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## Private Low-Cost Housing and the Peri-Urban Frontier: The economics of building outside Indian cities

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# **Private Low-Cost Housing<sup>1</sup> and the Peri-Urban Frontier:**

The economics of building outside Indian cities

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**Abstract:** *This paper examines the role that the private sector can play in the creation of low-cost housing stock in India. We use theoretical and empirical evidence to establish the optimality of locating low-cost housing projects in peri-urban areas, and illustrate this with a case study of a successful low-cost housing project in Shapar-Veraval district in Gujarat. We conclude by suggesting that an infrastructure subsidy for low-cost developments in peri-urban locations may spur investment and additionally make housing more accessible to low-income groups.*

## **I. Introduction**

With India's urban population poised to go from the current figure of 340 million to about 590 million by the year 2030<sup>2</sup>, there are pressing questions to be addressed with regard to the adequacy of urban infrastructure. Arguably, one of the most critical gaps is the shortfall in housing.

Section II of this paper defines the existing shortfall in urban housing according to income group, revealing that the majority of this shortfall concerns the poorest sections of urban society. Section III puts forward the argument that the Indian state is an inefficient housing provider, but may have a role to play as a facilitator. Private sector housing provision should in theory circumvent the agency problems inherent in public sector undertakings. However the existing shortfall in housing is a clear indication that the private sector has not been able to fill this gap under existing conditions. Section IV of the paper explores the underlying economics of the housing market and Section V surveys the current state of formal private sector housing provision across the country, highlighting the fact that this sector does not currently serve households earning less than INR 7000 (\$143) per month. The survey also reveals that the vast majority of low-cost housing projects are located in peri-urban areas on the fringe of cities, which ties in with the analysis of the housing market presented in Section IV. This result is presented in Section VI, which also briefly explores the dynamics of peri-urban spaces and their suitability as a location for low-cost housing projects. Section VII presents a case study of a successful private sector low-cost housing project - 'Ashray Housing' located near Rajkot, Gujarat - and identifies key success drivers. The last section explores ways in which the state could play a role in facilitating formal private sector provision of low-cost housing.

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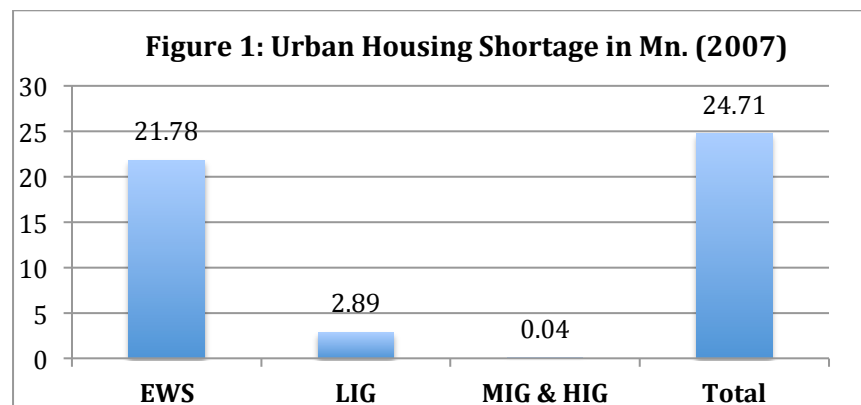
<sup>1</sup> Low-cost housing and affordable housing are used interchangeably in this paper.

<sup>2</sup> McKinsey Global Institute, (2010) "India's urban awakening: Building inclusive cities, sustaining economic growth". MGI

The discussion is limited to the economics underlying the creation of new low-cost housing stock. This stock once created may be sold directly to low-income households or to a third party who rents it out to low-income tenants. A discussion of the modalities of this latter type of arrangement is beyond the scope of the present paper.

## II. Defining the Problem

The Report of the 11<sup>th</sup> Five Year Plan Working Group on Urban Housing estimated a gap of 24.71 million, slated to rise to 26.53 million by 2012. The McKinsey Global Institute projects the shortfall in urban housing will grow to 38 million by the year 2030<sup>3</sup>. More than 98% of the current estimated gap consists of housing for households with monthly incomes less than INR 7500 (\$153). In the figure (Figure 1) below we use the income groups defined by the Ministry of Urban Employment and Poverty Alleviation in 2006 to define the anatomy of this shortage.



**Data source:** Report of the 11<sup>th</sup> Five Year Plan (2007 – 2012) working group on urban housing with focus on slums, GOI

Of the 24.71 million homes needed, 21.78 million are required by households in the Economically Weaker Section (EWS), with monthly incomes under INR 3300 (\$67)<sup>4</sup> and 2.89 million by the Lower Income Group (LIG) earning less than INR 7500 (\$153). The gap for the middle and higher income groups together adds up to a paltry 40,000 homes in comparison.

**Table 1: Classification of Income Groups in India<sup>5</sup>**

Income Group	Monthly Household Income (INR)
Economically Weaker Section (EWS)	Less than 3,300(\$67)
Lower Income Group (LIG)	3,300-7,500(\$153)
Middle Income Group (MIG)	7,500-14,000(\$286)
Higher Income Group (HIG)	More than 14,000

<sup>3</sup> ibid

<sup>4</sup> All figures in Indian Rupees (INR) included in the text have also been given in United States Dollars (\$,USD) at the prevailing exchange rate of INR 1 = US \$0.02041

<sup>5</sup> Govt. of India, Planning Commission – 11<sup>th</sup> Five Year Plan (2007 – 2012) Vol. III Link - [http://www.planningcommission.nic.in/plans/planrel/fiveyr/11th/11\\_v3/11v3\\_ch11.pdf](http://www.planningcommission.nic.in/plans/planrel/fiveyr/11th/11_v3/11v3_ch11.pdf)

Accessed on September 10, 2011

### III. Role of the state in providing housing

In the initial years of planning circa 1950, the state saw itself as the pre-eminent housing supplier. By the 1980s however the task forces on housing and urban development set up by the Planning Commission recognized that government schemes had made only a marginal contribution to the overall housing scene and by the time of the Eighth Plan (1992-1997) housing provision had come to be regarded as essentially a private activity<sup>6</sup>.

In 2007 the government of India tabled the National Urban Housing and Habitat Policy in both houses of Parliament, which promises “Affordable Housing For All”<sup>7</sup>. The policy aims at a comprehensive strategy for affordable housing including accelerating the development of housing and related infrastructure, creating adequate housing stock both on rental and ownership basis and using technology to improve cost efficiency, productivity and quality. More recently the government released its guidelines for slum rehabilitation under the Rajiv Awas Yojana (RAY) on the back of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), all of which stress the need to improve the housing situation in urban India.

As with many government schemes there is a considerable gap between expressed intention and real-world impact. An editorial piece published in *The Hindu*, a national English daily, on the 1st of September 2011 stated that only 30 percent of the houses sanctioned for the poor under JNNURM have been constructed. It goes on to report that of the \$300 million allotted under the Interest Subsidy Scheme for Housing the Urban Poor, a paltry \$1.4 million or less than 1 percent has actually been utilized<sup>8</sup>. There is a wealth of literature that puts forward the view that public sector involvement in housing across the world has been inefficient and ill conceived, including papers by Perlman<sup>9</sup> and Turner<sup>10</sup>. These authors argue that public housing tends to be poorly designed and poorly located, that it does not provide opportunities for multiple use and expansion and that it does not generally allow its beneficiaries flexible payment options. The private sector is generally regarded to be more efficient in such matters, and economists would say it is a matter of incentives. However as will be established in subsequent sections, the market costs of housing provision are not affordable for a vast majority of those who need homes. If the “Affordable Housing for All” policy directive is to be achieved, the only way forward may be for the government to facilitate private sector provision of low-cost housing.

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<sup>6</sup> UNCHS, (2006). “*National Trends in Housing-Production Practices*”, Vol. 4: India, Nairobi, UNCHS (Habitat) HS/310/93

<sup>7</sup> Ministry of Housing and Urban Poverty Alleviation, (2007), “*National Urban Housing and Habitat Policy*”, Accessed on 01/09/2011 at <http://mhupa.gov.in/policies/duempa/HousingPolicy2007.pdf>

<sup>8</sup> Opinion: “*Dismal Progress in Social Housing*”, *The Hindu*, 1<sup>st</sup> September 2011

<sup>9</sup> Perlman, J., (1976), “*The Myth of Marginality: Urban Poverty and Politics in Rio de Janeiro*”, Berkeley: University of California Press

<sup>10</sup> Turner, J., (1972), “*Housing as a verb*”, in J. Turner and R. Fichter (Eds.) *Freedom to Build: Dweller Control of the Housing Process*, New York: The Macmillan Company and Turner, J., (1977), “*Housing by People: Towards Autonomy in Building Environments*”, New York: Pantheon Books.

#### IV. The Economics of Housing

This section contains a brief discussion of the economics underlying demand and supply of housing with specific reference to the case of low-cost housing. This is meant to provide an analytical framework that will define the ensuing discussion on low-cost housing provision in India.

**Fig 2: How Housing Markets Work**



Source: Adapted from Malpezzi, S, (1999)

Figure 2 above is a snapshot of the components of the housing market. Supply-side agents, such as developers and landlords, combine inputs such as land, finance, infrastructure, labour and materials to produce housing services<sup>11</sup>. These in turn are demanded by homeowners or tenants, who pay prices or rent in exchange for access. Input costs as well as the level of demand for housing services thus influence prices or rent.

The term housing services is used because housing is often described as a composite commodity and can be examined in terms of its service flows. Alternatively housing can be characterized as a bundle of characteristics. This latter conception is linked with the hedonic price model credited to Sherwin Rosen<sup>12</sup>. While housing is treated as a single commodity, demand for housing is seen as a demand for differentiated attributes such as location, size, design, interior plan, distance from a school, utilities etc. Consumers with different sets of preferences are seen to differ in their willingness to pay for different attributes and thus to opt for different sorts of housing. There is a large body of literature that attempts to decompose demand using hedonic regression techniques in order to define housing sub-markets, which has been criticized of

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<sup>11</sup> Malpezzi, S, (1999), "Economic Analysis of Housing Markets in Developing and Transition Economies", Handbook of Regional and Urban Economics, Elsevier Science B.V.

<sup>12</sup> Rosen, S, (1974), "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition", The Journal of Political Economy, Vol. 82, No. 1, The University of Chicago Press

providing too little information about consumer behaviour<sup>13</sup>. Yet it is a useful analytical tool to employ when looking at housing choice, and as a method of predicting what attributes certain types of consumers - such as buyers of low-cost housing - may reveal a preference for. As mentioned above, housing provided by the state has often been ill conceived and has not met the needs and preferences of its intended occupants. Private housing providers on the other hand are motivated to cater to the preferences of consumers in order to be able to sell housing and make a profit. Arguably the most significant attributes of a house for most consumers are its location and its size. The price a consumer pays for these is determined by the price of land. It can therefore be said that land economics largely determines affordability.

In a monocentric city with a central business or commercial district (CBD), the most basic determinant of the desirability and therefore price of a house is its distance from the center. While only a few large metropolises today are monocentric in structure, many medium size cities continue to be monocentric and much of what works within this framework can be applied to multi-centric cities<sup>14</sup>. The trade-off faced by households is that of locating themselves close to the center paying higher prices (or rents) but spending less on the commute to work versus finding cheaper housing and paying more to come in to work everyday. The Alonso-Muth theory of income segregation predicts that poor households will choose to locate themselves closer to the CBD, saving on transport costs at the cost of higher rental rates, whereas wealthy households will choose to live further from the city center in order to rent larger living units but pay relatively more to commute to work<sup>15</sup>. While this seems to hold true in the case of cities in the United States such as Detroit, this pattern is reversed in European cities like Paris and London where the rich live in the center and average incomes drop as you move towards the periphery<sup>16</sup>. The pattern is less clear in the case of cities like Mumbai and New Delhi where low-income and wealthy neighbourhoods often coexist cheek by jowl. However this may be explained by the fact that these low-income settlements or slums are built on land where property rights are not clearly defined. It is estimated for instance, that 40% of the population of Pune lives in informal housing<sup>17</sup>. The existence of pockets of informal housing that are not freely transferable because titles are not clear, may actually drive up the prices in the land market by creating artificial scarcity. Thus low-income households in India are constrained either to live in informal housing close to the city center or to travel long distances to work everyday.

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<sup>13</sup> Ellickson, B., B. Fishman and P.A. Morrison, (1977), *"Economic Analysis of Urban Housing Markets: A new Approach"* Santa Monica, CA: RAND Corporation.

<sup>14</sup> O'Sullivan, A. (2000) *Urban Economics*, Fourth Edition, Chapter 14. New Delhi, India, McGraw-Hill.

<sup>15</sup> Alonso, W. (1964) *Location and Land Use*, Cambridge, Mass.: Harvard University Press and Muth, R. (1969) *Cities and Housing*, Chicago, Illinois. University of Chicago Press.

<sup>16</sup> Brueckner, J.K., J-F Thisse and Yves Zenou, (1996) *"Why is Central Paris Rich and Downtown Detroit Poor? An Amenity-Based Theory"*. Working Paper

<sup>17</sup> Kapoor, M and I. David, (2004), *"Measuring the Risk on Housing Investment in the Informal Sector: Theory and Evidence from Pune, India"*, World Bank Policy Research Working Paper No. 3433

Relative to the work done on housing demand, there are few analyses of housing supply. The supply of housing consists of two distinct categories: investment in new housing stock and supply from existing stock. The latter is not relevant to the present discussion. Studies of the housing construction industry suggest that it is typically a very competitive industry that uses simple technologies and has few barriers to entry<sup>18</sup>. However there is evidence that distortions in land markets can cause concentration of power in the hands of a few large players<sup>19</sup>. Many households end up constructing their own units. While acquiring land is often the biggest hurdle, access to finance and self-supplying infrastructure often prove to be equally challenging in the Indian context. The next section looks at private sector supply of low-cost housing in India.

## **V. Current Supply and Affordability of Private Housing**

The Centre for Emerging Markets Solutions conducted a survey of 39 affordable housing projects across the country in August 2010<sup>20</sup>, which revealed that only a very small minority of these projects caters to the lower income group (LIG) and none to the economically weaker sections. While all the projects surveyed had labeled themselves “affordable housing” projects, the prices quoted ranged from INR 311,000 (\$6300) for the cheapest house to INR 5,100,000 (\$104,080). Unit size also varies between 200 square feet up to a maximum of 2,250 square feet. In most cases housing companies offered a choice of differentiated units at prices that varied according to unit size and facilities provided. We have considered the lower bound or cheapest units in each case for the purposes of the analysis below, as the aim of this exercise is to establish the current benchmark for private provision of low-cost housing. All of the projects surveyed aim to meet the minimum requirements to qualify for an occupation certificate and provide residents access to water, hygienic sanitation facilities, power as well as road access.

The table below (Table 2) calculates affordability of the lowest cost house available in India for different income groups. The yardstick for affordability is usually proportion of income spent on housing. In the United States this figure is 30 percent<sup>21</sup>, however the fairly robust result in both industrial and developing countries is that the proportion of income spent on housing by households within a particular city tends to be higher for low-income households.<sup>22</sup> We have used a 40 percent thumb rule to test affordability, which should be regarded as the maximum proportion that a low-income family can afford to contribute towards housing.

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<sup>18</sup> Mohan, R, (1994), *“Understanding the Urban Metropolis: Lessons from the City Study of Bogota and Cali, Columbia”*, Oxford university Press, New York

<sup>19</sup> World Bank, “Housing-Enabling Markets to Work” Washington D.C.

<sup>20</sup> CEMS, (2010), Survey of Affordable Housing Projects (Unpublished)

<sup>21</sup> Schwartz, Mary and Ellen Wilson, (2006). *“Who Can Afford to Live in a Home?: A look at the data from the 2006 American Community Survey”*, US Census Bureau

<sup>22</sup> Malpezzi, S. and S. Mayo, (1987), *“The Demand for Housing in Developing Countries,”* Economic Development and Cultural Change, Vol. 35, No. 4 and Mayo, S., S. Malpezzi, and D. Gross, (1986), *“Shelter Strategies for the Urban Poor in Developing Countries,”* World Bank Research Observer, Vol. 1, No. 2,

**Table 2: Home Affordability Based On Monthly Income (INR)**

Loan Period (Years)	20	Income Percentage	40
Interest Rate (%)	12	Down Payment (%)	20

	Monthly Income	Expenditure on Housing	Total Loan Amount (80% of the house)	House Price
MIG	14000	5600	5,08,588.73	6,35,736
	12000	4800	4,35,933.20	5,44,916
	10000	4000	3,63,277.67	4,54,097
	8500	3400	3,08,786.02	3,85,983
LIG	7500	3000	2,72,458.25	3,40,573
	7000	2800	2,54,294.37	3,17,868
	6000	2400	2,17,966.60	2,72,458
	5000	2000	1,81,638.83	2,27,049
EWS	4000	1600	1,45,311.07	1,81,639
	3300	1320	1,19,881.63	1,49,852
	2700	1080	98,084.97	1,22,606
	2500	1000	90,819.42	1,13,524
	2250	900	81,737.47	1,02,172
	2000	800	72,655.53	90,819

Given that the cheapest available house at the time cost INR 311,000 (\$6300) and that the average family contributes 40 percent of their monthly income towards housing, it is evident that households with monthly incomes less than INR 7000 (\$143) cannot afford home ownership<sup>23</sup>. This illustrates the point made above that private developers cannot currently address the shortfall in housing for the EWS and can only supply to the upper end of the LIG.

While this is sobering news in view of the 21.78 million EWS households that require housing, a close look at the details of private low-cost housing projects reveals a significant pattern in the choice of locations. The pattern of peri-urban location of low-cost housing projects is explored in the following section.

## VI. Peri-Urban Areas and Low-Cost Housing

Frank Lloyd Wright, the architect is said to have observed, “*the outcome of the city will depend on the race between the automobile and the elevator, and anyone who bets on the elevator is crazy.*” Population growth in large cities does not usually increase the population density of high-density areas, but tends to promote densification of less developed areas and expansion of the urban fringe.<sup>24</sup> Development towards the periphery is driven by lower land prices and lower development costs.<sup>25</sup> In countries like India, peri-urban development is augmented by migration of rural populations as agriculture and other rural livelihood opportunities become unsustainable. Thus as cities grow, peri-urban

<sup>23</sup> We have assumed that home buyers will be required to self-finance a fifth of the value of the house and will borrow the remaining 80 percent from a bank at 12 percent interest rate for a term of 20 years. The “Expenditure on Housing” column represents the value of the monthly instalment towards repayment of the housing loan if households were to put aside 40 percent of income for this purpose. Aside from the fact that home buyers need to be earning at least INR 7000 a month, they also need to be eligible for a home loan and to be able to provide the 20 percent down payment.

<sup>24</sup> Ingram G., (1998), “*Patterns of Metropolitan Development: What Have We Learned*”, Urban Studies 35.

<sup>25</sup> Meyer, J. R. and J.A. Gomez-Ibanez, (1981), “*Autos, Transit, and Cities*”, Cambridge, Harvard University Press



areas become the interfaces where the centrifugal force of urban expansion meets the centripetal force of rural-urban migration.

The term peri-urban, unlike suburban is not very common in the literature and definitions vary. Traditionally what has been referred to as the peri-urban interface – PUI has been defined casually as ‘the edge of the city’, the ‘urban fringe’ or ‘the spatial transition zone between urban and rural areas’<sup>26</sup>. While spatial proximity to urban areas seems to be intrinsic to the definition, Peri-urban communities are stated to have a dual urban-rural orientation regardless of spatial proximity<sup>27</sup>. Closer to home researchers at Anna University, Chennai analysed 9 settlements and came up with three sets of indicators which included socio-economic, agricultural and infrastructure indicators. This last set defined peri-urban areas to lie at least 25 kilometres away from the city centre and additionally to lie at least 2 kilometres away from a major road or rail corridor<sup>28</sup>.

Given the dynamics of land markets discussed in Section IV, it seems logical that low-cost housing projects would tend to be located towards the outskirts of cities. We selected a subset of 25 projects from the original survey<sup>29</sup> based on price, ranging from INR 311,00 (\$6300) to INR 860,000 (\$17550), and measured their distance from the periphery of the nearest urban agglomeration.

As can be seen from the figure (Fig. 3), a majority of the projects were located more than 10 kilometres from the periphery of the nearest urban agglomeration. The average distance from the periphery of the nearest urban agglomeration is about 39 kilometres. The 8 projects located between 11 and 20 kilometres from the outskirts of nearest city, are mainly located near cities with populations of just under or over 1 million, whereas the projects located more than 40 kilometres are all located near cities like Mumbai, Delhi or Chennai with population sizes above 5 million. This is not surprising, as larger cities tend to have larger urban footprints. The fact that all of these projects are located on the outskirts or beyond the outskirts of cities is indicative of the fact that it is not currently viable to construct low-cost housing within city limits.

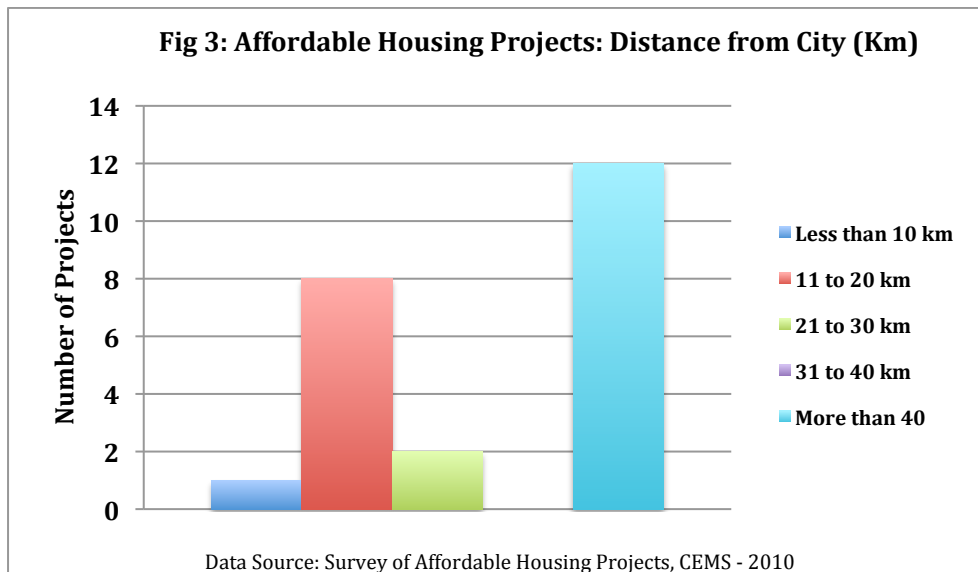
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<sup>26</sup> Kölbl, R and R. Haller, (2006), “Periurban – A Comparison Between India And Western Countries”, Proceedings of the Conference of the Association for European Transport and contributors.

<sup>27</sup> Iaquina, D. L. and A. W. Drescher, (2000) “*Defining periurban: Understanding Rural-Urban Linkages and Their Connection to Institutional Contexts*”. 10th World Congress of the international Rural Sociology Association. Rio de Janeiro

<sup>28</sup> Thirumurthy, A. M. (2005) *PERIURBAN Deliverable 2: Socio-economic Conceptual Frame Work (WP2)*, Chennai, Division of Urban Systems Development, Anna University.

<sup>29</sup> CEMS, (2010), Survey of Affordable Housing Projects (Unpublished)



However, while land prices are relatively low in peri-urban areas, they lie outside the purview of urban development authorities and lack basic infrastructure<sup>30</sup>. This implies that low-cost housing developers are forced to provide trunk infrastructure, which adds to the costs of housing construction. The next section contains a case study of a successful low-cost housing project located in a peri-urban area close to Rajkot, Gujarat.

## VII. Case Study: Ashray Housing, Shapar-Veraval, Gujarat<sup>31</sup>

'Value Realtors', a Gujarat-based affordable housing company, began construction of 'Ashray Housing' a 218-house township in Shapar-Veraval situated 15 km from Rajkot in 2010. The project is nearing completion, and the first phase of this development should be ready for occupation by December 2011. The project is targeted at workers employed in the 3000 odd micro, small and medium enterprises situated in and around Shapar. One of the most remarkable aspects of this project is that 60 percent of the 218 units were pre-sold on the first day of sales, despite the fact that the promoters did not invest in marketing or advertising. 'Ashray Housing' has been selected because it offers the cheapest formal housing option for sale anywhere in India<sup>32</sup>.

The fact that over 60 percent of the units were sold on the first day of bookings indicates a combination of successful strategy and high demand. There are several factors that may have contributed to the success of the project. These include the location, design of the units, choice of construction technology, provision of utilities and road access and the fact that the Ashray Housing Company facilitated access to finance by convincing a few banks and non-

<sup>30</sup> Hogrewe, W., S. D. Joyce and E. A. Perez, (1993), "*The Unique Challenge of Improving Peri-Urban Sanitation*", Water and Sanitation for Health Project Report Technical Report No. 86, USAID, Washington D.C.

<sup>31</sup> All information pertaining to the Ashray Housing Project including floor plans and cost structures have been reproduced with the consent of Value Realtors. Similarly all data regarding the project has been obtained directly from the promoters.

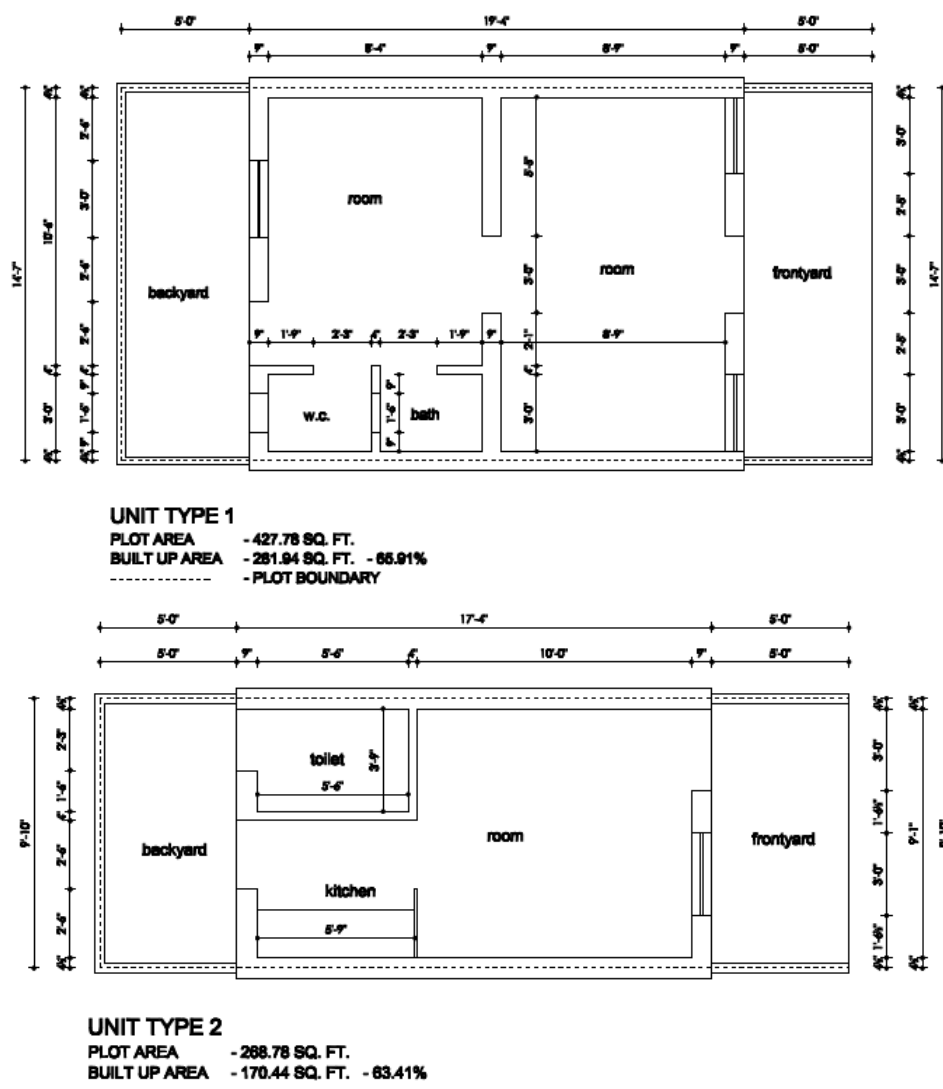
<sup>32</sup> CEMS, (2010), Survey of Affordable Housing Projects (Unpublished)

banking financial companies to lend to home-buyers. We will briefly discuss a couple of these aspects below.

### Design, Construction and Provision of Utilities

The project offers home-buyers two types of housing options. The first option (Type 1) is a house with 2 rooms, kitchen and bathroom with a built-up area of 430 sq. ft. The price of this unit was INR 480,000 (\$9796). The second option (Type 2) is a smaller option with one room, kitchen and bathroom with built-up area of 272 sq. ft. This unit was sold at INR 311,000 (\$6,350). Both the units above are designed as to allow the buyer to develop an extra floor replacing the terrace if required.

**Fig 4. Floor-plan of Unit Types 1&2, Ashray Housing, Shapar, Gujarat**



One of the key areas the company focused on prior to the launch of the development project was to try and ensure that the final product would be acceptable to the end-user. The promoters used feedback from focus-group discussions with industrial workers in the area to inform their design decisions and strategy. The feedback indicated demand for a house built using traditional brick and mortar technology, preference for a ground-floor structure and

willingness to pay a premium for a private walled front and backyard. Other facilities provided include electricity, a running water connection with water tanks for each unit and septic tanks for sewage water disposal. The water tanks on the terrace of each house are used for individual water storage that provide water connections to the kitchen and bathroom.

There are specific design characteristics of the smaller unit (Type 2) that cater specifically to the preferences of low-income families and may not be preferred or even acceptable to households from a different socio-economic class. Examples of these characteristics are; the creation of storage space above the roof of the toilet and the fact that residents must exit onto the backyard in order to access the toilet.

It is difficult to determine the extent to which specific design characteristics influence the choices of low-income home-buyers without more detailed research. However a study that used hedonic pricing regression models to examine preferences of low-income renters in Pune, India, found they were willing to pay more for a kitchen, proper sewerage and good toilet facilities<sup>33</sup>. Analytically there is no reason why this result should not apply to home-buyers. Design and layout are particularly important in the case of small low-cost units, so that households can be allowed to make optimal use of limited space.

### Location and Cost

Place of work seems to have a very strong link with choice of residential location. Both theoretical and empirical work indicates that household residential location is strongly linked with workplace location, though the direction of causation is not clear<sup>34</sup>. However it is reasonable to assume that housing shortages will be most acute around areas that offer employment opportunities. Not surprisingly people are willing to travel long distances if they're employed in the centre of the city, but would prefer to be located closer to the workspace if it is located in the suburbs. Decentralization of employment has a potential for reducing travel distances of commuters<sup>35</sup>. This implies that as jobs move towards the outskirts, residences move with them.

Shapar-Veraval is an industrial zone with over 2500 micro, small and medium enterprises, which employ an estimated 50,000 industrial workers across various sectors<sup>36</sup>. It is located 15 km from Rajkot, which is classified as a Class I city with a population of over 1 million inhabitants<sup>37</sup>. The promoters of Ashray Housing conducted extensive surveys that revealed a housing shortage for

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<sup>33</sup> Kapoor, M and I. David, (2004), "*Measuring the Risk on Housing Investment in the Informal Sector: Theory and Evidence from Pune, India*", World Bank Policy Research Working Paper No. 3433

<sup>34</sup> Ingram G., (1998), "*Patterns of Metropolitan Development: What Have We Learned*", Urban Studies 35.

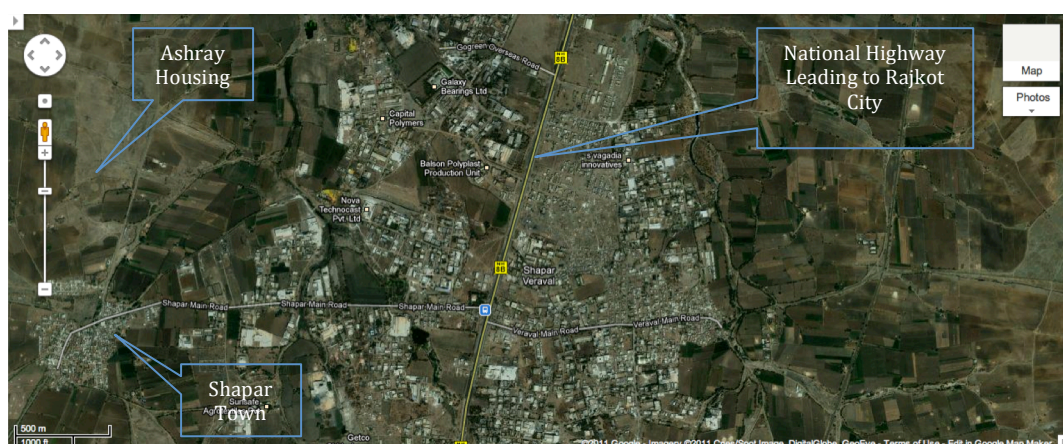
<sup>35</sup> Downs, A., (1992), "*Stuck in Traffic*", Brookings Institution and Lincoln Institute of Land Policy

<sup>36</sup> Government of India, (2011), Labour Commissioner Offices Rajkot Region

<sup>37</sup> Government of India, (2011), Office of The Registrar General & Census Commissioner

industrial workers, some of whom had to make the daily commute from Rajkot. Ashray Housing was thus conceived as a township that would cater to the housing needs of industrial workers employed in factories in the Shapar area.

As can be seen from the map below (Figure 5), the project site is situated very close to Shapar Town, at a distance of roughly 2.1 kilometres, allowing residents easy access to facilities and services located in the town. The National Highway (NH-8B) provides access to the neighbouring urban centre (Rajkot) with commute time varying from between 30 to 60 minutes depending on traffic conditions and mode of transportation. Thus the location allows households the flexibility of having one or more members commuting to the city for education, work or leisure activities. In addition proximity to the Shapar Town gives residents access to facilities such as schools and hospitals. These already exist, and provide services for the industrial workers and their families.



**Fig. 5: Map of Shapar-Veraval, indicating location of Ashray Housing, Gujarat<sup>38</sup>**

The location of a housing project also has important implications for costs and pricing. This is the central, most basic determinant of the cost of housing. As discussed in Section IV, in the case of a monocentric city distance from the centre, all other things being equal, determines the price of land and therefore housing. It was established in Section VI that the 25 most affordable housing projects in the country are located on average around 40 kilometres from the periphery of the nearest urban agglomeration. It is reasonable to assume that this trend is driven by land prices. Most of these projects are located in what can be termed peri-urban areas, which lie outside cities and may not be included under the jurisdiction of the city urban development authority. The previous section contains a discussion on the nature of per-urban spaces and their suitability for affordable housing development projects.

<sup>38</sup> Source: Googlemaps, Link-

<http://maps.google.co.in/maps?q=Ashray+Homes,+Gujarat&hl=en&ll=22.164514,70.797443&spn=0.095863,0.184364&sll=21.125498,81.914063&sspn=41.568427,73.037109&vpsrc=6&hq=Ashray+Homes,&hnear=Gujarat&t=h&z=13>, Accessed on October 15<sup>th</sup> 2011

**Table 3: Cost Structure for Type 2 Unit**

Cost	Percentage of Total
Land	28%
Infrastructure	12%
Construction	60%

Data Source: Value Realtors

If we make the fairly reasonable assumption that the cost of finance is invariant with regard to project location, the cost of building a house can be decomposed into two other components aside from land: The cost of infrastructure provision and the cost of construction, which includes labour and material cost. Construction cost is determined by choice of technology. In the case of Ashray Housing, traditional brick and mortar technology was adopted in view of end-user acceptability. As can be seen in the table above, construction cost accounts for about 60 percent of the cost of the unit. It may be possible to use non-traditional technology to construct cheaper housing, but that discussion is beyond the scope of the present paper. The cost of infrastructure provision is particularly relevant to affordable housing projects in peri-urban areas, as access to water, sanitation facilities and roads may have to be provided by the developer.

In the case of Ashray Housing, infrastructure costs contributed 12 percent to the cost of the unit. However the proximity to Shapar Town and being situated in a rapidly developing industrial zone may have mitigated costs of infrastructure provision. It is likely that these costs may be higher for other projects. While Ashray Housing serves as a useful example of what the private sector can provide, one should be cautious about generalization. The unique combination of proximity to employment opportunities, access to social infrastructure and relatively low land cost may prove challenging to replicate in other locations. What is evident is that private low-cost housing provision may only be viable in peri-urban areas.

## **VII. Conclusion**

While it is clear that the private sector has a role to play in the provision of low-cost housing, it is presently a limited one. Given that the cheapest housing currently available is only affordable to households with a monthly income above INR 7000 (\$143) and that close to 90% of the shortfall concerns households earning less than INR 3300 (\$67) this role seems almost insignificant. Yet with the government's poor record as a provider of housing there may be a case for a collaborative effort between private providers and the state. We suggest that an infrastructure subsidy for affordable housing construction in peri-urban areas may serve to intensify private sector investment in low-cost housing projects and also provide housing at a lower price point. This latter consequence assumes the existence of a mechanism that ensures that the benefit subsidy is passed on to the home-buyer.

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