expert, as a formal and outside actor, into this client-mason nexus. Therefore, this lesson relates back to the importance of building a relationship with the client early and investing time in helping them to understand why these structural changes will benefit them and their families.

The mason as our ally: Again, the communication style with the mason continues to be central. It must be characterized by mutual respect and include a give-and-take on both sides as opposed to the technical assistance provider acting as a heavy hand. If the mason feels that the technical team is questioning their expertise and legitimacy, they will understandably become defensive and resist. (See "Focus on the mason" for more information.)

Product/Client demand

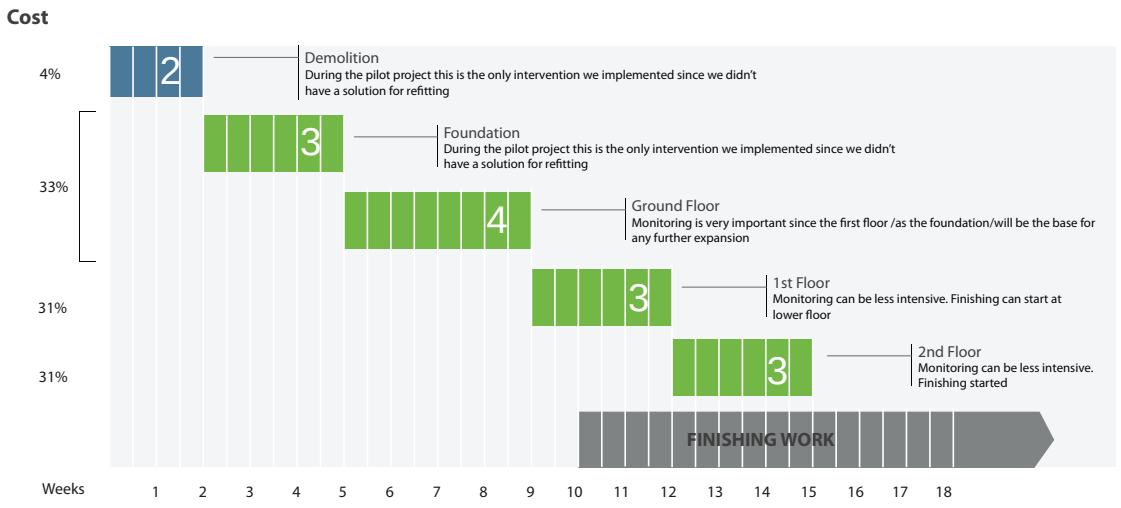
Money is power — the implication of financial control: Control of finance and loan disbursals has significant implications on the relationship with the client. Holding the reigns of the financial component of the product can create tension and conflict with the client on the one hand and help to ensure compliance with the technical recommendations on the other. Partway through the pilot process, it was decided by MHS and BASIX that the MHS technical assistance team would do a technical audit prior to every disbursement, putting the power primarily in the hands of the technical team to decide whether or not a family receives their next installment. This improved technical compliance, but also created tensions with the homeowner because the MHS field team was seen as the go-between for BASIX and the client and was therefore synonymous with the lending institution from the client's perspective.

Similarly, BASIX learned early on that it was important to phase the loan disbursal into three installments. Again, this maintained a certain level of control over the process and helped to ensure that the client was in fact using the loan to invest in the construction of a new home and had not diverted the money elsewhere during the construction phase.

> *Insights for scale-up:* ***Controlling the finance during the construction process allowed mHS to have more leverage, but also created tension with the client and role confusion with the financial partner. It can be a powerful and effective tool to tie the finance and the technical assistance together in such a way, but the dynamics it creates should be understood so as not to break that essential trust with the client and to maintain role clarity between the partner institutions.***

Status is supreme: The aesthetics of the home are intimately linked with status anywhere in the world, and especially in India. When walking around a low-income urban community, one is struck by the amount of plastered facades and tiled floors even in poor families. The structure of the house may be bare bones and the bricks recycled, but the plastered exterior is a finishing touch that covers up all the cor-

TIMELINE OF CONSTRUCTION PROCESS*



**Time and costs are related to a technical solution prior to the new one presented later in this chapter. This estimation considers an existing structure of G+1/2 floor to be demolished and a new structure of G+2 structure*

ners that were cut along the way. Clients frequently buy finishing materials they cannot afford in order to upgrade the status of their home, even if it means using up the loan prematurely and leaving the upper floors half completed.

> *Insights for scale-up: **There is an opportunity to increase the desirability of the product by creating new designs that include sought-after status elements as well.***

The need for heavy site monitoring: Before launching the pilot we were idealistic about the amount of monitoring that would be necessary to ensure quality construction. For the variety of reasons discussed above, if the mHS technical team did not visit the construction site for a few days, some clients or masons would alter the course, often causing irreversible structural damage. We also observed that the client frequently stayed home to monitor construction because quality of the mason's work was just as much their concern as ours. Therefore, it became clear that heavier site monitoring was required.

Mid-way through, we altered our strategy and hired a site-engineering firm to visit each client almost daily. Not only did this dramatically improve the quality of construction, it also improved the relationship with the homeowner. Most of them highly valued the additional site monitoring. It built trust and helped the client to feel more benefits of having a professional technical team look out for them and engage in on the spot problem solving.

> *Insights for scale-up: **We learned that a service that meaningfully influences the self-construction process will most likely be high-touch. In the case of DHS, this means including heavy site monitoring, especially in the absence of a mason/client training program.***

A high-touch business model: The recognition that heavy monitoring was required also had implications on the business model and cost structure. This caused us to question our assumptions about what DHS would look like at the steady state and what it would take to scale. For example, the technical assistance fee from the client was meant to reflect the actual costs to deliver technical assistance to each client. However, given the level of involvement, training, and monitoring necessary for a satisfactory impact, it will require a restructuring of the fees to reflect the actual costs incurred by the technical team and potentially integrating additional sources of revenues.

Expanding the definition of technical assistance

The construction process taught us about a variety of pain points that the homeowner feels along the way. A local professional service provider has the opportunity to alleviate many of these pain points, and integrating more services into the product would both increase the desirability and the impact. Some of these difficulties and potential solutions to them include:

- ***Access to high quality masons:*** *Many clients expressed how difficult it is to find a highly qualified mason who is also affordable. These clients would value assistance in selecting a mason and/or training for their chosen mason.*

  Suggested new addition: List of preferred masons and masons training program

- ***Understanding the costs:*** *Correct costs, especially of materials, can be a mystery to the client, which allows the mason and/or materials supplier to take advantage of them and overcharge.*

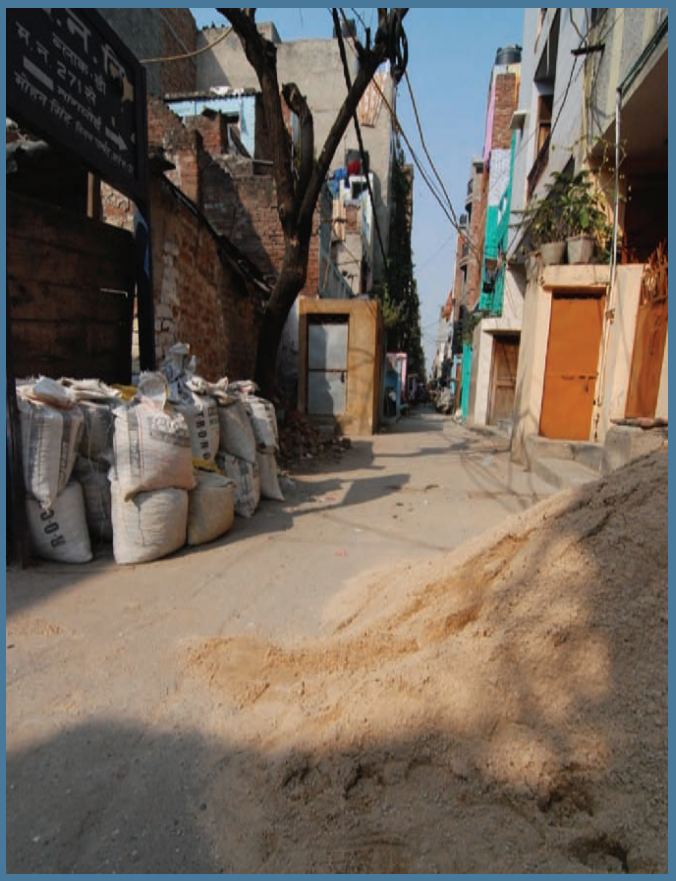
  Suggested new addition: Clear cost estimates

- ***Acquiring affordable materials:*** *As mentioned before, cutting costs is an extremely high priority. Therefore, a technical services provider working with multiple households has the opportunity to buy materials such as cement, bricks, and steel in bulk in order to save money for the client. Additionally, the client often runs out of cash before the next loan disbursal, and so they wait to buy materials until after receiving an injection of cash, not always aligned with when the materials are actually needed. This can cause costly delays.*

  Suggested new addition: Technical service provider may acquire materials in bulk and sell them to the client at a discount or tie-up with suppliers to avail the supplier's credit

- ***Storing the materials:*** *The client has to pay extra money to store materials (either in the form of bribes to the city government for encroaching or to rent storage space).*

  Suggested new addition: Provide storage space for the client at a discounted rate.



Case study: Shoba

Shoba is a widow who is employed by the municipality to sweep Delhi's streets. She became a DHS client to upgrade her ground floor structure into a G + 2 home, wanting to accommodate her four sons who would all marry and continue living in the house with their wives over the next few years. Especially given the dilapidated state of her old home, Shoba wanted her new house to be beautiful and set apart from the rest of the neighborhood.

Two months into construction, Shoba's Rs 250,000 loan (USD 5,500) was running low, even though the upper two floors were far from complete. Yet the upper floors could wait—Shoba's priorities were elsewhere. Instead, she spent the last of her loan on smooth white marble tiling to cover the floor ground level.

There were many things that set Shoba's new house apart from the old structure. She had semi-permanent walls before; now they are strong brick walls covered in plaster that give them a cool, smooth finish. She had a two room structure with a tin roof before; now her house is three stories tall with seven rooms that are big enough to house her growing family. But of all the differences between old and new, the marble floor gave Shoba the most pride.

The rest of the house will be finished eventually, Shoba assured us. But she wasn't in a rush. She was happy for now with a ground floor that caused her to feel pride every time she stepped foot inside.

Stage 4: Post construction

After the new home

After three to four months, construction is finished and the house complete. The family typically moves back in to the lower floors, perhaps renters move into the upper floors, and life begins in the new house. At this point, official interaction with mHS is complete and the client continues to repay the loan to BASIX in monthly installments for seven years at the most (although they usually find ways to pay off earlier, to relieve themselves from the burden of debt as soon as they have the money).

Still learning, even after construction is over...

Product

Word of mouth marketing: given the nature of the self-construction market, and the fact that decisions are made based on the past construction experience of family and neighbors, the most effective form of marketing will likely be through word of mouth. This again, means that the path to scale may be neighborhood-by-neighborhood, community-by-community. This also means that reputation risk is very real. Clients can spread negative opinions about the service just as quickly as positive opinions. As our friends at Urbanology wisely stated, if we take the time to invest in relationships and maintaining them even post-construction, former clients could be at the forefront of spreading the product:

"If mHS market expansion logic follows a somewhat spatial or social network strategy, the reputation could spread organically and open markets in other neighborhoods. Just in the same way as a satisfied client would recommend a mason, she could recommend an architect. This is why investing in the relationship with clients and maintaining the network of previous clients alive is so important."

Conclusion

We began the DHS pilot committed to positively influence self-construction practices and improve the quality of life of low-income households. Our primary objective was to learn how to alleviate the major barriers for low-income families with a desire to upgrade their living situation. This included providing them greater access to affordable finance and ensuring that they use it to build safer, higher quality homes.

The pilot in Mangolpuri provided essential feedback and demonstrated first hand the importance of influencing self-construction practices. There is a huge opportunity for social impact, but also many challenges to getting it right.

mHS conceptualized the pilot with a set of assumptions on product structure, the level of intervention needed with each client, and the path to scale. The majority of these assumptions were questioned after attempting to implement the model. Yet, we wrapped up the DHS pilot just as convinced that there is not only a massive opportunity to meaningfully improve the self-construction process, but especially given the lack of any law or regulation, there is a moral obligation to do so. This is true for financial lenders that now see the large-scale opportunity in home-improvement financing, yet underestimate the risks associated with providing cheaper finance without the means to build safe homes. We remain committed to applying our lessons to the search for an impactful and financially sustainable scale-up strategy.

As is clear from this chapter, the lessons were vast and varied. We will incorporate all of them into future strategies, but a few stand out as the most central to getting this right, and they relate directly back to our original objectives for the pilot:

Impact

What is the level of impact of DHS? How can this impact be maximized?

The opportunity for impact is large scale, and is not isolated to resettlement communities. But the current structure of the DHS product is by no means the only way to enter into this market. The pilot showed us that there are many different possible ways of influencing and improving the self-construction process and outcomes for low-income households.

Client case study: Manjesh

Manjesh is a 27-year-old security guard who was born in Mangolpuri when the colony was almost ten years old. The rest of his family recently moved back to their village, but Manjesh wanted to stay in Mangolpuri and upgrade their home so he could someday raise his own family there. His existing home was an old semi-permanent structure and only half of the plot was used. Manjesh received Rs 200,000 (USD 4,500) from BASIX to demolish and build a new G + 1.5 structure.

During ground floor construction, the mHS technical team explained to Manjesh and his mason that they need to increase the size of their columns from the standard 4"x9" to 9"x9" in order to build a sound structure. At first, it seemed that they understood the rationale behind this requirement and expressed to the architects that they would do so. They began building 9"x9" columns.

After the first floor were built the mHS technical team felt confident that it was okay to go a few days without visiting the site. When we arrived on site the next week, we immediately saw that Manjesh and his mason had bent the steel on all of the columns in order to achieve the original 4"x9" size. Apparently, the communication was not as clear as the mHS team originally thought.

An architect proceeded to sit with Manjesh and his mason and used 3-D pictures to explain why it is necessary for all the columns to be the same size. This time, when the time was invested and creative methods were used, Manjesh and his mason were truly on board with the design. They eventually bent the steel back to 9"x9".

Manjesh's case demonstrate not only the need to revise our technical solution, but also the importance of monitoring the construction site everyday and taking the time to communicate (through words and visuals) with the client about the rationale behind our design.

For example, we learned that the qualified mason is the linchpin of the process, and engaging him more intentionally is central to meaningfully alleviating the difficulties for low-income households.

The pilot also reiterated the importance of technical assistance, alongside finance, and that we should not compromise on structural safety. Providing low-income families with home-improvement loans, but without the checks and balances in place to ensure that they build safe, sound structures is irresponsible on the part of the lending institution. In fact, while

technical assistance clearly increases the level of involvement with the client, it ensures monitoring of end-use of the loan and improves the social impact in the long run, as opposed to putting them in danger.

Demand

What is the overall receptivity of the community towards DHS? What are their priorities and demands?

Receptivity depends on a number of factors, but especially on catering to the client's priorities and taking the time to build a positive, trusting relationship with them. The status quo self-construction methods cater to the client's need to maximize space and minimize costs, yet DHS required families to prioritize safety while spending more and using more space. This dramatically reduced receptivity quite understandably.

In order to turn DHS from a "push" product to a "pull" product, the solution will need to allow the client to spend the same or less than the status quo. In the months since completing the pilot we have already progressed on a technical solution that gets closer to settling this trade-off. In addition, meeting the needs of the client may also require thinking outside the box about the kinds of services that could be bundled into a DHS-type product to make it more desirable to the client.

Business model

Is this a financially sustainable product? What should be the pricing and fee structure? What are the operational parameters?

We began the pilot with a business model that demonstrated how financially attractive this product could be at a steady state. It was a low-capital cost, low-touch model that allowed for relatively rapid scale and cost recovery. Any future financial model will look different based on the lessons learned from the pilot, but we strongly believe that it can still be financially sustainable and even attractive if structured creatively.

Stakeholders

Who are the major stakeholders involved? How can we engage these and other stakeholders to improve the product?

The pilot showed us the importance of a variety of players in addition to the client, namely the mason, the community, the municipality and the materials suppliers. In fact, engaging these stakeholders would make it possible to significantly alter the status quo and improve self-construction practices. For example, as mentioned previously, buying material in bulk and selling it to clients could provide an additional source of revenue to the DHS technical service provider. Another example, developing a training program for masons and seeing them as our direct client (i.e. they help us to find homeowners interested in the product) could alleviate some of the struggles related to both client acquisition and mason compliance, and reduce the need for heavy site monitoring.

Scale

Does DHS have the potential to scale? What could scale look like for such a product?

We were culprits of the common mistake of being overly ambitious about the path to scale. It is clear that there are many different ways to look at scale and it depends entirely on how the product is structured and the priorities of the entity driving it.

The pilot experience shows that the path to scale might look quite different. As discussed above, the

sheer fact that we are trying to influence a predominantly informal process that runs on social networks means that this will inherently not be a minimalistic product. While the R&D needed for each house will reduce over time, we feel strongly that we need to work with partners offering complementary services and engage the informal sector for higher quality delivery.

The financial partner, BASIX, came out of the pilot enthusiastic by the potential to scale and convinced about the need for technical assistance. They see a huge commercial opportunity to rapidly scale the product across India. They plan to integrate technical assistance, but in a more hands-off manner than we believe would be ideal for genuine social impact.

Big questions remain, but the opportunity to influence self-construction is huge and virtually untapped by formal players. Millions of low-income families across India and beyond are investing in self-construction. A large portion of them are in need of affordable finance and the tools to build higher quality structures. We wrapped up the DHS pilot sobered, energized and committed to build on our many lessons and develop strategies that meaningfully improve the quality of housing for low-income families across India.

Lessons from piloting the DHS

DHS is one of several possible conceptual methods to address the self-construction market by combining the offerings of finance and technical assistance, which we understand are key drivers in the market.

From piloting the DHS concept, we learnt that:

There are many ways to impact this market. Working with the mason and spreading awareness about the need for structural safety in self-construction are also legitimate ways to enter the market, besides DHS. Engaging various stakeholders is a vital step in this market.

Two important factors that will impact demand for DHS is the team's ability to build relationships of trust with homeowners and creating awareness regarding safety to enable low-income families to prioritize this. The most vital factor, however, is cost. DHS must be perceived to cost the same or less than construction without DHS.

Innovative business models will be needed to implement solutions for the self-construction market. Big questions remain on the ways to scale up DHS. Whereas the market is thriving, with or without the intervention of market players, urgent steps to enhance safety and quality of life are required. The initiative of scaling up DHS can be best taken through partnerships between various private sector players with support from the government, especially in creating the right structures for financial institutions to be proactively involved and creating mechanisms to monitor and guide technically sound construction.

Epilogue

mHS is still driving product development and in the proof of concept phase. We are continuing to experi-

Prerequisites for DHS

Demand

Clear demand for self-construction: There is plenty of evidence of low-income families already investing in home upgradation and construction in communities across India

Awareness of safety and health issues: These are not top priorities for low-income families, but do need to be placed on their radar

Technical

Finding local partners for technical assistance: Documented guidelines for safe construction as well as for design and site monitoring would be needed for scaling up DHS

Masons training and other technical awareness initiatives: These would be a good entry point into the communities and build long-term capacity

Building codes and by-laws: The team needs to be competent in meeting these

Finance

Income levels: The community's household income levels need to be sufficient to be able to pay the installments

Titles: Clear titles/leases and possession slips would be needed to satisfy the needs of the finance institutions

Guarantor: Families should have acceptable guarantors to back their loans

ment with DHS by applying our lessons from the Mangolpuri pilot to another test phase in Savda Ghevra. We are in partnership with the Self Employed Women Association Mahila Housing Trust (SEWA MHT), a part of SEWA, a well-respected Indian NGO with over 1 million members and a strong low-income housing arm. We will use the Savda Ghevra pilot as an opportunity to test our new technical solution, tie up with materials suppliers and develop a mason's training program, amongst other new additions. Following this pilot with SEWA MHT, we will continue to look for additional financial partners in order to continue scaling up.

BASIX is also moving ahead with self-construction loans in resettlement communities and unauthorized colonies around Delhi. The repayment rates in the pilot experience over the last six months have been extremely encouraging. They are currently expanding to an area in East Delhi, where they are partnering with a local engineering firm to provide the technical assistance. There is a possibility that BASIX and mHS will work together again in the future, where mHS would play the role of a resource agency, engaging in R&D and product design and development, and mentoring the local engineering team.

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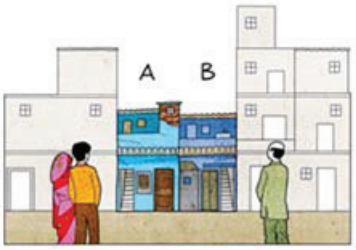
[1] DID, Canada capacity building

[2] Some other resettlement colonies have tenancy rights of as low as seven years

[3] Matias Echanove and Rahul Srivastava, "Micro Home Solutions: Context, practice and perspectives." Urbanology, April 2011

[4] The Institute of Urbanology and its affiliate, URBZ, "facilitates the production and exchange of information, knowledge, ideas and practices towards better cities for all." They organize participatory workshops, designs adaptable structures and develops web tools for urban communities and practitioners. The co-directors, Rahul Srivastava and Matias Echanove, spent one week on field with the mHS team to identify additional learnings from the pilot, engage the community, and experiment with innovative communication techniques to generate buzz about the DHS concept.

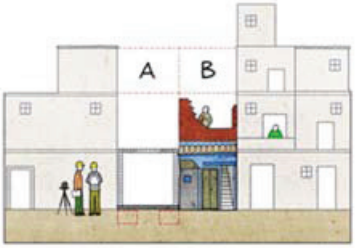
The Mangolpuri Diaries: Why DHS is a great idea!



Family A and B, residents of Mongolpuri, are contemplating expanding their home

Family A opts for DHS, Family B goes to the local moneylender

While the Technical Assistance team works with Family A to plan a new home, Family B goes ahead and starts building a floor above their existing home

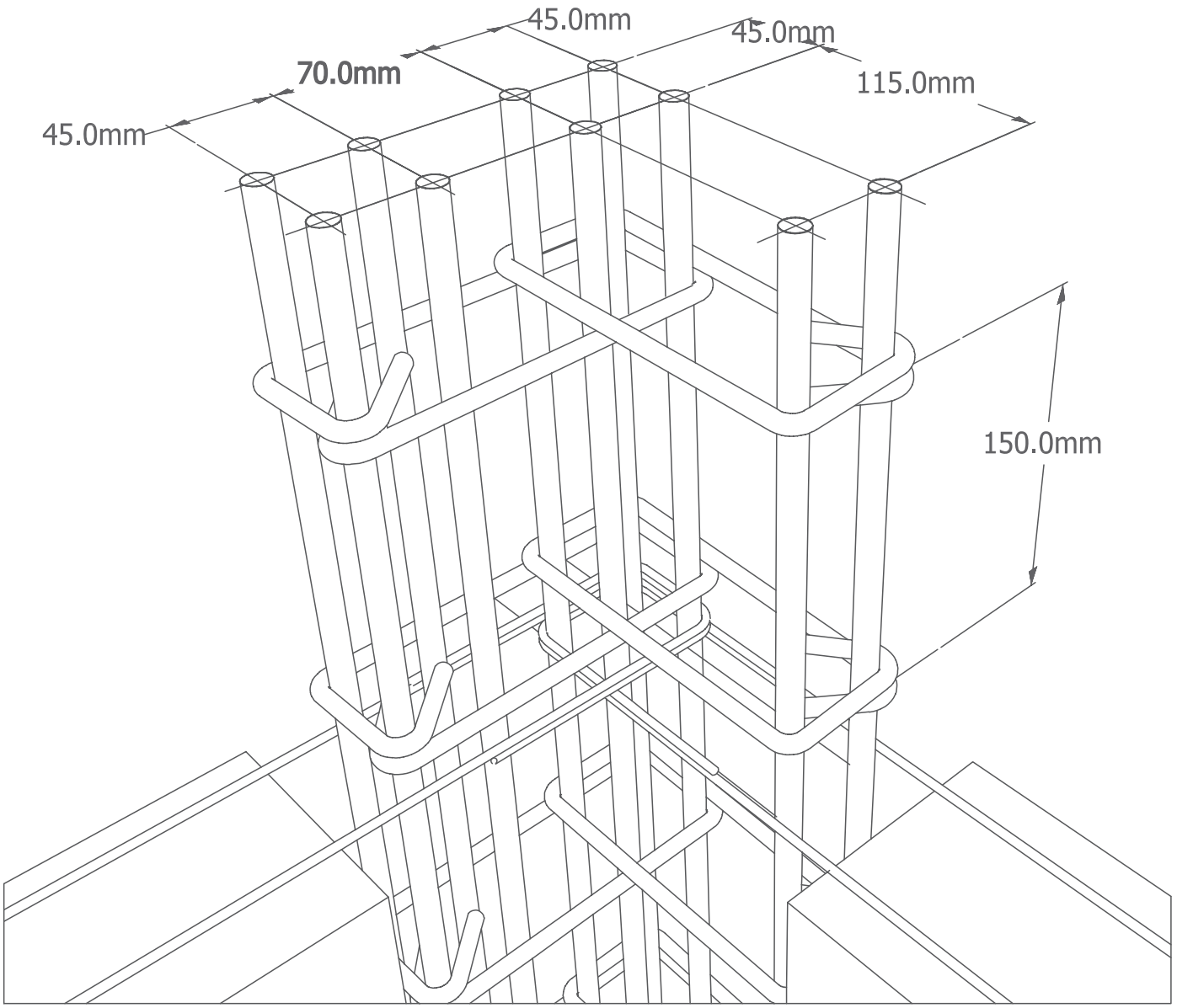


Family A's home is torn down to the ground; Family B's home continues to go vertical

Family A gets a new, strucurally safe, well-lit and ventilated home; Family B adds yet another floor on top

When both homes brave the elements and an earthquake shakes Delhi, Family A's home continues to shelter them; Family B's home is, sadly, reduced to rubble

DHS is really a good idea!

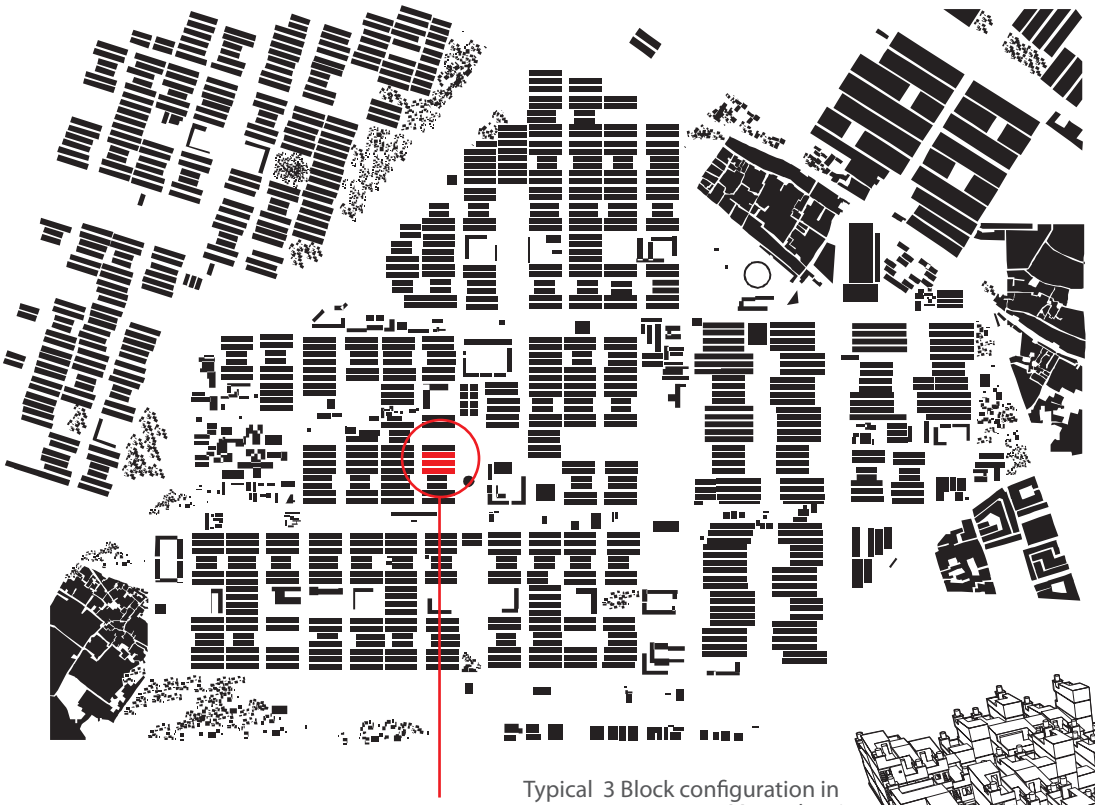


SELF CONSTRUCTION

Technical Supplement

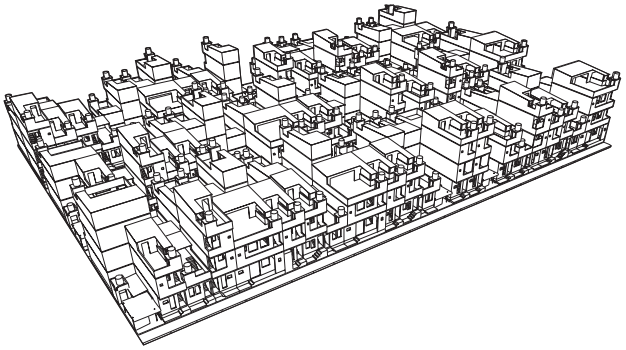
This supplement is part of a 2011 mHS Report
"Self-construction: Enabling safe and affordable housing in India"
Supported by Michael & Susan DELL Foundation

mHS
OCTOBER 2011



Plan of Mangolpuri

Typical 3 Block configuration in Mangolpuri



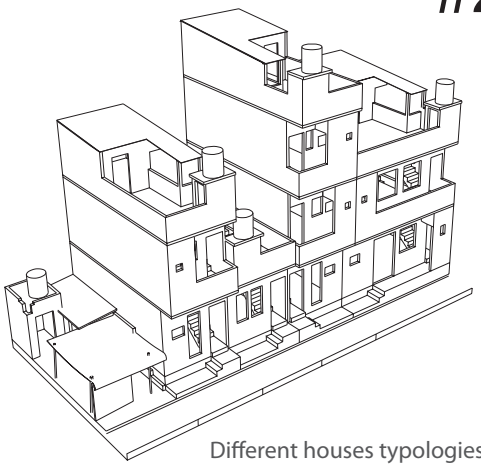
Mangolpuri New Delhi Urban Area

#1 The pilot project context

Design Home Solutions (DHS) is a product conceptualized by micro Home Solutions (mHS) that aims to serve low-income dwellers in formal and informal settlements in urban areas. It is the coupling of a responsibly priced financing package with technical assistance (TA.) This insert addresses the evolution of the TA process in Phase I and Phase II of the pilot programs. The idea came after we observed that construction was taking place in all corners of resettlement colonies and that on many, if not most job sites, there was little consideration given to structural safety. In many instances single wythe brick walls were the sole load bearing elements of G+2 or even G+3 houses. Even where reinforced concrete was used, we observed an inadequate use of steel within the foundations and columns, of serious concern to us, knowing that Delhi lies within seismic zone 4 (with 5 being the most severe) and that even minor construction errors or omissions could prove fatal in the event of a moderate earthquake.

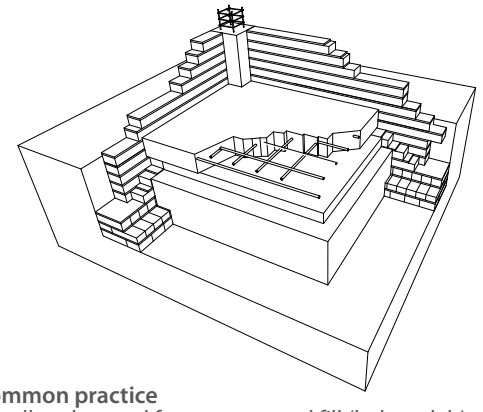
Above: Typical view of a resettlement colony
Below: Masonry single brick walls with no reinforcement

#2 Typical housing evolution in Mangolpuri



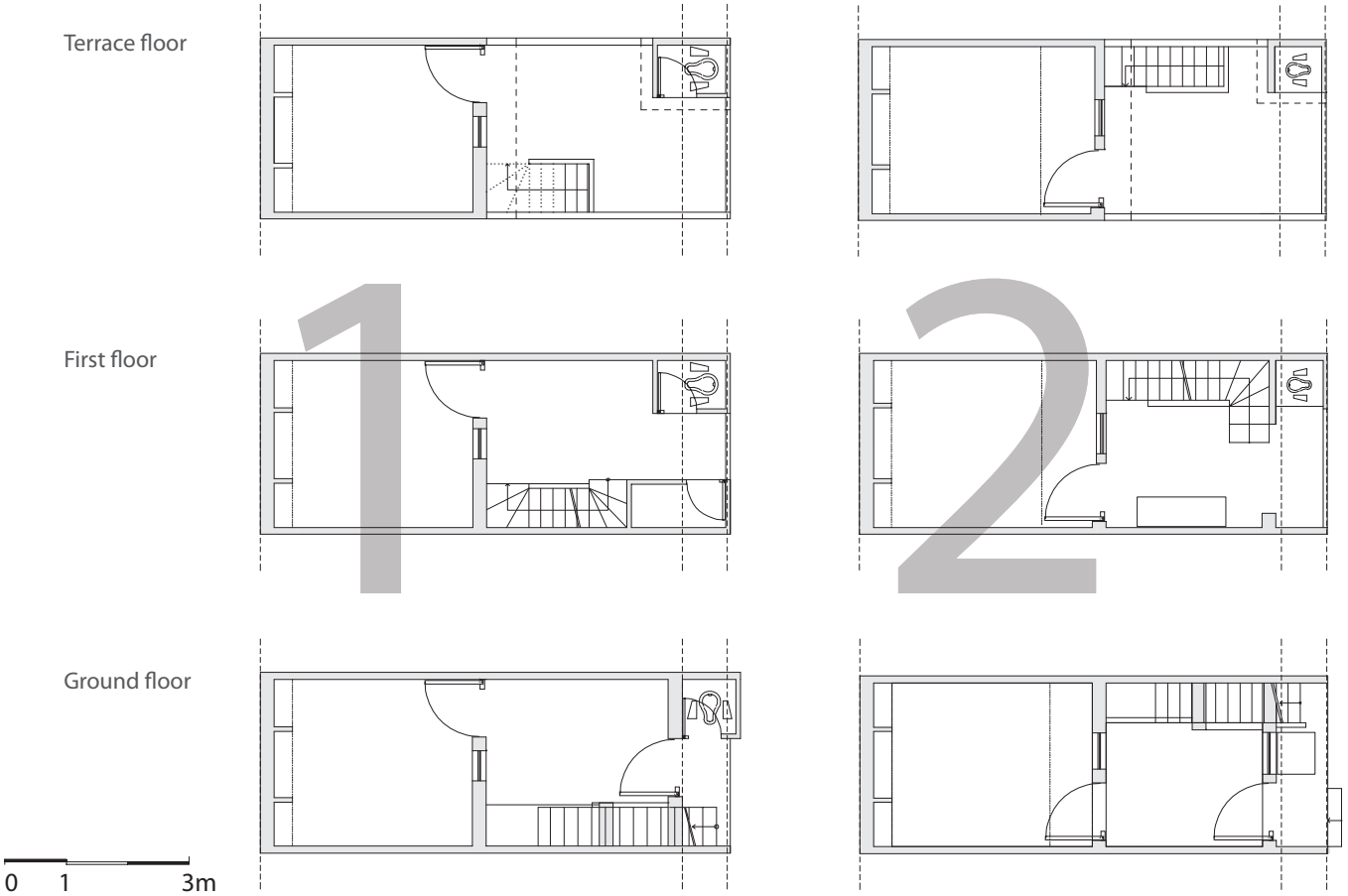
Different houses typologies

Mangolpuri plots are 3 meters wide and 7 deep. In some instances 2 plots are combined to create 6 meters wide homes.
Although there are a few remaining one-story *kaccha houses* built with temporary materials, most homeowners have added new floors so that majority of the houses are now 2 or 3 stories high.



Detail of typical foundation: Common practice
Thickened masonry foundation wall and spread footer structural fill (below slab)
Concrete slab on grade with varying amounts of steel reinforcing
Above grade concrete column with varying amounts of steel reinforcing or un-reinforced masonry walls

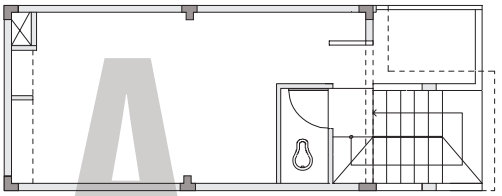
Different houses typologies
Two existing typical layouts



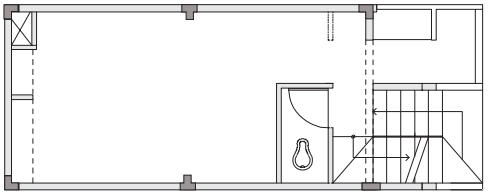
#3 Structural solutions & typological studies

Plot sizes vary from one resettlement colony to another. In Mangolpuri they are 3 by 7 meters. Once the engineering criteria for a safe structure had been established, DHS then worked closely with the homeowner to prepare a set of plans and details that met their specific living needs. Despite this regularity there are variations: single front plots (majority) but also corner plots, double plots and others. To suit these varying conditions and to respond to individual homeowner needs, several layouts have been studied.

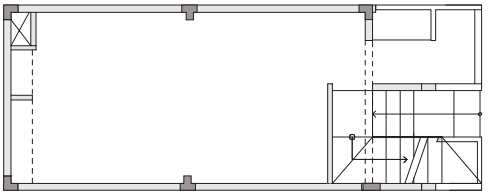
In spite of these variations, the types of structural frames are fewer, more repetitive and more rigidly defined. Moving forward, the majority of on-site monitoring effort will be spent ensuring that the structure is erected correctly. Although DHS will continue to offer advice and recommendation for the interior layouts, the priority will be to ensure safe construction.



Terrace floor

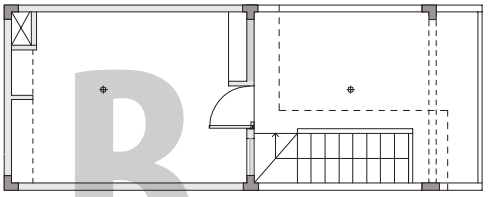


First floor

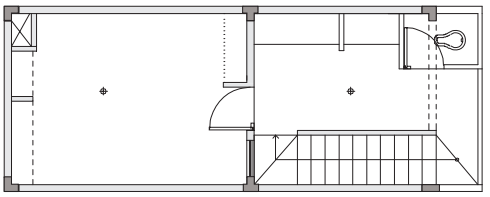


Ground floor

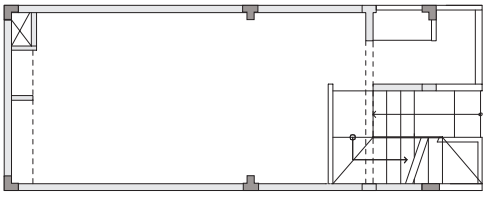
0 1 3m



Terrace floor

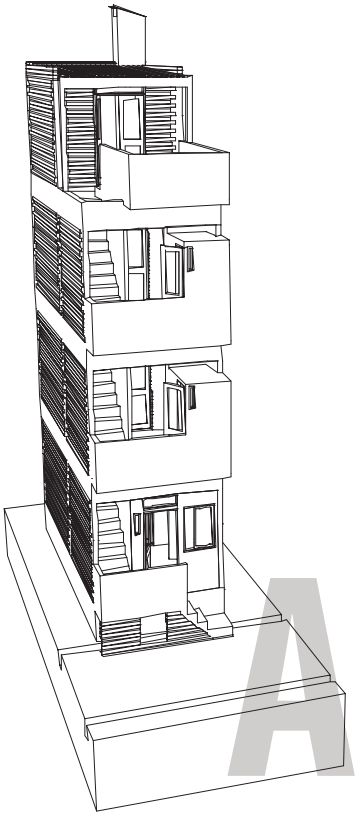


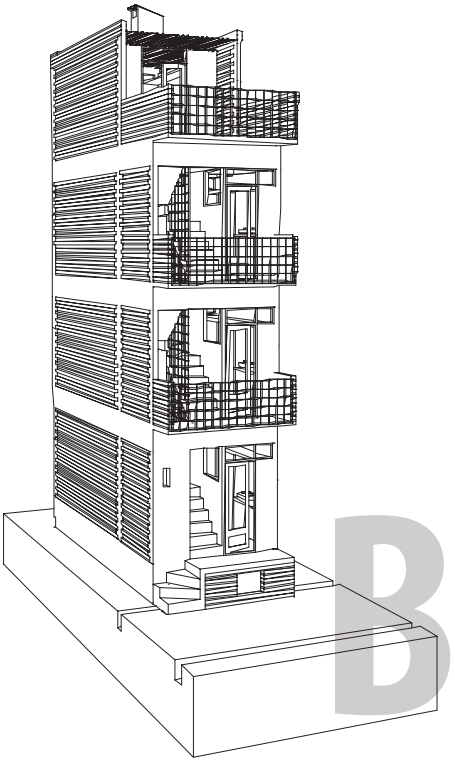
First floor



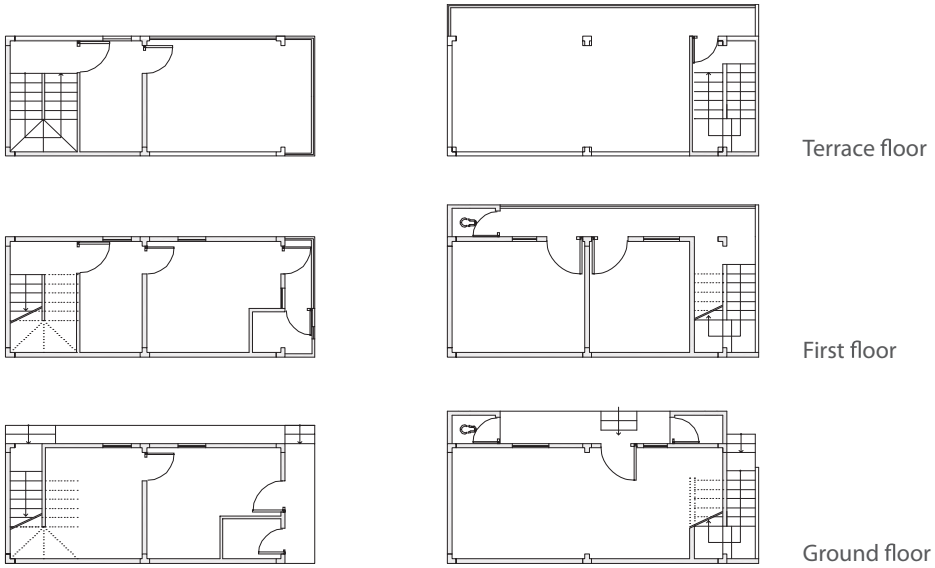
Ground floor

The above layouts are based on the new structural (Jurina) solution



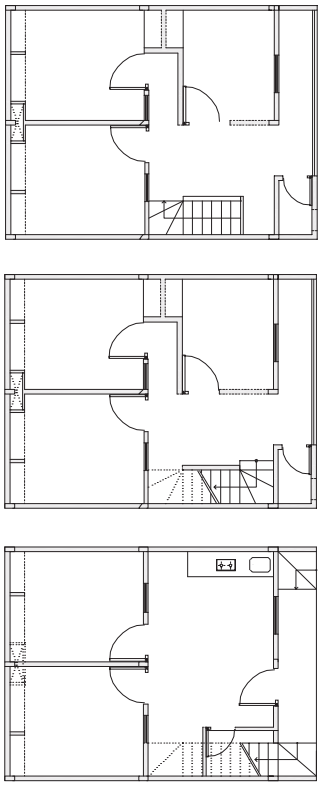


Typological studies
Corner and double plots

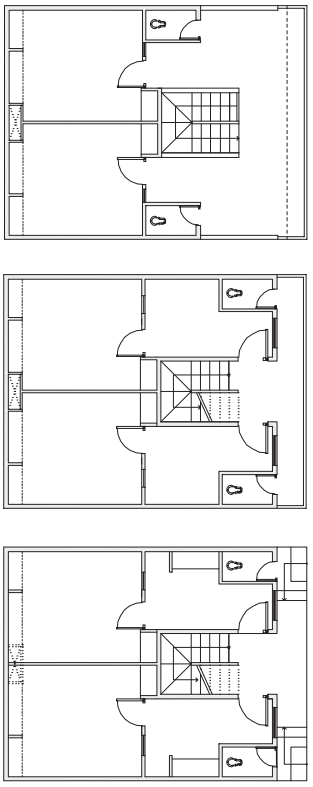


0 1 3m

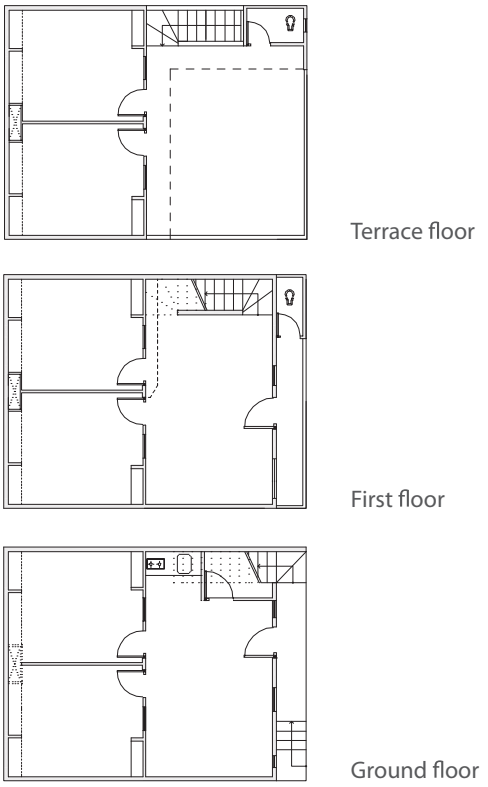
TYPE D-R.C.C.



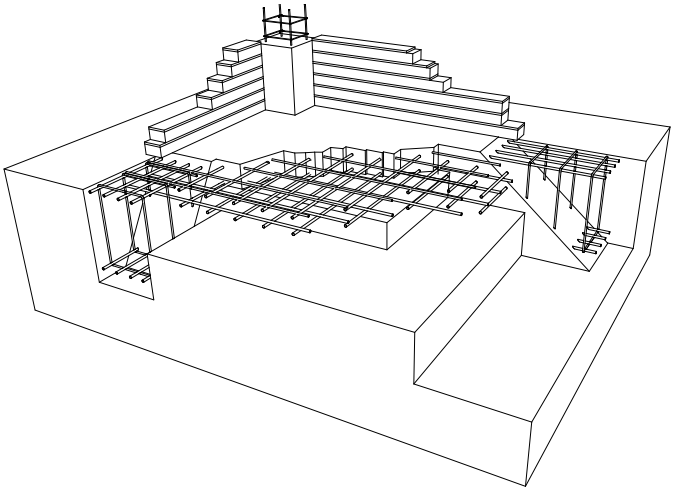
TYPE C-R.C.C.



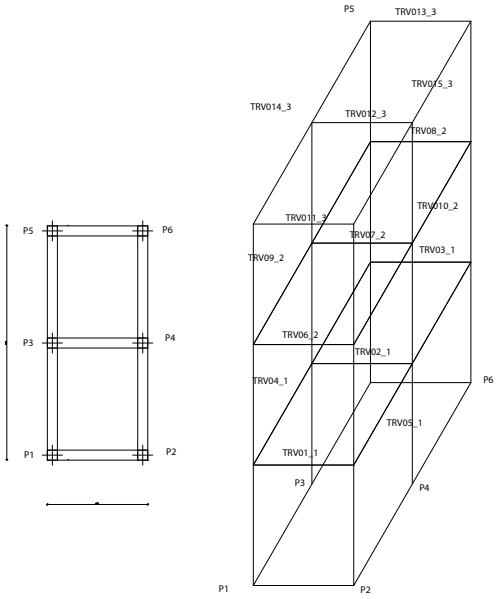
TYPE B-R.C.C.



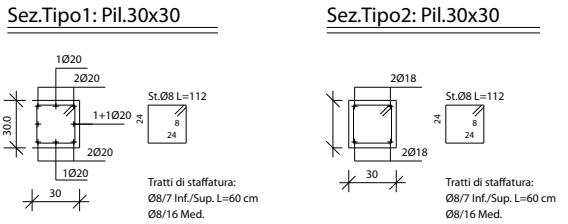
DHS worked with multiple engineering consultants early in Phase I of the pilot to develop standards and details for constructing a reinforced concrete frame that would significantly improve the home's ability to withstand seismic forces.
The study, developed with the help of Engineer Maurizio Albertini, resulted in an RCC framing system with traditional brick infill. Column sizes were 30x30 cm and beam sizes varied from 50 to 60 cms. During the pilot project we encountered resistance from the families we worked with due to the loss of space caused by the size of the columns and the quantity of steel required, which exceeded what they used in common practice.



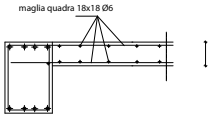
Detail of foundation: Implemented solution (Albertini)
40 cm x 60 cm r.c.c. grade beam
Structural fill (below slab),
Concrete slab on grade with top and bottom reinforcing mesh
Above grade 30 cm X 30 cm r.c.c. column
Masonry walls



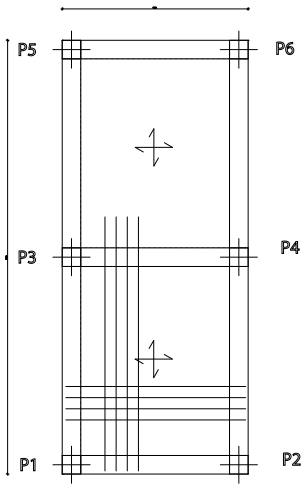
Schematic frame of implemented structural solution (Albertini) and few component's details

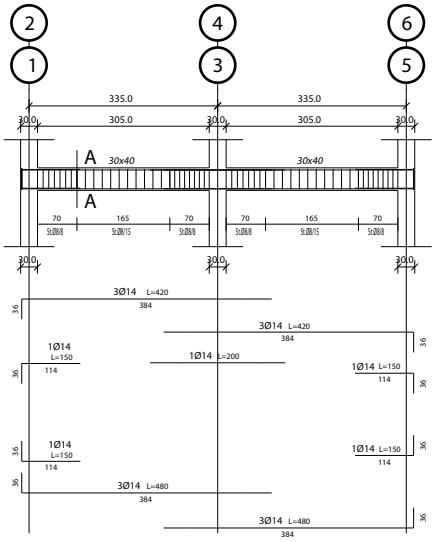


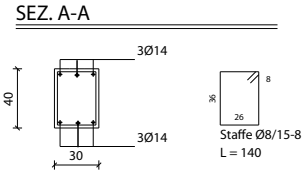
Detail of pilasters' reinforcement



Detail of slabs' reinforcement



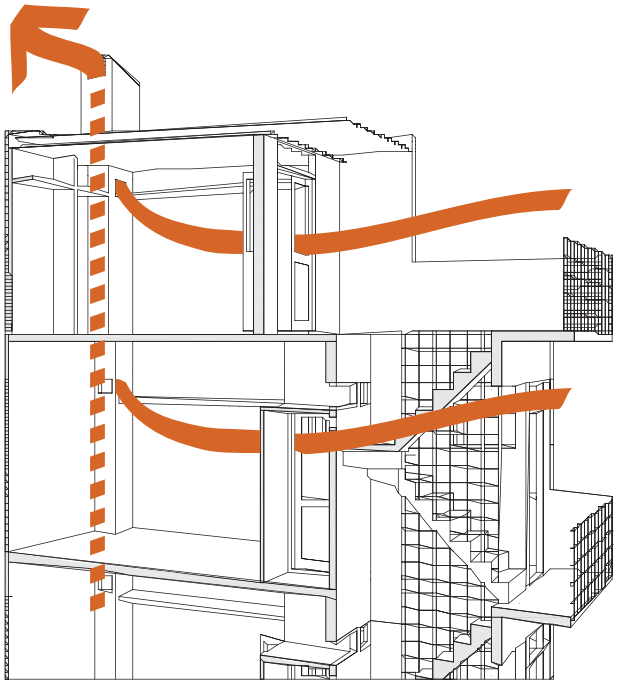




Beams' reinforcement detail

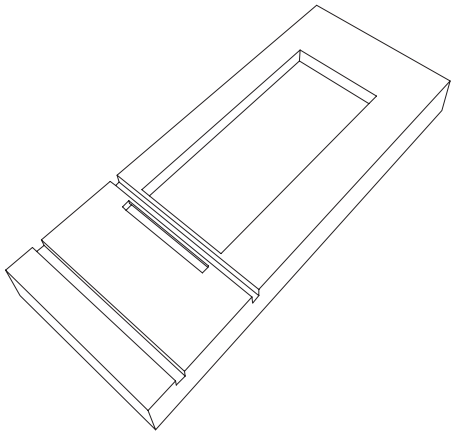
With construction underway, the DHS field team provided daily on-site monitoring to ensure that work was being carried out in accordance with the drawings. Construction projects in this very informal sector often can evolve in unexpected ways. For this reason, we increased the field monitoring from 2-3 days a week to almost everyday [and this varied according to the importance of the phase of construction] with little flexibility when it came to critical steps like ensuring that steel reinforcing is spaced and configured as shown on the engineering drawings, that concrete is mixed with the correct ratios of cement, water and aggregate and that it is then allowed adequate curing time before being loaded.

The DHS designs also introduced a number of measures to improve the light, ventilation and efficient use of space within dwelling units. In addition to clerestory windows, passive air movement would be introduced by means of a ventilation shaft which, through convective action, would exhaust warmer air from the upper parts of the room.

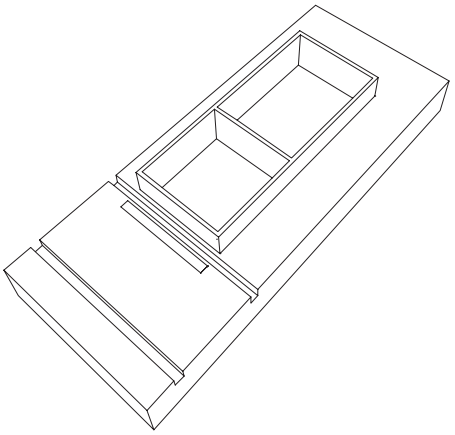


Passive ventilation system

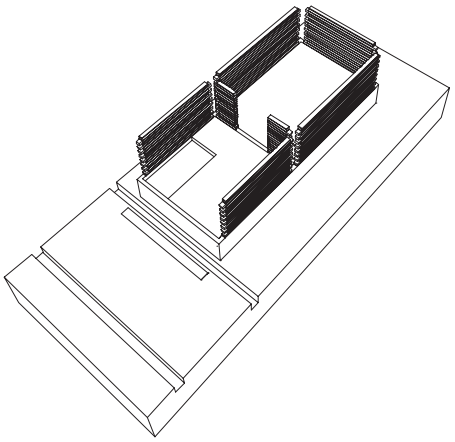
Importance of day-to-day monitoring



STEP 1
Excavation to a depth of 55 cm.
Reinforced concrete box frame with compacted structural fill



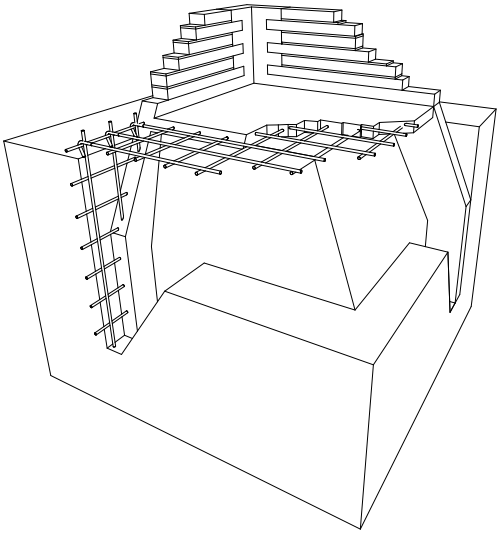
STEP 2.
Slab is poured and 1.5 brick layed up



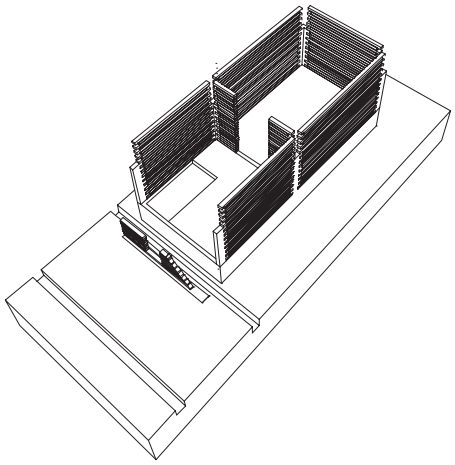
STEP 3.
Columns are formed in 2 lifts per floor so as to minimize voids in concrete pour

#4 Further advancement of the structural frame design

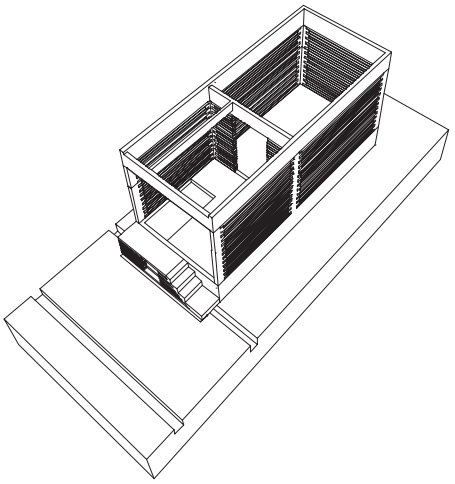
Phase II if the pilot program will begin in the autumn of 2011. Houses being built in this phase will test an innovative, lean structural frame designed to resist seismic loads. The proposed technique has been devised by Professor Lorenzo Jurina, an expert in the field of seismic resistant masonry structures from the Politecnico di Milano in Italy.
The main goal of the project is to create a building able to behave as a rigid "box" under lateral loads. The solution relies on an intimate bond between the cast in place concrete and the masonry infill. This bond is achieved by means of strategically spaced and tied reinforcing, in both concrete and brick walls.
The principal concrete frame consists of columns and beams, with the floor acting as a concrete slab. Thanks to the reinforcing bars placed in two directions, each floor behaves as a rigid diaphragm, able to resist seismic loads.
Additionally, the masonry wall is reinforced with small horizontal steel bars positioned inside the mortar after every three rows of bricks. Their extremities are bended-up around the vertical reinforcement of columns, so that a strong connection occurs. Furthermore, masonry walls are lined by a steel net, possibly on both sides, and embedded in the finished plasterwork.
Steel reinforcing is the most costly component of the structural assembly and the least visible once the home has been completed and, as such, it is the most commonly cut corner.



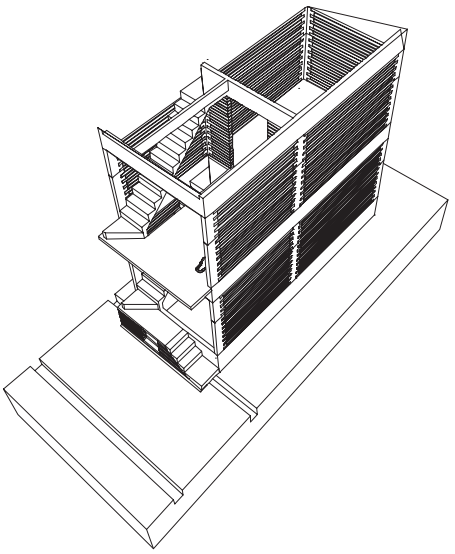
Detail of foundation: Jurina
115cm wide x 130cm deep foundation wall with steel reinforcing mesh
75cm structural fill (below slab)
Concrete slab on grade with one layer of reinforcing mesh
Above grade 115cm wide concrete "L" shaped column with steel reinforcing masonry walls with horizontal steel reinforcing and diagonal welded wire mesh



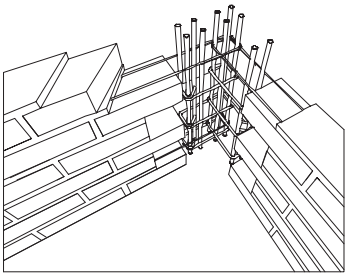
STEP 4
Upper half of brick is layed



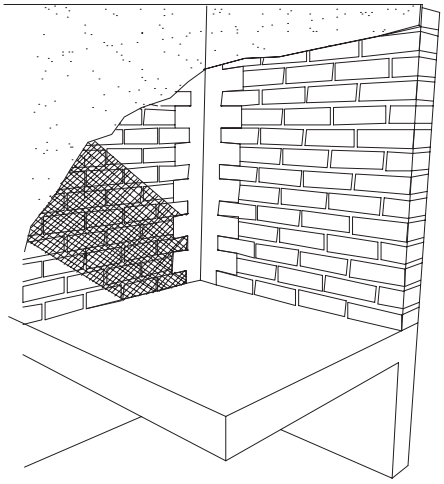
STEP 5
Second lift of concrete columns and first floor beams are poured



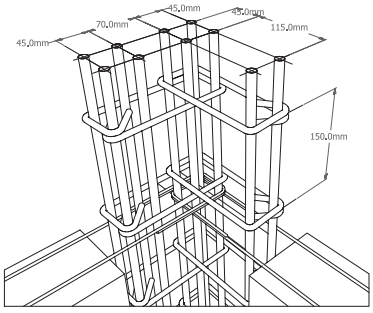
STEP 6
Upper level floors follow ground floor process



STEP 3
Horizontal renforcing bars are placed every 3 brick courses and engage column renforcing



Welded wire mesh is secured to brick with through/wall clamps and encased in cementitious finish coating



It is inevitable that a structure which is resistant to seismic forces will require more reinforcing steel than one which is not, but the proposed Phase II design endeavors to save space while requiring only 15% extra steel than a conventionally engineered structure. Although additional steel is required within columns and perimeter beams its weight is offset by less steel required within floor slabs.

Given the very tight margins within which these projects must be executed, this revised structural approach is designed to be as efficient as it is strong. Efficiency is measured both in terms of space requirements and in terms of material quantities and costs. The engineered bond of masonry with poured in place concrete allows for a very strong “box” to be built without apparent columns taking up precious living space. This can be achieved because the poured in place reinforced concrete columns which anchor corners and intersections of brick walls and have dimensions no larger than that of the brick they engage.

Inside and outside of typical local houses

Panoramic view of Mangolpuri

Before and after of a house during the pilot [Shoba]

Before and after of a house during the pilot [Manesh]

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4 Market Study
Evaluating the self-construction market

The built-up environment develops in an organic and incremental manner in the low-income self-construction market. As described in earlier chapters, the result is often unregulated, precarious housing structures and sub-standard living conditions.

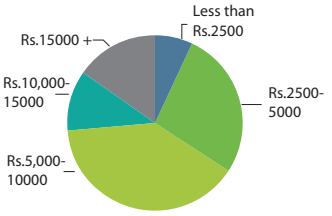
The pilot project in the Mangolpuri resettlement colony (described in Chapter 3) was designed to test the DHS concept by giving low-income residents access to affordable formal finance and professional technical assistance. While the experience was encouraging and timely, we were educated in several other issues with regards to building practices and supply chain logistics that need to be better understood.

The market study, which focuses on uderstanding the self construction market, draws from a sample survey covering 1500 households across three resettlement colonies in North West Delhi (Narela, Savda Ghevra and Mangolpuri). The chosen settlements had varying degrees of basic services, tenancy-ownership rights and socioeconomic characteristics (described in Chapter 2). The study illustrates the socioeconomic background of the residents and information related to access to finance, construction and housing choices. It then attempts to highlight the nature and size of the opportunity to make a far-reaching social impact on living standards of low-income households that are engaging in incremental self-construction. While we looked at past construction trends and practices, the aim was also to assess the potential supply of housing that can come from such locations.

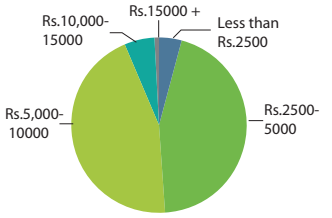
The primary research in this section is backed by mHS's interactions with residents and regular visits to these settlements over the last 18 months. It also covers our interviews and dialogues with stakeholders in this sector and their perspective on the opportunities and challenges. With a deeper understanding of the market dynamics, we hope appropriate policy, products, and services can be created and implemented, keeping in mind the on-ground realities and the opportunity to improve self-construction.

Before discussing the nature and size of the market, we first highlight the socioeconomic characteristics

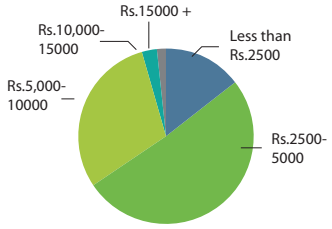
Household Income Levels



Mangolpuri



Narela

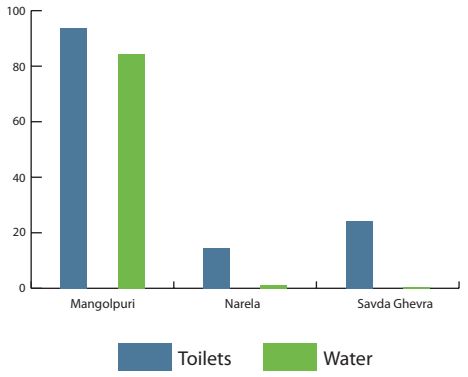


Savda Ghevra

Source: Primary data collected through 1500 household survey

Older resettlement colonies, such as Mangolpuri, have higher income levels than newer settlements such as Narela and Savda Ghevra

Access to Basic Services



Source:Primary data collected through 1500 households survey data

Even after five years of resettlement, residents of Narela and Savda Gherva still live without individual toilets and household-level water connections

of the residents in the chosen settlements and trends in housing, construction and finance.

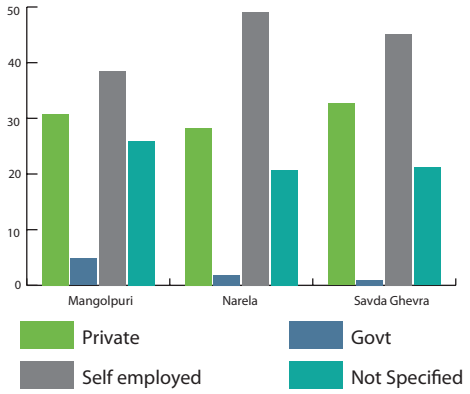
Socioeconomic characteristics

Resettlement usually begins with the distant relocation of slum dwellers, whose livelihoods are either lost or put at risk as a result of the process. The resettlements colonies of Narela and Savda Ghevra are located in Delhi's urban peripheries and have

Water tankers are the only available source of water for the residents of Savda Ghevra

on average, lower income levels but also a more immediate need for housing. These relatively recently established settlements are in contrast to older re-

Employment



Source:Primary data collected through 300 households survey data

Self-employed in Mangolpuri, running enterprises and shops, while Narela and Savda Ghevra are more casual labour

settlement colonies that have been engulfed by the rapidly growing city. Incomes are relatively stable in these areas and there are often multiple earning members per household.

Limited access to basic services

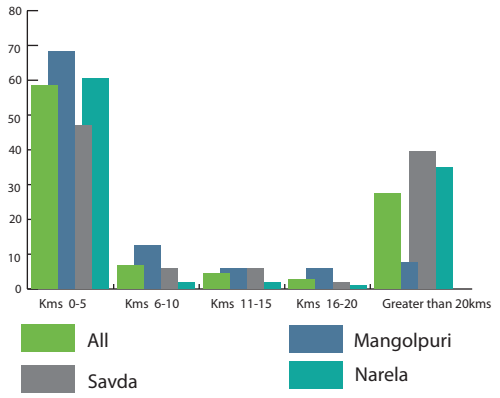
Chapter 2 described that often in such settlements the majority of basic services do not reach until well after resettlement begins. While some families indicate a preference to wait for amenities such as sewage and water connections before investing in their housing, most that have access to savings or

40-50% of residents are self-employed and run small shops or market stalls, like this man who sells spices in the weekly market in Savda Ghevra

financing do not wait for the government to deliver. They often build homes with individual toilets and septic tanks.

Households either work close to home (i.e run enterprises within these locations) or commute long distances of over 20 kms

Distance to workplace



Source:Primary data collected through households survey data (Kanhu Analysis)

Largely informal sector workforce

Most residents of resettlement colonies are part of the 92% of India's workforce who are employed in the informal sector—many are either self-employed or on casual contracts. In some pockets within resettlement colonies, there is a significant concentration of residents who are class-IV employees of government (municipality karamcharis, such as street sweepers or security guards). We observed that there is a thriving economic activity taking place within such settlement areas, despite technical illegality due to land-use regulations according to Delhi's Master Plan 2021. The self-employed households range from mini-enterprises employing other workers to small home-based activity such as tailoring.

Proximity to work place

For those who do not rely on home-based enterprise, a large portion of the household income is spent on travel to place of work, especially for the residents of Narela and Savda Ghevra . Many wage earners choose to live in cheap rentals close to the workplace and return to families during weekends or periods of leave. As is evidenced from the data, the majority of households either work very close to home (0-5 km with most working from the home itself) or greater than 20 km and with an average travel time of 70 minutes.

Current use: Home to owners, renters and home-based enterprises

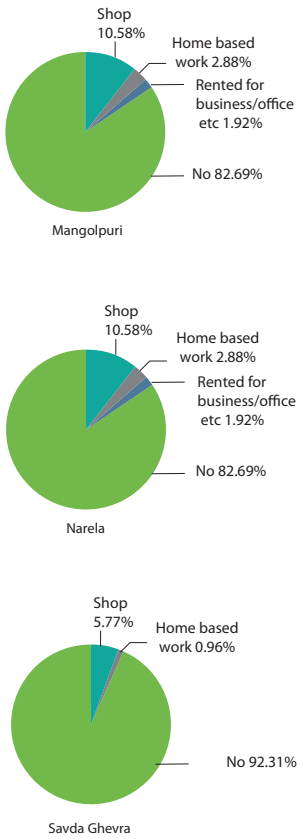
There is large supply of rental housing stock provided by low-income settlements like Mangolpuri and Sultanpuri. In contrast, the periphery locations of Savda Ghevra and Narela are less attractive to renters. In one discussion with a new resident of Savda Ghevra, we learned that the family was previously renting in Mangolpuri, and recently acquired a plot in Savda Ghevra upon which they aspire to build their own home one day.

Trends in housing, finance and construction

Weak titles are not a deterrent for housing construction

The colonies surveyed had three different types of possession slips providing tenancy rights. While Mangolpuri relocated in 1976 and has 99-year licenses to the land (although with restrictions on building), Savda Ghevra has ten-year licenses and Narela only

Use of Space



Source:Primary data collected through 1500 households survey

There is a large demand for rental housing in Mangolpuri and the dwellings are also used for running home based enterprises

The Savda Ghevra transportation challenge

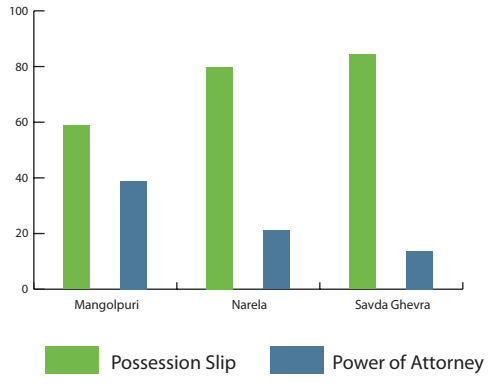
Many of the O-Block members in Savda Ghevra have been relocated from Raghubir Nagar, an area in central west Delhi. The transition to life in Savda has been a challenge as most jobs are located in the urban center. For example, Laxmi Narayan, a community leader in O-Block, has two sons who are the sole earning members supporting a family of seven. Their combined monthly income is INR 15,000 (USD 330) which is relatively well off in Savda. Due to the long, roundabout bus routes, the boys must leave home at 5:30 AM to reach their day shifts starting at 8 AM.

seven-year licenses. From the resident's perspective in the newer settlements, it was clear that politically and practically another eviction does not seem possible and provision of facilities such as schools, dispensaries, and even a Mother Dairy (brand selling dairy products) booth all serve as signals of permanency of their settlement.

Thriving secondary market for home buying

The residents in the resettlement colonies are relocated by government agencies on the condition that the 'tenancy right' is not mortgage-able or transferable. In fact, many of the residents have a license of five to seven years for which they paid upfront nominal amounts of Rs 4,000 - 7,000. However, this has not prevented the 'beneficiaries' from informal sales through power of attorneys, and many residents in such communities have bought the plot from the original allottees.

Nature of Ownership Documents



Source:Health and Living Conditions in 8 Indian Cities, NFHS-3, 2005-06

Even though there is a informal secondary market for titles, settlements have many original allottees or family members that still have possession slips

Savings and informal debt are primary sources of finance for housing

The largest percentage of financial debt is from housing related expenditure, even though many did not disclose the source of borrowing. The preference is for savings and committee funds, friends and family, moneylender and then the bank. There is still a taboo in being indebted, especially with a formal bank, so it is likely that many families did not disclose accurate debt levels to the surveyors.

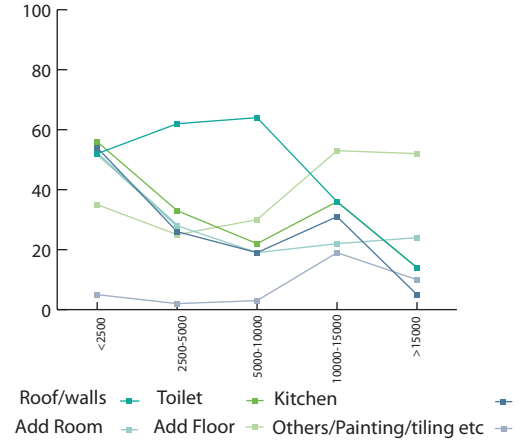
Home construction needs vary according to the settlement, income, family demographics, financial ability and employment types

The construction and housing requirement varies from new construction, finishing, waterproofing work (minor improvements) to small additions such as that of a toilet, room (extensions) to full-scale construction of the house (full construction).

New construction: Upon establishment of a colony, families are given or buy a vacant plot, upon which they construct from scratch. This full construction typically falls into two categories:

- Building from the ground-up on a recently vacant plot

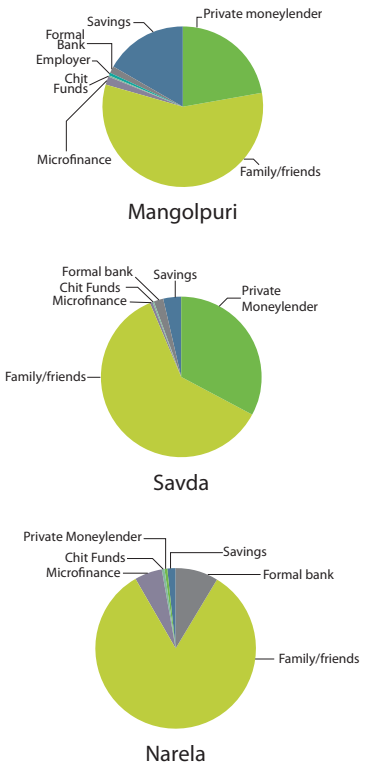
Use of New Space by Income Levels



Source: Primary data collected through 1500 households survey

Home construction needs Both minor repairs and constructing their first shelter is a priority for poorer residents, while the better-off are looking to add a floor or a toilet

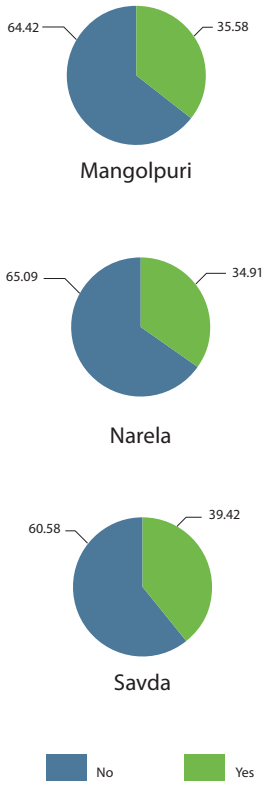
Primary Source of Finance



First recourse is own savings and family and friends, then the monelylender

Source:Health and Living Conditions in 8 Indian Cities, NFHS-3, 2005-

% that accessed Informal Debt



Source: Primary data collected through 300 households survey
On average about 30% reported borrowing money from informal sources

- Tearing down a one-story substandard house and rebuilding from there

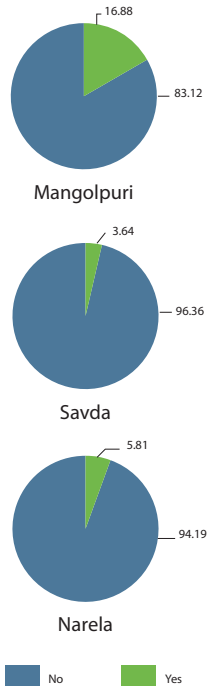
There is a large financial need for full housing construction and the tenure and terms of the loan need to be flexible with multiple financing options. Although it appears that a large number of urban households collect their savings in anticipation of housing construction or purchase, many still rely on outside sources.

Possession slips are the only form of license given to resettlement community residents. Here is the possession slip allotted to a Mangolpuri resident in 1976

Extensions and additions: While this market for extensions is large in the low income settlements, it is also the most challenging from a technical perspective, especially in highly dense, seismic zones. Any new addition on an existing weak structure enhances the risk of structural collapse. Thus the provision of adequate technical construction assistance, in addition to the appropriate innovative solution, is very important for this market segment. Many families end up demolishing the existing structure in order to build significant additions, such as more floors.

Minor Improvements: Common minor improvements include fixing leakages, roofing, tiling walls,

% of people that used a contractor in three locations



Source: Primary data collected through 1500 households survey

As settlements become more prosperous, more families have a contractor; even so, very few do

etc. Households looking for small-scale improvements to an existing structure often require financial assistance, and less input of technical assistance. However, if the existing structure is weak, the improvement will be temporary and the family will need to fix the problem in the future. For the financiers, this kind of product can be positioned primarily as a 'personal loan' and can neatly fit with the existing products of microfinance institutions.

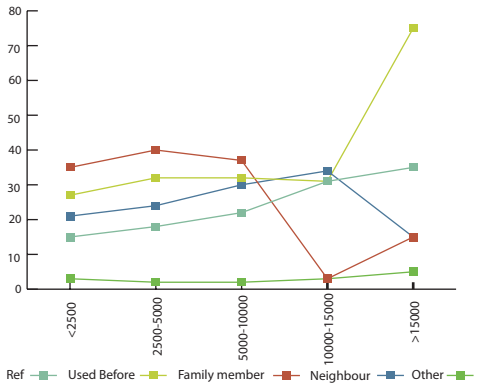
Mason, not contractor is the homeowner's choice for construction

Similar to insights gained during our pilot operations, the majority of households have either undertaken construction in the past or have plans to undertake construction soon. Most will go about this construction simply by hiring a mason and providing close supervision by a trusted family member. This bypasses the overhead costs of a contractor and affords the owner more direct involvement in the building process.

Income levels and housing need

Across the board, more than half of the respond-

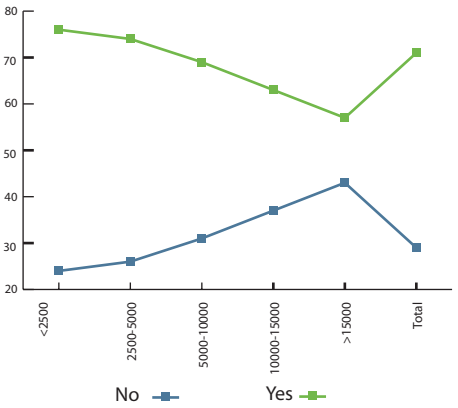
Choice of Mason by Income Level



Source:Primary data collected through 1500 households survey

Highest income households choose the mason based on references (quality), while lower income levels look to hire family members or from the neighborhood

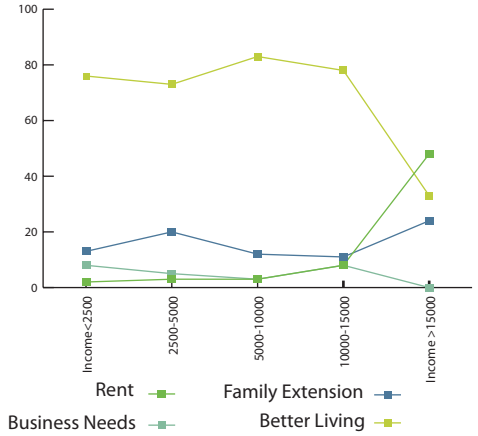
Home Improvement Need and Income



Source: Primary data collected through 1500 households survey

Many homes, such as the one above, suffer from low quality roofs and walls, and 50-60% of lower-income families express the need to upgrade the quality of their roofs or walls

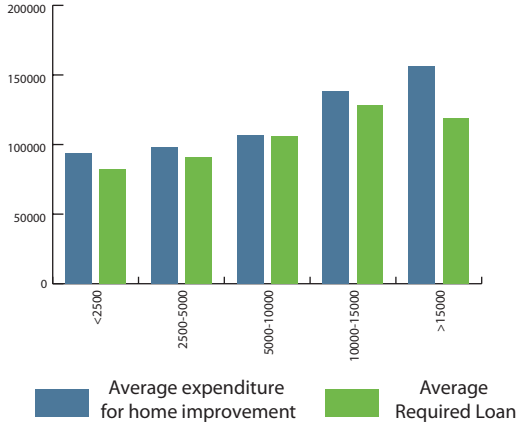
Use of constructed space



Source:Primary data collected through 1500 households survey

Many construct homes to earn rental income

Loan Needs for Home Improvement



Source:Primary data collected through 1500 households survey

The minimum home improvement borrowing need ranges from USD 2,000-3,500. In the pilot the loans were approximately USD 6,000 to create multi-storey structures

ents say there is a home-improvement need. The survey finds that the poorer the plot owner, the higher the probability that they will have a home improvement need. This probability is highest for the lowest income group (76%) and lowest—yet still more than 50%--for the highest income group (57%).

The survey indicates that strengthening the roof or walls is the most common housing need for the lower income homeowners. The proportion of homeowners who believe roof/walls are the top priority goes up from income levels one to three then goes down drastically from levels three to five. Similarly, and not surprisingly, the need to build a toilet also goes down as income increases. Construction of additional rooms and additional floors, on the other hand, seem to become more important as income increases.

Here we look at how people in different income groups plan to use the new space created after construction. We can see that for the lowest income groups, the primary goal of home improvmeent is "better living," but the highest income groups more frequently construct for rental income, which speaks to the need and corresponding supply of rental housing in these resettlement colonies.

This shows that the highest income householders choose masons based on reference and familiarity, while the lowest income householders often choose family members and neighbors as their mason.

The total monetary requirement for construction goes up from Rs 92,737 (USD 2,060) for lower income ranges to Rs 156,571 (USD 3,479) for the highest income range. Of this monetary requirement, the lowest income group needs to take a loan of Rs 82,457 (USD 1,832)—almost the entire amount for construction—to meet the need, while the highest income group only needs Rs 119,167 (USD 2,648) to meet its need. Hence, the higher income groups can meet their home-improvement needs without resorting to as much debt as the lower income groups.

Maximum installment payment ability

The average monthly installment payment ability goes up with the income level, as the lowest income levels can pay Rs 1,096 (USD 25) a month and the highest income levels can pay up to Rs 4,026 (USD 90) per month. It is also interesting to note that while the residents opt for the longer term loan product, there is a wish to pay off the loan early depending on their income situation.

Without formal mortgage documents, households typically need to find guarantors for their loan in order to access formal finance. We see that only 33% of the lowest income range householders have access to guarantors for loan, while 90.5% of the highest income range householders have guarantors. The proportion of householders who have guarantors by income range is as follows:

Access to guarantors

Income Range	Proportion with Guarantors	Maximum Guarantee Size (Average)
Income<2500	33.3%	33,916
2500-5000	45.8%	47,588
5000-10000	59.3%	54,232
10000-15000	88.9%	98,518
Income >15000	90.5%	187,222

Lower income households have few in their networks who can stand as guarantors for a large loan amount, and often gurantors to these households come at a price

The majority of the households say the guarantor is a relative. For the highest income range, the proportion of respondents who believe that neighbors would be their guarantors is 16%, significantly lower than the proportion of other groups, which hovers around 30% or more.

Next we look at the average of the maximum amount that this guarantor can guarantee across income levels. As would be predicted, the size of the guarantee goes up with the income range. The fact that the guarantee size is much less than the cost of construction for the lower income segments means that lending institutions should consider allowing multiple guarantors for a single loan.

Nature and size of opportunity

Large un-built capacity in resettlement colonies

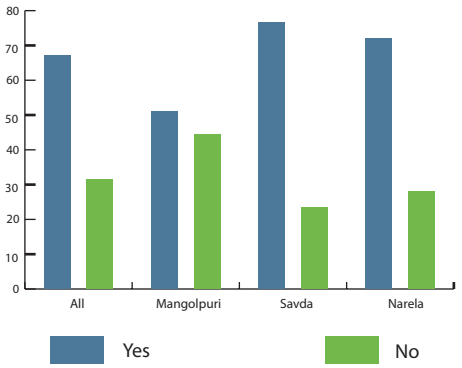
Looking at the construction patterns, there is an urgent demand for new home construction in recent resettlement colonies, such as Narela and Savda Ghevra, and more incremental housing needs in older settlements, such as Mangolpuri. The construction need is mostly driven by a desire to accommodate family expansion and better living conditions for the family.

Estimating the potential supply of new housing units in resettlement colonies

We argue in this study that a large percentage of Delhi's low-income housing stock can be made available through the self-construction taking place in resettlement colonies and similar areas. In an attempt to estimate this potential supply, we plotted all such resettlement colonies in Delhi and categorized them into three phases: Phase I from 1960-1970, Phase II from 1970-1980 and Phase III from 1980-2005. Assuming that each location has the capacity to build up to 3.5 floors, we estimate that there is almost 39% un-built capacity in these areas. We estimate a potential of over 347, 079 units.

The resettlement community of Savda Ghevra has significant un-built potential, and its residents are rapidly expanding vertically

Future need for home improvement



Source: Primary data collected through 1500 households survey

There is more immediate and urgent need for basic housing in newer settlements where incomes are lower

Unbuilt housing capacity in resettlement colonies

	Total Plots	Total Capacity	Units already built	Potential Supply of new units
Phase I	181,612	635,642	425,880	209,762
Phase II	14,915	52,203	31,322	20,881
Phase III	55,446	194,061	77,624	116,437
	251,973	881,906	534,826	347,079

Our estimates indicate that resettlement colonies of Delhi can supply an additional 350,000 units indicating the potential to influence new construction standards and raise quality of living

Density and living conditions

We must highlight here that while resettlement colonies present this massive opportunity for housing the poor, increased population density in these colonies without appropriate planning for basic services and improved layout and design would aggravate the problem for existing and new residents, making it comparable to conditions in a slum. Not only should the technical assistance providers help ensure quality as these areas densify, it is just as critical that government and other infrastructure providers account for the capacity additions that are to come to these areas . We have discussed the above and governance-related issues in further detail in our policy study with Mahila SEWA housing Trust 'Re-thinking Resettlement Colonies'[1].

Demand for housing and housing finance

The large potential of over 347,079 units then begs the question—how can we unlock the possibility of the self-construction market to supply Delhi with its much needed stock of housing, in a timely and high quality manner? Furthermore, we need to ensure that the enhanced density does not negatively impact living standards, making provision of technical assistance even more important.

Number of units already constructed in resettlement colony	534,826
Number of people living	2.6 million
Investment already undertaken in these areas	USD 1.39 billion
Potential supply of new units	347,079 units
Number of people that can be accommodated	1.7 million
Total housing investment required	**USD 900 million**

We estimated how much investment (and thus finance) has already been made by residents through incremental construction in these locations and how much further investment is required in Delhi alone.

Assessing the existing landscape

Looking at the survey data we see that many of the households are currently indebted and the majority cite housing-related reasons for the debt. Since the majority are informal-sector workers with poor title deeds, they typically resort to informal sources of financing.

Factors influencing access and supply of home-improvement finance

The formal financial institutions are traditionally wary of providing credit to low-income informal sector households. Those that find it attractive do so in order of fulfill the norms of a priority sector lending mandate that requires a certain percentage of portfolio lending for identified segments, including low income. For housing finance, specialized lending institutions such as housing finance companies are looking at the micro-mortgage market and some have also recently ventured into financing the self-construction/ home-improvement market. However, there is risk, as highlighted earlier, in making finance cheaper and more accessible without ensuring quality-building structures. This will encourage residents who currently cannot access loans to build homes that are unsafe and lead to even poorer living conditions. Thus, we argue that access to finance or materials must go hand in hand with basic minimum building standards, especially in the face of poor regulation.

The ability to improve access to finance will be driven by the following:

Sensitivity around giving up original possession document: While the possession document remains the most attractive form of collateral for any lender in the resettlement colonies, there is a hesitation to give this away to the financial institution. A number of factors can explain this. Firstly, if the amount of loan is less than the actual perceived value of the home, the homeowner feels she has not leveraged enough (thus for loans under a certain value, and especially for minor improvements, this may have implications on their willingness to take the loan). Secondly, often the possession slip is the sole ownership document for the house to access to electricity connection, ration cards and similar benefits.

Ability to mortgage the possession document: The lack of legal enforceability and repossession of plots has deterred formal lenders from entering this market for construction loans. There is still no clarity amongst the residents on the renewal of licenses. The survey revealed links of these households to their villages and assets, which could be explored as collateral or guarantees. For example, 20-30% of households also own agricultural land in their village.

Ability of financiers to assess income of informal sector earners: A large section of residents in these locations are either engaged in self-employment or employed in the informal sector. Others have salaried

Recommendations on housing finance and ISHUP scheme

- ***Deal with access first:*** *The main policy concern should be to address the access to finance barrier. Urban Local Bodies (ULBs) and other government agencies do not have the expertise or the capacity to target highly disbursed and fragmented groups of low-income households.*

- ***Eligibility to be inclusive instead of exclusive:*** *There should be no fixed ratio for low-income persons and the scheme should be accessible across income groups. Households structures are extremely diverse with multiple people and families living together contributing to household income and expenditure.*

- ***Include households seeking construction finance:*** *For instance, a roughly estimated 30% of Delhi's low-income housing supply can come from resettlement colonies and unauthorized colonies where homeowners are indulging in self-construction (up to 3.5 stories) through sources of informal finance to meet the increasing demand for home-ownership and rentals.*

- ***Fixing of interest rates:*** *Ideally interest rate should not be capped. Also, there should be no cap on maximum loan amount to Rs 160,000. For example, to build a 40 sq m single storey structure at conservative rate of construction of Rs 5,000 per sq m implies a cost of Rs 200,000 per floor. Usually plot owners build two-storey structures to house extended family and for rental income.*

- ***Loan terms:*** *Poor and low-income households have a preference for shorter terms of under ten years, thus multiple loan options should be provided and the no pre-payment penalty clause should be retained.*

- ***Enforce technical assistance to ensure safety in housing construction:*** *Owners are building multi-storey structures in highly dense urban areas without any technical oversight—a large-scale disaster in the making. ULBs should put in place mechanisms to bring awareness on building codes and if necessary facilitate approval of standard drawings and plans.*

- ***Permit alternative collateral mechanisms:*** *They should be permissible and banks should be allowed to accept possession slips/licenses/powers of Attorney and be eligible for re-finance from the National Housing Bank. Some level of informality in housing titles is required to disincentive land-pooling by sharks and inviting interest of large property dealers.*

jobs with government agencies and private companies. The ability of formal finance companies to undertake due diligence and develop credit scores for these urban informal groups is a clear hurdle. The role of the MFIs and self help promoting institutions could be explored.

No incentive for banks to address this segment: As a commercial bank, the Reserve Bank of India's non-performing assets (NPA) standards are to hold across income-groups. While there is a large lucrative market for housing finance from the upper- and middle-income groups, there is little incentive to address informal worker segments. Legalities notwithstanding, demand aggregation and underwriting norms are high risk areas.

Mortgage guarantee fund: The 2011-12 National Budget discussed the creation of a Rs1.2-billion (USD 27 million) mortgage guarantee fund to achieve credit enhancement for the housing sector. This was given despite schemes, such as the interest subsidy scheme for housing the urban poor, that have been in place to make credit cheaper for the households.

Factors influencing safe construction practices: While lenders are preoccupied with the credit risk of

lending in informal markets, there is an additional risk associated with proposed self-construction. The self-construction in these markets relies on the mason and owners, with no formal information or knowledge about building norms. As discussed throughout this report, with no requirement for approvals of building plans or monitoring in place, the residents engage in ad-hoc construction. Therefore, technical know-how is extremely important and will be driven by the following factors:

Continuity in technical R&D and innovation: Solutions that are more affordable and work with the priorities of the household (e.g maximize carpet area and minimize costs), need to be developed. There is an interest from suppliers of pre-fabricated materials, electrical appliances and cement, to design new products that can address this particular market. Whether motivated by the potential for a large volume of sales or social consciousness, several manufacturers of building products are becoming aware of the demand in the lower-end self-construction market.

For example, Legrand Group, a worldwide specialist for building electrical systems, approached mHS to seek advice as to how to approach the self-construction market with their line of affordable and durable lighting systems.

Similarly, Ambuja Cement, although already widely used on large and small jobsites throughout the country is currently working with mHS to devise mason training programs aimed at insuring that builders use cement, the central ingredient in masonry and concrete construction, according to the industry best practices.

Even manufacturers of panelized building systems, an industry in competition with traditional brick and mortar construction, have consulted with mHS as they explore the potential for adapting standard product lines to suit the uncompromising dimensional characteristics of 12 to 21 sq m parcels in resettlement colonies.

Greater information and transparency about how much construction is allowed: Currently there is no requirement for formal approval of building plans in these areas, and thus a lack of compliance with basic construction standards. There is a lack of access to formal technical know-how in the low-income communities, and as a result, the mason emerges as the definitive construction authority. However, the lack of a clear regulatory environment, especially no system of building officials insuring safe conditions by approving plans and inspecting job sites, frequently leads to unsafe construction. This unregulated building environment also allows municipal officials to take advantage of the lack of clarity, and a large segment of residents complain about harassment from the local officers during construction.

Regulation by urban local bodies: Although resettlement areas are planned and legal colonies, the role of the municipality has been extremely limited, and responsibility typically stops with the provision of basic services. Building codes and land-use regulations have to be designed by the municipality to meet the needs of the communities and their residents as they grow. For example, encouraging mixed-use of land and residential buildings will allow residents to operate home-based enterprises and enhance the household income.

The World Bank has expressed its intention to include incremental housing projects as part of its support to National Housing Bank (NHB), and acknowledged and highlighted the risk of funding unsafe housing. They are looking to develop construction standards and technical assistance to go along with wholesale lending done by the NHB.

Enhancing skills of the informal players/capacity building of the sector: There is a need to enhance capacity of players such as masons and the construction workforce that are engaged in the self-construction market. This means involvement of industry. A variety of entities are already playing a role in this capacity building, from cement companies such as Ambuja Cement to NGOs such as the SEWA Mahila Housing Trust. This capacity building has the potential to create significant impact, given that masons and construction laborers build dozens of structures during their careers. Enhancing their skills will in turn alter construction practices in significantly more households than attempting to address the challenges one household at a time.

Role of multilateral institutions

With interest in affordable housing broadening, a large number of financial institutions are looking

to boost both the demand and supply side of housing. DFID and the World Bank are working with the Ministry of Housing and Urban Poverty Alleviation on capacity building and designing the Rajiv Awas Yojana scheme for a slum-free India. The IFC is working with the Indian National Housing Bank to create a mortgage guarantee fund and ease credit into the market.

Quality supply chain

In urban areas, finding construction materials is not an issue for the homeowners—supply is readily available. Currently, material suppliers (bricks, steel, cement) play a passive role. However, cost and availability of cash in hand can both be significant barriers. There is large scope for innovative role for suppliers of materials that will tie in with assuring affordability, quality and appropriate use of products.

Conclusion

A large informal housing market in resettlement colonies of Delhi has already supplied roughly 540,000 units through residents engaging in self-construction since 1962. Around USD 1.4 billion has been invested in this market. According to our estimates, there is potential to add at least 350,000 more units. Thus far the residents have relied on their own savings or informal sources of financing, ad-hoc purchase of materials, contrived approvals and technical assistance of local construction industry, neighbors and masons.

The magnitude of this market and the opportunity to make an impact is dependent on many factors, from enhancing livelihood security to ensuring availability of affordable credit. The quality of housing, especially with regard to basic safety standards, has the potential for longer-term sustainable impact. It requires investment of technical institutions and industry players in solutions that may be applicable to these areas, acceptable to the residents and easily understood by the informal workforce. In addition, with increased density improving access to basic services and solutions for decentralized systems would make a drastic impact on the daily lives of the residents.

Materials acquisition is a central part of the construction process. There are many opportunities for material suppliers to play a more active role in this process

Our socioeconomic survey and industry experience both demonstrate that there is large-scale demand on the household level to engage in self-construction, yet many barriers stand in the way of homeowners constructing in affordable and high quality ways. The opportunity to influence this process is being recognized by a growing number of players, and there is room for many more to intervene and improve the quality of housing stock developed by and for the urban poor.

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Conclusion

The urban housing shortage is massive and growing quickly. Almost all strategies to address it, whether from the government or private sector, focus on new developments. However, ignoring the chance to influence and encourage safe and affordable self-construction denies a large-scale potential to improve the lives of the urban poor and address the shortage of quality homes available to them. Although low-income home owners are meeting their own needs for more living space, we should not miss the opportunity to influence this process and meaningfully improve long-term living conditions of the poor.

Low- income communities are incrementally becoming denser through self-construction. In doing so, significant additions are made to the housing supply much more quickly and organically than green-field development. However, if the status quo continues, this construction will perpetuate the very same financial insecurities and dangerous housing that currently undermines their quality of life.

Providing families with the necessary tools to improve the self construction process can support a system which already has considerable momentum while insuring affordability, safety, and quality. The need for these services is wide reaching, and it will only get larger as India's poor continue to move from rural to urban areas.

Impact on self-construction comes in many forms...

Why?

Influencing self-construction is set apart from the dominant affordable housing strategies for a variety of reasons. Self-construction retains the desirable aspects of the fabric of the community while upgrading and densifying. One of the most essential pieces is the retention of livelihood. Most low-income communities are "mixed-use," meaning that they are a combination of residential and enterprise activities. Many are also "mixed-income," typically fostering a co-dependent existence that has the potential to encourage inclusive cities much more than the income-segregation that can result from resettling/rehabilitation in newly constructed areas. Taking away mixed-income and mixed-use by replacing the current structures with high-rise developments strips many of their livelihoods and the potential for upward mobility.

In addition to its speed and organic nature, self-construction works with the poor to upgrade their living situation in communities where they are already rooted and feel comfortable. It supports a thriving local construction industry that provides significant employment for the community, either as masons, laborers, or materials suppliers. And perhaps most importantly, it is fundamentally self-led, which maintains dignity and personal choice.

What?

There are many categories of intervention in the self-construction process. As addressed in Chapters 3 and 4, low-income families have a variety of construction needs-- In Mangolpuri, for example, 39% of people are planning to build additional floors, while in Narela and Savda Ghevra, fixing roof/walls is the most common construction need (66.95% and 60.65% respectively).

Given the variety of self-construction needs and challenges, it is not difficult to imagine the ways in which many different stakeholders could intervene. Our work at mHS has focused mostly on finance and construction, touching peripherally on the policy side as well. While the majority of this report expands on these areas of intervention, the possibilities do not stop there. There is a need to think creatively about the multitude of strategies that could exist to alleviate challenges for low-income families looking to upgrade their homes.

Improving access to finance

Construction is expensive, especially when the demand is to add new rooms and build vertically. However, most low-income families do not qualify for formal loans of this size, especially if they have temporary or no tenure over their land. Usually the only alternative is to take money from a moneylender at

exorbitant rates. Formal financial players should recognize the chance to provide affordable construction finance to these families.

Our survey showed that home construction was the most common reason families take debt--40% in Mangolpuri, 61.54% in Savda Ghevra, and 20% in Narela. Yet, the majority of housing-focused lending institutions provide almost exclusively micro-mortgages. This only addresses a fraction of low-income housing finance needs—it only satisfies the needs of those looking to purchase new homes, as opposed to the far more common need to self-construct on an existing plot. Therefore, financial institutions that span the spectrum from microfinance to housing finance companies to commercial banks have an important role to play in improving access to affordable self-construction finance.

Improving construction practices

Even if finance is easily secured, a multitude of challenges await during the construction process. Here again, there are many opportunities for outside actors to help improve the process, both to alleviate some of the pain points during construction and to ensure that the family has a high quality structure coming out of it.

Providing access to professional technical assistance is one of the most direct and essential ways to simultaneously address the construction and post-construction sides of the equation. As this report shows, without TA it is likely that the finance will be used to build unsound structures that could actually put the family in danger and/or require them to spend even more money on maintenance.

Technical assistance can and should include many different components. We learned through the pilot that skills-training, especially of the mason, is absolutely essential, as is construction monitoring. Working with the client to develop professional architectural design layouts also has many long-term benefits for the household because it translates into more livable, better lit and better ventilated spaces. Finally, the client also faces challenges related to materials acquisition, materials storage, and accurate cost estimates.

Each of these services could be provided to the client by the same or separate entities. Together, these interventions in the construction process will ensure that the client is able to maximize every rupee and invest in truly upgrading their living situation.

Lessons from piloting the DHS

DHS is one of several possible conceptual methods to address the self-construction market by combining the offerings of finance and technical assistance, which we understand are key drivers in the market.

From piloting the DHS concept, we learnt that:

There are many ways to impact this market. Working with the mason and spreading awareness about the need for structural safety in self-construction are also legitimate ways to enter the market, besides DHS. Engaging various stakeholders is a vital step in this market.

Two important factors that will impact demand for DHS is the team's ability to build relationships of trust with home-owners and creating awareness regarding safety to enable low-income families to prioritize this. The most vital factor, however, is cost. DHS must be perceived to cost the same or less than construction without DHS.

Innovative business models will be needed to implement solutions for the self-construction market. Big questions remain on the ways to scale up DHS. Whereas the market is thriving, with or without the intervention of market players, urgent steps to enhance safety and quality of life are required. The initiative of scaling up DHS can be best taken through partnerships between various private sector players with support from the government, especially in creating the right structures for financial institutions to be pro-actively involved and creating mechanisms to monitor and guide technically sound construction.

Policy as an essential enabler

Whenever housing is involved, policy cannot be ignored. There is an essential choice for government to make about whether to act as a barrier or an enabler of self-construction. If the latter is chosen, government has the potential to impact self-construction practices at a scale that most of the other stakeholders can only dream of.

Rajiv Awas Yojna (RAY) puts a mandate on the Municipal governments to make India "slum free." Whether or not this is a realistic goal is up for debate, but regardless, the cities are under pressure to create formal housing for the poor.

RAY recognizes the failures of the resettlement model and explicitly favors "in-situ redevelopment," rehabili-

tating people in the location where they currently reside. However, the vast majority government-led in-situ projects demolish the existing community and place high-rise apartments in its place. Not only does this ignore the essential mixed-use nature of these neighborhoods, treating them as purely residential which could not be farther from the truth, it also gives people no say over the type of housing they are given.

City governments are struggling to find strategies to satisfy RAY, yet none have recognized the potential that lies within self-construction. In some cases, it may be better not to demolish and build anew, but instead to put the mechanisms in place to allow people to upgrade their own structures through a self-led process. In order to take advantage of this opportunity on a large-scale, government must actively enable the process through the provision of tenure in currently informal settlements, which in turn will enable housing construction finance to enter.

The other side of encouraging densification, which is an important part of city growth, is the provision of infrastructure and services to meet the growing needs of the community. The government is the driver of this process and should not stop at housing. Arriving at development plans for low income communities, acknowledging their full build-out potential and providing the services necessary to satisfy that future density, should also be the role of the government.

Where?

We began in resettlement communities for a variety of reasons and continue to believe that these are an essential area to influence, especially in the Delhi context. Government recognizes that resettlement communities were a failure because they take away livelihood, relocation is traumatic, services are not provided in a timely manner, and large areas of land are tied up that could later be sold to real estate as extra revenue for municipal governments. Regardless of whether government continues to keeps resettlement communities as part of the low-income housing strategy, there are nearly 2 million people already living in these areas in Delhi alone, and they are expanding rapidly as families build vertically. There is a huge opportunity to improve the residents' ability to construct high quality homes so resettlement communities do not turn into the equivalent of planned slums.

The importance of this intervention is increased even further when considered in the context of city growth. As we know from the three communities in which we work, resettlement communities may be created in the outskirts of the city, but the metropolis expands so rapidly and extensively, that before long they become integrated into the fabric of the city. Within a few decades (or less) they are connected to the metro, surrounded by livelihood opportunities, and include a multitude of schools, health centers, and even entertainment facilities within their midst. However, slums exist within similar surroundings, and the environment does not necessarily determine the quality of housing or quality of life within the community. Therefore, there is a chance to intervene now, before these resettlement communities are built up and it is too late, and to set resettlement communities on the path to become desirable low-income neighborhoods.

Beyond resettlement communities

Self-construction is not isolated to resettlement communities, and therefore, neither is the need to intervene. Self-construction is happening in low-income communities all across India, from informal to formal, rural to urban. The need to influence self-construction extends to many neighborhood types. In each context, the opportunity to intervene will look slightly different, but the thread that ties them all together is that a massive amount of self-construction is on-going and there is an imperative to influence the manner in which these areas densify.

There will always be an opportunity to influence and enable self-construction, but it must be done with urgency in the major metros like Delhi, Mumbai, and Kolkata. These areas are rapidly densifying now. Eventually, they will become saturated, at which point, it will be too late. Even then, the need to intervene will extend down into the tier 2 and tier 3 cities, and eventually the rural areas. Families will increasingly invest in upgrading their homes in these areas as livelihood opportunities increase and the need to migrate decreases. If we recognize the chance to intervene in self-construction now all the way through the spectrum, from megacity to semi-rural area, India's rapidly growing towns may avoid many of the challenges faced by the major metros.

Many are recognizing the opportunity

We are not alone in our recognition of the need to influence and support self-construction amongst the low-income. A variety of stakeholders are either talking about or beginning to respond to this demand. In this mix can be found financial players, materials suppliers,

NGOs, and even recently, international aid agencies.

Each has its own strategy and philosophy, yet the commonality amongst us is that we are all at an early stage. Each of us is experimenting. Based on the pilot project, socio-economic survey and extensive R&D at mHS, we strongly believe that anyone hoping to influence self-construction must look at the opportunity comprehensively. This means understanding the nature of the existing market, its drivers, and the priorities of the homeowners. It means recognizing what fundamentally sets self-construction apart from the status-quo housing solutions and maintaining these aspects, even whilst formalizing them to some degree.

It takes time

We began this process idealistic about what it would take to meaningfully intervene in the self-construction process. We were convinced that it would be quick and easy. However, when we put our theories to the test, it quickly became clear that the self-construction nut is complicated to crack, especially as an outsider.

The nature of the competition... While conceptualizing DHS, we addressed the question of competition as would a traditional business plan. "Who is providing access to finance and technical expertise to low income families with a self-construction need?" When we examined the market for other social enterprises, NGOs, government or private sector players, we found few, causing us to believe that we were entering a fresh market and treading new ground.

However, when we showed up in the communities and began working with clients, we quickly learned that the competition is vast. It is a dynamic informal system that lives and breathes on social ties and trust. And it turns out this is much harder to compete against than the typical private player. Understanding how to meaningfully influence self-construction practices has meant becoming intimately familiar with this informal system and in many ways, working within it instead of against it. This takes time.

Each location is different... Take a look at Savda Ghevra, Mangolpuri and Narela, and you can see the extensive differences between locations. Then add non-resettlement communities to the mix and the differences expand even further. Each location—each with different income levels, livelihood types, available services, and tenure statuses—comes with different home improvement needs, different abilities to pay, and even different priorities.

Technical assistance is essential... However, one thing is standardized across locations—the need for TA. As mentioned before, the intervention must be seen comprehensively. If finance is given without TA, families are likely to build unhealthy, unsafe structures—they have no alternative without access to professional engineering and design assistance. Similarly, if TA is given without affordable finance, a moneylender may force families into a cycle of debt that could even result in eviction from their home. There is a moral obligation for those who are working to increase the quantity and quality of housing supply for the urban poor to recognize these dynamics.

What comes next

A call to action

The primary purpose of this report is to catalyze action in this sector. Our hope is that the proceeding pages illuminate the great potential that lies within the self-construction process. At mHS, our commitment is to continue refining the Design Home Solutions product in order to address the dual needs for affordable finance and technical assistance. However, there many other ways to positively influence the self-construction process and tap into its potential to improve and increase the stock of affordable housing for the poor.

Shifting the paradigm

The low-income housing paradigm needs to shift. There is an imperative to move on from the "one-size fits-all" strategies and recognize the need for a portfolio of housing solutions in order to address the massive housing shortage faced by urban India. Green-field development alone will not solve it. Self-construction alone will not solve it. Rental housing alone will not solve it. We need each and every type of solution to truly meet the challenge.

Self-construction has an essential role to play in this mix of housing for the poor. It is rapidly increasing the supply of housing irrespective of whether we intervene. It is our responsibility, especially if we hope to increase the supply of quality housing available to the urban poor, to recognize this opportunity to impact the way in which this construction occurs. If we do so, we will be that much closer to building truly socially inclusive cities.

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