Review of Housing Delivery for the Urban Poor and the Rationalization of Tenement Apartments in Dhaka City

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Abstract

This paper presents findings from a study on urban poor housing in Dhaka city. Dhaka is a burgeoning mega city and capital of Bangladesh with population of over 12 million, 30 percent of which lives in informal settlements and is classified as urban poor. To make housing programs accessible to the urban poor, the apportioned cost must be affordable to them. As the resources of Government are meager, housing programs can only be sustained if aimed at full cost recovery. This study seeks to contribute to a sustainable approach of affordable housing for the urban poor by reviewing existing housing situation and supply trend. With a particular reference to 'Bhashantek Rehabilitation Project (BRP)', devised to house 80,000 urban poor, it addresses aptness of the project based on 'affordability', 'cost recovery' and 'replicability' concepts. The study revealed that the foreseeable outcome of the project has a clear disparity with its aim which might not contribute well to curve the housing dearth. Later, the study approaches the concept of tenement apartments for the impoverished city dwellers. Study results expose the preeminence of tenement apartments by admitting the trilogy which is affordable, capital recoverable and sustainable to replicate housing.

Keywords: affordability; cost recovery; replicability; tenement housing; urban poor

1. Introduction

Housing scarcity is acute, complex and a universal problem in the developing world. 'Adequate shelter for all', is the philosophy articulated in most policy documents (UNCHS, 1997). Policies to supply housing seem to be ill-suited to the realities of cities and villages where nearly all housing is produced by private or community efforts. The role of Government in housing is very different from traditional policy maker because a policy without the realities is destined to fail. Nowhere is this situation seen more vividly than in the cities of the developing countries. Dhaka is one such cities where the gap between the strategies to supply shelter vis a vis effective regain to lessen the shelter crisis is vibrant.

Dhaka is the world's tenth largest urban agglomeration, the second among cities with fast population growth and is in the list of mega cities (UN, 2004). A great majority of the urban population lives in informal settlements and manages to build and maintain their habitats without direct or with very limited support from the formal and public sectors, often in the face of tenure insecurity. The private and informal entrepreneurs supply scarce yet costly housing solutions to them. As a result of inability to meet huge housing demand, the Government is slowly espousing participatory approach involving the private sector to deliver shelter related services to the poor. The need arose to conduct this study is to address the housing problem of the urban poor and to search for a solution within the available resources.

The current low cost housing programs in the developing countries were primarily brought by the policy of cost realization adopted by the international funding agencies led by the World Bank (WB) in the 1970s (O'Hare et al., 1998). The primary motivation of this study is to evaluate the present trend of housing supply for the urban poor in Dhaka based on the WB's 'affordability–cost recovery–replicability' concept.

Residential land in Dhaka is extremely high priced and short in supply where home ownership is a massive challenge for the most and notoriously difficult for the poor. The concept of tenement housing arose here. In tenements, families occupy limited individual space and share services. This brings down the unit price and paves way for the city and it's dwellers to satisfy their housing needs. Such developments have resulted into a high-density living but at relatively affordable
cost. The study proposes 'tenement apartments' as an alternative to present supply trend that potentially offer a solution to the housing need of the vast urban poor in Dhaka city.

This study provides an analysis of the existing housing situation in Dhaka and their subsequent problems they present. It investigates BRP, a specifically designed project to house the urban poor currently executed under public-private partnership. The evaluation is made on WBs trilogy and later a viable alternative is searched to meet the ideologies. Particular attention is, therefore, given to the development of tenement apartment as low income dwellings. This introduction is followed by a research design, literature on housing policy in developing countries and a review of the existing housing situation in Dhaka. Next, the BRP case is presented followed by an analysis and a cross check for the prospects of tenement apartment. The conclusion recapitulates the main arguments and suggests some policy and research implications.

2. Research Design

Given the above introduction, this research aims:
- To examine the housing situation, especially for the urban poor in Dhaka;
- To analyze BRP on the basis of WBs concept 'affordability–cost recovery–replicability' and to determine its appropriateness for the urban poor;
- To validate the prospect of 'tenement apartments' as an alternative for the housing poverty groups.

Thus, the method of study involves the review of relevant literature, collection and estimation of costs of all inputs for housing production and field investigation to BRP. The study deals with the urban poor and Lower Middle Income Group (LMIG) that constitutes one third of total city population. Assessment was made to evaluate the study groups' affordability to obtain an apartment unit as a mode of permanent shelter. All estimations of major cost components are based on market price and relevant statistical record as of 2005. Data from the survey were analyzed to comply with the concept of tenement housing that will guide both the provision of affordable housing to the urban poor and sustainable capital recovery by providers.

3. Housing Policy in the Developing Countries

From the end of the 19th century up to the 1970s, housing policy for the urban poor in many developing countries often imitated that of developed countries. An absolute trust was put on those models which too often were incompatible to realities in developing countries. All too often, however, these plans were divorced from the reality on the ground (Devas, 1993). Policy with regards to housing for urban poor followed the western models of slum clearance and replacement by public apartment blocks. The former results into slum re-generation around the city while the later increases gap to housing affordability by the poor (Pugh, 1989). The current WB's approach was based upon following the implications of three relatively simple concepts — "affordability", "cost recovery" and "replicability". A number of Indian cities became testing laboratories for this new approach in 1980s (Pugh, 1990).

4. Housing Situation in Dhaka

4.1 Population Growth

Dhaka is expected to take the 5th position in the list of world's largest metropolitans by 2015 (UN, 2004). The average annual growth rate of the city's population over past three decades has been over 7% and the population almost doubles in every 10 years. From a humble beginning as a small colonial town, Dhaka emerged as a prominent city when it was selected to be the capital of Bangladesh in the 1970s. The result was that while overall urban population growth averaged 5.4% between 1981 and 1991, Dhaka's growth averaged 6.5%. Since 1991, Dhaka has been recording a growth rate of 4.3% which is higher than the national average of 3.2% (Table 1.).

| Year | Population (million) | Annual Growth Rate (%) | Total Area (sq. km) | Gross Density (per/km²) |
|------|----------------------|------------------------|---------------------|-------------------------|
| 1974 | 2.0                  | 10.4                   | 336                 | 6,156                   |
| 1981 | 3.4                  | 8.1                    | 509                 | 6,759                   |
| 1991 | 6.4                  | 6.5                    | 1,353               | 4,795(1)               |
| 2001 | 9.9                  | 4.3                    | 1,464               | 6,771                   |

Source: BBS, 2001 & 2005

4.2 Housing Situation

Dhaka, a city of 12.6 million people increasing at 5% rate, has an annual demand of 80,000 new dwellings. The growth in housing supply has always lagged behind the demand. This has resulted in overcrowding with high occupancy rates. The unsatisfactory housing situation is further reflected in the total and per capita availability of floor space of the main living area. The average floor space per person is 3.7m². In Dhaka about 70% of the total housing stock is rented (ADB, 1997). The Bangladesh Bureau of Statistics (BBS) has categorized urban housing types into cement/brick, corrugated iron/metal sheet, mud/unburnt brick, straw/bamboo. Eighty-nine percent of poor households in Dhaka live in one-roomed homes of the latter types. In the densely populated slums of Dhaka, the floor area per person is as small as 1.2m². In short, the poor in Dhaka city live in impoverished conditions lacking access to land, shelter and basic urban services.

What is more important, for the concerns of this paper, is that a significant proportion of the urban population can be categorized as poor and live in informal settlements. According to an estimate by Islam (2005), in Dhaka around 35% of the people lived below the poverty line, out of which about 20% were classified as "hardcore poor" who lived in informal
settlements. Lack of tenure security and poor quality of housing is the direct indicators of these settlements.

4.3 Household Income and Housing Expenditure

Monthly Household Income (MHI) of Households (HHs) and individuals is hard to ascertain since they have several sources of income; formal and informal. The most comprehensive and latest data on the income of Dhaka city dwellers are available for 2005 from Islam (2005). It has made estimates of distribution of HHs by their incomes in Dhaka city as presented in Fig.7. The target HHs comprises nearly 35% of the total population in Dhaka. According to newspaper reports published at different periods, and expert opinions on housing expenditure pattern, housing expenses were found to be more than 45% of their MHI.

4.4 Housing Cost

Building a house in the city area has become too difficult to majority of people where land is mostly owned by the rich. Usually the rich people own land in planned residential areas or in industrial zones, while the upper-middle class owns land in the urban fringes or congested urban areas.

4.4.1 Land

The high price of land in Dhaka acts as a prohibitive factor in the supply of housing to all but the highest-income groups. On account of high price of land, lower-middle class HHs, who are actually majority in cities, are virtually kept out of the land market (ADB, 1997). The Bangladesh Urban and Shelter Sector Review shows that in Dhaka, the price of un-serviced and undeveloped land would be a minimum of US$ 3 per sq. m, with that of serviced land around US$ 45 to 66 per sq. m. The price of prime serviced land is around US$ 1,615 per sq. m in the central business district. Fig.1. provides an idea of land values of residential plots as of 2005. Residential land values in prime locations of Dhaka range between US$ 550 and 1,560 per sq. m. These figures prove that land prices are too high compared to other developing cities.

4.4.2 Construction Cost

Escalating prices of conventional materials like bricks, cement and steel have made housing unaffordable. Construction costs per sq. m for various standards were estimated as in Table 2. In Table 3., estimates for new apartments at different locations in Dhaka are given.

4.5 Population Unable to Afford Housing Cost

This section attempts to compare and give an indication of each income group's minimum housing expenditure required to meet the minimum housing cost. There is no significant change in the number of affordable population within the Low Income Group (LIG) and the poor even though their housing expenditures may exceed half of their MHI due to poor fiscal capacity.

5. Case Study: Bashantek Rehabilitation Project

The Government of Bangladesh (GoB) has taken up Bhashantek Rehabilitation Project (BRP) to provide housing for the slum dwellers, who have so long been objects of neglect and sufferings although they play important roles in the economic activities of the city.
The project is expected to provide shelter to more than 80,000 urban poor. This is the first public-private partnership project of its kind. In this project, GoB has provided land at Bhashantek in the outskirts of the city. To date, almost one third of the project is complete and is awaiting for final inspection at this year end. The terms and conditions on transfer of ownership of the apartment units to Slum Dwellers (SD) and LIGs are fixed by the developer and approved by relevant Government agency.

5.1 Project Details
Total land area of BRP is 20 hectare where 15,024 apartment units will be constructed. Gross dwelling units density is 748 dwelling units/ha. Residential land coverage is about 58% of total land. Gross population density is 3,740 persons/ha and average HH size is 5.5. Hence the total target population to be housed is 82,632. The project also provides community facilities including school, college, vocational training institute, mosque, health center, shop and parks. Government’s land for the project worth’s about US$ 50 million. The land price at project location is about US$ 254 per sq. m and the selling price of apartment units is US$ 160 per sq. m.

5.2 Finance of the Project
The implementation of this project is by joint efforts from Government (land provider), private investments, and beneficiaries’ deposits. The private developer has constructed affordable low cost flats for the beneficiaries who are supposed to re-pay on installment basis. But the condition of the SDs appeared to be really tough to pay the monthly installments. Existing housing finance system is also not supportive to access housing loan to them.

5.3 Types of Dwelling Units and Beneficiaries
Two types of 6-storied buildings are being constructed for the poor in the project. The 18.75 sq. m type-A flats are for SDs and 28 sq. m type-B flats are for the LIGs (Fig.3.). Type-A flat has one room with a kitchen and a toilet; and type-B flat has two rooms, one kitchen and one toilet. There is a small veranda in both types of flats. It was initially decided that 60% of the dwelling unit would be for the SDs and the rest for low-income families and low-paid government employees.

6. Analysis
Affordability means adopting a realistic approach to housing supply in terms of what the urban poor could really afford, recognizing that, initially at least, the standards of these housing would fall below conventional norms. Cost recovery is related to the concept of affordability in that it implied a ‘user pays’ policy rather than the adoption of subsidies. The standards provided would then be based on what could be afforded by consumers, rather than on design ideals. Replicability completes the apparent process of logic in this approach in that, if costs are recovered because they are affordable to the groups affected, then the successful repetition of such projects becomes likely, leading to overall improvement in housing provision.

6.1 Affordability of BRP Apartments
In the developed countries, housing cost is considered equal to 30-36 months’ income in order to calculate recovery and return (Jorgensen, 1977). Housing prices can neither be determined rationally in relation to incomes of the target groups, nor does income limit by prices, since there are wide variations between individual HH’s propensities to pay and access to resources. In this section, an attempt is made to measure the actual level of affordability as affordability equation is often calculated theoretically which exceeds the capability of the low-income beneficiaries in reality.

The house price to income ratio of BRP apartment units is found to be 4.4 and 4.3 for SDs and LIGs respectively. The house price to income ratio of BRP apartment and other average cheap apartments having same floor area for the two distinct groups are compared in Fig.4. It is evident from the figure that BRP apartments costs half or less than half in comparison with other cheap apartments at a market price. Theoretically, these units are affordable to the target population, if house price to income ratio is the only consideration. Another important parameter to measure housing affordability is house rent to income ratio. Other studies affirm that house rent covers about 53% of MHI to the SDs and 43% to the LIGs (Fig.5.). The figure shows that the average rental floor area of the two income groups is 22m² and 42m² respectively. Hence the average rental floor area of SDs and LIGs are similar to the apartment units at BRP. It reveals that the BRP dwelling units are compatible to the general
rental floor area of the two income groups.

The affordability issue has been treated variously for the lower-income groups, and failures have been ascribed to wrong estimation. If the HHs' affordability is estimated properly, housing projects could be sustained by setting the standard at appropriate level and optimizing the resource usage that are expensive in one way and in excruciatingly short supply in the other way, and thus ensuring full cost recovery.

At BRP, unit floor area costs about US$160 per sq. m. To evaluate the affordable floor space of the target population, monthly savings – 45% of MHI for a maximum 5 years is considered. In fact, the agreement between developer and beneficiaries is to repay by installments no more than 5 years despite there is no external finance either from the Government's side or from the developers' end. Thus, target HHs affordable floor area is determined and presented in Fig.6., based on the assumption that individuals cover this expense from savings or other individual effort.

HHs percentage according to their monthly income in Dhaka city is presented in Fig.7. The projection of Fig.7. to Fig.6. well explores the affordable floor area by the target groups and their size in percentage. Interpolations in Fig.6. clearly show that 3m$^2$ and 10m$^2$ are affordable floor spaces to SDs and LIGs respectively. It also appears that it is quite difficult to own an apartment with savings only for the low income beneficiaries. More than 80 percent of the target population will not able to own these apartments due to poor affordability and lack of external finance for the target population even though these are considered cheap enough.

### 6.2 Cost Recovery

As the resources of the Government are little, housing programs can only be sustained if aimed at full cost recovery from the beneficiaries. There are basically five elements in the shelter sector that have to be financed (Tym, 1984). They are land, on-site infrastructure, the superstructure, design and management costs, and interest payments on capital. Land and construction costs take-up the largest share of the total investment and here these two elements among the five are considered in order to analyze recovery estimation. In BRP, land is supplied by the government for the low income population without any charge. Government will only take registration cost from the beneficiaries and virtually there is no return. Hence it can be treated as a highly subsidized project.

Construction cost of the whole project is born by the private developer. The final beneficiaries of the project will be selected by drawing lots out of many applicants who will be allowed to pay the total cost in not more than 60 installments. The developer will not hand over legal ownership title to any beneficiary if the payment is not fully made. In this way, it is assumed developer is secured to recover the capital. But the repayment calculation of the beneficiaries is different.

Total cost of the dwelling units are equivalent to amortize 40 percent of monthly income devoted to housing for 10.6 and 10.8 years for the SDs and LIGs respectively and the detail is explored in Fig.8. A lower expenditure will definitely require longer repayment time. It will be very difficult to repay the unit cost by the beneficiaries within 5 years and within the prevailing financial situation. Banking criteria rarely allow for loans to be granted on the basis of anything other than regular and documented income. Thus the beneficiaries will be in disadvantageous state to repay the cost.

Low-income members are known to live in extended HHs, and in many occasions the HH-head has more
than one job, complemented by informal incomes by the spouses and children. BBS (2001) shows that among the lower and middle-income groups, primary earners contribute 70% of HH-income, and each HH has 1.45 earners on average. A study showed that 60% of homeowners identified savings as their major source of finance for land purchase and another 17% sold assets and Fig.9. outlines the modes of informal finance in Dhaka city (ADB, 1997). It can be concluded that a beneficiary could be able to repay the cost and eventually own a home if there are records of savings, selling other assets and to borrow from informal sources to supplement the formal finance.

To make a housing program accessible to the target HHs, the apportioned cost must be affordable to them. If the project is aimed at homeownership, then it should have some provision of finance. Otherwise it will be difficult to revolve housing schemes for the urban poor as the occupant's investment from savings will be beyond the limits set by the project criteria. It is very clear from BRP example that the target population will find difficulties to attain home ownership mainly due to lack of external finance despite a relatively low cost of the apartments.

Of the total housing supply in Dhaka city, only 7% is supplied by the public sector. Its provisions are limited to sites and service plots and government staff housing. Informal housing type in the private sector has emerged in the last four decades which has largely remained unnoticed and hence undocumented to be the active housing provider. In Dhaka, the rental sub-market in informal settlements is the single largest supplier of housing. However, utilizing the potential of informal housing supply energy might respond well to revolve housing programs in Dhaka.

7. Tenement Apartments: An Alternate Approach

Tenement houses in various forms and names initially built as low-income housing can be found in many cities. In early industrial cities these were built as cheap accommodation for the workers by their employers. However, recently new industries are being established away from the core areas and the existing near by old industrial zones become rundown areas.

7.1 Concept of Tenement Apartments

There are housing shortages in many cities of developing countries. As a result, the poor resort in substandard housing. Tenement house is a dwelling which is divided into small dwelling units. Usually these are a row of houses with the occupants sharing common facilities and services. This reduces floor area per HH and increases density. Sharing of essential services and public spaces is an effective way of reducing the housing cost as these would allow a reduction in dwelling unit size and in the number of service outlets. Tenement houses based on this concept present a potential solution to the housing crisis in the developing countries.

7.2 Tenement Houses in Dhaka

There are about 50,000 tenement units providing accommodation to more than half a million people in older part of Dhaka city (Chowdhury, 2006). The reasons that it evolved only in the old Dhaka are mainly two. One, old Dhaka being largely a commercial, manufacturing area, attracts less-skilled workers who tend to flock to the old city from rural areas; two, there are many houses in old Dhaka that are fit to be used as tenement houses because of their location, ownership, physical pattern, and demand. Most of them are deteriorating and their service provisions are rather inadequate.
Two distinct forms of tenement houses are found in the vicinity of old Dhaka. The first form comprises 50 years old blocks originally of different use and later converted to tenements. These usually have more than one court which forms the hub of most activities. The other one is the purpose-built tenement house which usually takes the form of a group of dormitories connected by long corridors. Compared to the converted tenement houses, the purpose built tenement houses are of recent origin. The long corridors in this later form link the various rooms to strategically positioned shared services. The later type in multi-storey apartment form is proposed in this study.

The life style, living norms and dwelling cultures has no means to survive, it has instead, to follow that of tenements as inherent from the western world. Thus, there is a dramatic shift from local to foreign style of living. Transfer of western notions of housing development and faded mutual relationship between the tenants and the owner causes not to reproduce tenement houses in newly developed area of the city though the relationship was hot and deep in the past.

7.3 Planning Approach of Tenement Apartments

The apartments could be 5-6 storied walkup forms where the ground level would be kept open for some storage, children's play and other social activities. The floor coverage should be two-thirds of the plot which would comply with the building bylaws and attain FAR of 2.7-4. The plots would be of 135-335 sq. m size which would make available 90-225 sq. m of living and service areas on each level. There could be 3-6 tenement units on each level and a single stack of service area comprising of washing, bathing, toilet and cooking facilities. Thus a total of 12-25 HHs can be accommodated in one building.

Size of the tenement units would vary between 23-42 sq. m plus share of the service areas. Each tenement unit may comprise of 2 living bed rooms, at least one of which would be divisible into compartments with simple partition walls. Larger units might have a veranda which at times and requirements could also be turned into a small additional room. These would be suitable for small to medium-sized families with 4-6 members. Thus it will be possible to keep the cost 25% below the conventional system. The construction cost would vary between US$ 50-80 per sq. m depending on the soil condition, height of the building and the finishes applied. This will also encourage incremental building – moving into a semi-finished building and then gradually improving the condition according to the choice, need and affordability.

7.4 Cost Estimation

It is estimated that the housing units should be made available at a cost of US$ 2,600-3,700 which would include an apportioned land cost to reach within the abilities of the target population. In order to meet that, land within price range of US$ 25-50 per sq. m should be chosen. In such a development the apportioned land cost would be US$ 300-520 per HH. Cost of each unit would be between US$ 1,470-3,940. Thus it would be possible to keep the whole package cost between US$ 2,205-3,675. Monthly repayment installment of US$ 2,205, for a unit at a simple interest rate of 10% per annum repayable in 10 years would be around US$ 28. The repayment period can be extended up to 20 years if the interest rate is 5-8%. Also 10-25% of the cost can be met from the down-payment. Thus, monthly repayment installment on US$ 1,840 at a simple interest rate of 7.5% repayable in 20 years would be less than US$ 14.7. Then people with a monthly income of as little as US$ 52 can afford such housing units. As a result the coverage would be as high as 85% of the urban population.

7.5 Strategies for Implementation

In absence of well-established formal land and housing markets in Dhaka, the informal sector has been playing a major role in catering the housing needs. Small-scale builders and developers and (self-help) owner-builders operating in the informal private sector, are the largest suppliers of land and shelters in Dhaka. Generally the informal providers acquire land and gradually construct their houses. Only a small proportion of HHs have access to housing finance. The majorities of the informal providers adopt piecemeal construction technique or build the house incrementally. They start with small finance and develop consistently. This is the prevalent way of house building in the informal sector and thus they became the largest housing provider in Dhaka. These informal providers' with small finance can initiate the proposed models of tenement apartments who often provide sub-standard housing for the poor with tenure insecurity. It can address the real poor who face the threat of rampant eviction. Government's role here is to ensure adequate infrastructure and enhance financial arrangements as well.

The Bangladesh strategy for collateral free loans to the poor (given peer group accountability) has been recognized worldwide (Begum, 2007). This, in microcosm, could be extended to housing sector finance, whereby groups or cooperatives could be recognized as viable units for land ownership and powers of acquisition. The private sector, including the non-governmental organizations and community-based organizations, might thus be motivated to target groups for shelter and services.

8. Conclusion

Based on the analysis and outcomes of this study, the following conclusions can be drawn to formulate policies and programs to lessen housing dilemma in Dhaka city.

First, housing in a form of permanent shelter is extremely expensive for the low income population. Specifically, land price in Dhaka city is too high and it causes home ownership beyond the reach of the study.
population.

Second, apartment units at BRP are quite low-priced as the project is highly subsidized. There has been absence of formal finance for the beneficiaries to repay the unit price. Due to lack of formal finance, home ownership for the low income population remains difficult even though these dwelling units are cheap. Developers can possibly recover their capital but beneficiaries might suffer a lot from life hardships as a result of massive shifting of their income portion to serve loan payment.

Third, difficulties of acquiring land in appropriate parcels and locations remain one of the major hurdles to revolve housing projects like BRP. The target population might be deprived and hence the aim of the project might derail. Tenement houses are still present in the older part of Dhaka city where people share services which can save 20-25 percent individual living space. Promoting the concept of tenement housing for the low income population will obviously reduce housing cost per family. Tenement apartments can run well under the rental sector to provide decent shelter to the urban poor.

Fourth, Dhaka's housing is dominated by the private and informal sector. To direct the potential of tenement apartments or any housing scheme, the private sector's effort need to be utilized. Under the management of private housing energy; either in rental or ownership sector, is expected to be affordable, recoverable and replicable without any subsidy or large investment from the Government.

Finally, an unaffordable project can reach the target group only with subsidy and that is again wasted on subsidized sites-and-service projects. The misinterpretation of affordability that suppresses people's capabilities reduces the efficiency and effectiveness of the housing programs like BRP in various ways. Affordability is the generic problem inhibiting the poor HHs from the market. Access to credit is identified as imperative to eliminate the constraint. Since tenement housing is a potential solution to the unresolved housing crisis, mounting to more severe with every passing day, growth of these should be encouraged. In order to address the housing crisis effectively, the government should reorient its priorities and strategies towards making provisions which would facilitate the growth of cheap, small and popular housing units. Encouraging tenement housing could be one step towards that end.

Notes
1) Area of Dhaka mega city in 1991 includes the extended suburb and thus the city area is more than two and half times than that the city area in 1981.
2) US$ 1= (approx.) 68 BD Taka (2008 Value)
3) For the analysis, city population is classified as: LMIG = Lower Middle Income Group, MIG = Middle Income Group, HMIG = Higher Middle Income Group, LHIG = Lower High Income Group and HIG = Higher Income Group.
4) An average minimum apartment unit is found to have a floor area of 65 sq. m at a rate of US$ 550 per sq. m. Thus the cheapest unit cost is US$ 35,750.
5) Slum dwellers are considered as poor in the HH income distribution.
6) Cost of new apartment units in a low land price location is about US$ 376 per sq. m and further discussed by Kamruzzaman and Ogura (2008).
7) See Reference 9.

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