A STUDY ON PHYSICAL REQUIREMENTS OF HOUSING FOR LOW-MIDDLE INCOME FAMILIES IN DHAKA CITY - AN ATTEMPT TOWARDS AFFORDABILITY

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MASTERS OF ARCHITECTURE

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By

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_____

Asma Akter
Student No. 100701014 P

Dedicated to my beloved parents and family for their unconditional love & support.

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Abstract

Dhaka city is one of the most populous mega cities of the world. Because of unplanned urban growth, shortage of land in comparison to the ever-increasing population, and uneven distribution of residential lands among different income groups, it has never been possible to meet the housing demand of the low-middle income families of Dhaka city, the target group of the research which is 20% of population is one of the major fractions of the total population. The thesis illustrates the present housing scenario of the target group of the city. The research examines the three parameters, the physical requirements of housing affordability namely, i. Land price, its location, and availability, ii. Building construction's cost: in materials and techniques, and iii. Unit sizes, down payment and recovery period. With a deliberation on housing, the paper shows that the three parameters of the physical requirements of housing affordability are responsible for increasing the housing unit price. Based on secondary sources the localities of Mirpur, Badda and Demra of Dhaka city, the three study areas are selected for field investigation. Extensive reconnaissance survey and the questionnaire survey of randomly selected 36 household of said income group observes the household size, living condition, income and expenditure, rents paid, preference of unit sizes, internal layout of a housing unit, aspiration of a housing ownership, and capacity to pay for a housing unit. The compilations and computations of the data obtained from questionnaire survey were done using frequency distributions and cross tabulations. Case Studies also facilitates decision making. Based on the analyses of secondary information and primary data, inferences are drawn and recommendations are presented. A housing unit price generally comprises of land cost, building construction material cost, and space allocation. The analyses show that without taking the land cost in account, through different permutation and combination of various construction materials, space allocation and distribution, and deliberations in floor to floor heights about 20**%** reduction in price of housing units is possible. Cost reduction through different suggested measures would not be sacrificial to the environmental quality. For Dhaka city, availability of land for housing is another crucial factor. Land assembly and land swap would provide more buildable area. The study provides effective and appropriate guidelines to make housing accessible to the low-middle income group in an affordable price in Dhaka City. A framework for realistically addressing the constraints to affordable housing for the target group is provided that may be followed.

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List of Abbreviations

ADB	Asian Development Bank
BBS	Bangladesh Bureau of Statistics
BCL	Building Construction Limited
BRP	Bhashantek Rehabilitation Project
CBD	Central Business District
CUS	Centre for Urban Studies
DAP	Detailed Area Plan
DCC	Dhaka City Corporation
DESA	Dhaka Electricity Supply Authority
DIT	Dhaka Improvement Trust
DMDP	Dhaka Metropolitan Development Plan
FAR	Floor Area Ratio
GoB	Government of Bangladesh
HBFC	House Building Finance Corporation
HBRI	Housing and Building Research Institute
HHs	Households
HIG	High Income Group
HSD	Housing and Settlement Directorate
LGED	Local Government Engineering Department
LIG	Low Income Group
MIG	Middle Income Group
MoL	Ministry of Land
MoF	Ministry of Finance
NGO	Non-Government Organization
NHA	National Housing Authority
NSPDL	North South Property Development Limited
PPP	Public-Private Partnership

PWD	Public Works Department
RAJUK	Rajdhani Unnayan Kartipakkha
RCC	Reinforced Cement Concrete
RCBM	Reinforced Concrete Brick Masonry
REHAB	Real Estate and Housing Association of Bangladesh
SD	Slum Dweller
SPSS	Statistical Package for Social Science
UN	United Nations
UNCHS	United Nations Commission on Human Settlements (habitat)
UN ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UN-HABITAT	United Nations Human Settlements Programme
WASA	Water and Sewage Authority

Chapter 1

1.1 Introduction

Dhaka, way back in 1608, was made the regional capital of Bengal by Subader Islam Khan Chisti for its political and military importance, and being a capital, it required more space for administrative, military purposes and accommodation. Dhaka gained further importance as the capital city of Bangladesh since the very inception of an independent state after the liberation war of 1971. The UN International Economic and Social Affairs Department identified Dhaka as a mega city in the year of 1987 (Rahman, M. M., 2001). In the year 2010 Dhaka city had a population of over 14 million in an area of 1533 sq.km (Hussain, A., 2010). Being one of the locations of trade, commerce, higher education, health facilities, and employment, Dhaka is getting congested day by day with copious rural migrants. Henceforth, Dhaka is now being regarded as one of the most populated cities in the world (Islam and Shafi, 2008 and C. Wendell, 2012). The gigantic growth in population results in stress on its accommodation, infrastructure, utilities, services, and other facilities. The population is greater than the accommodation facilities available in Dhaka city, thus housing in Dhaka city is in a despondent state and is unable to keep pace with the population explosion, existing housing backlog, and ever surge of housing price. Many people are living in just a shack, a mere shelter that is devoid of any essential utilities, services, and facilities.

Housing is not just a mere shelter, but it is a place where a family lives and it plays a comprehensive role as far as socio-economic state of the family is concerned. Housing is considered to be a global problem all around the world. In many cities of developing countries, up to half of the urban population lives in slums and squatters. (Zahur, 2008) Dhaka, being no exception to this problem also faces problem in providing proper shelter in an affordable rate to all of its inhabitants since there are three different major income groups living here. According to Bangladesh Bureau of Statistics (BBS, 2010) urban population is categorized into High, Middle and Low income groups. Being of greater economic ability and of minute part of city dwellers a lot of housing options are available to High Income Group (monthly income bracket Tk.50,000- 100,000+, Islam and Shafi, 2008). The Middle Income Group (MIG- Tk.5,000- 50,000, Islam and Shafi, 2008) being a majority, 50% of total population is considered the driving force for the city's overall development process. In the Middle Income category, there are three divisions (i) Higher Middle Income, who can

manage housing by themselves (ii) Middle – Middle Income afford it with assistance and (iii) Low-Middle Income (Tk. 5000 – 10,000/ month), who comprises 20% (Islam and Shafi, 2008), a majority fraction of Dhaka city's households, have severe problem in accessing housing at present market price. The Low Income Group (LIG- Tk.<2,500- 5,000, Islam and Shafi, 2008) comprises of Hardcore and Moderate Poor face even worse situations in having access to permanent housing although many NGOs, the Government body, and other housing providers are trying to work for them.

Now as far as the affordability scenario of housing of Dhaka city is concerned, it is very much apparent that the high income and higher middle income groups do not suffer from having access to housing but the middle-middle income households to some extent have difficulty in owning housing units and the low-middle have quite a lot difficulty in owning a housing unit, and low income group have almost no access to housing (Rashid (Ekram), K. 1980). Literature research shows the situation has not changed. Currently a lot of steps and projects have been taken and is on the process of being taken to bring in 'affordability' in housing for the middle, middle-middle and low income groups (RAJUK, pg.45). Thus the low-middle income households are left out of the schemes. UN-HABITAT (2011) identifies affordable housing as that "which is adequate in quality and location and does not cost so much that it prohibits its occupants meeting other basic living costs or threatens their enjoyment of basic human rights. Thus the physical requirements --- land, building materials, construction techniques and space allocation and optimization to avoid 'over housing' (Stone, 2006), all come into consideration to make housing units affordable to particular income groups. By saying affordable, it does not mean only to cut the price of land, building construction materials, or size of units rather it shows how these components of housing affordability (UN-HABITAT, 2011) are responsible for increasing the housing price.

As far as housing cost is concerned, land cost in particular, exacerbates the gap between the cost of new construction and the income of the target population. Land, being inelastic, is extremely short in supply; again buildable land is expensive and almost unavailable in Dhaka city. Therefore, utilization of land in most efficient and effective way is one of the important aspects to be concerned with. In addition to land utilization, other components affecting housing price such as floor areas, height, building construction material, construction cost, and techniques need to be modified to ensure the reduction of housing unit price in order to bring in affordable range to the particular income group.

1.2 Present State of the Problem

J.M. Quigley and S. Raphael write, the largest part of household's income goes in housing expenditure and a slight change in housing price and rents will play a vital role in non-housing consumption (Quigley, J. M. and Raphael, S., 2004). In Dhaka, Bangladesh the housing unit's prices are going up at a very high rate (Muzzini, E. and Aparicio, G. 2012) so is the living cost while household income of many income groups have not increased at a comparable rate. In Dhaka city, owning a housing unit depends entirely on financial solvency of the household that is the paying capacity of the family. For them housing supply and housing demand is pretty stable. But in Dhaka city, like all other cities of other developing countries, the ever growing population is creating an increasing need for shelter which is pledged to be a fundamental right of every human being by both UN declaration of human rights Act 25.1[1] (1948) and the Constitution of the People's Republic of Bangladesh.[2]

Zahur (2008) stated the urban housing condition in Bangladesh is very unimpressive as there is an acute shortage of housing supply and the backlog is continually on increase in all metropolitan cities, especially in the city of Dhaka. An estimate showed that leaving aside the existing backlogs Dhaka City alone needed 50,000 housing units annually (Rashid (Ekram), K., 1980). The public sector and the private sector are involved in urban housing supply system towards resolving the crisis. However, much has not been gained as the involvement of public sector is limited and the private sector is naturally profit oriented. According to Islam and Shafi (2008), "For the 7.5 million people in central city or DCC/DMA area there are about 1.0 million dwelling units while the DMDP or Greater Dhaka area may have 1.6 million dwelling units, assuming an average per dwelling unit occupancy of 7.5 persons." Thus the deficit of housing unit stands to be more than 0.3 million in DCC/ DMA area considering 5.6 persons per household. According to Nasrin, M. (2011) it has reached a zenith, about 100,000 new units only per year is required in Dhaka City. The situation is indeed grave.

With the inception of National Housing Authority (NHA) in 2001 and the national housing policy (final draft of 2012) being in the process of getting approval from the parliament, there

1 Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.

2 The provision of the basic necessities of life, including food, clothing, shelter, education and medical care. Article 15; Part II

is every intention to resolve the housing crisis of the nation and also of Dhaka City. The public sector has taken several steps and many of their projects are in progress, unfortunately the low–middle income families a majority fraction of Dhaka city's population, having difficulty in accessing housing at present market price are excluded. Being a fraction of the majority, the low–middle income households are to be also taken as an active part of the driving force for the city's overall development process (Islam and Shafi, 2008). There is a claim that private sector provides 80% housing to meet the housing demand of Dhaka City (Siraj, 2007), private sector's current contribution is mostly towards high and higher middle income groups though a very few attempts are there for low income families that are also jointly with the public sector. The housing need of particular income group - Low-middle is remaining untouched.

The title of this thesis being 'A Study on Physical Requirements of Housing for Low middle Income Families in Dhaka City –An Attempt towards Affordability' the key words are Housing, Physical Requirements, Affordability, Low-middle Income Families and Dhaka City that are discussed in detail in subsequent Chapters.

1.3 Objectives

The objectives of the research are:

i. To explore different land readjustment tools and techniques that relates with the context and would assist in increasing availability of land within Dhaka City.
ii. To suggest building materials, construction methods and techniques that would lower the cost of housing units. Space optimization and determination of building height that would reduce the construction cost.
iii. To suggest down payment amounts and lengths that is within in the paying capacity of the target group and would not over burden them.

1.4 Research Methodology

1. Literature Search and Review

Relevant literatures from home and abroad, books, government documents, published statistics, economic surveys, published papers, journals, reports and other recorded

documents were reviewed extensively to gain knowledge on housing and its affordability issues in general and in particular

- To get a grasp of Housing Scenario of Dhaka City and identify the conditions and stance of present physical requirements of housing for target income group of Dhaka City.
- To assess various components of housing affordability namely land, building materials, construction techniques, space allocation and optimization and also role of different sectors in housing production and
- How the affordability issue for similar income groups are practiced in other countries.

2. Case Studies and Field Research

The case studies and field research are under taken and conducted to gain hands on knowledge in accomplishing the objectives of the research especially objective numbers ii and iii.

2.1 Case Studies

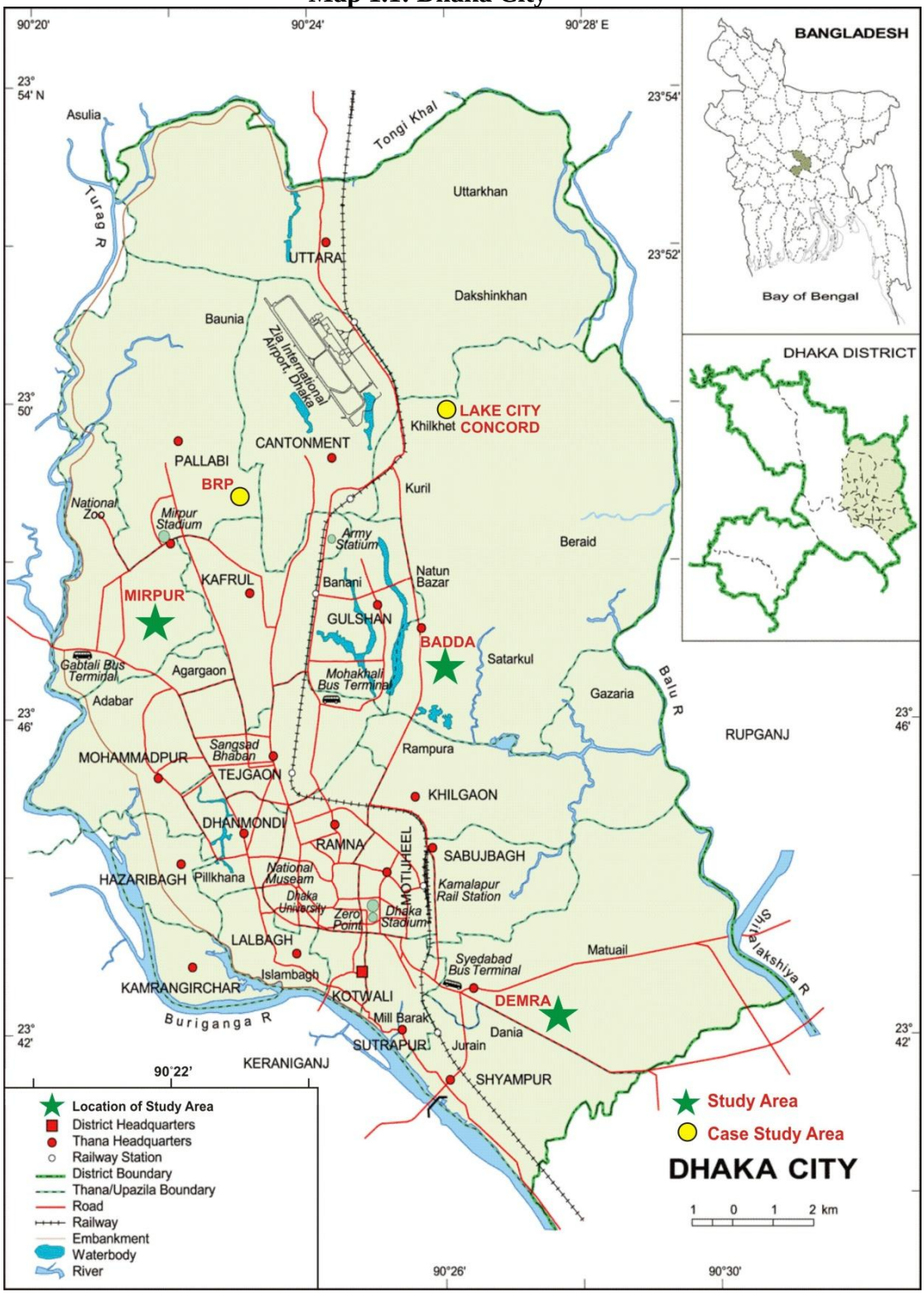
In the absence of any housing compound or complex of mostly low-middle income families within Dhaka City, Lake City Concord, Khilkhet – a project of private sector and Bhashantek Rehabilitation Project, Mirpur - a public sector endeavor though was meant for Low Income families (Begum and Amin, 2012) are taken for case studies. The case studies assessed the land value, unit cost, floor areas of units, building fenestrations, building heights, building material, construction techniques and payment mode for the housing units. A matrix comparing different components of the two cases, and also a SWOT analysis of both the case studies are done to have a comprehensive and distinct view of the housing situation prevailing in Dhaka city.

2.2 Field Research

From literature research it is evident that land is the major limitation to affordable housing. ‘Land remains a central constraint of increasing the supply of affordable

housing in Asia (UN-HABITAT, 2011). Not only UN-HABITAT but others also ascertain that especially Dhaka City being predominantly built-up, land and its availability affect the housing cost massively. The value of land in Dhaka city, mainly in the central area, has increased at a rate much higher than the rate of any other commodity. While between 1969 and 1979 the cost of living in Dhaka has increased 4 folds, the price of high class residential land has increased 25 to 35 folds (Seraj, 2010). Different tables and figures (pg. 27-28) of secondary sources confirm that towards the periphery distant from central city in Badda, Pallabi, Mirpur and Demra ranges of land price is moderate. The proposal of Islam and Shafi (2008) stated that people of low-middle income group are living in private owner occupied and rental housing in unplanned areas of these localities. MAP 1.1 of Dhaka City shows Mirpur, Badda and Demra localities.

Map 1.1: Dhaka City



By scrutinizing the Google maps of Mirpur, Badda and Demra three pockets one in each locality were identified as Study Areas for Field Research. The selection is based on the following criteria:

- Availability of buildable land and underutilized land. Underutilized land is referred to where residential accommodations are either in temporary, semi permanent or less than 3 storey structures.
- Surrounding condition in terms of residential environment and facilities.

Extensive Reconnaissance Survey on the three study locations of private housing areas of Mirpur, Badda and Demra of said Low Middle Income group was done:

i. To have informal discussions with inhabitants thus familiarize with their living pattern, economic condition and aspirations regarding owning housing units.
ii. To observe quality of built-up areas, space allocations, services and facilities available.
iii. To asses land utilization, fenestration of built-forms, building heights, and physical layout of the area.

Questionnaire survey of the Households (HHs) of the three Study Areas was carried out. In total randomly selected 36 Households (HH) were covered to assess the following through the questionnaire:

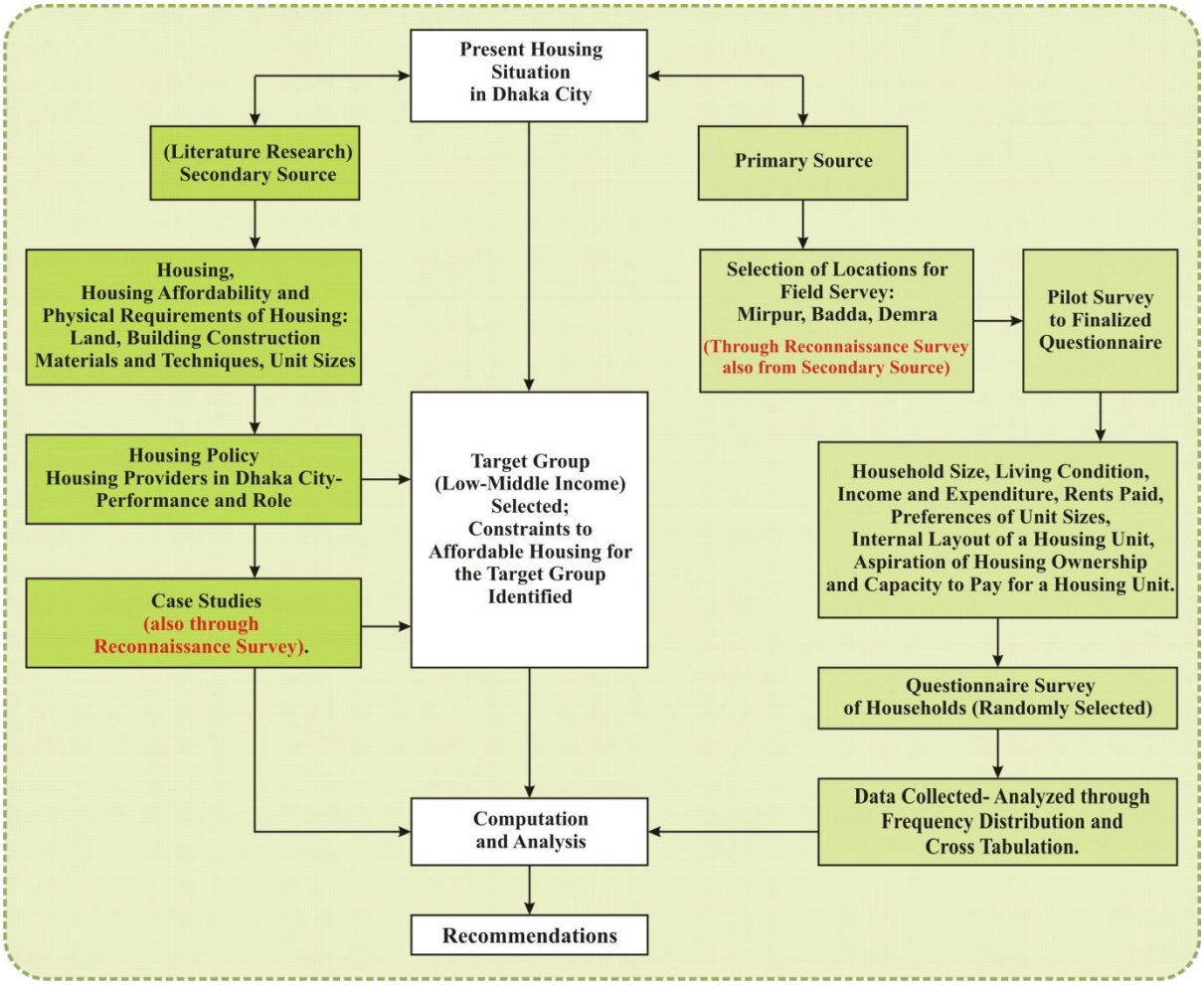
i. HHs' expenditure and savings.
ii. Floor spaces and its uses.
iii. Common spaces and its uses.
iv. Preferences to floor levels and tenure.

The compilations and computations of the data obtained from questionnaire survey were done through frequency distributions and crosstabs.

The low-middle income group, who comprise 20% of the population, plays a vital role in the city. Low-middle Income Households are the target group. The research is based on mainly the secondary sources and primary information and data. Compilation of the findings from literature research, case studies, reconnaissance survey and questionnaire survey was carried out and then analysed. Constraints in the provision of affordable housing for low-middle income families of Dhaka city were identified. The constraints -- land, alternative construction materials and techniques, unit sizes and building height, being also the components affordable housing are discussed in detail. Land readjustment, space

optimization and design related suggestions are given and are also shown the time and instalments to be paid to own the housing units located within Dhaka city.

How the research progressed is shown in the flow chart below.



1.5 Scope and Limitations of the Study

'Housing' is being a complex and at the same time a vast issue it has been assigned different meaning by different authorities. To demystify on it large and extensive secondary sources are available. But for this particular context most of the secondary information and data are related to housing for the middle income as a whole and or for the low income groups. Due to financial and time constraints, only three study areas of three localities of Dhaka city and only 36 HHs (approved by the Board of Post Graduate Studies, Department of Architecture, BUET) were chosen for the collection of primary data. The existing secondary data not being adequate and at times being outdated and not relevant to the target group or study areas

extensive reconnaissance survey and informal discussions with relevant personnel had to be done. Sometimes, the small of amount information and data that exist with different organizations is guarded and lacked willingness to share them. A few hindrances came across the study; for example, people were reluctant to disclose their household incomes neither they wanted to reveal that how much they would be willing to pay at a time as a down payment. The land owners were willing to go for readjustments if benefited but did not give a directed answer, may be, they thought it would be a commitment.

1.6 Organization of the Thesis

Chapter 1 starting with a preamble expounds the present state of the problem underlining the key words and identifying of the target group. The aspiration of the thesis is endowed with the research objectives. Research Methodology is drawn; the scope and limitations of the research are stated.

Dhaka City being one of the largest agglomerations of people its state of affairs is important to be judgmental on its housing condition and housing affordability situation. Housing is a premise having various facets differing from context to context. In chapter 2, the concept of housing, housing affordability and its components especially land and building construction materials are discussed in detail in relation to the context and target group.

In chapter 3, in the total absence of governments' enumeration on housing demand, need and supply in Dhaka city, information and data are extracted from various sources. The role of the public and private sectors in augmentation of urban housing in Dhaka city has been traced. Related institutions to housing supply and productions were scrutinized. Finally lack of co-ordination among different stakeholders and limited initiative in researches were ascribed as a problem.

Lake City Concord, Khilkhet – a project of private sector and Bhashantek Rehabilitation Project, Mirpur — a public sector endeavor are taken for case studies. Chapter 4 discusses these projects in terms of the land value, unit cost, floor areas of units, building heights, construction materials, construction techniques and payment mode for the housing units. A matrix of comparison of different components of the two case studies and SWOT analyses are done.

In chapter 5, Study Areas and Field Research are placed. Descriptions of the study areas along with housing typologies present there are discussed. Outcome of the Questionnaire survey of 36 Households (HHs), randomly selected, from the three Study Areas of MIrpur, Badda, and Demra are computed through frequency distributions and cross tabulation using Statistical Package for Social Sciences (SPSS) and analysed to draw inferences.

Of the components of housing affordability land and building construction materials, construction techniques, unit size and down payment requirements being of primary concern, Chapter 6, therefore is designed to present guidelines by analyzing the above mentioned holdups in housing sector in Dhaka city and provides an estimation of solving the problem on the basis of land readjustment tools, available alternative building construction materials that cost less than the traditional ones, and access to an adequate unit size. Down payment amounts and lengths are calculated to facilitate the easement of payment of the low middle income group.

Chapter 7, the last chapter focuses on particular recommendations meant to meet the affordability and match expectations of the low-middle income families. It is concluded that till now there exists a prospect of providing affordable housing in Dhaka City for low-middle income families residing here.

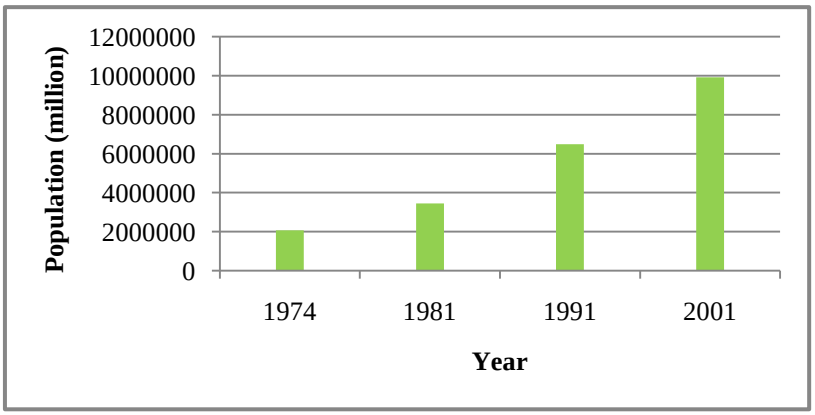
Chapter 2

Housing Situation in Dhaka City

2.1 Introduction

Way back in 1987 the UN International and Social Affairs Department indentified Dhaka as a mega city. Henceforth Dhaka is being regarded as one of the most populated city in the world (Nasrin, M. 2011). According to the 2001 census, the population of Dhaka mega city was 9,912,908, area being 1464 sq. km with an annual growth rate of nearly 4.33% (BBS, 2001). Dhaka is one of the fastest growing cities in the Asian world (Islam and Shafi, 2008) not only by considering its spatial aspects but by taking the population growth in concern as well. In 2010 Dhaka city's population stood of over 14 million with an area of 1533 sq. km. (Hussain A., 2010).

Fig. 2.1 Population Growth in Dhaka City from 1974 to 2001



Source: BBS, 2001

According to the results of BBS of year 2001 and 2005, in 1974 when the total urban annual growth rate of Bangladesh was 6.6%, Dhaka had an annual growth rate of 10.4%. In the year of 1981, on the other hand, 10.0% was the total urban annual growth rate while Dhaka's annual growth rate was 8.1%. In the year of 1991 Dhaka's annual growth rate 6.5% was again higher than the total urban annual growth rate 5.4% of Bangladesh. This escalation continues during the next ten years and according to the census of 2001 Dhaka's annual growth rate was 4.3% where the total annual growth rate of urban population of whole Bangladesh was 3.2%. According to this statistic only in 1981 Dhaka's urban population

growth rate was less than that of whole urban Bangladesh. Subsequent to that the growth rate is demonstrating an upper drift.

Table 2.1: Population, Growth Rate and Density in Dhaka and Urban Bangladesh

Year	Bangladesh (Urban)		Dhaka			
	Population (million)	Annual Growth Rate (%)	Population (million)	Annual Growth Rate (%)	Total Area (sq. km)	Gross Density (person/ sq.km)
1974	6.2	6.6	2.0	10.4	336	6,156
1981	13.2	10.0	3.4	8.1	509	6,759
1991	22.4	**5.4**	6.4	**6.5**	1,353	4,795
2001	28.6	**3.2**	9.9	**4.3**	1,464	6,771

Source: BBS, 2001, 2005

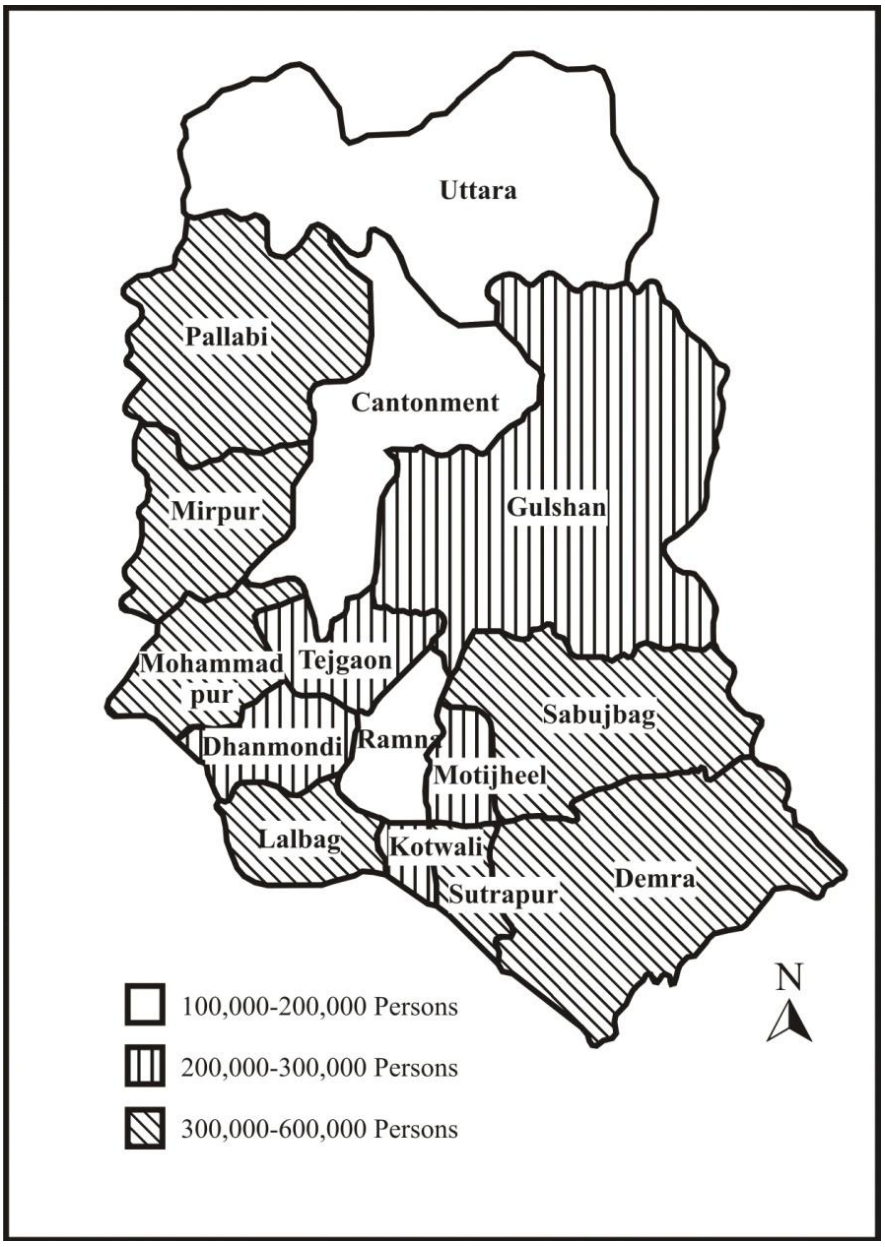
In 2015 Dhaka's population would be 15.57 million as per the future projections of the Dhaka Metropolitan Development Plan (DMDP), 1997. Hence forth it may be concluded that the population of Dhaka city is growing at an unabated rate.

Fig. 2.2 Top Ten Populous Cities of the World in 2015

Source: Kamruzzaman M. and Ogura N., 2007

Map 2.1 shows the distribution of population in Dhaka City.

Map 2.1: Population Distribution in Dhaka City



Source: Kamruzzaman M. and Ogura N., 2007

2.1.1 Housing Situation in Dhaka City

The overall housing situation of Dhaka city is not at all satisfactory neither it was in the past. In 1991, just more than half (59.7%) of the housing were of permanent structure. Moreover, only 46% of the total housing was constructed complying with the minimum building regulations (Urban Indicators Program Phase I: 1994–1996 of ADB). The housing situation of Dhaka is also typified by very low homeownership rate. Urban indicators program of

Asian Development Bank (ADB), 1994-1996 shows that only 31.9% of housing units are owner occupied, whereas 53.6% are rental housing. The rest of the housing stock comprises very insignificant social housing e.g. public housing and the housing by cooperatives or associations (1.2%), sub-tenant and rent-free housing (6.5%), the squatters and others (6.9%). Another study by Hoek-Smit (2000) shows that in Dhaka city 65% of total housing units are rental housing. If the existing housing market performance continues, the housing situation would be even worse in near future and the huge urban agglomeration may act as an abominable threat for the urban dwellers. According to the UN data sheet of 2002 (Mehdi, M. I. and Reza, M. S. 2002), the Dhaka metropolis, currently the 22nd largest urban agglomeration in the world will be the 5th largest with a population of 19.5 million, by 2015.

The only record available on the city's population of different income groups and their approximate residential land coverage based on the records from Islam, (1996) is in Table 2.2. Although the data is old, literature research shows that the situation has not changed much for the better.

Table 2.2: Land Coverage by Income Groups

Income Groups	% of Total Population	Approximate Coverage of City's Residential Land
Higher Income Group	7%	15%
Middle Income Group	58%	65%
Low Income Group	35%	20%

Source: Islam, 1996

Data on household incomes are notoriously difficult to compile since most households and individuals have several sources of income, both formal and informal. Therefore all household income data are approximations. BBS (2001) shows that among the low and middle-income groups, primary earners contribute 70% of household income, and each house hold has 1.45 numbers of earners.

A study jointly conducted by Asian Development Bank (ADB), Government of Bangladesh (GOB) and Local Government Engineering Department (LGED) of Bangladesh in 1996 on urban poverty measured the monthly households' income. Later others updated the figures.

Table 2.3: Income Groups and their Distribution in Dhaka City Corporation (DCC)

Income Group		Monthly Household Income in Taka	Households Percent	
Low Income Group	Hardcore Poor	<2500	25	40
	Moderate Poor/Low Income	2500-5000	15	
Middle Income Group	**Low Middle Income**	**5000-10,000**	**20**	50
	Middle Middle Income	10,000-25,000	20	
	Upper Middle	25,000-50,000	10	
High Income Group	Lower High	50,000-100,000	7	10
	Upper High	100,000+	3	

Source: Islam and Shafi, 2008 and RAJUK, 2010.

Therefore, with low incomes of the majority population, like many other metropolises of the Asian world, Dhaka also faces a huge deficit in providing adequate accommodation to its inhabitants. This is also recognised by Islam and Safi (2008). It can be estimated even on a very conservative scale that about 1, 00,000 new units only of all types are required every year in Dhaka City (Nasrin, M. 2011). If added to existing backlog the total number would certainly supersede one million.

Table 2.4: Population growth of urban areas and new shelter requirements (1980-2000).

Urban Center	Metropolitan Area (sq. km)	1980 Population (Millions)	1980 Households (000's)	2000 Population (Millions)	2000 Households (000's)	1980-2000 New Housing Units req. (000)
Dhaka	360	3.5	515	9.3	1691	1176
Chittagong	168	1.43	220	4.0	727	507
Khulna	59.57	0.70	108	2.4	418	310

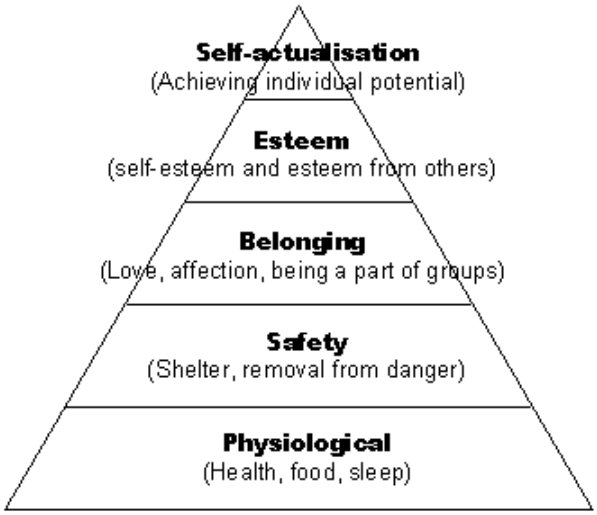
Source: Rashid, M. 2004.

From the discussion and figures above it can be concluded that in Dhaka city a wide number of families suffer from the failure of getting an affordable housing unit, either for rent or for ownership, according to their economic ability.

2.2 The Perceptions on Housing

World Health Organization (WHO) defined housing as "an enclosed environment in which man finds protection and feels secured from hostile forces and can function with increased comfort and satisfaction as regards to privacy to the individual and his family. The environment must include all necessary services, facility, equipments and devices needed for physical and social well being of the family or the individual" (Sarma & Mollick, 2005). This description of housing characterizes it to the same extent as one of the basic and vital needs for a life. It is equally important as food, clothing, and medical facilities. It provides a household with a sense of safety and belongingness which further promotes health and comfort, provides a sense of privacy, a basis for employment and income. It symbolizes social acceptance and status and also fulfills the important social functions, i.e. a centre for communal gathering, a shelter to protect from natural calamities or criminal exploitations. It is not just a mere structure of "bricks-and-mortar" rather to be more précised, it comprises psychological aspects or significant emotional aspects resulting from its association with accumulated life experience. As Zahur (2008) states, "At the household level, it provides a physical enclosure for domestic behaviors, place of relative privacy for daily activities, where people can cook, eat, socialize, and rest away from the public realm and a place where, in many cultures, they born and die." Zahur explains it as a "setting removed from external scrutiny" which protects us from all external ignominy and desolation. Nehru in 1977 asserted, "The house is not merely a place to take shelter from the rain or the cold, or the sun. It is, or should be an enlargement of one's personality, and if human welfare is our objective, this is bound up with house" (Sadullah, 1991). Supporting this view, it may be concluded that a housing unit demands the "qualities of comfort, conveniences, and amenities" which are "essential for a family as a centre of total residential environment" (Zahur, 2008).

Housing provides a psychological support to a person, a sense of security and wellbeing that relieves one from mental stress which might be an impediment against an individual's social and personal achievements. As Maslow suggests that "before more sophisticated, higher-order needs can be met, certain primary needs must be satisfied (Maslow, 1970, 1987) and therefore, Maslow's model places "safety, love and belongingness" right after physiological needs, i.e. food, water, and sleep etc.



Maslow's Hierarchy of Needs (Feldman, R. S., 2011-2012)

From this pyramid diagram of human needs, it is confirmed that these basic physiological and social needs actually promote higher-order needs. And housing is the sole device to provide this sense of security and belongingness since it accommodates a whole family and its affiliations; it is the place where the members of a family share their emotion and memories with each other. In other words, housing is not a shelter only but an urn of piecemeal memories and emotions of people who are bracketed together. Thus 'Housing' comprising mainly of dwelling units is a total entity and 'owning it is realization of primary objective and need' (Sharifah, 1994).

In an elaborate notion Rashid (Ekram), K., 2008 depict Housing as, "beside all functional aspects encompassed in a haven, it is an environment --- a total entity where children would be vibrant with joy having safe journey to schools, secured play areas to play; for senior citizens' spaces to debate and thus know each other, have facial recognition and direct contacts; different genders of different age groups performing different activities according to their needs and choices. However, such an entity requires considerable chunks of land and the renters or owners need to have financial capability to dwell in. It is too utopian considering Dhaka city's present physical environment as well as economic setting of the families as well as the government". {Rashid (Ekram), K., 2008}

Under the present housing condition existing in Dhaka city this thesis credits on how Ministry of Construction and National Housing (MCNH) of Zimbabwe (1991), Olweny (1996) and Plymouth City Council (2005) deem housing, house, and affordable housing. MCNH of Zimbabwe understands housing as 'a stock of shells for the provision of shelter for

man against the weather and alternatively as a process by which the stock is created (Mafico 1991). 'The term house conjures several different meanings. Ordinarily, it is used to define a variety of aspects of the environment connected with a dwelling, from health to social structure and status' (Olweny, 1996). "Affordable housing is that which can be afforded where dwelling has the smallest number of rooms appropriate to meet the needs of a household which cannot afford to buy or rent on the open market without some form of subsidy (Plymouth City Council 2005). This reliance will be discussed in detail in onward chapters with housing affordability and the present housing situation of the low middle income households – the target group of Dhaka City.

2.3 The Premises on Housing Affordability

"Affordability is quite often expressed in terms of "affordable housing". But this term is at best meaningless and at worst misleading, as affordability is not a characteristic of housing, it is a relationship between housing and people.", states Stone (2006). Bratt, Stone, and Hartman collectively think that "no housing is affordable unless it is free to some people", while for some, "all housing is affordable, no matter how expensive" it is. These some people are none but people of different income categories.

The term "affordability" is widely in use from last three decades or so especially in the English Language while discussing about housing. Though the term has achieved international importance yet still it lacks a précised and consistent definition. Stone states that "'Affordable housing' came into vogue as part of the retreat from public responsibility for the plight of the poor and as affordability challenges moved up the income distribution." However, for most scholars this concept is found "difficult to define". Robinson, Scobie, and Hallinan stated in their collective work *Affordability of Housing: Concept, Measurement and Evidence* that "'Afford' is defined as being able to pay without incurring financial difficulties". Nonetheless, affordability is not considered as an "inherent characteristics" of housing (Stone: 1994) rather it defines the relationship between the household's income and relative prices.

The term is often very much misleading since it relates the household's income with the expenditure for housing: if the cost of housing is higher than the income of the household, it will definitely be beyond his/her capacity to afford; on the other, even if the housing cost is

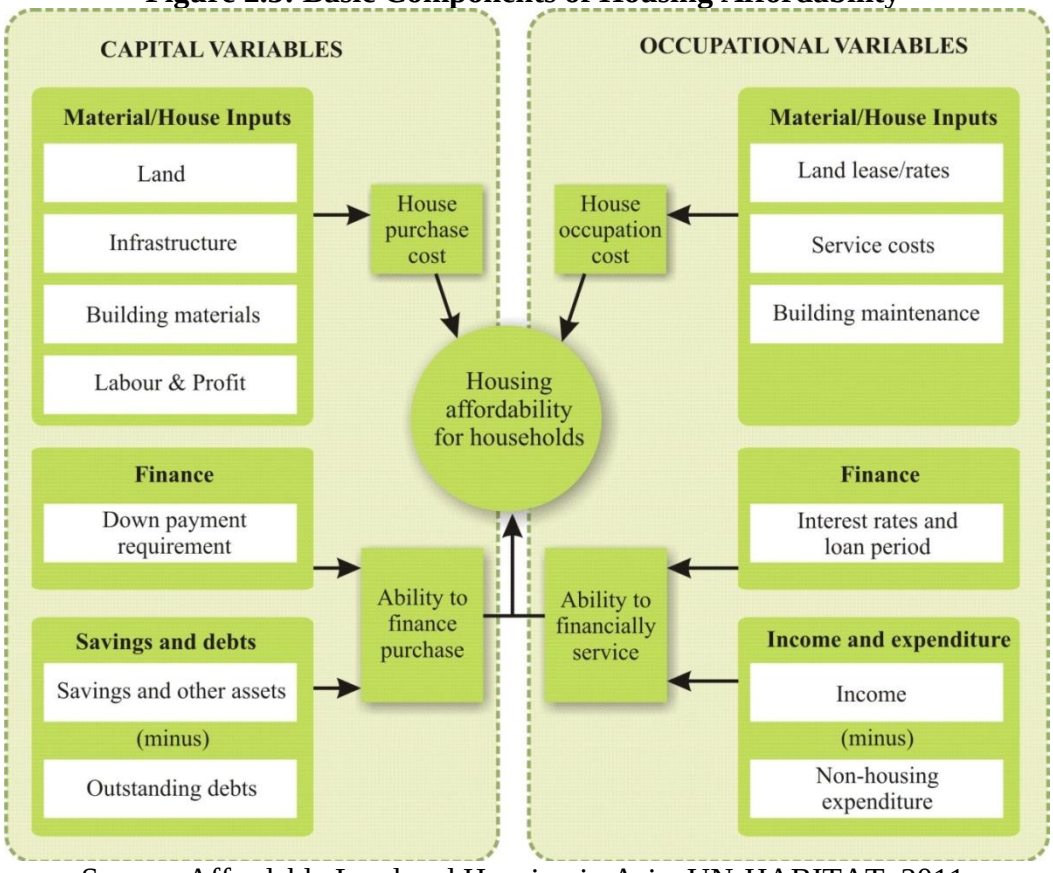
adequate to the income ratio of the household, if it doesn't leave the scope for the household to afford other familial expenditure, it won't be accounted as affordable housing; moreover, that housing is unaffordable which lacks in providing adequate number of rooms fulfilling the requirements of the household although its cost is within the household's means and leaves the household with the scope of other expenditure for his/her family. On this note, Cambridge Learner's Dictionary, 2nd ed. presents affordability as a cost that is "cheap enough for most of the people". It is not just about having enough money to buy something rather it's about the cost of the thing, the adequacy of the thing's condition and supply that make it affordable to the buyer. Stone (2006) states that housing affordability is no separable from housing standards which means the "over housing" causes unaffordable housing since it imbalances the relation between the number of rooms and the number of members in the family. UN-HABITAT (2011) identifies affordable housing as that "which is adequate in quality and location and does not cost so much that it prohibits its occupants meeting other basic living costs or threatens their enjoyment of basic human rights." Stone describes (2006) that "it has come to encompass not only low-income housing but also housing that includes financial assistance to middle-income households that find it difficult to purchase houses in the private speculative market. It thus seems that a far more accurate and honest term than "affordable housing" would be "below-market housing". UN-HABITAT (2011) finds housing affordability, however, "multi-dimensional and involves more than the often-used simplified conception of the ratio of house purchase price to household income. Housing affordability in Asia is pervasive for several primary reasons. Firstly, the majority housing finance mechanisms have high interest rates and are inflexible, which makes obtaining housing finance and servicing monthly loan repayments difficult. Secondly, real estate prices are high primarily due to high land costs and the high cost of building materials. Thirdly, there are few alternative low-technology housing construction methods available, or used, which could reduce housing cost. Fourthly, the compliance costs and regulations surrounding formal housing development are expensive and time consuming. Lastly, there are significant income disparities between households and the financial assets and incomes of low-income households are not high enough to afford mainstream, formal, market-procured housing." Undoubtedly for Dhaka City, 'Affordable housing with a communal environment is the need of the day' {Rashid (Ekram), K., 2012}.

2.4 Housing Affordability and Its Components

Affordability, though not a characteristics of housing, plays the most vital role in engaging an accommodation for the family of a household and it is highly affected by some variable elements that work at the foundation of any housing. UN-HABITAT, in their study in 2011, has identified these components which they have divided into two parts: a. capital variables (house purchase cost) and b. occupational variables (cost associated with keeping the house). Both capital variables and occupational variables highly affect that how much it would cost the household to absorb a unit in housing. Under these two categories come the components that affect housing cost. According to UN-HABITAT's report (2011), "the ability of a household to purchase a house is affected by the purchase cost (which is the sum cost of land, infrastructure, building materials and labor and profit) and the ability to finance the purchase (principally set by the finance down payment requirement and the balance of household savings)."

Figure 2.3 Components that affect housing affordability as put forwarded by UN-HABITAT, 2011

Figure 2.3: Basic Components of Housing Affordability



Source: Affordable Land and Housing in Asia, UN-HABITAT, 2011

Here the housing affordability components are seen from two perspectives namely capital investment (i.e. House purchase cost) and households capability (i.e. House occupation cost). Of the capital investment side Land, Infrastructure, Building material, Labour and profits, down payment requirements are considered important to make housing affordable to purchasers. Location of land, Service cost, Building maintenance cost, Interest rates, Payment period, Savings determine the households purchasing ability. Labour being available in plenty and still being comparatively cheap in Dhaka; its impact on price of units could be over looked. Among the above mentioned components land, building construction materials, and techniques (often known to be the physical requirements of housing) are found to be the greatest effective components that highly affect the purchase cost of housing especially in the context of Dhaka city. Alongside these variables, many experts like Stone, Balchin, Isaac, Mauren and others take unit size into account as shaping the purchase cost of housing. Down payment period is an important issue that affects the purchasing ability of the intended owner. Therefore, this thesis focuses on land, building construction materials and techniques, unit sizes and down payment issues in attempting towards affordable housing for the low-middle income households of Dhaka City.

Glaeser and Gyourko equate the housing price:

Housing price = land area + other controls + Structure cost.

The other controls include the number of bedrooms, the number of bathrooms, and the number of other rooms'. (Edward L. Glaeser and Joseph Gyourko, 2003) Thus the other controls actually are an alert factor of avoiding 'over housing' (Stone, 2006). Structure cost is dependent on materials used and construction techniques.

A housing affordability crisis is the relevant benchmark for housing costs. Affordability campaigners often argue for the ability to pay (for example, some percentage of income) as a relevant benchmark. But this again conflicts with poverty, poor are in no position to pay for the housing prices even if it is highly subsidised. For the low income category especially for the hard core poor it may have to be almost free and for them a more sensible benchmark is only the physical construction costs of housing[3]. UN Habitat, 2011 has other components as 'Labour and Profit' and 'Infrastructure' on housing affordability issue. 'Labour' may be overlooked in the context of Dhaka City as labour is still cheap here than other Asian Cities.

3 Prof. Khaleda Rashid (Ekram), 2008, Class Discussions during Course 6301 Housing Problems and Policies

The government of Bangladesh is not in a position to give anything free not even with high subsidy and it would be unethical to practice it for this income group in particular. In course of the thesis marginal profit and availability of basic infrastructure is considered. For the low middle income with a steady and incessant income the main components of affordability may be regarded as land, construction cost, and unit size.

From the discussions on housing situation within Dhaka City particularly for the low middle income families and the housing affordability issues as judged in different literatures, this thesis has three parameters: 'land and its availability', 'building materials and construction techniques' and 'space optimization', to deliberate with. Here in the figure below connectivity among the parameters, the objectives outlined and the research methodology adapted to access the objectives are shown:

2.4.1 Land

Khan, Alam, and Islam (2010) consider land as one of the central constraints of increasing the supply of affordable housing in Dhaka city:

> "The exorbitant land price is at the root of Dhaka's housing problem. Dhaka's land prices are comparable to those in suburban New York or London. Prices are similarly high in most other residential areas of Dhaka, including the periphery. Because of this, it is impossible to make housing affordable for the poor."

Economic growth as well as population growth in Dhaka city is pushing up the cost of land within the city since it is currently very difficult to find out a suitable, well-located land. "It is obvious that, in recent years, apartment price increased due to the unimaginable increase in land price" (Amin, M.I., Sen, S., Bashar, S. M., Robbani, M.G., Khan, M.S.A., and Faridi, R. 2012). UN-HABITAT (2011) considers high land price as a constraint to affordable housing in Dhaka city, "Bangladesh is an example where……land prices have skyrocketed, which is a central reason why housing affordability in Bangladesh is so low." Payne and Majale (2004 and 2012) stated "lack of access to land" as a major impediment for developing new housing in urban areas. According to their hypothesis, the high land price and low income of the households make "land the largest cost component of legal housing in most cities" and Dhaka city is not excluded from this list of the cities. On this note, Jamil and Ahmad (2006)

passed on their observations by saying, "As increasing high and unregulated land price takes a lion part of the housing cost, no effective solution to the housing problem can be reached without addressing this issue." Shafi in a study in 2007 also pointed out "access to land and land price" as the foremost constraints for the improvement of shelter in the city of Dhaka. Muzzini and Aparicio (2012) also considered "high land price" as one of the major constraints "to housing" in Dhaka city. However, UN-HABITAT (2011) suggests some effective measurements that may lead to develop a guideline for making housing affordable for the income groups of lower strata: land banking, land sharing, land readjustment or assembly, and land swapping, joint venture agreements, negotiated purchase. Among these adjustment tools UN-HABITAT identifies land banking and sharing a bit challenging to be effective enough. For example, they have shown that land banking had been used successfully in Asian countries like Malaysia and Singapore. Land banking is no longer seen as a way forward neither land sharing, since to make it effective enough many preconditions are needed to meet and henceforth, after its successful venture in India, Thailand and the Philippines, it has not been used for any other country in Asia. Therefore, land readjustments – assembly and or swapping, joint venture agreements, have been suggested by them to be the most preferable adjustment tool for land which is discussed in the context of Dhaka city and the target group below.

UN-HABITAT states (2011) that land, "remains a central constraint of increasing the supply of affordable housing in Asia." In case of Dhaka City availability and price of land, both affect the housing cost in a massive way.

> The major hindrance of providing affordable housing to all is the high value of land in Dhaka city. (Siraj, 2010)
>
> The high land value results the high value of housing units, for purchase and rent. (Siraj, 2012)

With these facts it is very difficult to keep pace with the need in housing sector. Thus the attempt is to identify the supply constraints of land for housing, analyzing the current land development process and land management system in Dhaka. To describe existing land supply situation and to delineate the constraints, this chapter is immensely depended on the secondary sources. Required data on Dhaka to assess the situation are not available due to the

absence of effective and efficient information collection, compilation and systematic maintenance of them.

2.4.1.1 Land Development for Housing

For housing development, the lands are mainly provided by the public sector agencies, private land developers and the individual residents. Presently, central parts of Dhaka and the old Dhaka being predominantly built-up, peripheral lands are used for housing and are also developed for housing. The contributors of peripheral land development are individual households or public sector agencies or private developers. The first group is the land owners who, without obtaining any of the necessary permissions, sub-divide and sell the land to individuals who thereafter build their housing in an incremental fashion. Public and private sector agencies acquire low lands from land owners, raise those lands with earthwork, subdivide into small plots, provide with utility and services and then sell to individuals. Beside public sector, various housing societies currently in private sector, some developer companies are involved in land development. Generally speaking getting big chunk of land for housing is always difficult, time consuming and also huge amount of fund is required. For public sector, it could be less troublesome to acquire land but this task for the private developers is not an easy task. Usually only big developers with clouts can properly manage the whole process. A chunk of land suitable for a housing land project can be owned by several landowners and all of them may not wish to sell land to the developers. The developers depend on many techniques for acquiring land some which are even unethical. The developers make the land owners agree to sell lands with the help of local powerful people or hooligans who work for the developers in return of money. There is another technique known as land-blocking which is totally unfair. In this technique, a developer purchases all the lands surrounding that owner's land who opposes to sell. Then that parcel of land becomes valueless as that has no access and that land owner becomes bound to sell that to the developer at very low price. Regarding land acquisition, developers generally face two core problems: one is the unclear land title and the other is the fraudulence by few land owners or intermediaries. Again sometimes they cannot acquire suitable lands due to land disputes caused by inadequacies of land registration system. Another difficulty for the private sector companies is that they financially depend on pre-sale, self finance and bank loan. However, buyers' money of down payment and installments is the main source of finance for

private developers. Consequently land development activities start after the buyers start the down payments and installments. The developers raise the low lands by huge earth filling, part them into smaller plots and make available local road networks. Other utilities like electricity, water, and gas are supplied by concerned government authorities like Dhaka Water and Sewage Authority (WASA), Dhaka Electricity Supply Authority (DESA), Titas Gas Transmission & Distribution. Though the developers manage these organizations to provide these utilities but the customers have to bear the cost. Ultimately the costs of units go up. The development activities usually take several years; which may fluctuate from five to ten years and sometimes even more. If land is very far from the city core, in one hand utilities and services take longer time to set up there. On the other hand being away from employment locations later the transportation costs and time consumed also add up with the total expenses of the owners before their realization.

2.4.1.2 Land Speculation and Land Grabbing

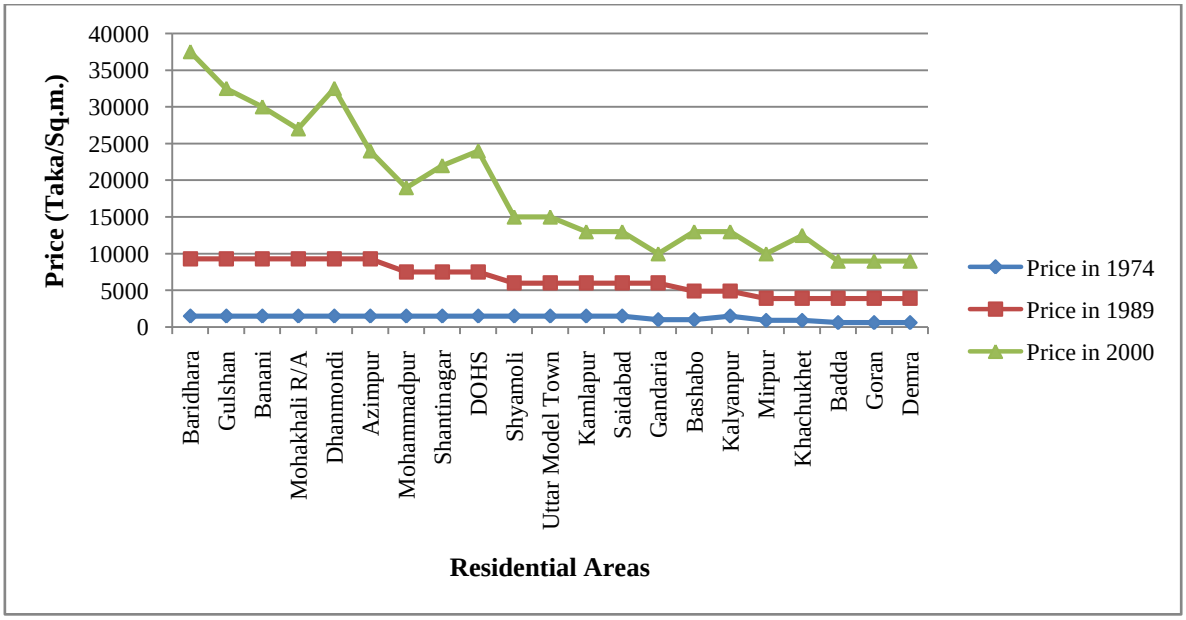
Investment in land is considered as one of the most profitable businesses in the third world cities like Dhaka; several means of trading land are available among which some are either illegal or to some extent unethical, i.e. land speculation or coercive usurping. There are two classes of speculators who are involved in this business; one class comprises the real estate developers or other individuals and despite being few in number, the speculators in the land market hold significant amounts of land especially in fringe areas and this minimize supply of land (Author's Experience). The other group includes underground operators active in the field who illegally and at times forcibly occupy vacant government land or even private land. Recently, a Parliamentary Body revealed that different real estate developers and others in the name of associations and groups have illegally grabbed about 1,000 acres of state land in Dhaka and its environs (The Daily Star, November 07, 2003). Thus, the land speculation and land grabbing have narrowed down the availability of developable peripheral lands in fringe of Dhaka.

2.4.1.3 Land Value

Urban culture always provides scopes to create new types of stratification in a society, now which is dominated by the economical condition and it can overshadow the previous

stratification based on religion, cast, race or occupation (Rapoport, A., 1977). In Dhaka city, buildable lands at suitable locations are in short supply on one hand, and if available, are highly priced on the other. Dhaka has experienced an unprecedented increase in land value since the early 1970s. In this 'imperfect' or 'distorted' market, land becomes arguably the most valued commodity (Ghafur, S., 2006). The pressure on land for housing has become extremely high due to tremendous population increase in Dhaka. The value of land in Dhaka city, mainly in the central area, has increased at a rate much higher than the rate of any other commodity. While between 1969 and 1979 the cost of living in Dhaka has increased 4 folds, the price of high class residential land has increased 25 to 35 folds (Seraj, 2010). In absence of any proper land value records it is very difficult to compare the land price over the past decades. However, the Figure 2.4 and Table: 2.5 will provide some idea about land prices in different residential areas and the increase from 1975 to 2006.

Figure 2.4: Increase of land value in different residential areas in Dhaka (1975-2000)



Source: 1975 – CUS, Dhaka University, 2000 – Sheltec (Pvt.) Ltd.

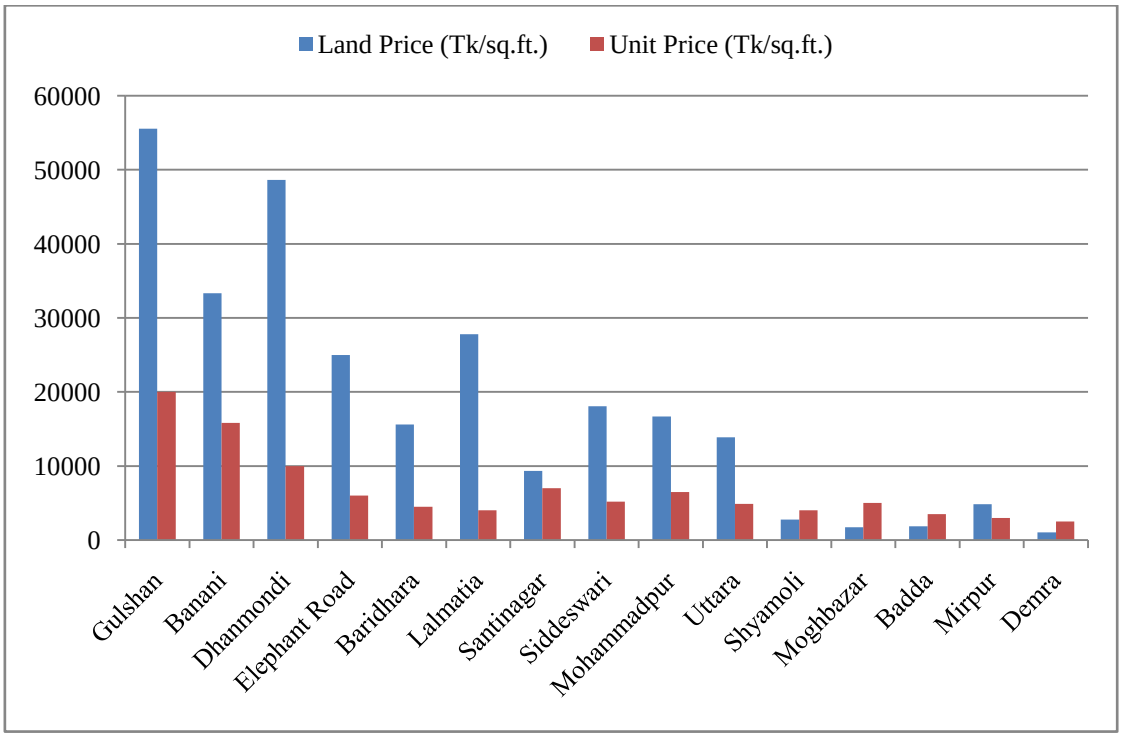
Table 2.5: Land prices in residential areas of Dhaka, 2006

Location		Land value (Tk./sq. ft)
High Land Price Area	Motizheel	(10,005-8625)
	Gulshan	
	Baridhara	
	Banani	
	Dhanmondi	
Median Land Price Area	Ramna	(5002-3527)
	Uttara	
	Mohammadpur	
	Lalmatia	
	Elephant Road	
	Tejgaon	
	Cantonment	
	Lalbagh	
	Kotowali	
Low Land Price Area	**Baddda**	**(2149-1732)**
	Pallabi	
	Mirpur	
	Demra	

Source: Kamruzzaman M. and Ogura N. 2006.

The figures above show that from 1989 there is a massive increase in land price and till now it is increasing unabated. Such figures establish that the price of land alone is high to make housing unaffordable to vast majority of Dhaka city. The land price in Gulshan, Banani, Bridhara and Dhanmondi, is skyrocketing. The intervention of housing developers in these areas may also have negative impact on land price. As the land is scarce, the high competition for acquiring lands which is termed by developers as unhealthy competition has also raised the land price. Recently, housing projects are taking place in Uttara, even though in 1995 there was no apartment project in Uttara (REHAB Survey, 1995). A few years earlier, in Uttara, the land price was not very high comparing to that of other residential areas.

Figure 2.5 Relation between land and house prices in different areas



Source: cellbazaar.com and author's field study, 2012.

Land consumes the major portion of housing investment. Hence the land price has a significant impact on house price. Figure 2.5 shows that in Dhaka the price of apartments provided by housing developers varies with the price of land.

Actually the house price is a summation of land cost along with other affecting outlays of housing construction is

Land Cost + Infrastructure Cost + Building Material Cost + Labor and Profit = House Price. (UN-HABITAT, 2011)

2.4.1.4 Land Subdivision

In Dhaka, the existing inheritance law allows unregulated freedom for division of urban land. With the passage of time, land parcels are becoming smaller and smaller, rendering some plots totally unbuildable. Excess subdivision of land also causes wastage of land. Due to excess subdivisions, it is not possible for housing developers to get a chunk of land for taking a successful housing project.

From the above discussion it may be concluded that in Dhaka city the supply of land for housing is highly inadequate in comparison to the need. Furthermore, the prices are far above the ground. The stoppage of un-utilization and under utilization of the land may address the urban shelter shortage; unfortunately the government, to some extent, is totally slack and heedless about it. Efficient government policy for proper utilization of land, adequate flood-protection and civic service provision can cater the housing demand {Rashid (Ekram), K. 2013}. The upshot of these insurmountable difficulties may be reduced by finding out proper techniques of utilizing the lands available.

2.5 Land Readjustment Tools and Techniques

Japanese Land Readjustment Tools and Techniques are more than a century older and are applied by many government agencies of different countries even USA. Of the tools and techniques Land Assembly and Land Swaps being relevant and applicable to the context is discussed below.

2.5.1 Land Assembly

"Land policies which support large scale public housing such as land banking, land pooling, land readjustment etc., must be brought into practice." (Islam and Shafi, 2008)

Among the land adjustment tools land readjustment or land assembly seems to be the most effective tool that can be implemented to reduce housing construction cost for large scale public housing within Dhaka city. Land assembly involves joining adjacent lots to make one larger parcel of developable land. A single vacant land in an urban area are often too small to build anything more than one house. Putting land together at a time can play a vital role in land scarcity problem. Developers, real estate professionals, lenders, housing authority representatives, and all governmental agencies can work together in all steps of the process from identifying potential sites to executing agreements for land purchase and to some extent in distribution and management as well. This idea is also supported by UN-HABITAT. They highly recommend it for Asian countries and in their report (2011) they gave evidence that how the usage of this tool resulted positively in Japan.

> Land readjustment is a more widely used variant on land sharing. It involves combining small plots of land, servicing the larger area, and then returning to the owners. In Bangladesh and India, readjusted land is returned to the owner on condition that a proportion of the increase in land values is handed back to government to make more land available to low-income groups. Approximately 30 per cent of the urban land supply in Japan has been developed through land readjustment. (UN-HABITAT, 2011)

Land assembly techniques can be a very effective step in increasing land availability. However rules and regulations of Building Construction Act, 2008 must be followed.

2.5.2 Land Swap

To get only a low price land is not enough. To increase land availability and to reduce the land preparation cost and construction cost, besides assembling of lands, land swapping comes in handy. Land Swapping may be done to balance facilities required in any region or area. In a residential area or zone factories and industries are often considered incompatible uses. There could be a land swap of functions; industrial functions may be taken to the areas designated for this function while that land is given to residential facility. Land swapping may take place due to various reasons. For example, a person owns 5 katha of land in Old Dhaka and he currently is not making any use of it rather he wants a plot of vast land area outside Dhaka city. Or may be another person who owns a vast land area outside Dhaka city or 18 Katas of land in Badda needs a smaller plot in Old Dhaka to establish his business there. Then these two land owners can switch their lands with each other and when it comes to constructing residential accommodation a housing provider may play the role of a mediator through relevant govt. authority. Ministry of Land must provide the rules and regulation for land swap to the mediator. In all cases there should be government approved rules and regulation and intervention.

2.6 Building Construction Materials

According to Muzzini and Aparicio (2012), beside land price “material price” is also acting as a huge constraint for housing development in Dhaka city. Building construction materials are believed to be the most vital components after land affecting housing cost. UN-

HABITAT (2011) considers the cost of these two key inputs- land and building materials, as the main reason that makes housing unaffordable for urban poor majority in Asia. According to their thesis land cost is affected by land "regulations" but the latter one is affected since "many governments, at central and local levels, insist on the use of conventional building materials and technologies". In their collective work Islam and Shafi (2008) showed "lack of natural resources and lack of major industrial production" in this sector as a major constraint to reducing the building material cost indicating towards housing affordability. Their research proves the use of conventional building materials as stipulated by building codes and regulations which are the outcome of colonial heritage or an adaptation of foreign architecture that prevent "the use of more appropriate, readily available local building materials, and also the use of cost-effective and environmentally-friendly construction technologies." UN-HABITAT's 2011 report finds out "the efficiency of the construction industry, in terms of its ability to supply housing in sufficient quantity and at an affordable cost as a key determinant of housing sector performance." However, this sector lacks research and revolutionary conception in Bangladesh while for facing the shelter problem, its highly required to have modifications and innovations both in techniques and the materials itself. Housing and Building Research Institute's (HBRI) performance is rather limited. On one hand, there is little research into alternative and low-cost materials and techniques while on the other hand; alternative building materials of indigenous sources like clay tiles get little interest (Elisa Muzzini and Gabriela Aparicio, 2012). There is lack of Construction Materials in the country. Industrially the sector has not received support of the government (Salma A. Shafi, 2007).

Previously, seven years ago, Jamil and Ahmad (2006) stated, "The availability and cost of building materials to a large extent influence the supply of housing in Bangladesh." UN-HABITAT suggests introducing alternative building materials against highly priced conventional materials to make housing affordable for the major population in the urban area. The UNESCAP (2011) refer to variety in design and construction strategies to be one of the most effective cost reduction strategies: "One of the best ways of reducing the cost of housing is to use a variety of design and construction strategies which make the unit construction costs lower and make more efficient use of the land." The HABITAT agenda calls on governments to encourage the production and distribution of building materials, including strengthening the local building materials industry, based as far as possible on

locally available resources. It also calls for the development of environmentally sound and affordable construction methods. It is obvious from Laurie Baker's correspondences of 1984 with India's the then Minster for Works and Housing, Kerala State how important it is to attempt cost reduction in building materials and construction techniques to lead to housing affordability. Laurie Bakers 'Cost Reduction Manual' (Bhatia, G., 1991) is an inspiring example. Cost reduction in building materials and construction techniques in the backdrop of Dhaka city and the target group is further elaborated and discussed below:

In 2007, Salma A. Shafi, emphasized that Low cost housing construction research and technology had not received attention to support large scale nationwide shelter delivery. Again in 2012, in connection to Bangladesh's construction industry, Elisa Muzzini and Gabriela Aparicio ascertained 'the technology and innovation in the construction industry may reduce construction cost and time, as well as increase safety. New technological innovations, often in conjunction with materials and equipment, should be introduced into several of the disciplines within the construction industry'. Not only there is a lack in research and thus innovation in construction material and techniques, construction related industries have not flourished much in the country. The end result is, the price of construction materials is consistently increasing, thereby increasing the construction cost and apartment price. (Siraj, 2012)

In Bangladesh, building materials is ranked the second biggest constraint to house construction (Jamil, G. M. H. and Ahmed, M. 2006), as it is expensive and supply is inconsistent. According to Siraj, 2010, the housing problem of the city is further aggravating due to the price hike of construction materials. This is attributed to the high-dependence on imported materials, components including cement, and cement clinker, lime, galvanized iron and asbestos cement roofing sheets, sanitary ware and fittings, electrical fittings and fixtures, glass, steel reinforcing bars, paints etc. It is estimated that construction cost of an average residential property in Bangladesh is split between 70 percent material cost and 30 percent labor cost (Jamil, G. M. H. and Ahmed, M. 2006).

2.6.1 Price of Construction Materials

There has been a gradual increase in the cost of construction materials in Bangladesh (Table 2.6), with prices doubling over the past 10 years and quadrupling over the past 20.

Construction material price increases still have lagged behind the phenomenal property price escalation in the country. The rise in the cost of construction materials has roughly followed the inflationary trend, and thus the rise in income levels. This fact indicates that it is the rise in land prices that really has pushed the property prices to unaffordable levels.

Table 2.6: Rise in the Prices of Construction Materials, Selected Years, 1988–2012

Year	Price of brick, per piece (TK)	Price of sand, per cft. (TK)		Price of cement, per bag (TK)	Price of iron rod, per ton (TK)
		Local	Sylhet		
1988	1.00	3.60	5.25	105	11,000
1998	2.00	7.10	9.00	182	17,500
2000	2.50	7.80	10.50	193	21,300
2004	3.25	9.00	15.00	240	37,000
2005	3.15	8.00	22.00	283	39,700
2006	3.90	9.00	20.00	313	42,700
2007	4.20	9.50	21.50	337	49,200
2010	6.50	9.00	26.00	300	49,500
2011	7.50	10.00	28.00	350	52,200
2012	9.00	12.00	35.00	435	70,570

Source: Housing Finance, 2010 and Author's field survey, 2012

2.6.2 Wall Materials and Cost Implications

In this segment of research, wall materials are selected where construction cost can be reduced because the weight of wall generally accounts for over 50 percent of the total weight of a building, or even higher in buildings with load-bearing wall. If the overall weight of a building becomes relatively higher, this makes the cross section of beams and columns and foundations larger and more expensive (Mulk, M. A. 2006). So wall material plays a vital role in the construction where cost matters.

In Bangladesh mostly solid burnt clay brick is used as wall material. The country's overwhelming dependence on bricks is due to non-availability of stones in any sizable quantity or other alternative building materials at comparable cost. Natural stones have very limited supply. About 44% of houses in Dhaka (according to the 1991 census) were built using bricks as the major wall material (Rashid, 2007).

Table 2.7

House (dwelling units) by construction material in Dhaka City		
Material of wall	Total no of houses	%
Straw, Bamboo	342,820	31%
Mud, un-burnt brick	125,467	12%
C.I. Sheet, Metal	142,319	13%
Wood	2,969	<1%
Brick / cement	**474,803**	**44%**
Total	1,088,378	100%

Source: Bangladesh population census 1991. Vol.3, Urban Area Report, 1997 (Cited by Rashid, 2007)

From the table above, it is quite visible that for constructing of any dwelling unit mostly brick and cement are being used and this cannot be categorized according to the income group variables although people of different income group take different shelters according to their income ability. Censuses show that these building construction materials can be categorized as permanent, semi-permanent, and temporary construction materials but no authentic data on the usage of these materials affected by the income ratio of the people or the consumption of the built units with these materials affected by their income is available. Usually when a family cannot afford to live in a well structured permanent building they go for other options. This discussion clearly shows that people's choice of structure is affected by their income. As mentioned earlier along with land price the building construction materials' cost plays a vital role in determining the purchase cost of a housing unit. Therefore, if the cost in the construction materials can be cut down, then the purchase cost of units will be lesser and brick is at the centre of this discussion since it is used as the most vital component of a construction. Islam and Shafi (2008) also, accuse the high cost of the building construction materials which makes the housing unaffordable to the consumers starting from the middle income to the lower income groups. It was also stated that the conventional technology requires high construction and maintenance cost which needs to be altered and this alteration must occur first in the usage of brick among all other construction materials.

Conventional solid burnt clay brick or 1st class brick is mostly used for wall, which is one of the large quantities of raw materials in the construction of housing and has the characteristics of being heavy weight. But wall materials should be lightweight, high strength, long

durability, and easy for construction. Nowadays, in Bangladesh there are two major brick plants that produce different new types in addition to the traditional solid burnt clay bricks. The new brick products mainly consist of perforated and hollow bricks, concrete hollow blocks, waste-using bricks, and several types of non-fired bricks, blocks, and slabs. The 3 hole brick/hollow brick and concrete hollow blocks are highly outstanding than clay brick that effectively reduce building load. These are the modern stone for masonry construction that enjoys a reputation for strength and stability. Like natural stone, it is available in a variety of sizes, shapes, textures and colors. The hollow cells in these types of blocks provide an air space within the brick or concrete block wall that renders unnecessary further insulation to resist the transmission of either heat or sound. The 3 hole brick or concrete block wall construction is a fast and economical way to construct building. As a result fewer workers are required, shoring and scaffolding are reduced and finishing operations can be completed quietly and easily.

Table 2.8

SL no.	Products	Approximate size in inch Crushing strength Water absorption	Price in taka / pcs.	Weight / pc. In kg. (approx)	Required no. / sq. ft.
01	 1st class brick	(9.5”x4.5”x2.75”) (2500 – 3500) psi 10% (approx.)	9.00	3.60	5.00 pcs
02	 10 hole brick	(9.5”x4.5”x2.75”) 4500 psi 8% (approx.)	17.50	3.30	5.00 pcs
03	 3 hole brick/Hollow brick	(9.5”x 4.5”x 6.5”) 2500 psi 8% (approx.)	18.00	4.10	2.32 pcs
04	 3 hole reinforcing brick	(9.5”x4.5”x2.75”) 4500 psi 8% (approx.)	20.00	3.30	5.00 pcs

05	 Concrete hollow block	(15.35”x3.54”x7.48”)	34.00	10.7	1.13 pcs
		(1233 – 7107) psi			
		Less than 8% (approx.)			

Source: Mirpur Ceramic Works ltd, Concord Groups and Author’s Field survey, 2012

Table 2.8 shows some different types of bricks that are available at present. But the concrete hollow blocks are different in sizes (Appendix F) which are also available in the market.

2.7 Sufficient Living Area- Housing Unit Sizes

It has already been stated in section 2.4 of this chapter that housing price is also affected by the size of unit. Affordability of housing is inseparable from the standard of living: that housing is unaffordable which lacks in providing adequate number of rooms fulfilling the requirements of the household. Unit size, building heights, building materials, construction cost, and purchase cost are therefore correlated in the sense that usage of building material fully depends on the height and size of units. Numbers of storey establish the building height and unit size is the covered space per household; the total cover area of the built-form considered in terms of sq. ft. and the elements of vertical circulation affects the construction cost and as the construction cost rises the purchase cost also be higher in a relative proportion. Stone (2006) therefore, states that housing affordability is no separable from housing standards which means the “over housing”[4] causes unaffordable housing since it imbalances the relation between the number of rooms and the number of members in the family. UN-HABITAT (2011) identifies affordable housing as that “which is adequate in quality and location and does not cost so much that it prohibits its occupants meeting other basic living costs or threatens their enjoyment of basic human rights.” Henceforth, to make housing affordable to the low-middle income group it is necessary to fix an optimum size for the unit and an optimum building height that will both promote minimum use of building materials and be able to match their living standard and social status.

4 Stone terms the surplus number of rooms as “over housed” where the need for rooms is lesser than the present numbers of rooms and he finds “That is, the number of households that appear to have an affordability problem, but would not have such a problem were they not over housed, is likely to be considerably lower based on application of some flexible standard rather than a simplistic person/room or person/bedroom definition of what it means to be over housed.” For example, a lower-middle income family of 4-5 members would, at best, need 2 tiny bedrooms, 1 tiny kitchen, 1 bathroom, and 1 living room but instead of this if there were 2 large bedrooms, 1 kitchen, 1 large dining space, 1 large bathroom, and 1 good sized living room then it would be called “over housed” since they don’t require it.

2.8 The Low Middle Income --- the Target Group

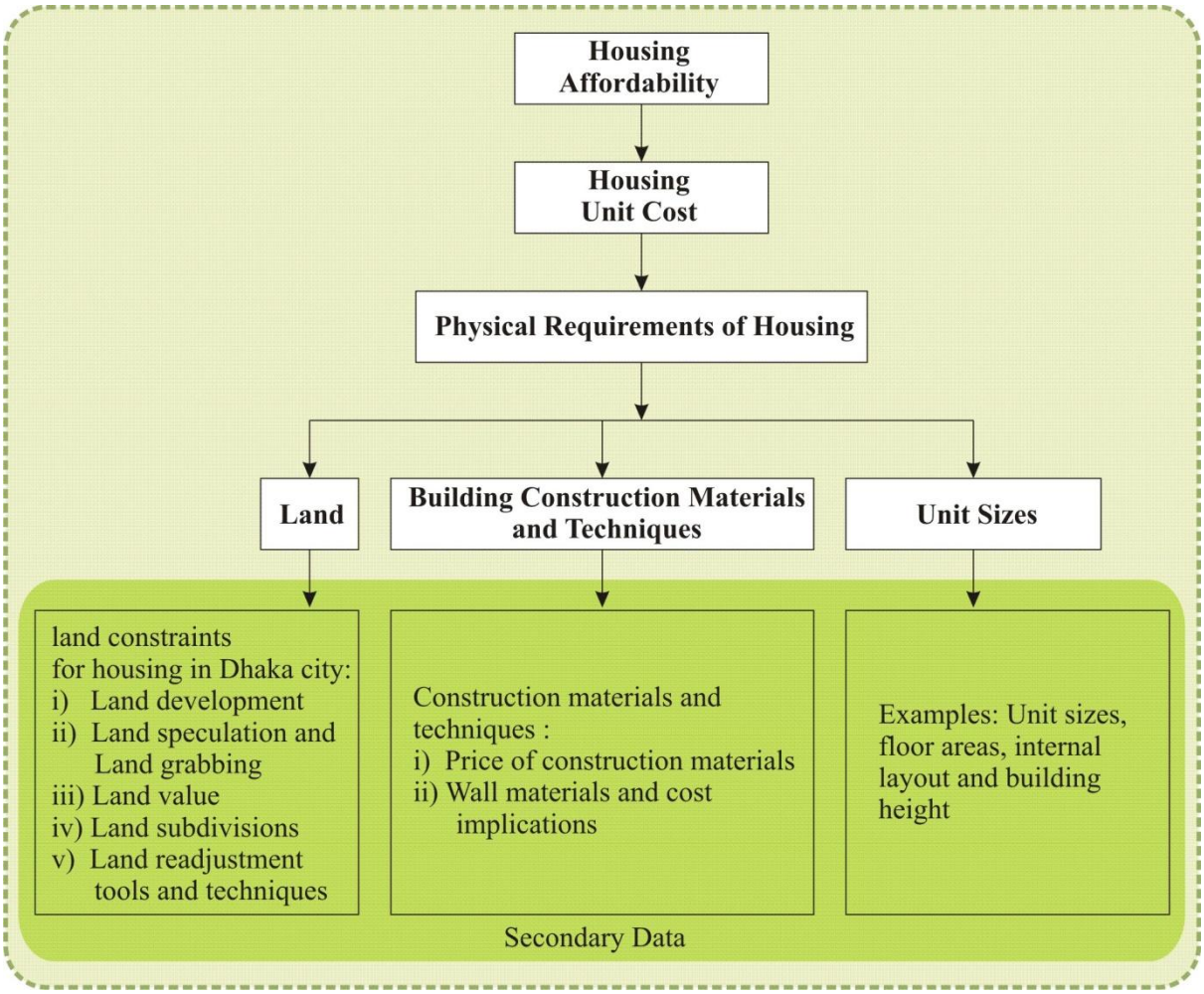
In majority cases there is no definite mention of Low middle income households who are a majority fraction within a separate income bracket. Islam and Shafi (2008) give evidence of their thesis through approximate figures in terms of numbers and locations where they have detailed on the existing housing sub-systems by income group, land tenure, density, source of supply, and finance (Appendix C).

As put by Edward L. Glaeser and Joseph Gyourko, 2003, 'A housing affordability crisis means that housing is expensive relative to its fundamental costs of production—not that people are poor'. Low middle income households are neither hard core nor moderate poor. Research have been conducted to find the means to make housing affordable to the low income group – moderate and hard core, (Islam and Shafi, 2008) but there are not much records of studies on making housing affordable separately to the low-middle income division of Middle Income Group of the city. The Low middle income households do not comfortably fit within middle income group as their financial capabilities are much less than the other fractions of Middle Income. Somehow statements are made encompassing them; 'the low and middle-income families are in need of low cost flats or plots, and the high and upper middle-income families are complaining that the cost of a decent plot or a decent flat is going beyond their means (Seraj, 2001)'. There is an immeasurable doubt that whether the low income group, hard core and moderate poor, can at all afford a permanent structure within Dhaka city with extensive subsidy. As Olweny (1996) puts housing unit is strongly associated 'to social structure and status'. Not being poor as the Low Income group but with a steady but low income and certain level of education the low-middle income families fall within a social structure with status[5].

The table of Appendix C also shows that only the private sector provides most housing for the Low-middle income group in Dhaka city. In this present market mechanism reduction of cost in housing unit prices may enable the target group, one of the majority fractions in Dhaka city, access to housing.

From the discussion above a conceptual framework on housing affordability and its components for the target group (Low-middle income) of Dhaka city is given below:

5 Field Survey, 2012



2.9 Conclusion

Shelter is the sole device to provide the sense of security and belongingness as it accommodates a whole family and its affiliations. In other words, shelter being not only a dwelling unit but an urn of piecemeal memories and emotions of people who are bracketed together, thus Housing is a collection mainly of dwelling units and is a total entity, owning it, is a realization of one of the primary needs. For Dhaka City, land is the most important component in achieving affordability. The land price in Dhaka city is getting skyrocketed day by day and so is the cost of building construction materials. Space optimization in the built-form is also a significant component. The low-middle income group is one of the fractions of majority inhabitants of Dhaka City whose purchasing capability of housing units, through present open market mechanism, has gotten surpassing their affordability. This chapter is a presentation of Dhaka city's housing scenario along with how the term 'housing' may be

considered to ease the housing bottleneck that exists here and an introduction to the concept of housing affordability that has gradually taken the shape of evidences trying to reduce the backlogs that the city is facing.

Chapter 3

Housing Need in Dhaka City and the Role of Public and Private Sectors

3.1 Introduction

Like many other cities, in Dhaka there is an acute shortage of housing units, so to say affordable housing units. Housing in Dhaka city is one of the major sectors where there is a dispute regarding actual housing supply, demand and need. There is no solid, up-to-date statistics or census on households and dwelling units in Dhaka city (Islam and Shafi 2008). So it is difficult to provide even an approximate picture on housing supply and its needs and demands.

Need and demand although they are synonymous but still a very sharp line exists between them; need is basically a necessity for the survival irrespective of its financial attachments whereas demand is a more superfluous term in respect to need. Demand is responsive to supply of the produce and the paying capacity of the consumer. In defining these terms, Rschisler (2010) states that "A Housing Need and Demand Study" is actually an investigation to determine the degree of the need for "affordable housing in a community". Ekram K., (2013) explains that in context of Dhaka City, Bangladesh, the Higher and High-middle income groups have easy access to housing in the present market mechanism that is their housing demand is being fulfilled in present condition but the other income levels for instance low-middle income households are unable to consume housing in the present market price and thus for them housing, being the basic component for living with a least requirements is a need in a reduced affordable price. 'Housing demand' for a given income group, is simply housing need backed by ability and willingness to pay of that particular group (Lloyd Rodwin, 1987). In this thesis housing for the target group – the low middle income families is considered as a need for affordable housing. Ekram K., (1980) traced an increasing demand of 50,000 housing units annually way back in 1979, in Dhaka city alone. Dhaka, a city of 12.5 million people increasing at 5% rate, had an annual requirement of 218,000 dwelling units up to the end of the century which included 80,000 new dwellings; 102,000 replacement units and 35,000 backlog units (BCL, 1996). This may stand at above 250,000 (Rahman, 2005).

As elsewhere, in Dhaka City procurement of housing services are either in the form of renting or owning. Renting, on one hand, is determined by the renter's ability to select their preferred quality of housing and its location. Ownership, on the other hand, is associated with title and depends directly on one's ability to meet the costs of housing unit a summation of land delivery cost (mostly, price of land + infrastructure), the costs of building materials, and techniques, cost of unit size, and the costs of labor contained in the construction process; also adding profit. Overall, housing is considered affordable if it leaves households with a sufficient income to meet other basic needs (Linneman & Megbolugbe, 1992). Referring to the program for housing development in Dhaka city proposed by Islam and Shafi (2008) in instruction by the National Housing Authority (NHA) of Bangladesh where estimation presented by Islam (2004) shows that there was 1.6 million housing units present in 2007 for the three income groups of the city. Bangladesh Bureau of Statistics (BBS), though doesn't provide any report on an estimation of the need of housing units for the existing income groups within the city, recommends an estimation based on the distribution of house ownership within the city by locality division where the ownership status has been divided into three categories on the basis of owner occupied, rent, and rent free house. The Table 3.1 shows that in comparison to other urban areas in Bangladesh, Dhaka holds the largest percentage of rented accommodation which reflects the measure for affordable housing for ownership is required and the National Housing Policy also puts high emphasis on housing ownership.

Table 3.1: Percentage Distribution of Ownership of House and Locality by Division

Ownership of House and Locality	Administrative Divisions						
	total	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Sylhet
1	2	3	4	5	6	7	8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Owned	83.7	90.9	83.5	74.2	87.5	93.4	76.9
Rented	12.6	6.9	14.5	22.9	8.5	2.7	7.6
Rent free	3.7	2.2	2.0	2.9	4.0	3.9	15.5
Rural	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Owned	94.1	94.2	94.6	94.1	95.7	95.4	81.5
Rented	2.2	3.5	3.3	3.2	1.5	0.9	1.7
Rent free	3.7	2.3	2.1	2.7	2.8	3.7	16.8
Urban	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Owned	49.3	67.2	48.5	40.5	51.6	79.1	43.5
Rented	46.9	31.4	49.8	56.3	39.0	15.9	50.1
Rent free	3.8	1.4	1.7	3.2	9.4	5.0	6.4

Source: BBS, Report on Welfare Monitoring Survey, 2010

3.2 Housing Needs by Income Groups and Number of Units - Present and Future

Usually it is a practice as Censuses the governments make assessments of housing demands and needs in a regular interval {Rashid (Ekram), K. 2008}[6]. In the absence of any government statistics Islam and Shafi gave an estimation of needs on the basis of their study of existing income groups and number of housing units over a time period of 2008-2025. It is their belief that if the 1st phase presented in Table 3.2 can be met by the end of year 2013 then in future it will provide a support to the future housing delivery system where there will be no backlog in the supply and it will be easier to meet the housing need of all income groups existing within the city by 2025 then. The rationale for this estimation of the required number of units for each income group is questionable though it is explained in the footnotes in brief. Within the Middle Income group three divisions exist with different income brackets. The income differences among them, the Upper-middle and Low-middle, are noticeable so is their lifestyle, status, physical requirements of housing. It is ideal that a given fraction of certain income group is subdivided according to total household incomes earned, and the housing stock can be categorized to housing types considered most appropriate. 'Over- adequacy' and 'under-adequacy' both bring imbalance in the housing market (Kumarasuriyar, 1985). The assumptions are unrealistic and also simplistic. Even at the very fag end of 2013 public sector Bhashantek Rehabilitation Project, Mirpur-14 and private sector's Concord Lake City, Khilkhet could not meet the completion deadlines. It is preposterous to assume that the first phase of five years i.e. within 2008 to 2013 the projects will be completed successfully and as shown in table 3.2 for the Middle Income families alone .30 million units would be completed. None of the gazettes as a matter of fact conform that during 2008 to 2013, for Middle Income families alone 30,000 housing units were in the process of being constructed, leaving aside other income groups. So far all the projects initiated by public sector and even some of private sector have failed to get to the target group, supply being limited higher strata of income levels tend to filter down and consume dwellings that are of a lesser standard (Stock-Users Matrix Model, Strassmann, 1977) . In which process the shelter needs were calculated is not apparent. However it is helpful in the sense that rather than having no information and data something is there to proceed on.

6 Prof. Khaleda Rashid (Ekram), Class Discussions during Course 6301 Housing Problem and Policies

Table 3.2: Shelter Needs by Income Groups and Estimates over a Time Period of 2008-2025

Income Groups	Shelter Provisions in 2008	Shelter Requirements Over Time*[1] (million units)			Total Requirements (Million units)
		2008-2013	2013-2018	2019-2025	
		1st Phase (5 years)	2nd Phase (5 years)	3rd Phase (7 years)	
Low-income groups	The homeless or shelter less*[2] (150,000 persons)	0.15*[3] (persons)	No backlog	No backlog	0.15 (persons)
	Occupants in non-residential buildings*[4]	0.40*[5] (persons)	No backlog	No backlog	0.4 (persons)
	Migrants*[6]/New comers to the city every year*[7]	.50	.25	.10	.85
	Natural growth*[8]	.02	.02	.02	.06
	Housing which need replacement or relocation*[9]	.20	.20	.20	.60
	Upgrading and standardizing *[10]	.10	.10	.10	.30
Total		**.82**	**0.57**	**0.42**	**1.81**
Middle-income groups	Migrants/New comers*[11] to the city every year	.75	.50	.25	1.5
	Natural growth *[12]	.15	.15	.10	.40
	Upgrading and standardizing *[13]	.20	.15	.15	.50
Total		**1.10**	**0.80**	**0.50**	**2.40**
High-income groups	Natural growth *[14]	.08	.08	.08	.24
Grand Total		**2.00**	**1.45**	**1.00**	**4.45**
Grand Total (Including homeless and people in non-residential units)		2.00 million +0.55 persons	1.45	1.00	4.45 million units + 0.55 persons

*[11] Middle income group in Dhaka is the biggest percentage. About 15000 hh are considered as new comers every year. Their number will decrease over the years and tentatively taken as 10,000 in the interim and 5000 in the final stage.

*[13] Out of an approximate 1 million MIG households living on owned or rental household predominantly in the informal system at least 50 percent will require upgrading or standardizing.

Source: Islam, N. and Shafi, S.A., 2008

It is indeed conclusive that there exists an acute housing shortage in Dhaka City both for renting and owning along with affordability crisis. With a huge backlog in housing units and current need of units, provision of housing even to majority is a big constraint on the government towards solving the problem.

3.3 Role of Public Organizations

In Bangladesh, different institutions both public and private are working on different aspects of housing. However many think that their roles are not very transparent nor they are focused. In Bangladesh, lack of coordination amongst different organizations is one of the major institutional problems, where the policy formulation, planning, design, implementation, monitoring, management, evaluation, and services programs are not properly coordinated according to the commitment of the organizations. (Zahur, 2008)

The following public organizations are currently working for urban housing development in Dhaka. A brief analysis of their activities and performances are discussed below:

The Rajdhani Unnayan Kartripakkha (RAJUK)

The Rajdhani Unnayan Kartripakkha (RAJUK) commenced its journey in the year 1987 on April 30. It was established by replacing Dhaka Improvement Trust (DIT). The endeavor was to improve, extend, and manage the centre and the peripheral areas of the city through a proper development planning with control. In 1961, the then DIT, presently known as RAJUK started its residential area development through site and services schemes. The organization developed Dhanmondi, Gulshan, Banani, Baridhara, and Uttara residential areas for upper middle income people of the Dhaka city. In reality, in majority cases, RAJUK provided residential plots at much below market prices to politically influential and higher income groups (Chowdhury, A. I. et.el, 1992).

RAJUK developed Purbachal, Uttara (Third phase), Jhilmil residential project for middle income people of the city. RAJUK also provide rehabilitation plot at Jorashara, Gandaria, Shaympur, and Badda areas. (Zahur, 2008). Under government's promotional strategy, RAJUK has become the prime public agency responsible for housing provision for the urban poor in Dhaka. Under enabling (as well as provider) strategies, RAJUK is responsible for

strategic development plans and developing housing facilities for all citizens at all income levels, especially the urban poor (Bari & Efroymson, 2009; DAP, 2008).

RAJUK has carried out and still maintains a number of housing development projects with sites and services schemes, but all of them eventually ended up benefiting upper middle- and high-income populations only (Rahman, 2009; Hossain, 2006). Rahman (2001) argues that, under the umbrella of public agencies, RAJUK has been operating as a typical real estate company in the housing market. It is also accused of being the most prominent government organization that serves only the interests of the rich and powerful in the name of all income populations (Islam, 2006; Islam, 1996). 'Sites and services schemes' are the most commonly proposed and implemented approach for many low-income housing projects, and they turn residential areas into very expensive neighborhoods (Rahman, 2001).

Taking RAJUK at its concern, Total News Bangladesh (2013)[7] published the statements of State Minister for Housing and Public Works, Abdul Mannan on the ongoing progress of RAJUK's work and its contribution for developing urban housing at an affordable rate:

> 'RAJUK has taken four projects to construct flats in the city's different areas, including Begunbari- Hatirjheel Apartment Project, Uttara (Model Town) Residential Apartment Project, Jhilmil Residential Apartment Project and Purbachal Residential Apartment Project. In the Uttara (third project), he said, RAJUK is constructing 22,500 flats and it has already called for submitting applications in prescribed Form for the allotment of 6,600 flats (Type-'A' net area 1250 sq. ft.) in the Uttara Sector-18 and the last date for submission of applications is September 30, 2013. The Uttara Apartment Project is being implemented on 214.44 acres of land. Under the project, application for the categories (Type- 'B' net area 1050 sq. ft.) and (Type- 'C' net area 850 sq. ft.) would be called in phases. RAJUK would also construct 20,000 flats in Purbachal New Town and 10,000 flats in Jhilmil'.

Beside the observations of Rahman and Hossain it is also questionable from where do the magic unit sizes as 1200 sq. ft., 1050 sq. ft. and 850 sq. ft. come from and whether ultimately it would be affordable to which income groups? In the context of high land price,

7 http://www.totalnewsbd.com/2012/09/14/bangladesh-plans-housing-facility-for-low-and-middle-income/ [Accessed on May 31, 2013]

construction and materials cost and also change in life-style naturally the housing units tend to be compact than before (Ghafur, S., 2005) but no such attempt is visible in the projects under taken by RAJUK. These so called housing units of RAJUK at affordable rates may have the same faith as before, as unearthed in previous cases by Rahman, 2009; Hossain, 2006 that all of them eventually ended up benefiting upper middle- and high-income populations only.

National Housing Authority (NHA)

The NHA is constructing 12,000 flats in city's Mirpur and Mohammadpur areas while public works directorate has taken steps to construct 3,000 flats alone. (Total News Bangladesh) [7]

National Housing Authority established in 2001, previously known as HSD-Housing and Settlement Directorate (Islam and Shafi, 2008) is one of the public institutions working for urban housing development in Dhaka city. In 1993 Housing and Settlement Directorate (HSD) drafted a National Housing Policy with limited actions. It was amended in 1999. With the initiation of National Housing Authority (NHA) it was further expanded and more actions were incorporated in it. Besides land related issues, establishment of housing estates of different categories; set out to housing production of different types and floor spaces in collaboration with, both public and private, agencies and organizations; dig up construction material etc. are featured in the final draft. From the very beginning NHA is responsible for the Government-Housing program. They have established many housing estates within Dhaka city such as, in Lalmatia, Mirpur, and Mohammadpur; at that time they were known as HSD. (Zahur, 2008)

NHA has submitted final draft of new housing policies in 2012 for approval of the parliament and proposed some issues to make urban housing affordable for the low and middle income groups in Dhaka city. The National Housing Policy categorized the policies according to different components and aspects of housing like land, building construction materials and techniques, legal framework, disaster-affected housing, human resource development, institutional arrangements and fiscal policies. The zests of important points and relevant issues of the proposed policy that are directly related to this research are provided below:

i. Each year a report must be submitted to the Ministry of Land, NHA, and PWD on the unutilized land owned for more than 10 years by the Government, Semi-

government, and Private organizations and these lands must get first priority for urban housing development.

ii. Access to land and its proper utilization will be promoted and to keep land unutilized will be highly discouraged to prevent land speculation.

iii. Low land cost, building construction cost, and house rent will be promoted so that public gets interested in investing in housing.

iv. Through promoting land readjustment and other up to date methods should be promoted for increasing land availability for different projects of urban housing development especially for the poor.

v. The private organizations should be encouraged for land development and building construction for the low and middle income groups.

vi. Unutilized khas land in towns and cities will be pooled to form an Urban Land Bank while khas lands in rural areas should be pooled to form Rural Land Bank.

vii. Simplify the housing finance system. Public Private Partnership (PPP) should be encouraged for increasing investment in the housing sector.

viii. Industries, Housing Finance Companies, developers, and builders involved in construction related activities will be allowed to pay lower rates of taxes for the portion of business related to low income housing.

ix. Establish research institute for making innovations in construction materials, technology for ensuring housing service for all income groups.

x. By discouraging the use of high priced- foreign materials, low cost-environment friendly-local materials and technology usage will be promoted.

xi. Construction materials and technology for low cost housing will be promoted and special concession and advantage will be given for this.

xii. For low cost housing, the architects, engineers, land and housing developers, labors and all other construction related professionals would get special training for developing their skills.

xiii. According to the planned urbanization and land use policy, for housing development for different income groups, especially for the poor, lands in the fringe areas of the city will be identified and its proper residential usage will be ensured.

xiv. In the National Housing Policy, 2012 (final draft), the joint venture of both public and private sectors of housing is encouraged.

Source: National Housing Policy (Final Draft), 2012

The National Housing Policy to some extent lacked focus thus failed to provide definite guidelines. The issues listed above are rather disjointed and are not policies rather actions to be taken. Proper utilization of land is considered as a top priority in Bangladesh (Ghafur, S., 2005). Proper utilization requires deliberation on both unutilized and underutilized lands. Within Dhaka city having temporary, one or two storey structures should be considered underutilization of land. Even RAJUK has set a rule on public building to be of at least 10 storied. In Azimpur Government Housing for Govt. Employees constructed in 1950s later two storey was added to make it five storied. Several times there is mentioning of 'unutilized land' but no mention of underutilized lands. In both the organizations deliberation on Affordability Criteria and Components are totally missing. These are just few examples of narrow and unrealistic visions of RAJUK and NHA. Many more can be given. However, the central focus should start with consumption requirements. Socio-cultural factors are subjective and vary in time and between individuals. Hence there is a continued view of housing in terms of material standards and quantities along with character of dwellings and environmental array (Turner, 1972, 1976 and later by others as Merrett, 1984). Another important aspect that is 'Housing Needs Assessment Approach' virtually accepted by all governments and dominates housing polices throughout the developing world (Gary and Richardson, 1985), is not at all taken into consideration. Here in Bangladesh Middle income households have three divisions with substantial income as well as status differences. Each

category within the divisions should be considered separately and then the need and consumption requirements should be assessed.

However from the very beginning NHA became involved and took responsibility for the Government-Housing programs. With the initiation NHA have established many housing estates within Dhaka city such as, in Lalmatia, Mirpur, and Mohammadpur.

Public Works Department (PWD)

Public Works Department (PWD) is recognized as the sole institution working for the construction of government building. They have completed the huge number of construction works with totally honest effort by far. "PWD mainly caters for all categories public employees at highly subsidized rate during the tenure of jobs" (Zahur, 2008). For the government officials, they have constructed flats of different sizes at different locations of Dhaka city. Zahur states, "PWD constructed 1000 sq. ft. flat at Uttara, Green Road, Shahjahanpur, Motijheel, Agargaon, Sobhanbagh, Azimpur, Palasee areas. It has also constructed 500-800 sq. ft. flat at Rajarbagh, Azimpur, Motijheel, Agargaon, and Paikpara." PWD has also constructed "1800-2500 sq. ft. size flat for senior government officials at Ramna and Eskaton Garden areas."

In 2013, an article was published[7] where the State Minister for Housing and Public Works, Abdul Mannan gave a statement on the ongoing progress of NHA's work and its contribution for developing urban housing in Dhaka city: "The new housing," he said, "would have modern civic amenities like schools, colleges, parks, playgrounds, hospitals, graveyards and police stations. Both plots and flats will be available in the housing areas. He also mentioned about NHA's expanded activities from the capital city to divisional headquarters to district and upazila levels keeping intact other activities. According to NHA, the development of flat and plot projects are going on in Mirpur, Mohammadpur, Joypara-Dohar in Dhaka.

All the programs and projects are descriptive and vague and have no rational basis. When the country is having acute housing shortages the assumption of having modern facilities is on one hand preposterous and on the other hand over ambitious considering the financial constraints of the Government.

In public sector, so far, the attempt in providing affordable housing is basically missing. Dealings are mainly for subsidized rental accommodation for the high, upper-middle, or the low income government employees. The considerations are for mega or large developments which have failed to meet the completion deadlines as well as attain intended target group. The Bhashantek Rehabilitation Project is an example. Large scale development way back in 1950's was considered undesirable by Mahatma Gandhi (Kinneth, R., 1955) and in the same line Schumacher in 1973 proclaimed small scale investments and developments as beautiful. However, encouragement of the joint venture of both public and private sectors of the National Housing Policy has some merit and would certainly open up new horizons (Ekram, K., 2008)[8].

3.4 The Non Government Organizations (NGOs) and Co-operative Societies

The NGOs are involved in urban housing development at a very marginal scale. Among the NGOs present at Bangladesh, BRAC and Proshika have invested for the development of housing for the low income group comprising of hard core poor and moderate poor outside Dhaka city. Grihayon Tohobil of Bangladesh provided a 100 million taka soft loan to BRAC. (Zahur, 2008) According to the data of Association of Development Agencies in Bangladesh (ADAB), among 1195 NGOs only 30 work in the area of housing development for the rural and urban poor. Zahur (2008) gave an explanation of their functions by saying that they "provide loan for construction of house and provide low cost housing materials to their beneficiaries" and beside these, many of them provide temporary shelter to the victim in time of natural disaster. Zahur (2008), regarding the co-operatives in Bangladesh stated that among 145,000 of them only 144 are housing co-operatives although they "mostly set-up high-middle income households to allow them too jointly for the construction of housing units for their members". They have developed less than 14,000 plots as Zahur claimed (2008).

From analyzing the NGO's performance it can be concluded that very few NGO's are directly involved in providing finished housing units and mostly they are working for

8 Prof. Khaleda Ekram, Class Discussions during Course 6301 Housing problem and Policies

housing for low income group. The Co-operative Societies' contribution in augmenting housing deficiency is negligible.

3.5 Private Developers of Dhaka City

Many private institutions, the developers are working in the development of housing sector within the urban areas of Bangladesh, particularly in Dhaka. But the problem with their work is their purpose is totally to do business and for that they could not make any such achievement in making urban housing affordable to inhabitants in Dhaka. Even a project named Lake City Concord was initially initiated for the middle income group by Concord Ltd., but when it witnessed that it is profitable to do business with the high income through getting higher installments and also in time, the chance for the middle income group subsided. The contribution of the public sector in housing is only about 7 percent of the total housing stock (DMDP, RAJUK, 1995). According to private sector's analysis, Dhaka city alone is generating the demand for 50,000 new houses annually. But the average rate of production is only 20,000 units per year. (Seraj and Murshed, 1990). Private developers' find, 'The low and middle-income families are in need of low cost flats or plots, and the high and upper middle-income families are complaining that the cost of a decent plot or a decent flat is going beyond their means (Seraj, 2001)'.

The developers buy the lands in high price with the loans from banks which they need to pay back with high interests which basically affects the price of the housing units. Besides, the construction cost of the housing units in relation to the unit size and construction materials also increases the cost and since the developers need to keep a percentage of their profit thus these factors make the housing units beyond the reach to the income groups of lower strata. Zahur (2008) states that some developers in Dhaka city, for a limited duration had targeted the middle income group as their buyers but after sometime as the per sq. ft. cost of the units jumped in comparison to that of the past two and three years, these attempts automatically stopped.

Small-scale builders, developers, and (self-help) owner-builders operating in the informal private sector, are the largest suppliers of land and shelters in Dhaka (Islam, 2004). Generally, the informal providers purchase land and gradually construct their houses with or

without official approval of plans. Only a small proportion of households' have access to housing finance. They start with small finance and develop consistently.

3.6 Housing and Building Research Institute (HBRI)

HBRI was founded in November 1960 when the then Government of East Pakistan approved a scheme for establishing such an institute in Dhaka. It is an autonomous organization under the Ministry of Housing and Public Works with a constitutional framework of 18 members of a Governing Council headed by the Honorable Minister in charge of the Ministry. The Institute is the only National Research institute which is entrusted to conduct research in housing problems, innovation in construction materials, technology and planning.

The institute emphasizes the study of availability, development and utilization of indigenous materials in construction; promotion of better uses of building materials, particularly commonly used materials, including improvement of methods of planning and designing, construction and maintenance works; development of cheap and new materials and better technology through pilot projects. It also acts as a clearing house for the latest available knowledge and technical know-how relating to development of new materials or techniques and assessments of their potentialities for diverse application to the construction industry of the country.

The activities of HBRI related to having innovative building materials and cost reduction are not visible. The Housing and Building Research Institute (HBRI) is encouraged to develop new building materials and techniques with the objectives of reducing costs and imports (Muzzini, E. and Aparicio, G. 2012, "6th Urban Research and Knowledge Symposium—Rethinking Cities: Framing the Future", Barcelona, 8-10 October).

3.7 Private Organizations in Building Material Sector

There are quite good number of private organizations in building materials section. Concord Group is one of the oldest business houses in Bangladesh (founded in 1972) and in time, it has grown as one of the biggest players in the construction and real estate industry. They are the first to produce and use environmentally safe and earthquake proof building materials in Bangladesh. Concord Group is not only producing but they are using the concrete hollow

blocks effectively as well. These hollow blocks are at a time very much effective in reducing building construction cost at least (15-20) % and echo friendly as well.

Khan, K. (2009) states in one of his articles that these concrete hollow blocks are one of the most effective substitutes for conventional bricks and stones in construction, "They are lighter than bricks, easier to place and also cut costs of construction and consumption of cement." This earth-shaking product was introduced in Bangladesh for the very first time by the Concord Group and it helps to construct more lightweight building those are more durable and have great protection against salinity, heat, and sound.

> "Demand for such construction materials is on the rise as some real-estate companies use them in buildings to ensure "high quality"." (Khan, K., 2009)

Shaikh Aftab Ahmed, chief operating officer of Shanta Properties Ltd (SPL), which has set up a block manufacturing unit to meets its demand, said: "We switched to using blocks from clay bricks. It is very difficult to ensure quality in construction with bricks" (Khan, K., 2009). Pioneered by Concord Group, concrete blocks are produced by around 20 big and small companies now.

Ceramic industries are also increasing in number in Bangladesh. Some of them are engaged in producing bricks, blocks, tiles both glazed and unglazed. Of them Mirpur ceramic works Ltd. is the largest of its kind not only in Bangladesh but also in the whole of Asia; it was incorporated as Private Limited Company in 1958. Over a long period of more than 50 years this Company is engaged in manufacturing quality structural clay products like Bricks, Blocks, Pavers, and unglazed Tiles etc. with technology being developed from time to time by its Research and Development (R&D) Department. MCWL's one of the major contributions to the housing market in Bangladesh is the production of high quality 3 hole/ hollow brick often known as "wonder bricks". These bricks are clay made and very much environment friendly and as claimed by MCWL they help to reduce the building construction cost up to 20%.

Every year the Company now produces 30 million pcs of different products. Besides meeting the country's requirement they export a sizeable quantity and earned not only foreign exchange but a reputation in and outside the country. More researches and production of alternate low cost different types of bricks or other blocks are still highly needed.

3.8 Conclusion

Apart from the problem of population growth it is visible that there is a lack of coordination among pertinent institutions of housing providers. From the discussion in this chapter it is very much visible that no such achievement has been made in making housing affordable for the income groups of the lower strata yet and even if the public and private sectors had initiated to do it for the low and middle income groups at some point of their journey, they could not become successful in their venture yet. Moreover, there has been no such project intended for the low-middle income group yet. Therefore, as mentioned earlier, this thesis targets to propose a possible solution for making housing affordable for the low-middle income group in Dhaka city.

Chapter 4

Case Studies

In the absence of any housing compound or complex of mostly low-middle income families within Dhaka City, similar projects as Lake City Concord, Khilkhet – a project of private sector and Bhashantek Rehabilitation Project, Mirpur — a public sector endeavor are taken for case studies. To be candid examples of housing for the Low -Middle Income groups are hard to find. Some Government quarters built about 50/ 60 years back are present, they are not only few in number but are not representative of current conditions in terms of outdoor space allocations, building heights. Azimpur Government Housing for government employees is a project of above scheme. A few buildings there are in rental arrangement for low-middle income government employees. The units are of 500 and 600 sq. ft., the buildings were initially three storied but because of demand later two storey were added to make it five storied. The complex has large outdoor spaces.

The case studies assessed the land value, unit cost, floor areas of units, building heights, construction materials, construction techniques and payment mode for the housing units. A matrix of comparison of different components of the two cases and SWOT analysis are done. Unfortunately in both the cases, the inhabitants were reluctant to disclose their income brackets. However from observation from outside the building and inside of the units it could be ascertained that majority were of high middle and middle-middle income groups. In Bhashantek, Mirpur a few were low middle income households.

4.1 Lake City Concord, Khilkhet, Dhaka

Concord, private a real estate company, established in 1972, out of total 1275[9] numbers of developers, is a solvent and reputed one, introduced a housing project "Lake City" in 1999. Initially, the objective of the project was to provide shelter to all segments of middle income group. Here in this project for the first time a step was taken with innovations in construction material and technique for making housing affordable to the middle income groups. To reduce the cost, Reinforced Concrete Brick Masonry (RCBM), is used in the project and till now this is the largest housing project in Bangladesh that has been built by using Hollow

9 REHAB Survey, 2010 (Seraj, T. M. 2012, 'Private Sector Housing'.)

Concrete Blocks. The project was successful to some extent in reducing the construction cost. Because of huge demand of housing units and being of comparatively lower unit prices high income families are interested and are buying them. Satisfying the demands of high income, high middle income and middle-middle income families the units are not available to the low-middle income group. Thus the units are beyond the reach of the low-middle income group.

Fig 4.1: Location Map of "Lake City Concord", Khilkhet

4.1.1 Land Requirement

Total land area of Lake City Concord is 7.6 hector where 2184 apartment units are accommodated in 14 high-rise buildings. Thus gross dwelling unit density is 287.36 dwelling unit/ha.

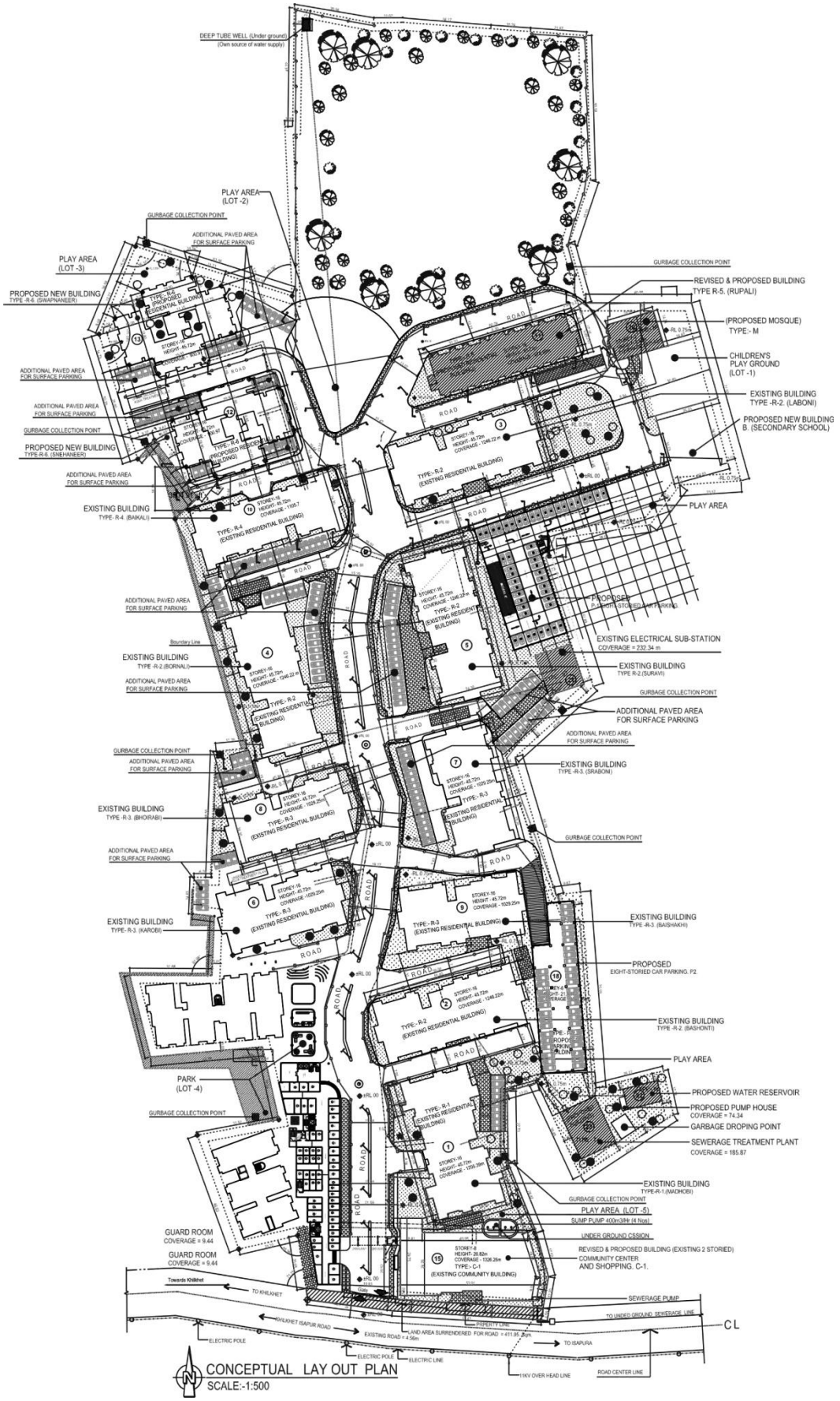


Fig 4.2: Master Plan of "Lake City Concord"

4.1.1.1 Ground Coverage

Total land area of Lake City Concord is 19 acres=7.6 hector=57 bigha=1140 katha=8, 20,800 sq. ft.

Table 4.1: Required area for residential building

Sl. No.	Unit type	No. of building	Total no of flat	Coverage/ building (sq. ft.)	Total buildable area (sq. ft.)	Storied	Ground coverage
1	R_1	1	165	13938.39	13938.39	16	**20.31%**
2	R_2	4	660	13409.32	53637.28	16	
3	R_3	4	540	11074.73	44298.92	16	
4	R_4	1	165	11897.33	11897.33	16	
5	R_5	1	270	10533.50	10533.50	16	
6	R_6	2	256	10587.02	21174.04	16	
7	R_7	1	128	11254.64	11254.64	16	
Total		**14**	**2184**		**166734.1**		

From the table it can be seen that with the common facilities, the total habitable unit area is 166734.1 sq. ft. and the residential land coverage is about 20.31% of total land area. The minimum distance between each sixteen storied buildings is near about 30 feet as observed by the researcher.

4.1.2 Space Allocation in Housing Units

Among 14 high-rise blocks only one high-rise named "Rupali"-building type-R_5, may be considered for low-middle income family where each floor contains 17 numbers of units. The unit size ranges from (590-600) sq. ft., have one bed room with a kitchen, a toilet and a space designed as dining cum living. When privacy is needed to be maintained, there is an option to place a temporary partition between dining and living. But it is not a very wise design consideration as about 15% area of the unit is used for circulation (i.e. in a 600 sq. ft. unit 90 sq. ft. is for circulation - almost a room) when unit size is related to unit price. Besides, all the units are connected with a double loaded corridor which is not well lighted at all.

Fig 4.3: Unit Plan of R_5 Building, Rupali, Lake City Concord

Some families living in these units expressed their dissatisfaction on the internal layout and felt that one more bed room could have been accommodated within this 600 sq. ft.

The other 13 high-rise buildings are larger in sizes ranging from 1000 to 1155 sq. ft. and the prices being much higher it is out of reach of the low-middle income families.

4.1.3 Building Construction Material, Techniques, and Cost Efficiency Analysis of the Project

In “Lake City” housing, an effective measure has been taken in the construction of the building to reduce the cost. The structural system of all the sixteen storied buildings is Reinforced Concrete Brick Masonry (RCBM), in which concrete hollow blocks have been used in walls, roofs and floor slabs of all the buildings.

Concrete Hollow Blocks

Concrete Hollow Blocks are used on the Roof

Concrete Hollow Blocks are used in the Wall

Fig 4.4: Building Type R_6 is Under Construction, Lake City Concord

For comparing the construction cost of conventional R.C.C. frame with solid burnt clay brick infill and RCBM system of a sixteen storied building, a detail cost comparison data have been collected from the Design Section of Concord Real Estate (Appendix-K) shows that by using RCBM system the cost of units is reduced by Tk. 229 per sq. ft.

From the data it is found that the minimum construction cost by using R.C.C. frame with solid burnt clay brick is about 930 Tk. / sq. ft. and by using concrete hollow blocks on walls, roof and floors, it is about 701 Tk. / sq. ft. The cost-efficiency of "Lake City" housing project is shown below:

1) The ground coverage of the R_5 building = 10533.50 sq. ft. / floor
2) Number of floor = 16
3) Total built up area = (10533.50 x 16) sq. ft. = 168536 sq. ft.

Sl. No.	Items	Total construction cost (TK)	Reduction of cost (TK)	Savings rate (%)
1	R.C.C. frame with solid burnt clay brick	(168536 x 930) = 156,738,480	(156,738,480-118,143,736)= **38,594,744**	**24.62**
2	RCBM	(168536 x 701) = 118,143,736		

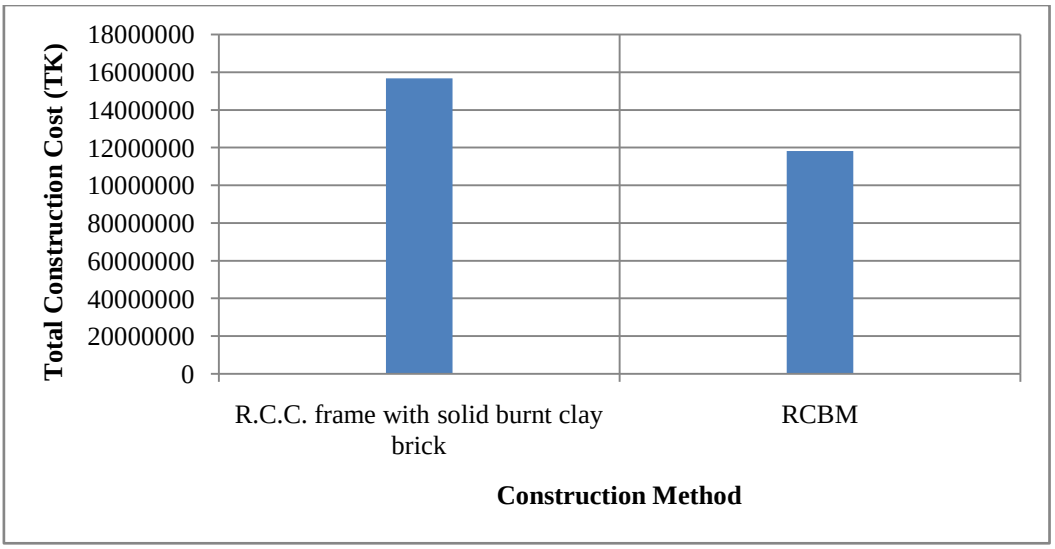


Fig 4.5 Comparative Analysis of Cost between R.C.C. Frame with Solid Burnt Clay Brick and Reinforced Concrete Brick Masonry (RCBM)

Hence the 16 storey building has achieved a cost reduction of up to 24.62% in "Lake City Concord". So it proves that by using concrete hollow block, the cost can be reduced.

Being a private developer company the focus naturally centers only on the profit and thus the unit price ranges from Tk. 4500 to Tk.8000/ sq. ft. Some incentives from the government in the form of tax rebate, low interest rate, bonds etc would certainly motivate the developers to cater for the housing needs of the low-middle income groups.

4.2 Bhashantek Rehabilitation Project (BRP), Mirpur-14, Dhaka

The Government of Bangladesh (GoB) undertook Bhashantek Rehabilitation Project (BRP) to provide housing to the slum dwellers and low-income groups who are always neglected and suffered even though they play an important role in the economy of the city. The project was initiated in 1998 on about 50 acres of government land which was intended to build and provide more than fifteen thousand small flats to slum dwellers and people of low income groups. Hence more than 80,000 urban poor were expected to get shelter here. This is a joint venture rehabilitation project by the Government and NSPDL (North South Property Development Limited) -- a developer. This joint venture development for first time occurred in the city. Access to land is a very important aspect of housing and its affordability. It is a known practice that land acquisition is easier for the public sector than the private and therefore in this project the govt. acquired land in the unutilized peripheral area Mirpur-14 of Dhaka city. But even with this advantage of overcoming the biggest obstacle of housing --- availability of suitable land, the project has failed to meet its goal of providing housing to its target groups. The reasons are, beside the land, other parameters of affordability such as cost of building materials, construction techniques were not considered. Though this project is an example of public-private sectors joint venture, it failed to address affordability of the concerned target group.

Fig 4.6: Bhashantek Rehabilitation Project, Mirpur

4.2.1 Land Requirement

The project is a public and private co-ordination where a private limited company taking deposits from the beneficiaries and invested on government land. GoB has provided 150 bighas of land at Bhashantek, Mirpur 14 of the city through a gazette on July 2, 1998 for this

project. The land ministry signed an agreement with the NSPDL (North South Property Development Limited), a private company, on September 29, 2003 to build the flats on the given land for families of low income group. Thus the development needed to be inexpensive and realistic.

Total land area of BRP is 20 hector where 15,024 apartment units are to be constructed. Thus gross dwelling unit density is 751.2 dwelling unit/ha.

4.2.1.1 Ground Coverage

Total land area of BRP is 50 acres=20 hector=150 bigha=3000 katha=21, 60,000 sq. ft.

Table 4.2: Required area for residential building

Sl. No.	Unit type	Floor area (sq. ft.)	Total no of flat	Buildable area (sq. ft.)	Storied	Average sq. ft./ floor	Ground coverage
1	A	215	9024	1,940,160	6	323360	
2	B	395	6000	2,370,000	6	395000	**33.25%**
Total			**15024**	**4,310,160**		**718360**	

From the table it has been seen that without the common facilities and the utility areas, the total habitable unit area is 4310160 sq. ft. In this way the calculated FAR is 1.99 and the residential land coverage is about 33.25% of total land area. The front-back distance between each six storied buildings is only 20 feet.

Fig 4.7: Existing Buildings in BRP

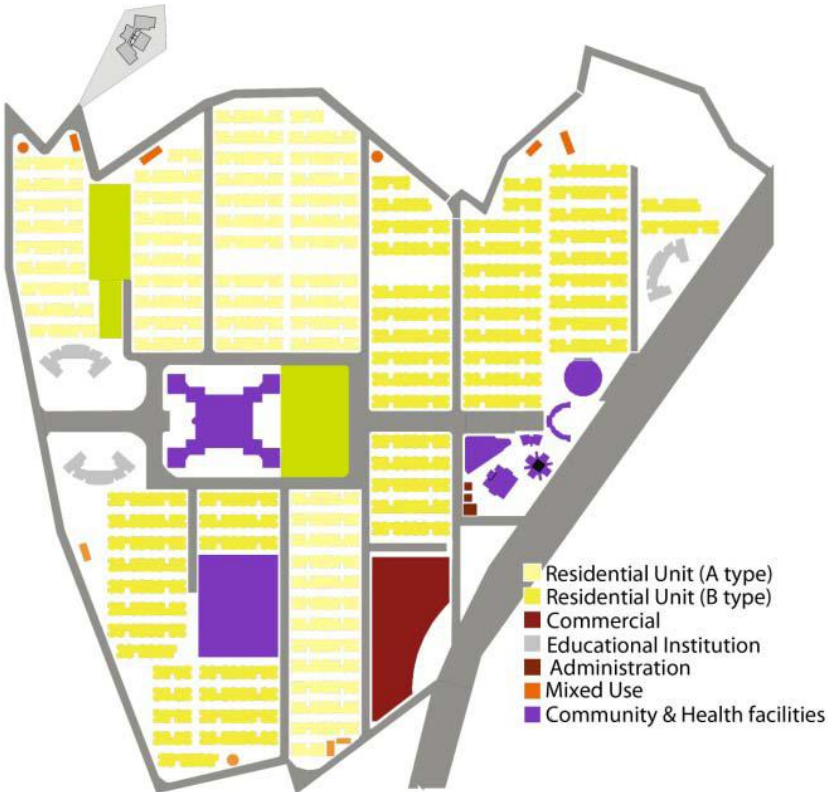
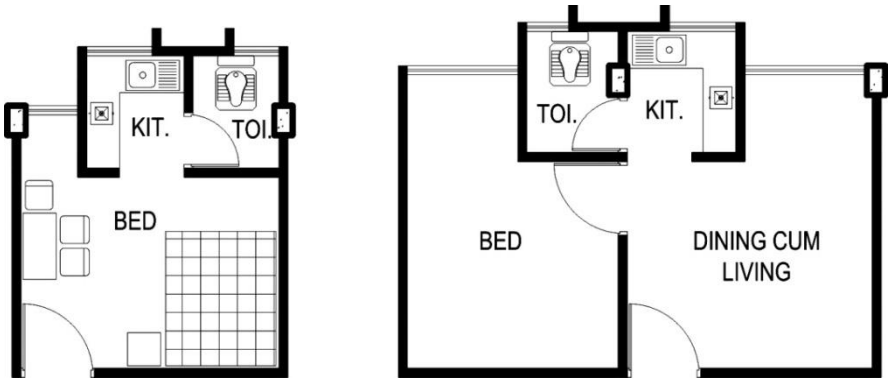


Fig 4.8: Site Plan of BRP

4.2.2 Housing Units or the Functional Usable Space

In Bhashantek Rehabilitation Project (BRP) on an average the household (HH) size is considered to be six (Hazra, S. 2004) and two types of unit are designed for two income groups. The 215 sq. ft. type-A flats are for slum dwellers and 395 sq. ft. type-B flats are for low income group. Type-A flat has one room with a kitchen and a toilet; and type-B flat has two rooms, one kitchen and one toilet. It will be very difficult for the single room unit to use the space as separate semi-private and private spaces. Whereas the two room unit have the facilities but there's no option to use the total space as multiple function area when required.



Flat (Type-A) Flat (Type-B)

Fig 4.9: Plans of Dwelling Units at BRP

Besides, there is no verandah with any of the units which can be used as a space for cloth drying or for other inner private utilities over there. A four feet wide double loaded corridor at a stretch for 12 HH has been provided for common circulation which is dark and is deemed to be congested (Fig.4.10-11). Each floor contains 16-24 units having a dark narrow corridor with no scope of getting a sense of meeting or conversing with neighbours. When unit sizes are tight and limited outside common spaces need to provide scope of bringing in neighborliness. Such corridors can never be comfortable both physically and mentally.

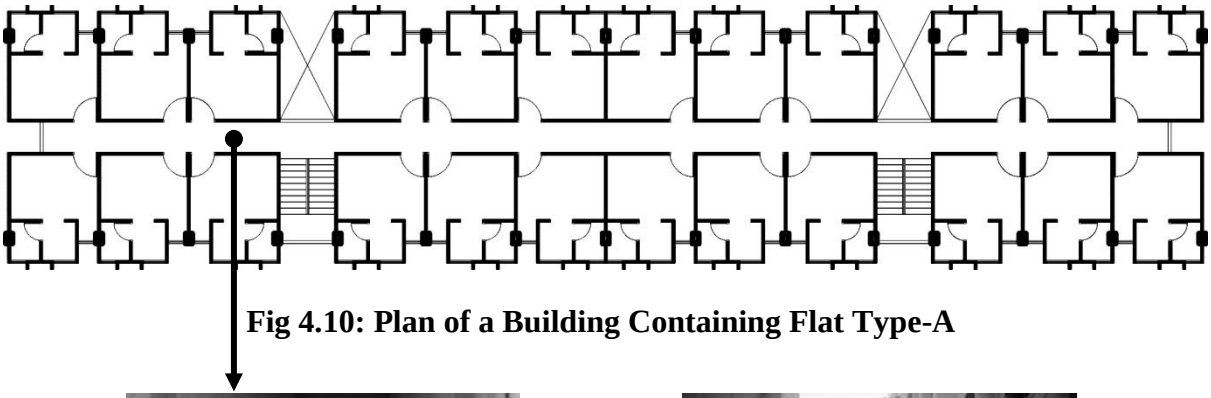


Fig 4.10: Plan of a Building Containing Flat Type-A

Fig 4.11: Four Feet Wide Double Loaded Corridor

Fig 4.12: Distance Between Two Buildings (20 feet)

4.2.3 Building Construction Material and Techniques Used in BRP

In BRP no measures have been taken to reduce the cost in building material or in construction technique. The structural system of all the six storied buildings is R.C.C. frame structure with solid brick infill. The only attempt towards affordability was to shrink the unit sizes to an uncomfortable state. So is the case with the corridor.

4.2.4 Housing Unit Cost

In Bhashantek Rehabilitation Project, type-A apartments of 215 sq. ft. are priced at Tk. 2, 00,000 (Tk. Two lakhs) each. The eligibility applied for type-A apartment is required to be a slum dweller with capability to pay Tk. 100 for an application form and to turn in the filled out form along with a refundable deposit of Tk. 10,000 as well as an eligibility certificate from the local ward commissioner. If disqualified, the deposit will be refunded to the applicant within 120 days. If the applicant is declared eligible, the balance of the apartment price is to be paid in 60 installments, Tk. 3,200 within five years.

Type-B apartments of 395 sq. ft. are designed especially for low income family and are priced at Tk. 3, 95,000 (Tk. Three lakhs and ninty five thousand) each. The application form for this type of apartment costs Tk. 200 and the deposit required is Tk. 50,000. An eligible applicant will have to complete the payment within two years with a monthly installment of Tk. 14,000[10].

4.2.5 Cost Efficiency Analysis of the Project

During the visit, none seemed to be of low income or are slum dwellers. Later when the nearby squatter settlements were visited, a number of Bhasantek slum dwellers said, they hardly heard that the BRP is for slum dwellers and none they know of applied to buy the apartment; very few buyers are slum dwellers. Abdul Karim of Bhasahntek slum said, "No one of the slum can afford a flat as it is almost impossible for any of us to maintain installments which are more than Tk. 3,000 per month." During the field visit it was found that a medical surgeon is an owner of two apartments.

Mubasshar Hussain, president of Institute of Architects, Bangladesh, who is the initial designer of the project said that NSPDL is charging higher price for per square feet. As they got the land free of cost from the government, their square feet charge should not include any land cost component. But in BRP it is found that the cost per square feet ranges from Tk. (930- 1000).

If calculated, it can also be found that it exceeds the capability of the target beneficiaries in reality. The ratio of unit price to income of target groups of BRP apartment units is found to

10 Project office of BRP, Mirpur, 2011

be 6.4 and 5.6 (Figure 4.13) for the SDs and LIGs respectively. Then they cannot repay the installments in 5 years for slum dwellers and 2 years for low income household. There is no other external financing either from the Government's side or from the developers' end except their own earnings. A housing unit is called affordable to the target group only when the house buyer will be able to manage all of his/her other basic family expenditures including the house price within the income. The individual households need to cover this expense from savings or from other private effort.

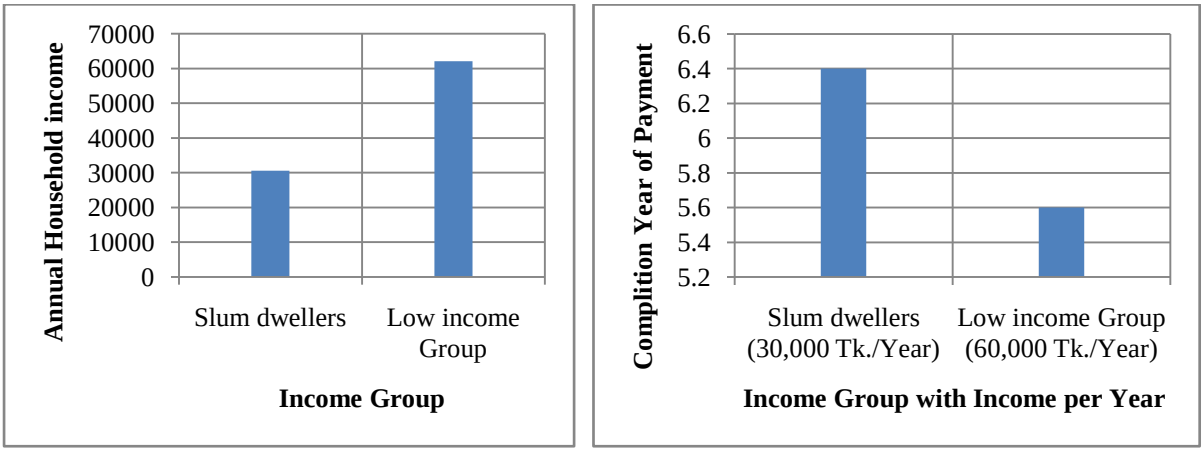


Fig 4.13: Affordability Analysis of the Target People (House Price to Income Ratio)

According to NSPDL the monthly installment for type-A is Tk. 3,200 for a duration of five years which means the owner of type-A flat will receive a Tk. 8,000 subsidy on the flat price as they have to pay Tk. 1, 92,000 in five years and the owner of type-B will receive near about a Tk. 59,000 on the flat but to the slum dwellers the price is still unrealistic and the subsidies provided for their flats are too low. Mubasshar Hussain claims the present installment plan is clearly a process to deprive the real slum dwellers from becoming flat owners.

An affordability analysis[11] is given below:

11 A detailed examination of an individual's ability to afford a house, taking into consideration income, liabilities, available funds, mortgage type, home price and closing cost. http://www.investorwords.com/141/affordability analysis.html#ixzz2b52rikWZ [Accessed on August 04, 2013]

- Apartment size: 395 sq. ft.
- Apartment price: 3, 95,000 Tk.
- Installment/Month: 14,000 Tk.
- Completion year of payment: 2 Year

According to the study of Islam and Shafi (2008) and RAJUK (2010), the monthly income of a low-income household is maximum 5000 Tk. Then how could a low-income household pay such installment of 14,000 Tk. per month.

But with such inequity, if we analyze the payment schedule, it is found that,

Installment per month = 14,000 Tk.
Installment in 12 month = (14,000x12)
= 1, 68,000 Tk.
So, in 2 years the apartment price is = (1, 68,000 x 2)
= 3, 36,000 Tk.
Again, the income of a low-income household per year is = (5000x12)
= 60,000 Tk.

So, the relation between the house price and income ratio is,
House price / Income per year = Completion year of payment
$\Rightarrow$ 3, 36,000 Tk. / 60,000 Tk. per year = 5.6 years

If it is calculated in the other way, then it is found that,
(60,000 x 5.6) = 3, 36,000 Tk.

This shows that, a low-income household needs minimum 5.6 years to repay the full installment.

Fig 4.14: Comparison of Different Elements of the two Cases Studies:

Sl. No	Introductory Information		Concord Lake City, Khilkhet		Bhashantek Rehabilitation Project, Mirpur-14	
			Completion Year of the Project: **(1999-Ongoing)**		**Completion Year** of the Project: **(1998-Ongoing)**	
			Executive Party: Private Developer		Executive Party: Public Private Partnership	
			Target Group: Low-Middle income		**Target Group:** Low Income and Slum Dweller	
			Owner: Majority: High Income Group, Upper Middle and Middle Middle Income Group		**Owner:** Majority: Upper Middle and Middle Middle Income Group	
			Users: Upper Middle Income, Middle Middle Income and Low Middle Income Group		**Users:** Low Middle Income and Low Income Group	
			Users Status: Renter		**Users Status:** Renter	
1	**Land**	**Total Land Area**	1140 Katha		3000 Katha	
		Price in respects of present market survey, 2013[12]	40,00,000/Katha		20,00,000/Katha	
2	**Housing Units**	**Size of Units**	590 sq. ft	600 sq. ft	215 sq. ft	395 sq. ft
		Unit Cost	19,47,000 TK	20,00,000 TK	2,00,000 TK	3,95,000 TK
		Unit Cost/sq. ft	Not less than 3,300 TK[13]		930 TK/sq. ft	1000 TK/sq. ft
		Installment/Month	No authentic data has been found and it varies from client to client		3,200 TK/ Month	14,000 TK/ Month
		Completion Year of Installment	No authentic data has been found and it varies from client to client		5 Year	2 Year
		Average no. of Inhabitants/Unit	6 Nos.		6 Nos.	
3	**Building Height**		16 Storied		6 Storied	
4	**Building Material and Construction Technique**		Reinforced Concrete Brick Masonry		R.C.C. Frame with Solid Burnt Clay Brick	

12 cellbazaar.com [Accessed on: July 12, 2013]

13 According to the Architects of Concord Real Estate, in 1999 the unit price per sq. ft. of Lake City Concord was about 1200 TK/sq. ft. But presently the rate is 4500-8000 TK/ sq. ft. Besides the unit size ranges from (590-600) sq. ft is not available currently for buying. But some individual clients of this type of unit wants to sell their own housing unit and the unit cost/sq. ft. is not less than 3,300 TK/sq. ft.

Fig 4.15: SWOT Analysis of the two Case Studies

Projects/ SWOT Analysis	Lake City Concord, Khilkhet, Dhaka	Bhashantek Rehabilitation Project (BRP), Mirpur, Dhaka
Strengths	The target group was all three segments of middle income including the low-middle income segment. By using RCBM method the construction cost for this project was reduced about 20%.	The target population was the low income group and the slum dwellers. The project aimed at providing housing to 80,000 people from these target groups. Government sanctioned 150 bighas of land to reduce price of housing units.
Weaknesses	High land price and profit deviated from the target group and now affordable mostly to High Income and Upper Middle Income Groups. All components of housing affordability were not considered at a time.	Deviated from its goal of providing affordable housing to the target group as no measures were taken to reduce construction cost. Developer NSPDL also being profit oriented charged higher price per square feet of units though they got the land free of cost. Flaws in project policy and housing delivery system. To some extent due to malpractices and weak program the project failed to attain its goal. Space allocations were brought to an uncomfortable stage.
Opportunities	Had the developer not being this much profit oriented then the project could have served the target group.	A great scope existed of experimenting on the construction materials and techniques thus could reduce cost and making the unit costs lower. Had scope of having successful Public and Private sectors' collaboration
Threats	Demand being high it did not filter down to the middle-middle and low-middle income families. Taking as example many other projects may follow the same path.	Some people owning more than one housing units at subsidized rate creates imbalance in housing market and in future this kind of practice may be repeated.

4.3 Conclusion

Lake City Concord and Bhasentek Rehabilitation Project -- both failed to filter down to the target groups. In case of Lake City Concord as from High income households it is filtering down to lower levels it never reached the target groups due to various reasons discussed in this chapter. Bhasentek Rehabilitation Project even with the advantage of overcoming the biggest obstacle of affordable housing, availability of suitable land with all most no cost , the project has failed to meet its goal mainly due to loop holes in the project's policy and the delivery system and naturally there are 'downward filtering'[14] as well. There are other reasons also for the failure -- beside the land, other parameters of affordability such as cost of building materials and construction techniques were not considered only space allocations were tightened to a painful limit. Down payment amount in Bhasentek Rehabilitation Project is ambiguous, the calculation shown in page 69, as the down payment is almost three times higher than the monthly income of the low income people. No way they can pay this amount and thus restricted them to afford a dwelling unit as such in Bhasentek. Though this project is an example of public-private sectors joint venture, it failed tremendously and did not address affordability of the concerned target group and also to some extent, created an imbalance in housing market, some are having more than one subsidized housing units where others have none at all.

14 Aslo known as 'raiding' of low income housing by higher income households.

Chapter 5

Study Areas and Field Study

In an attempt to achieve affordable housing for low-middle income households of Dhaka City in three study areas of Mirpur, Badda, and Demra extensive reconnaissance survey, informal interviews and questionnaire survey was conducted. In the absence of any data on income distribution by the government, the data on it from the proposal of Islam and Shafi (2008) is considered although it is just a rough proposal and yet to get approval from the government. During a face to face interview in 2013 of the researcher with Ms Salma A. Shafi, it was mentioned that the income range Tk.5000 to 10,000 for the low-middle income group that they had mentioned in their proposal for NHA in 2008 has increased. Other sources on income distributions[15] seem unrealistic.

5.1 Study Areas

From chapter 2, it is evident that the peripheral areas of Dhaka city namely Mirpur, Badda, and Demra are comparatively low priced land areas and people of the low-middle income group are living in private owner occupied and rental housing in these locations. The three Study areas from each of the locations, Mirpur, Badda and Demra were selected from Google Map for detail reconnaissance survey, informal interviews with inhabitants and questionnaire survey of households. The criteria of selection of study areas were availability of buildable and underutilized land and surrounding condition in terms of residential environment and facilities. Underutilized land is referred to where residential accommodations are either in temporary, semi permanent or less than 3 storey structures.

5.1.1 Description of Study Areas and its Residential Structures

15 Strategic Transport Plan for Dhaka, Final Report (December 2008) identifies three income groups, low, middle and high. The low income group is Tk 12500 pm/HH or less which would easily include all university lecturer an young class I government officials, if they do not have income from sources other than own salary. The study is based on randomly selected 6000 households from Dhaka City, but does not provide details on the sampling procedure or on the areal limit of Dhaka City. According to this survey, 48% of Dhaka city households belong to the low-income group, 48.6% to the middle income group and only 3.5% to the high income group. The lower limit of high income group in Tk. 55000 (Ref. Louis Berger Company and Bangladesh Consultant Ltd., DTCB, GoB, December 2005. Strategic Transport Plan for Dhaka Final Report).

Study Area of Mirpur

Study areas were chosen considering their potentiality for housing development. Infrastructure of the Study area of Mirpur is already developed, has nine parcels of land varying in sizes from three to fifteen kathas that are either vacant or underutilized (Table 6.4). Moreover, a girls' high school, markets, shops, clinics are within 5 to 10 minutes walking distance.

Description of one or two housing examples from each study areas are given below. They are selected on the basis of the inhabitant's willingness to allow the researcher inside the compound and share their views.

1) **Physical and Qualitative Characteristics of two Residential Structures of Mirpur Study Area:**
    a. Location: Area behind Manipur High School, Mirpur- 2.
    b. Income Category of Residents: Low-middle income
    c. Area: Approximately 1.29 sq. km.
    d. Housing Typology: Two types of dwelling units are present here:
        i. Multi-family Apartments
        ii. Multi-family Row Housing

1.1 Multi-family Apartment Buildings: It is a single storied building which has two units of 651-750 sq. ft. each on 4 katha of land. Each unit contains 2 bedrooms, 1 toilet, 1 kitchen, and 1 living cum dining area. In one unit the land owner lives and the other one is on rent. The building coverage is about 56% of total land area and open space is about 44% of the land. There is enough space with one foot setback on each side of the building and the spare space is being used as fruit garden. The plot is distinguished with a common boundary wall from the land beside it. Since the unit size is quite large thus the rent is a bit higher around Tk. 7500-8000/-. Though it's very tough for a low-middle income family to bear it but since these families have 3 earning persons thus they face little difficulty with the rent. But they still think that this unit size is more than just adequate and they would prefer a bit smaller unit size perhaps but since the houses those have their required unit size are all occupied in that area otherwise they would have shifted from here much earlier.


Fig 5.1: Single storied multi-family apartment housing with an ample open space in the study area of Mirpur

1.2 Multi-family Row Housing: On a 6 katha land area, it's a one storied building of 8 units; each unit is of 400- 500 sq. ft. Each unit consists of one large room with a toilet and a kitchen. The building coverage is about 98% of the total land area without any setback. There is a little space in between the two rows of 4 units. This space is in fact a narrow four feet wide passage way between the rows which works as the entry path for the units. Since the roof structure is temporary thus the roof is left unused. This plot is also separated from the land beside it with a common boundary wall. The monthly unit rent ranges from Tk. 2000 to 3000/-. The families living here have 4 to 5 members each and their monthly income is about Tk. 7001-9000/-. Despite this low range of income of the male members they are able to cope up with the cost since the housewives also contribute with their income which increases their earning to Tk. 9001-11000/-. Though units with the size of 400-500 sq. ft. are inadequate for them but houses with bigger size are not only unavailable there but are also high in rent which they are not able to afford. One positive side of this row housing is that it creates a good sense of neighborliness which affects the family income as well. As for example, a housewife who has mastery in tailoring gets the maximum orders from her neighbors. Moreover, parents can send their children for tuition to the teacher who lives in their communion. It not only lessens the parents' tension but also helps the teacher to earn more. But the lack of space disturbs the children to play which bound them to play outside their boundary that the parents do not like at all.

Fig 5.2: Multi-family row housing along with a passage way in the study area of Mirpur

Study Area of Badda

Infrastructure of the **Study area of Badda** is already developed, has six parcels of land varying in sizes from three to twenty five kathas that are either vacant or underutilized (Table 6.4). Moreover, a mosque, markets, shops, clinics are within 10 to 15 minutes walking distance.

2. **Physical and Qualitative Characteristics of Housing of Badda Study Area:**
    a. Location: Area behind the Hossain Market, Badda.
    b. Economic Type: Low-middle income family.
    c. Area: Approximately .72 sq. km.
    d. Housing Typology: Multi-family Row Housing

Multi-family Row Housing: On this 23 katha land area a one storied row house of 30 units is situated with 30 families living in them side by side. Unit size ranges from 400-500 sq. ft. and each unit contains 2 bed rooms, 1 toilet, and a very congested kitchen where only one gas burner can be accommodated. There is no setback as well and thus the ventilation of the units is hampered and the surrounding is very shadowy. There are 6 feet wide passage ways among the rows which are used as common spaces. Since the roofs structures are of temporary material, CI sheets, they are not used. This plot has a common boundary wall as well. The units' monthly rent ranges from Tk. 3500 to 4000/-. The inhabitants of this area are 4-6 in number in each family and their monthly income ranges from Tk.7001-9000/-. Again in some families the number of earning member is more than other households which benefits these

families with more household income which is Tk. 13000/- or slightly less. According to all of them this is an inadequate unit size for proper living. They think if the kitchen could be made a bit bigger in size and if a dining space could be accommodated there then it would be sufficient enough. Because of the lack of enough space in the kitchen it is difficult to work there properly. Moreover, as it has no door and is right on the circulation of the bedroom and the toilet (Fig. 5.3) thus the rooms' temperature gets higher which becomes intolerable in the sense as the units lack proper ventilation. But still they are living here for more than five years.

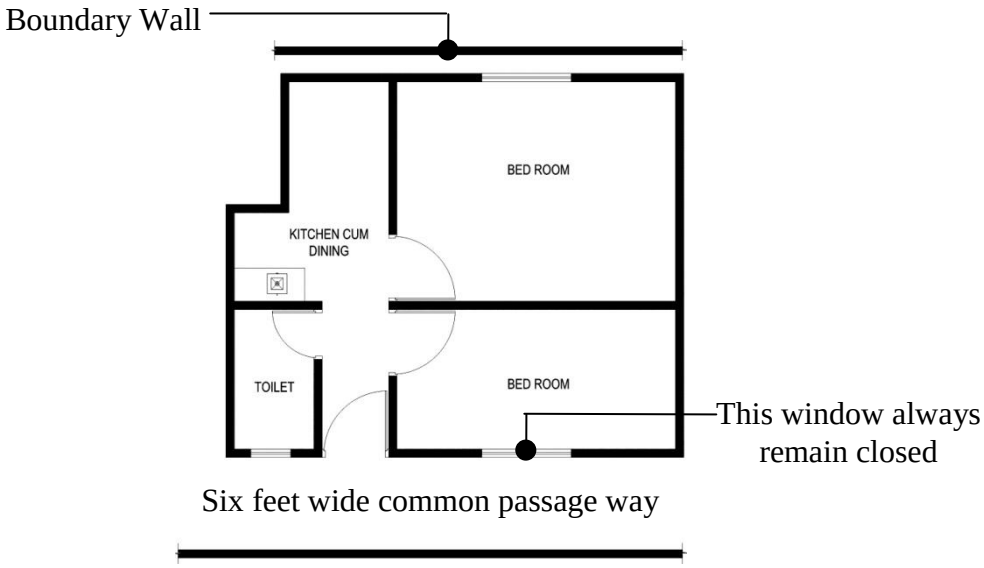


Fig. 5.3: A Housing Unit of Badda Study Area

Fig 5.4: Multi-family row housing along with a passage way in the study area of Badda

Study Area of Demra

Infrastructure of the Study area of Demra is not as much developed as the other two study areas, has seven parcels of land varying in sizes from three to fifteen kathas that are either vacant or underutilized (Table 6.4). Moreover, a cinema hall, shops, clinics are within 10 to 15 minutes walking distance.

3. **Physical and Qualitative Characteristics of Housing of Demra Study Area:**
    a. Location: Areas near Rani Mohol cinema hall.
    b. Economic Type: Low-middle income family.
    c. Area: Approximately .99 sq. km.
    d. Housing Typology: Two types of housing are here:
        i. Multi-family Apartment Building
        ii. Multi-family Row Housing

3.1 Multi-family Apartment Building: This plot of 2.5 katha is small in size and comprises of a one story building with two units, in one of which the house owner lives with his/ her family and the other is on rent. Each unit size ranges from 501-650 sq. ft. where there are two bedrooms with one kitchen and a toilet and there is also a multi-purpose space used as dining cum living space. The building coverage is 98% of the total plot with a setback of one foot all along and this plot is separated from the plot beside it with a common boundary wall as well. The monthly house rent ranges from Tk. 3500-4000/-. The family who is living here on rent has 5 family members among whom two are the earning members. They think though the unit size is adequate but if the rent was a bit lesser than it would be better for them. Here too the environment is affable and thus despite of high house rent they are living here for the last three years.

3.2 Multi-family Row Housing: The plot covers almost an area of 8 katha with a single storied building where 10 units have been built in two rows. Each unit size ranges from 400-500 sq. ft. and each unit contains a large bed room with a kitchen and a toilet. The condition of ventilation is very poor because of the lack of setback around the building and thus the surroundings remain very shaded all the time. The two rows are connected with a 3 feet wide passage way which works as the common entry space for the row houses. Like the previous buildings this building also has a

temporary roof structure which makes it not fit for use. This plot also does not have any boundary wall. The monthly house rent ranges from Tk. 2000/- to Tk. 3000/-. Each family has 4-5 members and their monthly income range is Tk. 7001-9000/-. And in some families the earning members are more in number which increases the income to the range of Tk. 9001-11000/-. This unit size appears to be inadequate to all of residents of the row housing, though the larger unit size requires higher rent.

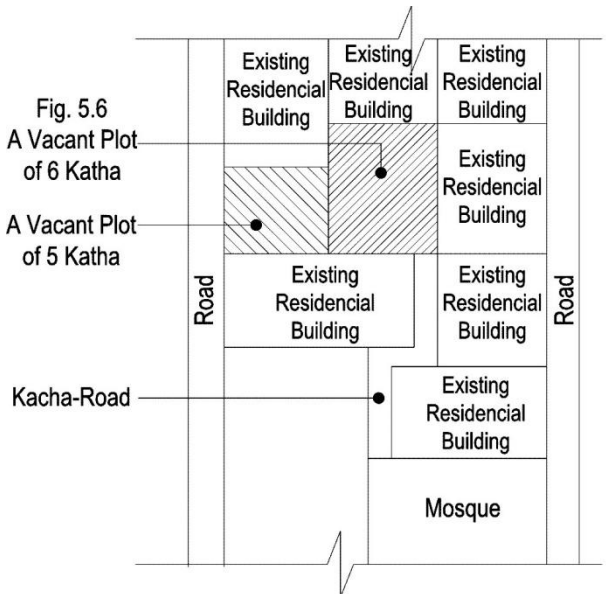
5.2 Overall Perception of the study Areas

One notable thing is the security aspect, in Demra it did not seem like that of Mirpur and Badda. Thus in Demra when children go out for playing, since there is no space inside the boundary of their living quarter, parents become a bit anxious. Besides, the roads are so narrow that it was very difficult to shoot photos there as well. Larger unit sizes such as units of 501-650 sq. ft. of Mirpur and Badda are not available in the study area of Demra since the house owners believe that if the unit size increases then the units will be lesser in number which hinders their financial gain. Thus to get more profit they try to accommodate more units in their small plots. Moreover, lack of proper space allocation and design privacy is hampered, ventilation and circulation is hindered. No setback rules are followed there. Despite all these problems, many families are living here and to some extent agreeable neighborliness existing among them.

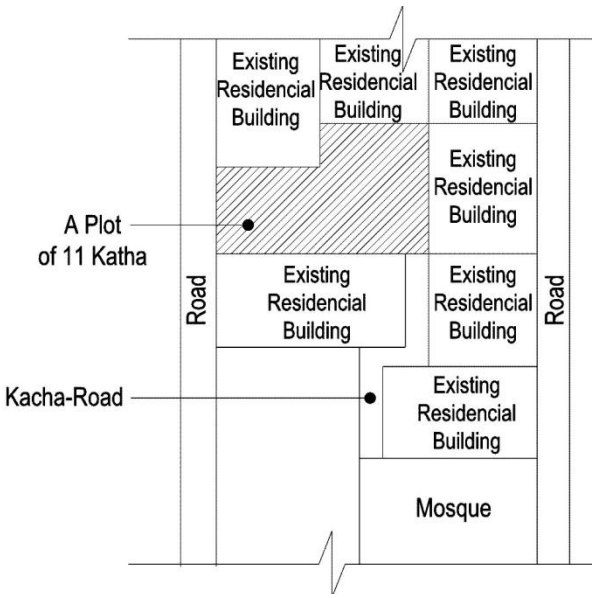
The common link between these two study areas of Mirpur and Badda is the presence a congenial neighborhood environment that not only build-up a healthy relationship among the inhabitants but also it allows better opportunities of extra income. In Badda the children use the passage ways as their playground and thus they don't go out of the boundary which lessens the parents' anxiety. In case of Mirpur the passage being too narrow it is only used by toddlers. In all the study areas, of the passage ways of the structures is the place where almost daily encounters happen among the inhabitants and in Badda Study area the passages are social interaction space for the people living there. It may be concluded that all the study areas possesses residential environment with infrastructure, facilities and services.

While undertaking the reconnaissance survey several vacant land areas in these study areas were found. Some land owners left the ground unused and some have made temporary structures and have given them on rent and some have grown orchards. Through informal

interviews it was learnt, though the land owners most of the time was hesitant to give a direct answer, that the land owners are willing to build buildings by developers but since there is no proper approach road they are unable to do so. Some showed kind of mistrust towards the developers. Regarding land readjustments as Land Assembly (pulling couple of lots together) land owners did not respond, it seems they felt if they answer it would be a commitment. In some plots there was problem of accessibility i.e. entry to the site from road, that can be solved (Fig 5.6) through land assembly.



Existing Situation (There is no Approach Road for 6 Katha Plot)



Situation after Land Assembly (Approach Road can be arranged by Land Assembly)

Fig 5.5: A residential plot of 15 katha (Mirpur)

Fig 5.6: A residential plot of 6katha (Mirpur)

Fig 5.7: A residential plot of 8 katha (Badda)

Fig 5.8: A residential plot of 7 katha (Badda)

Fig 5.9: A residential plot of 5 katha (Demra)

Fig 5.10: A residential plot of 8 katha (Demra)

From the discussion above, it appears it is possible to increase housing stock by taking into consideration the undeveloped and underutilized plots. Plots that do not have proper access roads may be readjusted through land assembly or land having problematic dual ownership etc., with exact enumeration and apposite measures. Available land must be properly utilized and bring them into housing development.

5.3 Questionnaire Survey: Outcome and Analysis

Questionnaire survey of 36 Households (HHs), randomly selected, from the three Study Areas was carried out. Beside general profile of the HHs, duration of stay in Dhaka City and their expenditure and savings were noted to get an idea of their status. Currently the floor spaces they are using and its adequacy was questioned to get a notion on an acceptable floor space requirement. The researcher used her judgements where needed. Common spaces and its uses were observed during the reconnaissance survey and also while filling out the questionnaire. Often ‘compact’ (Ghafur, S. 2005) housing units are compensated by built up common spaces. Preferences to floor levels and tenure type were also questioned.

The inclusion of field research within the study was necessary as it gave the researcher a firsthand knowledge on the target group, their aspirations and the environments, – physical, economic and socio-cultural, they live in. "In all countries and societies, in the longer run, householders must be able to make their own critical decisions. In the vast majority of cases, only they can know what they need most, and which are the best choices in a given situation" (Turner 1976, p.101). Of the total 36 samples, no. of samples for each three study areas was proportionate to study areas. 15, 9, and 12 cases were considered respectively from Mirpur (approx. 1.29 sq. km.), Badda (approx. .72 sq. km.), and Demra (approx. .99 sq. km.).

During the questionnaire survey a few hindrances came across for example, people were reluctant to tell their household income neither they wanted to disclose that how much they would be willing to pay at a time and the land owners disagreed to divulge whether they wanted to give their lands to the developers or not. However beside the structured questionnaire through informal discussion some gaze work had to be done.

A. Number of Family Member and Household Income

Table 5.1: Crosstab between no. of family member and household income

			Household income			
			7001-9000	9001-11000	<13000	Total
No of family member	4	Count	8	1	0	9
		% within No of family member	88.9%	11.1%	.0%	100.0%
		% within Household income	100.0%	5.6%	.0%	25.0%
		% of Total	22.2%	2.8%	.0%	25.0%
	5	Count	0	17	2	19
		% within No of family member	.0%	89.5%	10.5%	100.0%
		% within Household income	.0%	94.4%	20.0%	52.8%
		% of Total	.0%	47.2%	5.6%	52.8%
	6	Count	0	0	8	8
		% within No of family member	.0%	.0%	100.0%	100.0%
		% within Household income	.0%	.0%	80.0%	22.2%
		% of Total	.0%	.0%	22.2%	22.2%
Total		Count	8	18	10	36
		% within No of family member	22.2%	50.0%	27.8%	100.0%
		% within Household income	100.0%	100.0%	100.0%	100.0%
		% of Total	22.2%	50.0%	27.8%	100.0%

- The 36 families, the samples, of the survey through cross tab are categorized into different groups according to their number of family members and household income:

  a. Number of family members:

     i. 4 persons/ family.
     ii. 5 persons/ family
     iii. 6 persons/ family

  b. Household income range:

     i. (7,001-9,000) Tk./ month
     ii. (9,001-11,000) Tk./ month
     iii. <13,000 Tk./ month

  It is known to us, that the families whose monthly income ranges from Tk. 5,000 to Tk. 10,000 are considered as low middle income families. But the notable thing here is that most of the families here have an extra means of income that increases their range of household income, which means the actual monthly income range of these families is Tk. 7000 to Tk. 13000. It seemed that for some families it is even more.

- Among the total families of the sample 25% families consist of 4 members, 52.8% families have 5 members, and 22.2% families are of 6 members.
- The families that comprise of 4 members, among them 88.9% families' monthly income range is Tk. 7,001-9,000/- and 11.1% families' monthly household income range is Tk. 9,001-11,000/-.

  The families that have 5 members, among them 89.5% families' monthly earning range is Tk. 9,001-11,000/- and 10.5% families' earning is Tk. <13,000/- per month. Besides, all the 6 members' families have their monthly income range less than Tk.13,000/-.
- On the other hand, according to the monthly total household income range of the total sample size, 22.2% families' monthly total income range is Tk. 7,001-9,000/-. , 50% families' monthly total household income range is Tk. 9,001-11,000/-, and 27.8% families have a range less than Tk. 13,000.
- From the table above it is seen that 22.2% of total sample whose monthly income range is Tk. 7,001-9,000/- they comprise of 4 members generally.

  Moreover, 50% of the total sample size who receive the range of Tk. 9,001-11,000/-, 4 family members incorporate in 2.8% family among them and 47.2% families are

consist of 5 members which is almost 5.6% and 94.4% of the grand total of this particular income range.

On the other, 27.8% of the total sample size has an income range less than Tk. 13,000/- of which 5.6% family has 5 members and 22.2% has 6 members that is 20% and 80% of this income range particularly.

Inference:

Now from the relationship between number of family members and household income it can be observed that 50% of the total sample size has an income range of Tk. 9,001-11,000/- per month and they also comprise of 5 members which is more than any other category of family member.

From the table above it is also observable that if the number of family member is considered the average family size is 5 persons.

B. Number of Earning Members and Household Income:

Table 5.2: Crosstab between no. of earning member and household income

			No of earning member			
			1	2	3	Total
Household income	7001-9000	Count	8	0	0	8
		% within Household income	100.0%	.0%	.0%	100.0%
		% within No of earning member	88.9%	.0%	.0%	22.2%
		% of Total	22.2%	.0%	.0%	22.2%
	9001-11000	Count	1	17	0	18
		% within Household income	5.6%	94.4%	.0%	100.0%
		% within No of earning member	11.1%	89.5%	.0%	50.0%
		% of Total	2.8%	47.2%	.0%	50.0%
	<13000	Count	0	2	8	10
		% within Household income	.0%	20.0%	80.0%	100.0%
		% within No of earning member	.0%	10.5%	100.0%	27.8%
		% of Total	.0%	5.6%	22.2%	27.8%
Total		Count	9	19	8	36
		% within Household income	25.0%	52.8%	22.2%	100.0%
		% within No of earning member	100.0%	100.0%	100.0%	100.0%
		% of Total	25.0%	52.8%	22.2%	100.0%

- From these tables, it is visible that all the families with Tk. 7,001-9,000/- monthly income (22.2% of the total sample) have only one person as their earning members.
  And the families that earn Tk. 9,001-11,000/- per month (50% of total sample) among them 5.6% families have one earning member and 94.4% of them have 2 people as earning hands.

  Besides, the families with an earning amount of Tk. <13,000 (27.8% of total sample), among them 20% families have 2 earning members and 80% of them include 3 earning people.

- Now if the samples are arranged in an order respective of the no. of earning members then 25% families come up with 1 earning member, 52.8% families with 2 members who earn, and 22.2% families have 3 as their earning hands.
  In addition to this, among the set of 25% families there are 22.2% families earn Tk. 7,001-9,000/- per month and 2.8% families earn Tk. 9,001-11,000/- per month which is correspondingly 88.9% and 11.1% of the sect of one earning member families.
  Then again, the 52.8% families with 2 earning members, they have 47.2% families with a monthly earning of Tk. 9,001-11,000/- among them and also have 5.6% families with 2 earning members whose income range is less than Tk. 13,000/- which is respectively 89.5% and 10.5% of this faction.

  Besides, all the 22.2% families who have 3 earning members, their monthly income range is Tk. <13,000/-

Inference:

In every sector the actuality is that with more earning members the possibility of income goes higher since the earning of other members along with the main earning hand contribute a lot in the monthly house rent (Table 5.3).

C. Household Income and House Rent:

Table 5.3: Crosstab between monthly household income and monthly house rent

			Monthly house rent				
			2000-3000	3500-4000	4500-5000	7500-8000	Total
Household income	7001-9000	Count	8	0	0	0	8
		% within Household income	100.0%	.0%	.0%	.0%	100.0%
		% within Monthly house rent	66.7%	.0%	.0%	.0%	22.2%
		% of Total	22.2%	.0%	.0%	.0%	22.2%
	9001-11000	Count	4	14	0	0	18
		% within Household income	22.2%	77.8%	.0%	.0%	100.0%
		% within Monthly house rent	33.3%	77.8%	.0%	.0%	50.0%
		% of Total	11.1%	38.9%	.0%	.0%	50.0%
	<13000	Count	0	4	4	2	10
		% within Household income	.0%	40.0%	40.0%	20.0%	100.0%
		% within Monthly house rent	.0%	22.2%	100.0%	100.0%	27.8%
		% of Total	.0%	11.1%	11.1%	5.6%	27.8%
Total		Count	12	18	4	2	36
		% within Household income	33.3%	50.0%	11.1%	5.6%	100.0%
		% within Monthly house rent	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	33.3%	50.0%	11.1%	5.6%	100.0%

- From the survey it can be seen that the low-middle income families live in different housing unit where the rent varies. We can categorize the house rents in four groups:
    i. (2,000-3,000) Tk./ month
    ii. (3,500-4,000) Tk./ month
    iii. (4,500-5,000) Tk./ month
    iv. (7,500-8,000) Tk./ month
- From the tables above we can see that among the total surveyed sample 22.2% family's income range is Tk. 7,001-9,000/- per month, 50% family has an income range of Tk. 9,001-11,000/- per month, and Tk. <13,000/- per month is of 27.8% family.
- Those families whose income range is Tk. 7,001-9,000/- per month pay Tk. 2,000-3,000/- per month as house rent.

  The families whose monthly earning is Tk. 9,001-11,000/-, among them 22.2% families pay Tk. 2,000- 3,000/- and 77.8% families give Tk. 3,500- 4,000/- as house rent.

  Again, 40% of the sample whose income range is Tk. <13,000/- pays Tk. 3,500-4,000/- , 40% pays Tk. 4,500-5,000/-, and 20% pays Tk. 7,500-8,000/- as rental fee.

- Then again, the total samples can be categorized into four groups according to the rental fee where 33.3% families give a rent of Tk. 2,000-3,000/- per month, 50% families give Tk. 3,500-4,000/- per month, 11.1% families pay Tk. 4,500-5,000/- as house rent, and 5.6% families pay a house rent of Tk. 7,500-8,000/-.
- From the obtained result, among the 33.3% families who give a house rent of Tk. 2,000-3,000/-, 22.2% families receive a monthly income of Tk. 7,001-9,000/-, and 11.1% families earn Tk. 9,001-11,000/- per month; which is 66.7% and 33.3% of this range of house rent mainly.

  Again, the 50% families whose monthly house rent is Tk. 3,500-4,000/- among them 38.9% families' monthly household income range is Tk. 9,001-11,000/- and 11.1% families earn less than Tk.13,000/- and this percentage is 77.8% and 22.2% of the total of this group.

  Besides, 11.1% and 5.6% families' house rent is Tk. 4,500- 5,000/- and Tk. 7,500-8,000/- whose monthly household income is less than Tk.13,000.
- From the table above it is seen that, the families under the income range of Tk. 7,001-9,000/-, none of them can afford to pay a rent above Tk. 2,000-3,000/- per month. And among the total sample size almost 50% family whose monthly earning is in the range of Tk. 9,001-11,000/-, for them a rent above Tk. 4,000/- is unaffordable. On the other, those family who had a monthly income range less than Tk.13,000/- per month, among them (40%+20%)= 60% families pay a rent of Tk. 4,500-8,000/- and the rest which is 40% of the total of this group give a rent of Tk. 3,500-4,000/- per month. Since there are more family members in these families, they are living in larger units. Sometimes the location is also responsible for higher rents (Table: 5.4).

Inference:

Through analyzing table 5.3 we get result that 50% of the surveyed families who earn Tk. 9,001-11,000/- per month can pay Tk. 4,000/- as highest house rent. So the relation between monthly household income and house rent is Tk. 4,000 /- the highest house rent for the income range of Tk. 9,001-11,000/-. These families spend 36.36% to 44.43 % of their household income for house rent.

D. Area of Present Residence and Monthly House Rent:

Table 5.4: Crosstab between area of residence and monthly house rent

			Monthly house rent				Total
			2000-3000	3500-4000	4500-5000	7500-8000	
Area of residence	Mirpur	Count	5	8	1	1	15
		% within Area of residence	33.3%	53.3%	6.7%	6.7%	100.0%
		% within Monthly house rent	41.7%	44.4%	25.0%	50.0%	41.7%
		% of Total	13.9%	22.2%	2.8%	2.8%	41.7%
	Badda	Count	0	5	3	1	9
		% within Area of residence	.0%	55.6%	33.3%	11.1%	100.0%
		% within Monthly house rent	.0%	27.8%	75.0%	50.0%	25.0%
		% of Total	.0%	13.9%	8.3%	2.8%	25.0%
	Demra	Count	7	5	0	0	12
		% within Area of residence	58.3%	41.7%	.0%	.0%	100.0%
		% within Monthly house rent	58.3%	27.8%	.0%	.0%	33.3%
		% of Total	19.4%	13.9%	.0%	.0%	33.3%
Total		Count	12	18	4	2	36
		% within Area of residence	33.3%	50.0%	11.1%	5.6%	100.0%
		% within Monthly house rent	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	33.3%	50.0%	11.1%	5.6%	100.0%

From the tables above it is observable that 41.7% of the total sample of low-middle income families lives in Mirpur area. They pay Tk. 2,000-8,000/- as monthly house rent. Tk. 2,000 is the lowest amount of rent in this area and usually the majority of this area lives in units which have a monthly rent of Tk.3,500 - Tk.4,000/-.

Again, in Badda there live 25% families of the total sample, of who pays Tk. 3,500-8000/- as house rent per month. Hence the lowest amount of rent is Tk. 3,500/- and most of them live in the rental range of Tk. 3,500-4,000/-.

On the other hand, the families who live in Demra which is 33.3% of total surveyed samples; the highest rent they pay is Tk.4,000/- per month and the majority of this lives in the range of Tk. 2,000-3,000/-

Inference:

This shows that house rent is not only related with unit sizes but with the location as well.

E. Unit Size/ Floor Areas of Present Residence and Household Income:

Table 5.5: Crosstab between floor areas of present residence and household income

			Household income			Total
			7001-9000	9001-11000	<13000	
Floor areas of present residence	400-500	Count	8	18	4	30
		% within Floor areas of present residence	26.7%	60.0%	13.3%	100.0%
		% within Household income	100.0%	100.0%	40.0%	83.3%
		% of Total	22.2%	50.0%	11.1%	83.3%
	501-650	Count	0	0	3	3
		% within Floor areas of present residence	.0%	.0%	100.0%	100.0%
		% within Household income	.0%	.0%	30.0%	8.3%
		% of Total	.0%	.0%	8.3%	8.3%
	651-750	Count	0	0	3	3
		% within Floor areas of present residence	.0%	.0%	100.0%	100.0%
		% within Household income	.0%	.0%	30.0%	8.3%
		% of Total	.0%	.0%	8.3%	8.3%
Total		Count	8	18	10	36
		% within Floor areas of present residence	22.2%	50.0%	27.8%	100.0%
		% within Household income	100.0%	100.0%	100.0%	100.0%
		% of Total	22.2%	50.0%	27.8%	100.0%

From table 5.5 the range of monthly household income and unit size[16] of the low-middle income families can be observed.

- From the table it can be seen that 83.3% families live in units of 400-500 sq. ft., 8.3% live in units of 501-650 sq. ft., and again 8.3% live in the units of 651-750 sq. ft.
- The families those live in units of 400-500 sq. ft., among them 26.7% families' monthly total household income range is Tk. 7,001-9,000/-, 60% have a range of Tk. 9,001-11,000/- per month, and 13.3% of them have a range less than Tk.13,000. Again it also can be seen that the families living in units of 501-650 sq. ft. and 651-750 sq. ft., all of them earn less than Tk.13,000/- per month.
- On the other side, by categorizing the samples considering the income range there will be three groups among which 22.2% families' monthly total household income is Tk. 7,001-9,000/-, 50% families earn Tk. 9,001-11,000/- per month, and 27.8% earn less than Tk.13,000/- per month.

16 Sometimes the measurements like unit size have been estimated by the author, having six years professional experience being in practice in the field of architecture. Thus from the feedback of the participants as well as observation it was estimated by the author that the range of unit sizes is 400-750 sq. ft.

- The 22.2% and the 50% families which have a monthly income of Tk. 7,001-9,000/- and Tk. 9,001-11,000/-, they can afford to live in unit sizes between the ranges of 400-500 sq. ft. which shows that any unit size bigger than this is unaffordable for them despite the fact that they need bigger units to accommodate themselves properly those are sufficient enough for the families of 5 members (Table 5.1).

  Additionally, among the 27.8% families of Tk. <13,000 income range, 11.1% families live in the unit range of 400-500 sq. ft., 8.3% live in the units of 501-650 sq. ft., and the rest 8.3% live in 651-700 sq. ft. which is sequentially 40%, 30%, and 30% of this set of income range, according to the survey. In this set of families there are 6 members (Table 5.1) living in the small units of 400-500 sq. ft. Despite facing a lot of problems they are living there since the rent goes higher with enhancement of unit size. All of them agree on the point that if they want to afford a larger unit size then they will have to be depended on the extra income along with the basic household earning. Furthermore, 16.7% (8.3%+8.3%) of this set of families who live in 501-650 sq. ft. and 651-700 sq. ft. of units they all have the same opinion that though these unit sizes are adequate for them but to afford this accommodation they all have to depend on extra income. In addition, it is not possible for them to move in smaller dwellings because of the number of family members.

F. Floor Areas of Present Residence and Monthly House Rent:

Table 5.6: Crosstab between floor areas of present residence and monthly house rent

			Monthly house rent				
			2000-3000	3500-4000	4500-5000	7500-8000	Total
Floor areas of present residence	400-500	Count	12	18	0	0	30
		% within Floor areas of present residence	40.0%	60.0%	.0%	.0%	100.0%
		% within Monthly house rent	100.0%	100.0%	.0%	.0%	83.3%
		% of Total	33.3%	50.0%	.0%	.0%	83.3%
	501-650	Count	0	0	3	0	3
		% within Floor areas of present residence	.0%	.0%	100.0%	.0%	100.0%
		% within Monthly house rent	.0%	.0%	75.0%	.0%	8.3%
		% of Total	.0%	.0%	8.3%	.0%	8.3%
	651-750	Count	0	0	1	2	3
		% within Floor areas of present residence	.0%	.0%	33.3%	66.7%	100.0%
		% within Monthly house rent	.0%	.0%	25.0%	100.0%	8.3%
		% of Total	.0%	.0%	2.8%	5.6%	8.3%
Total		Count	12	18	4	2	36
		% within Floor areas of present residence	33.3%	50.0%	11.1%	5.6%	100.0%
		% within Monthly house rent	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	33.3%	50.0%	11.1%	5.6%	100.0%

- Table 5.6 shows that the 83.3% of the total sample who live in the units of 400-500 sq. ft. 40% of the units' monthly rent is between Tk. 2,000-3,000/- and 60 percent's rent is between the ranges of Tk. 3,500-4,000/- per month.

  The segment of the unit range of 501-650 sq. ft. which is 8.3% of the total sample size, receives a rent of Tk. 4,500-5,000/- per month.

  Again, the other 8.3% of units, of which the size range between 651-700 sq. ft.; among them 33.3% units' rent range is Tk. 4,500-5,000/- per month and the rest (66.7%) of the units charge an amount of Tk. 7,500-8,000/-.
- Moreover, the surveyed result considering monthly house rent shows that 33% housing units' rent is Tk. 2,000-3,000/- per month, 50% pay Tk. 3,500-4,000/-, 11.1% give Tk. 4,500-5,000/-, and the rest (5.6%) pay a rent of Tk. 7,500-8,000/- per month.

  Among these samples, the obtained 33% and 50% who pays the rent of (2,000-3,000) lives in units of (400-500) sq. ft.

  Then again, among the 11.1% families who pay a rent of Tk. 4,500-5,000/-, 8.3% live in units of 501-650 sq. ft. and 2.8% live in units of 651-700 sq. ft. which are 75% and 25% of this sect of housing unit.

  Besides, the 5.6% housing units occupy a size range of 651-700 sq. ft. which receives a payment of Tk. 7,500-8,000/- per month.

Inference:

In the table it is shown that house rent increases with the increase of unit size.

G. Floor Areas of Present Residence:

Table 5.7: Crosstab between floor areas of present residence and sufficient sq. ft.

			Sufficient square feet		
			Adequate	Inadequate	Total
Floor areas of present residence	400-500	Count	0	30	30
		% within Floor areas of present residence	.0%	100.0%	100.0%
		% within Sufficient square feet	.0%	100.0%	83.3%
		% of Total	.0%	83.3%	83.3%
	501-650	Count	3	0	3
		% within Floor areas of present residence	100.0%	.0%	100.0%
		% within Sufficient square feet	50.0%	.0%	8.3%
		% of Total	8.3%	.0%	8.3%
	651-750	Count	3	0	3
		% within Floor areas of present residence	100.0%	.0%	100.0%
		% within Sufficient square feet	50.0%	.0%	8.3%
		% of Total	8.3%	.0%	8.3%
Total		Count	6	30	36
		% within Floor areas of present residence	16.7%	83.3%	100.0%
		% within Sufficient square feet	100.0%	100.0%	100.0%
		% of Total	16.7%	83.3%	100.0%

The surveyed 36 families of low-middle income group are presently living in different unit sizes. The questionnaire had a question that gave three categories of housing units 400-500 sq. ft., 501-650 sq. ft., and 651-700 sq. ft. to these HH to judge their feeling of adequacy.

- 83.3% of families from the total surveyed sample are living in 400-500 sq. ft. of units. All the respondents, 100% living in 400-500 sq. ft. of units emphasized that the unit size is inadequate. All of them believe that if there were one more additional room in their units it would have brought a satisfactory outcome for them. But this also can't be denied that with the enlargement of unit size the rent goes higher.
- Furthermore, 8.3% of the total sample lives in the unit of (501-650) sq. ft. which according to them is sufficient enough. But since these set of families have to pay more than 4,000 Tk. (Table 5.6) as rent, they have to depend on the extra income along with the basic household income of the family members. Besides, the families are not interested to move to other units smaller than these units though the rent is

lesser there since their family members are more in number. They all wish to pay lesser house rent.

- Again, there is another set of 8.3% families who live in units of 651-700 sq. ft. though the rent is higher there. One of the reasons behind their living in comparatively costly housing units is preference of the locality and that most of the houses ranging less than 651-700 sq. ft. there are occupied. According to them if it is possible to get a better accommodation in a better location in a lesser price, they'll lose no time to shift.

Inference:

So, table 5.7 shows that all the families think units between the ranges of 501-650 sq. ft. are adequate for their living. That means, units of this range is first choice among all the families.

H. Monthly Household Income and Willing to Pay at a Time for Housing:

Table 5.8: Crosstab between monthly household income and willing to pay at a time for housing

			Willing to pay at a time for housing			
			500000-700000	800000-1000000	1100000-1500000	Total
Monthly household income	7001-9000	Count	8	0	0	8
		% within Monthly household income	100.0%	.0%	.0%	100.0%
		% within Willing to pay at a time for housing	28.6%	.0%	.0%	22.2%
		% of Total	22.2%	.0%	.0%	22.2%
	9001-11000	Count	15	3	0	18
		% within Monthly household income	83.3%	16.7%	.0%	100.0%
		% within Willing to pay at a time for housing	53.6%	50.0%	.0%	50.0%
		% of Total	41.7%	8.3%	.0%	50.0%
	<13000	Count	5	3	2	10
		% within Monthly household income	50.0%	30.0%	20.0%	100.0%
		% within Willing to pay at a time for housing	17.9%	50.0%	100.0%	27.8%
		% of Total	13.9%	8.3%	5.6%	27.8%
Total		Count	28	6	2	36
		% within Monthly household income	77.8%	16.7%	5.6%	100.0%
		% within Willing to pay at a time for housing	100.0%	100.0%	100.0%	100.0%
		% of Total	77.8%	16.7%	5.6%	100.0%

Table 5.8 shows that when it comes to pay at a time for a housing unit there is also a set of diverse categories of amount among families of different income ranges. As for

example, one group is willful to pay Tk. 5,00,000-7,00,000/- at a time, another can afford to pay Tk. 8,00,000-10,00,000/- and the rests have the ability to pay Tk. 11,00,000-15,00,000/-.

- The surveyed families those are under the income range of Tk. 7,001-9,000/- per month, they (100% of them) are willing to pay Tk. 5,00,000-7,00,000/- at a time for a housing unit and these people are 22.2% of the total sample size.

  And then the families who obtain Tk. 9,001-11,000/- as monthly income (50% of the total sample), 83.3% of them say that they can afford to pay Tk. 5,00,000-7,00,000/- and 16.7% families can pay Tk. 8,00,000-10,00,000/- for a housing unit.

  Again, among the families of Tk. <13,000/- monthly income (27.8% of the total sample) 50% can afford to pay Tk. 5,00,000-7,00,000/- and to 30% of them Tk. 8,00,000-10,00,000/- is affordable, and Tk. 11,00,000-15,00,000/- within 20% families' means.
- On the other hand, if the families are categorized considering the amount of payment for a permanent dwelling then we get three different sets of families. To 77.8% families Tk. 5,00,000-7,00,000/- is affordable, to 16.7% families the affordable range is Tk. 8,00,000-10,00,000/-, and for 5.6% families the amount is Tk. 11,00,000-15,00,000/-.

  Among these 77.8% families 22.2% families have an income of Tk. 7,001-9,000/-, 41.7% of them have Tk. 9,001-11,000/- as monthly income, and the rest (13.9%) earn less than Tk.13,000/- which is 28.8%, 53.6%, and 17.9% respectively of this sect.

  Again, the 16.7% families who have their consent in paying Tk. 8,00,000-10,00,000/- for a permanent housing unit, among them 8.3% have a monthly income of Tk. 9,001-11,000/- and the other 8.3% have an income of Tk. <13,000 which shows an illustration of 50/50 ratio.

  Besides, 100% of the sect of the families who earn less than Tk.13,000/- per month who are 5.6% of the grand total can afford to pay Tk. 11,00,000-15,00,000/- at a time.

From a glance on the table above, it is visible enough that the majority of families belong to the income circle of Tk. 9,001-11,000/- and it is undeniable that most of the families are willful to pay the amount of Tk. 5,00,000-7,00,000/- and this percentage occupies 77.8% of the total sample.

Inference:

Most of the families are willing to pay Tk.5,00,000-7,00,000/- at a time for a unit. It was easily understandable that though they afford higher amount, the HHs are not quoting a higher value for a housing unit as they feel it would be a commitment and if they get one in cheaper price it is even better for them.

The market values of the units are calculated on the basis of cost per sq. ft. Most of the families are willing to pay Tk.5,00,000-7,00,000/- at a time for a unit. It was redundant to ask the respondents how much they were willing to pay per sq. ft. for the unit. So this question was not included in the questionnaire survey and this information for the target group is totally absent in the literature survey. Therefore, a calculation is done (Appendix J) from which it is found that the low-middle income families generally wish to pay Tk. (1372-1780) per sq. ft. to buy a housing unit.

Proposition:

So, it is found from calculation that the low-middle income families generally wish to pay Tk. (1372-1780) per sq. ft. as installment to buy a housing unit.

I. Preferred Time of Owning a Permanent Dwelling:

25% of the surveyed respondents have been living in Dhaka city since 30 years and thus a desire of owning a permanent dwelling have been fostered in their mind from years. This 25% family from low-middle income stratum of society has a longing to have possession of a house built by their own and the other 75% families want to buy a housing unit to settle in Dhaka city permanently. But at present the housing cost in Dhaka city has gone to the roofs. Thus when the question was raised about their will to buy a housing unit, 97.2% families said that they would like to own a dwell whenever in future it become affordable for them and only 2.8% of them said that they would like to have it when their children would complete their graduation. When the respondents were asked about their preference of location one thing that was noticeable in their response is they are aware of the fact that housing cost goes higher with criterion of the location thus they are not at all bothered about the site. But at the same time they are fully concerned about social security.

J. Preferred Dwelling Layout:

Table 5.9:

Preferred dwelling layout	Frequency	Percentage
2 bed rooms, 1 toilet, 1 kitchen, 1 dining cum living	27	75
3 bed rooms, 2 toilets, 1 kitchen, 1 dining , 1 living	9	25
Total	36	100

According to the table 5.9, 75% respondents wish for 2 bedrooms, 1 toilet, a separate kitchen, and a dining cum living area. The other 25% respondents desire for 3 bedrooms with 2 toilets, 1 kitchen, a dining space, and a living room. Mainly these 25% are those who have a longing for building their own house. But the families from the circle of the 75% know that in Dhaka city housing cost is not only related to location but with unit size as well which they have witnessed in the case of house rent thus they want the minimum to accommodate themselves properly.

K. Floor Preference:

Choice of floor level is an important factor to consider when people buy a housing unit. There is a stereotypical concept that a taller structure should be considered if the land is expensive and out of stock but taller structure makes housing unaffordable since the cost heaves up with height and with the installation of utilities and services. So to lessen the housing cost and make it affordable to the low-middle income families an optimum building height should be determined before.

Table 5.10:

Preferable floor without lift	Frequency	Percentage
3rd floor	7	19.4
4th floor	11	30.6
5th floor	18	50.0
Total	36	100.0

Table 5.10 shows that about 50% household of low-middle income families prefer 6 storied building as the highest level for walk-up apartment without introducing the use of a lift.

5.4 Conclusion

Through the field research it was possible to explore and expose the actual or present housing scenario of the low-middle income households. Most of the theses/papers related to the topic of affordable housing are mainly based on cracking the barrier of housing for the low income or for the middle income strata of society; this indicates to the fact that there is a lack of information on low-middle income section of society. Therefore, due to the insufficiency of necessary information in secondary data, it was required to get primary data for this thesis paper. The data obtained from questionnaire survey was computed by SPSS and analyzed accordingly. It presents a thorough investigation on the low-middle income families, their areas of residence, income, expenditure, number of family members, number of earning hands in the family, rent of present dwelling, desired time of housing ownership, preference of dwelling size, internal layout, floor level, and affordability to buy a housing unit. The case studies to some extent and the reconnaissance survey and the questionnaire survey, to a great extent helped to draw inferences.

5.5 The Inferences Summed- up

From the field researches -- reconnaissance survey, informal interviews and questionnaire survey and its analysis and computation -- in three study areas of Mirpur, Badda, and Demra of Dhaka City of low middle income families the following inferences are drawn.

1. **Land Availability:** In the peripheral areas of Dhaka Mirpur, Badda, and Demra the land price is still relatively low, there still a good number of vacant and underutilized residential plots are available which can be developed for housing and could come of affordable range to the target group, Low-middle income families.
2. **Location:** Housing cost and rent per unit differs a lot because of the location.
3. **Adequate Range of Unit Size:** The adequate range of housing unit for low-middle income families ranges from 501 sq. ft. to 650 sq. ft.
4. **Average Family Member per Unit:** The average number of family members per housing unit of low-middle income families is 5.
5. **Percentage of Housing Expenditure of Low-Middle Income Family:** The low-middle income family spends maximum 44.43% of their income on housing.

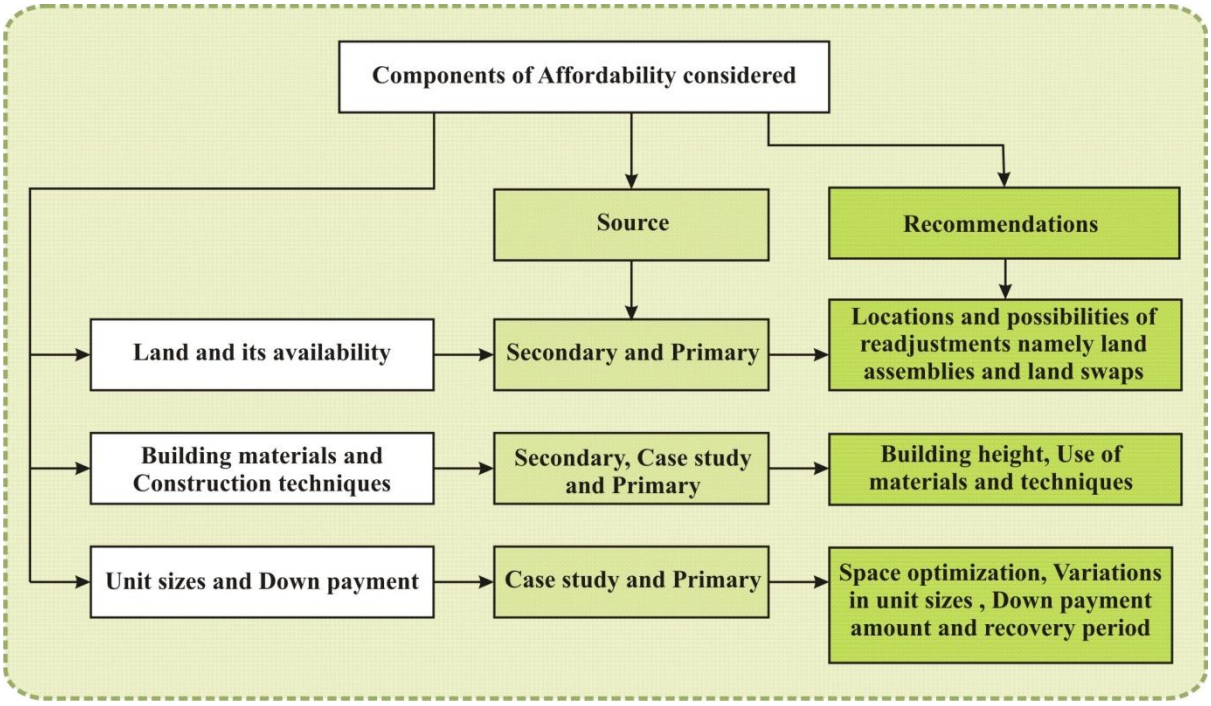
6. **Affordable Cost per sq. ft. for Low-Middle Income Families:** The low-middle income families can afford to pay Tk. (1372-1780) per sq. ft.
7. **Preferred Dwelling Layout:** Most of the families prefer two bedrooms with one toilet, a separate kitchen, and a dining cum living.
8. **Optimum Building Height:** Without using a lift, 50% low-middle income household prefer 6 storied building as the highest level of floor to climb up.
9. **Common Facilities:** Besides dwelling units a little common space where they can converse with neighbours and access and use of the roof are good enough to the respondents.

Chapter 6

Attaining Affordable Housing for Low middle income Group in Dhaka City

As discussed earlier in chapter 2 the components i) the price of land and its availability, ii) building materials and construction techniques, iii) unit sizes and amount and span of down payment that qualify affordable housing are discussed here in detail in the context of Dhaka city and the target group. The case studies to some extent and the reconnaissance survey and the questionnaire survey, led to draw inferences allied to the components towards affordable housing. The ability to finance the purchase principally set by the finance down payment requirements and the balances of household savings are also taken into consideration. Secondary and primary information and data are tagged together towards realizing affordable housing for the Low-middle income families of Dhaka City.

The primary focus of the thesis being attaining affordable housing for low middle income families in Dhaka city a framework on the analysis process on the affordability components considered is given below:



The chart above shows the components of affordability namely land availability, its value and location; building construction's cost: in materials and techniques; and unit sizes and down payments.

6.1 Analysis on Land Related Issues in Respect to Study Area

From the discussions in chapter 2 it has been found that land consumes the major portion of housing investment. Hence the land price has a significant impact on house price thus affordable housing for low middle income group. As discussed in detail chapter 2 through Land readjustment techniques, especially Land Assemblies and Land Swaps, the land owners won't have to face any loss as they would get their share of setback areas or the increased number of units with same sq. ft. Moreover by assembling plots, both the developer and the land owner would get extra benefit with the gained buildable area. When scarcity of land is at its highest, there the unutilized space that is almost comparable to a number of housing units; land assembly must be seen as an important beneficial method as shown in Chapter 2. There are a number of land owners who are willing to develop their plots by the developers (Table 6.4); the only thing is that they have to be convinced that land assembling is an approved method of the government as they are not familiar with it.

To get only a low price land is not enough; as land assembly land swapping must be taken into account. As discussed in detail in chapter 2, paragraph 2.5.2 Ministry of Land must provide the rules and regulation for land swap to the mediator. In all cases there should be government approved rules and regulations and interventions.

Land's location is another valuable aspect in successful housing development. As discussed in Chapter 2 (page-28) it is found that prices are much less in the peripheral areas of the city namely Mirpur, Badda, and Demra. The basic infrastructure is already there in these areas and facilities as schools, markets, mosques, clinics and hospitals are there along with other services. Moreover government projects of Hatirjheel-Begunbari area, the Kuril interchange, Mirpur–Airport-Bananni Flyovers, the Zia colony–Matikata interchange including an overpass at the level crossing on Banani Staff road, Mayor Mohammad Hanif Flyover have reduced the traffic congestion of the city and also improved the communication with the peripheral areas. Dhaka city with total land area of about 1530 km² out of which Mirpur, Badda, Demra, these areas contain the following percent of land of the city:

Table 6.1 Current value and Percent of land

Location	Total Area[17]	**Percent (%) of Dhaka City**	Land Price (Tk/sq.ft.)[18]
Mirpur	58.60 km²	3.83	4,862
Badda	16.78 km²	1.09	1,875
Demra	60.38km²	3.94	1,042

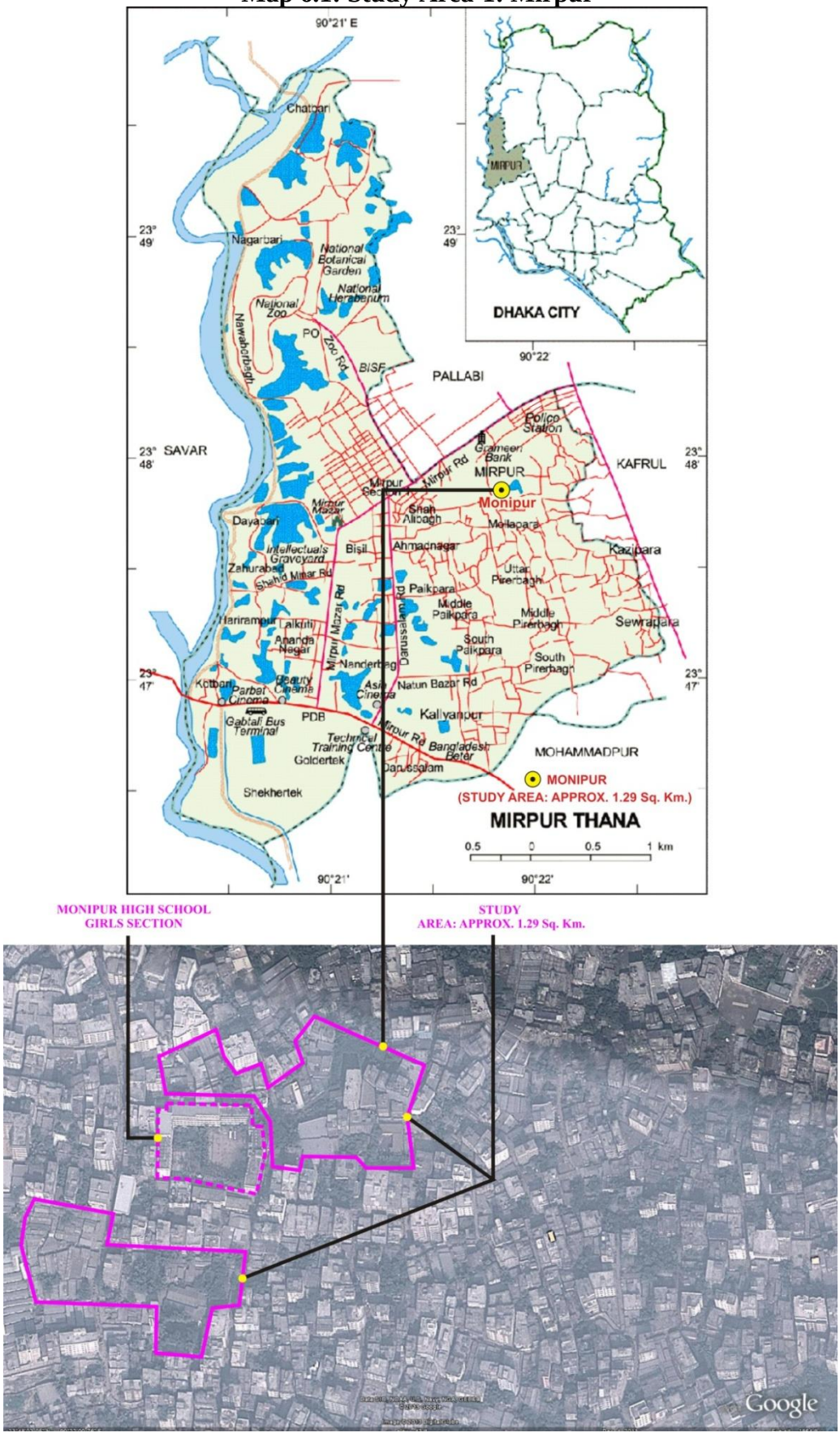
Since land price is one of the major predicaments in housing, so to make housing affordable to the low-middle income group, the low land priced localities namely Mirpur, Badda, and Demra have been considered and three pockets one of each locality were identified as Study Areas for Field Survey (Map 6.1-6.3), and was discussed in Chapter 5 and inferences were drawn.

During the reconnaissance and questionnaire survey in the study areas some residential lands which are unused or under used and suitable for building construction were noticed. Non availability of land is not a valid reason since still good number of land areas for housing can be found within Dhaka city. Of the plots some are vacant and some of them are with a single story building or are of temporary structures in a poor condition. Usually, these lot sizes vary from 3 to 15 katha and sometimes even more 15 to 25 katha each having a single ownership (Table 6.4). If an individual academic researcher the author of this thesis could find so many unutilized and underutilized residential plots within the study areas then it is quite feasible that the developers and other providers of land would have found more plots if they would have taken proper initiatives. Had there been an exact enumeration of every single residential plots, location and measurements recorded accurately it would have been much easier to detect the unutilized and underutilized land parcels. Thus as discussed in Chapter 2 article 2.5 proper utilization of lots through introduction of land assembly and land swap techniques are very much needed for affordable housing development.

Through an extensive reconnaissance survey of the study areas (Maps: 6.1, 6.2., 6.3) many land related facts, building materials and construction techniques of the existing housing stock their heights, space optimizations and down payment recovery options were comprehended. Presence of basic utilities and facilities in the study areas makes it suitable to initiate affordable housing for low middle income families.

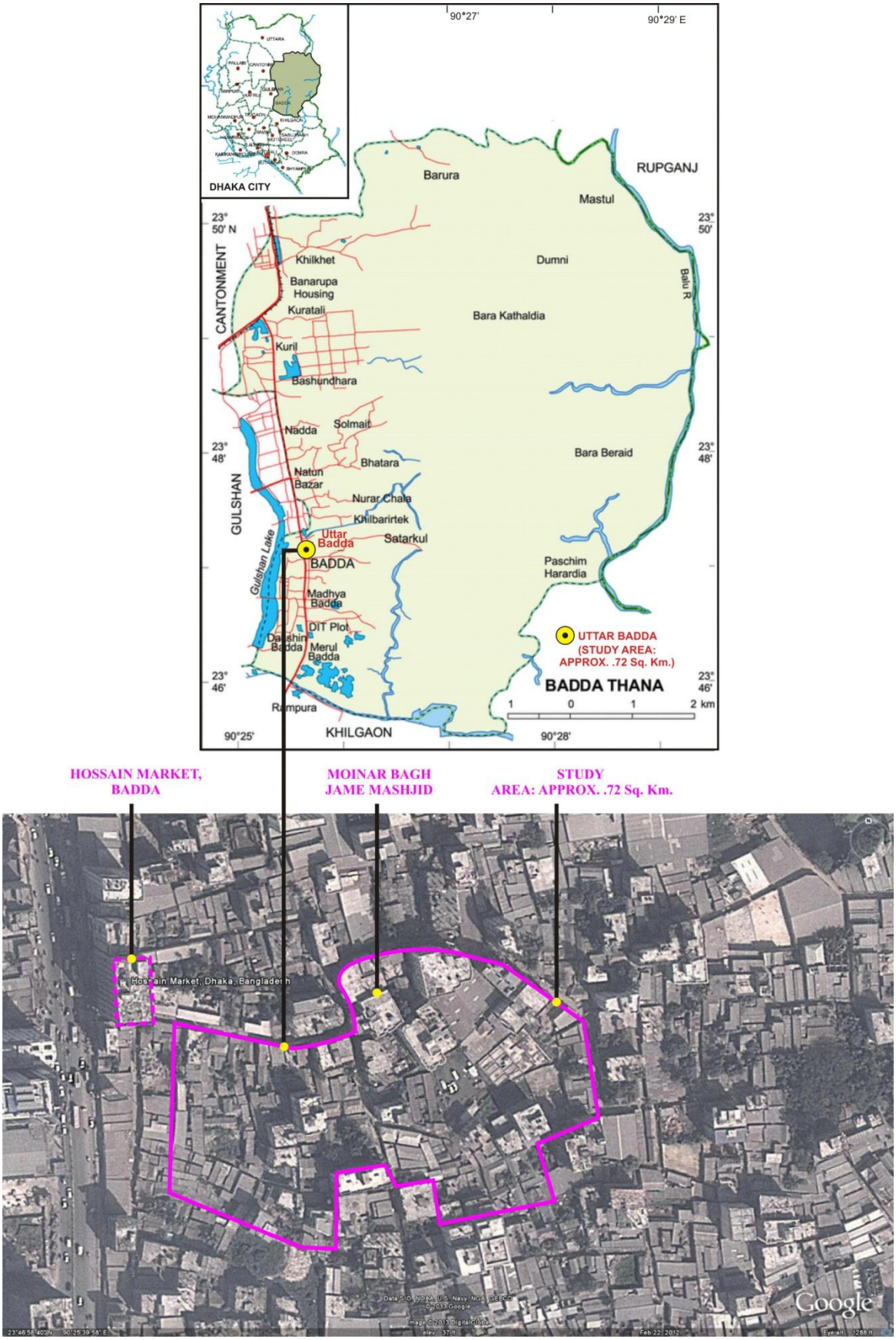
17 Detailed Area Plan (DAP), 2013
18 Cellbazaar.com, 2012

Map 6.1: Study Area-1: Mirpur



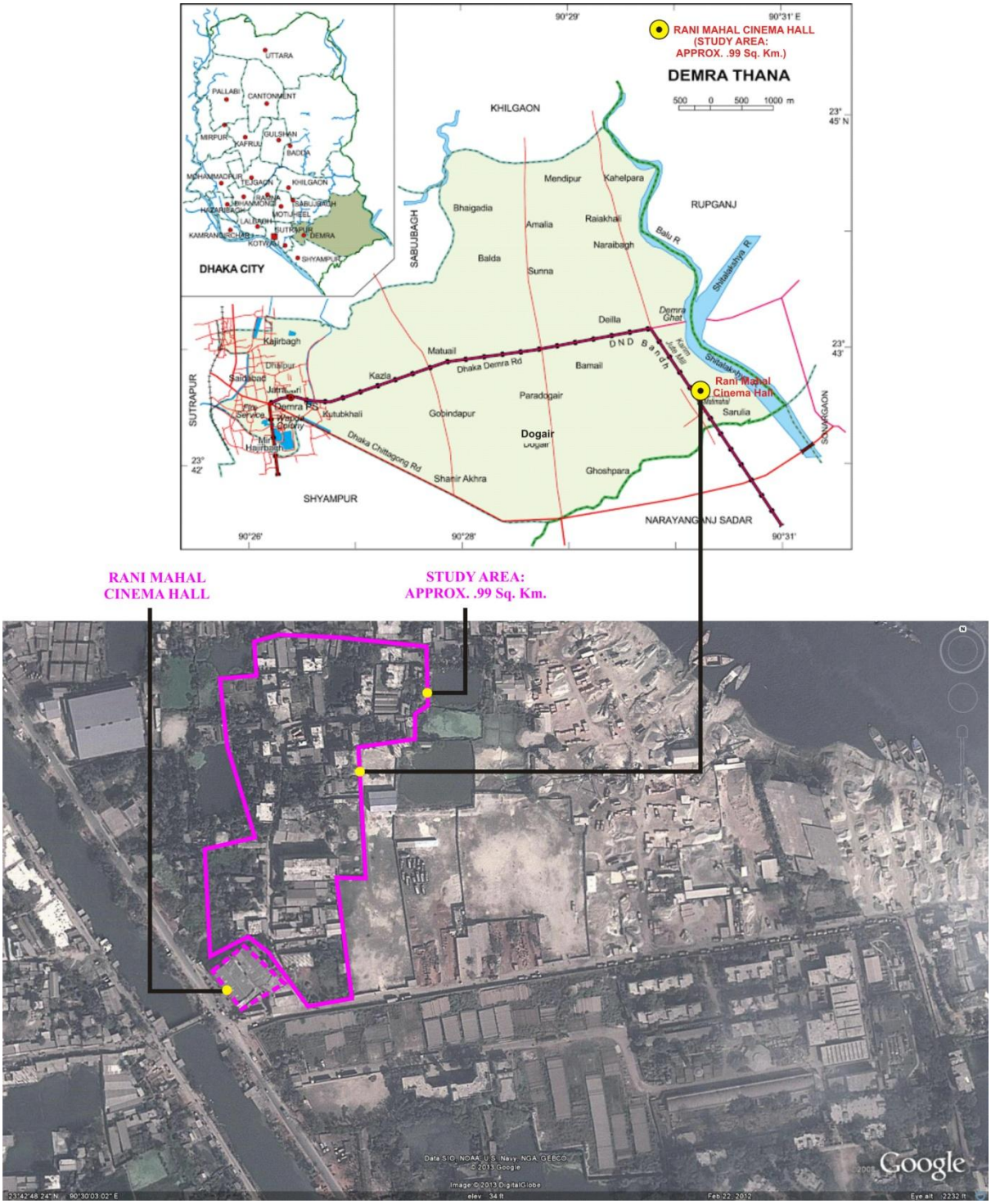
Source: banglapedia.org

Map 6.2: Study Area-2: Badda



Source: banglapedia.org

Map 6.3: Study Area-3: Demra



Source: banglapedia.org

In Dhaka, there is density control such as FAR, height zoning. In smaller plots, it is needed to keep more vacant space as per building by laws of Building Construction Act, 2008. Land assembly techniques can be a very effective step in this case. For example, suppose there are two 5 katha plots aside. One is plot A, and other is plot B. Now the land owner of plot A sales

his plot to a housing provider such as developer and makes an agreement that he would get a certain amount of sign in money and 50% apartment from the constructed building. From FAR calculation the total buildable area for plot A is found to be 12600 sq. ft. (Table 6.2)

As far the agreement is concerned, maximum 50% share that the land owner would get from the total buildable area is 6300 sq. ft. out of 12600 sq. ft. And according to the agreement the developer's only concern is to handover this 6300 sq. ft. or the number of units with same sq. ft. though this sq. ft. can be divided in different floors.

Afterwards the developer might get successful in buying the second plot B from its owner and signs the same conditions as with the first one. Now since the housing provider has become the sole owner of these two lands, if he design and construct the buildings on these two plots separately then according to 'Building Construction Act, 2008' he will get total buildable area of 25,200 sq. ft. (Table 6.2).

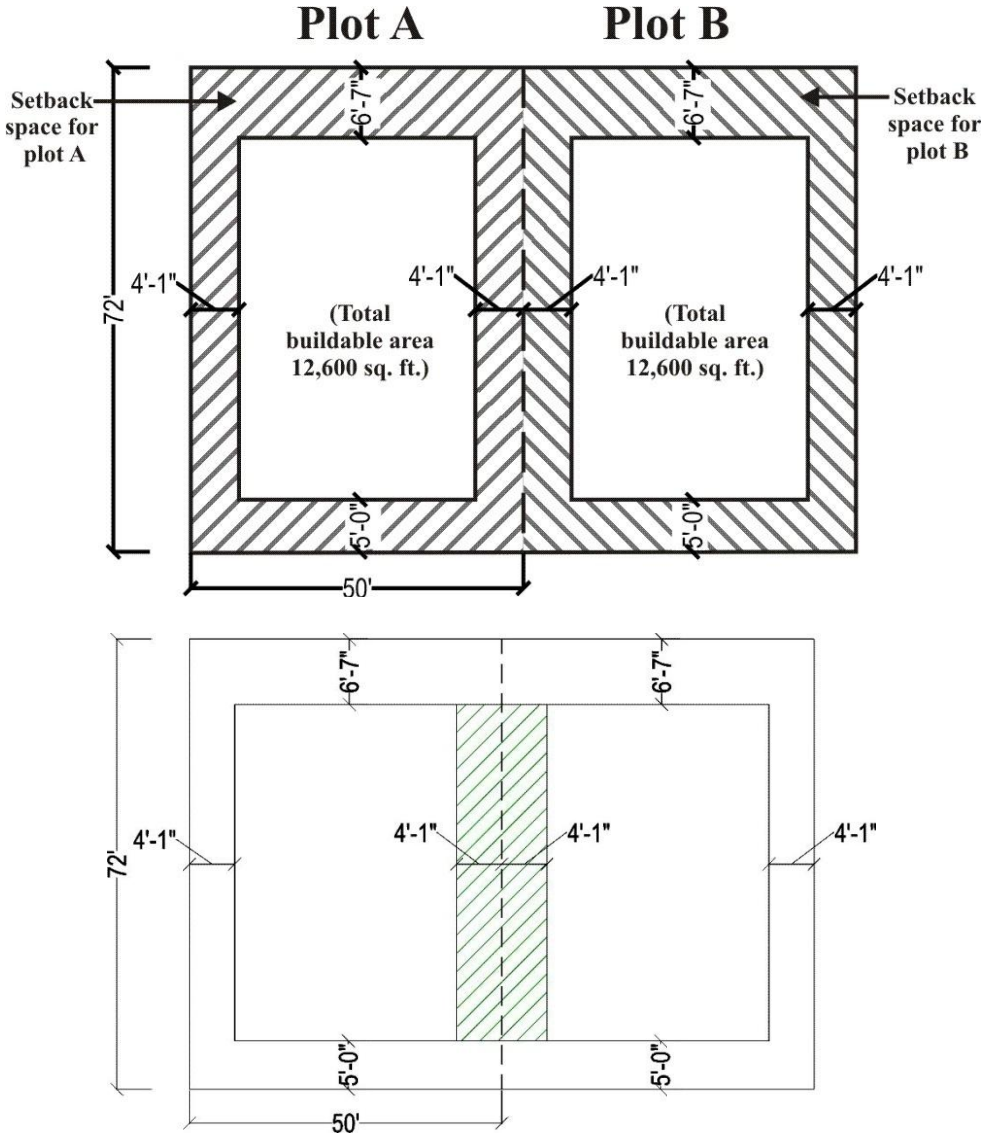


Table 6.2: FAR calculation for plot A and B:

Plot	Land Area	FAR	Total Buildable Area	Maximum Ground Coverage	Remarks
A	5 Katha= 3600 sq. ft.	3.5	(3600 x 3.5)= 12,600 sq. ft.	62.5%= 2250 sq. ft.	If the total buildable area of these two plots are combined then we get, (12,600+12,600) sq. ft.= **25,200 sq. ft.**
B	5 Katha= 3600 sq. ft.	3.5	(3600 x 3.5)= 12,600 sq. ft.	62.5%= 2250 sq. ft.	

Now if these two plots are combined together, considering land assembly, with approval from the relevant authority, it would be taken into account as a 10 Katha plot then the applicable setback remains the same but the FAR calculation for the joint by the plot will changes (Table 6.3):

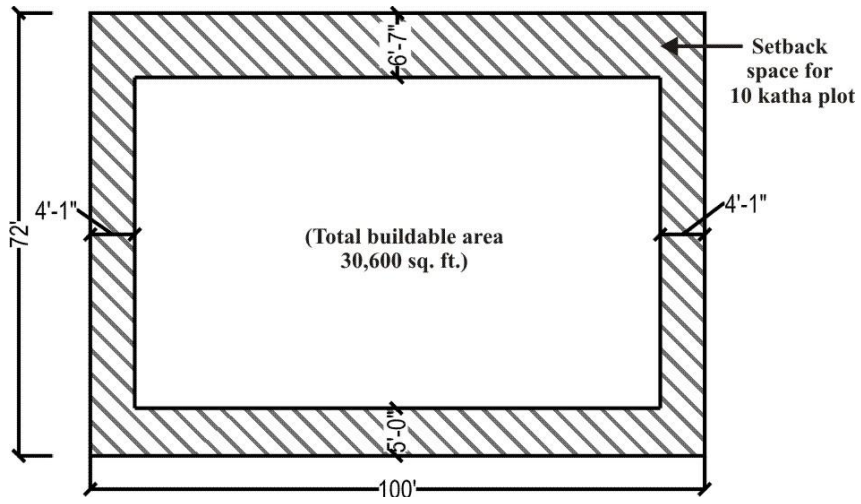


Table 6.3

Plot	Land Area	FAR	Total Buildable Area	Maximum Ground Coverage	Remarks
A+B	(5+5) Katha= 10 Katha Or, (3600+3600) sq. ft.= 7200 sq. ft.	4.25	(7200 x 4.25)= **30,600 sq. ft.**	57.5%= 4140 sq. ft.	Although the ground coverage has got reduced but an extra buildable area is pulled off from these combined lands (30,600-25,200) sq. ft.= **5400 sq. ft.**

From these Tables it can be seen that about 5400 sq. ft. of buildable area will prove to be a loss if the developer had chosen the 1st option (Table 6.2). But this extra area of about 5400 sq. ft. could be utilized if the two plots are assembled together while designing. Through another calculation also it is seen (Figure of 1st option') that the coloured shaded area is 493 sq.ft. and causes apparently a loss of about (493 sq. ft. x no. of floor). Here considering acute housing shortage housing of six storey high is built then the total gain stands as 2958 sq. ft. i.e. almost six housing units and the set back remaining the same. When scarcity of land is at its highest, there this unutilized space that is almost comparable to a number of housing units; land assembly must be seen as an important beneficial method.

On the other hand the land owners won't have to face any loss as they would get their share of 6300 sq. ft. or the number of unit with same sq. ft. Moreover by assembling plots, both the developer and the land owner would get extra benefit with the gained buildable area. There are a number of land owners who are willing to develop their plots by the developers (Table 6.4); the only thing is that they have to be convinced that land assembling is an approved method of the government as they are not familiar with it.

Table 6.4: Opinion of Landowners in Different Areas.

Sl. no.	Location	Plot size (Katha)	No. of land owner who are willing to develop their plot by developers
01	Mirpur	(3-7)	6 Nos
		(8-15)	3 Nos
02	Badda	(3-7)	4 Nos
		(8-25)	2 Nos
03	Demra	(3-7)	5 Nos
		(8-15)	2 Nos

Source: Author's field survey, 2012 [19]

Land Swap

To increase land availability land having factories that are located in Mirpur, Badda and Demra may be swapped with land in other areas such as out skirts of Dhaka City namely Gazipur where there are other factories. During field survey in Mirpur a sugar factory is situated in the middle of residential area. The compatibility of two different uses namely residential and industrial is in question. If the factory is relocated in some other area through

19 Presenting detail information about the participants will be considered an ethical violation of as they didn't want to disclose their real information and they only agreed to help since this would help an academic research.

land swap more land is available for housing. This will also reduce the air and noise pollution of the area.

6.2 Building Construction Materials and Techniques

In Chapter 4 on Case Studies, discussions are done on “Lake City Concord” where the sixteen-storied buildings made out of load bearing concrete hollow blocks with only eight-inch thick reinforced concrete block wall.

The second component in attaining affordability being building materials and construction techniques it is considered here taking into account the findings of secondary sources, Case Studies and Field Research. Since Dhaka is the capital of Bangladesh and the density being the highest it requires the highest amount of building material for housing purpose to accommodate its huge number of inhabitants. Moreover, it also has to deal with the fickleness in the sector of building material. As a consequence the unavailability of affordable materials, high cost of its transportation, lack of skills and knowledge in the use of local available alternative building materials drive building cost up and often make housing unaffordable in Dhaka city.

Efforts are required to provide alternatives in the arenas of building materials and construction method with a trained artisans for any meaningful housing development. Hence, cheaper building material is needed to be used in order to contribute to greater saving in cost and be compatible to a system of housing. If the cost of urban residential units can be minimized by adopting alternative building materials, adding up with other reduction it will be easier for greater number of low-middle income families to gain access to housing.

Fig 6.1 Concrete Hollow Blocks in Lake City Concord, Khilkhet, Dhaka

The cost analysis of this housing project has been shown in page 62. The engineers of this project said that the construction cost of these multi-storey buildings are reduced by the use of load bearing concrete block.

On the other hand, HBRI has also introduced Concrete/sand cement hollow blocks which is environment friendly as it doesn't require fuel power and saves agricultural land and forest resource, insulates heat and sound. Moreover, it is highly producible, reduces 40% of wall load (HBRI, Annual Report 2008), and earthquake resistant which makes the construction more economic. But the only limitation is, its water absorption is higher than any other clay bricks. So, more research is required for this type of blocks.

6. 2.1 Cost Comparison Analysis on Different Components of Built Forms

"Building houses" as Laurie Baker finds "is a costly business these days. A lot of the current expenditure is on unnecessary fashionable frills and designs. Much money could be saved merely by using common sense, along with simple, established tried building practices. Every item that goes to make up a building has its cost. The saving on each individual item may be small, but if you can cut down every rupee's worth of the current cost by twenty-five paise, a ten-thousand rupee house can be built for Rs 7,500. In saving and cutting down costs, the choice is yours" (Bhatia, G., 1991). And therefore, for making housing affordable he believes that the design, production and assembly of different components of a building-walls, foundations, roofs and windows-can be simplified, and, in the wasteful, budget-conscious

programmes of government housing, can be made more cost-conscious" (Laurie Baker's Cost-Reduction Manual). Laurie Bakers practical experience therefore, asserts that only through proper choice of construction material and technique, and design and layout neat 25% cost can be curtailed. However, it is known that the increase of the load of the walls affects the construction cost; also as the weight of wall gets higher, the building needs a stronger foundation, well-built columns, higher depth in beams cross-sections eventually amplifying the total usage of materials and thus the cost. Also the conventional construction materials are very high in price; therefore, the construction cost of the building also gets multiplied. The following analysis of the components of buildings shows how the cost of construction be reduced.

Wall: There is an effective means of reducing cost of construction by minimizing the quantity of building materials. For example, there is a 5 inch thick internal masonry wall of 100 sq. ft; to calculate the required material and cost, firstly the wall has been considered with solid burnt clay brick- the traditional one and 3 hole/hollow brick (Table 6.5) and secondly with solid burnt clay brick- the traditional one and concrete hollow block (Table 6.6). Most of the data and prices of the materials have been collected from some company's present market price list and also from visits to construction sites. Comparative analysis of required material, weight and cost are given below:

Table 6.5: Comparison between solid burnt clay brick and 3 hole/hollow brick

Sl. no	Items	Required no. of brick for 100 sq. ft masonry wall construction	Weight (Kg)	Cost (TK)	Cost reduction (%) in material
1	Solid burnt clay brick	500 pcs	1800	4500	7.2%
2	3 hole/hollow brick	232 pcs	951.2	4176	

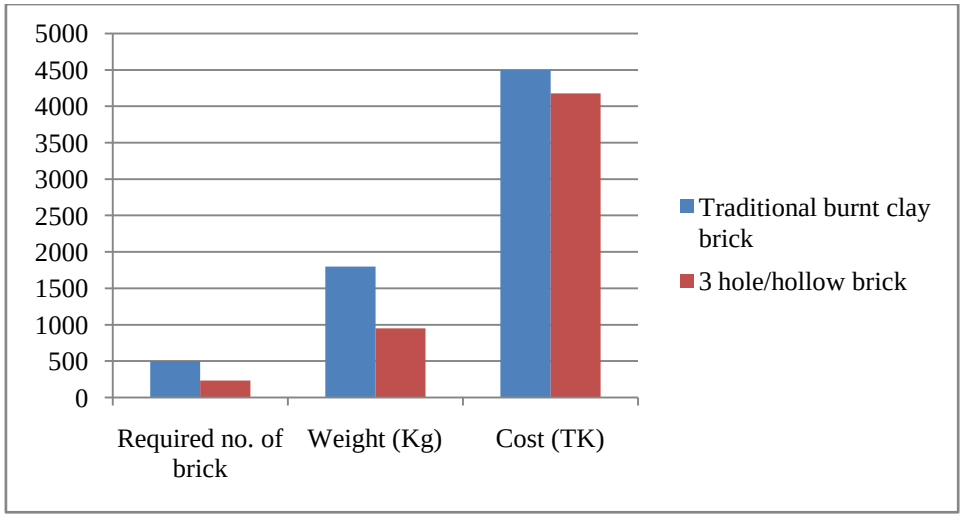


Fig 6.2 Comparison between solid burnt clay brick and 3 hole/hollow brick

Table 6.6: Comparison between solid burnt clay brick and concrete hollow block

Sl. no	Items	Required no. of brick for 100 sq. ft. masonry wall construction	Weight (Kg)	Cost (TK)	Cost reduction (%) in material
1	Solid burnt clay brick	500 pcs	1800	4500	14.6%
2	Concrete hollow block	113 pcs	1209.1	3842	

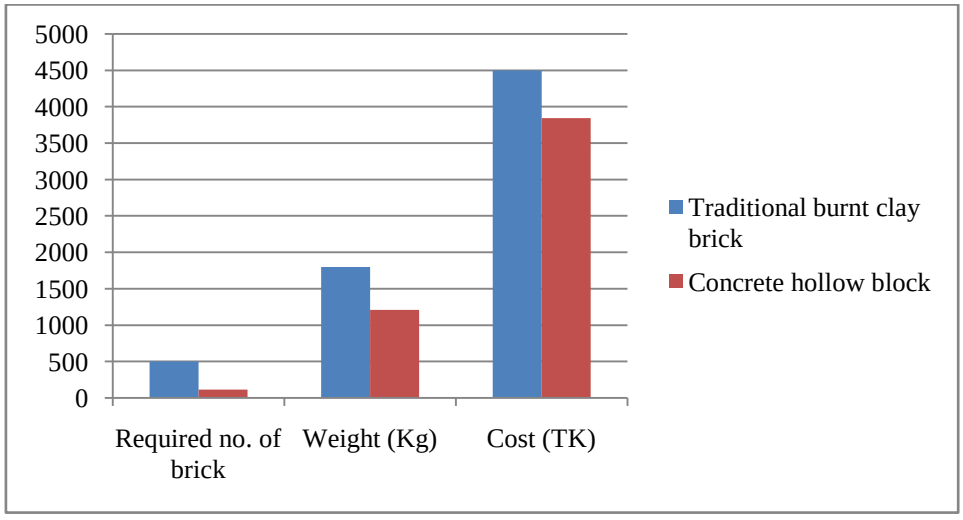


Fig 6.3 Comparison between solid burnt clay brick and concrete hollow block

Table 6.7: Comparative analysis of total construction cost

Sl. no	Items		Solid burnt clay brick		3 hole/hollow brick		Concrete hollow block	
1	Mortar	Sand	20 cft	240 TK	6.6 cft	79.2 TK	4.5 cft	54 TK
		Cement	1.75 bag (1:6)	761.25 TK	0.88 bag (1:6)	382.8 TK	0.7 bag (1:6)	304.5 TK
2	Labor cost		800 TK		800 TK		600 TK	
3	Brick material cost		4500 TK		4176 TK		3842 TK	
Total cost			**6301.25 TK**		**5438 TK**		**4800.5 TK**	

Table 6.8: Saving from alternative materials

Sl no	Items	Decreased cost	Savings rate (%)
1	3 hole/hollow brick	863.25	**13.69%**
2	Concrete hollow block	1500.75	**23.81%**

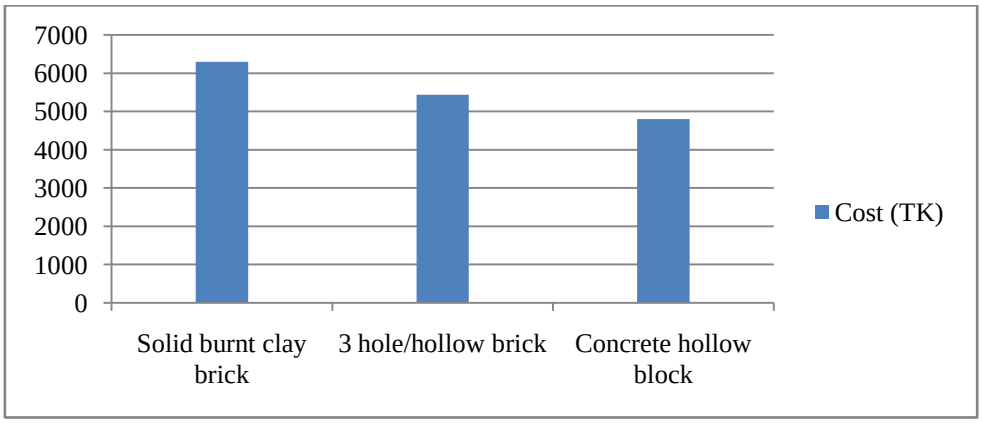


Fig 6.4 Comparative analysis of total construction cost (TK) of 100 sq. ft. masonry wall

Foundation: It is found that the overall weight of 3 hole/hollow brick and concrete hollow block is significantly lower than the solid burnt clay brick which reduces the entire load on foundation. Hence the cost also gets reduced in the foundation for using alternative material in the wall. For example there is a six storied building having a unit of 500 sq. ft. in each floor. For calculating the foundation cost, first the building is considered with solid burnt clay brick and then with 3 hole/hollow brick (Appendix G) in wall material.

Table 6.9: Comparative analysis of foundation cost

Sl. no	Items	Solid burnt clay brick		3 hole/hollow brick		Reduction of cost (TK)	%
		Required materials	Cost (TK)	Required materials	Cost (TK)		
1	Cement	32.2 bag	14007	29.78 bag	12954.3	**4626.68**	**9.11**
2	Sand	80.48 cft	2816.8	74.44 cft	2605.4		
3	Stone	160.96 cft	21729.6	148.88 cft	20098.8		
4	Rod	172.84 kg	12197.31	148.3 kg	10465.53		
Total cost			50750.71	Total cost	46124.03		

Finishing Work: From all the tables and figures above, it is found that the construction cost of traditional clay brick is higher than 3 hole/hollow brick and concrete hollow block. The larger size of 3 hole/hollow brick and concrete hollow block reduces the number of required brick and mortar joints for which less quantity of cement and sand are required. Also these types of larger units mean faster placement of wall and thus less number of labors is necessary which saves the money. Besides, the wall can be painted or left natural that lessens the cost of finishing work (Table 6.10). Thus the overhead cost and construction supervision are decreased to a larger extent.

Table 6.10: Comparative analysis of cost in finishing work of 100 sq. ft. masonry wall

Sl.no.	Items		Solid burnt clay brick		Concrete hollow block	Cost reduction (%)
1	Inside plaster	Sand	7.5 cft	90 TK	Can be left without plaster	**74.64 %**
		Cement	1.25 cft	435 TK		
		Labor cost	800 TK			
2	Inside paint	Labor cost	450 TK		450 TK	
Total			**1775 TK**		**450 TK**	

Window Installation: Some design consideration can also reduce the construction cost. As Baker states, "Windows are costly. One square foot of window can cost up to ten times the cost of the simple brick or stone wall it replaces."[20] Therefore, if certain changes can be made while installing windows, it would be effective for reducing the cost. For example, say there is a unit of 500 sq. ft. which contain five numbers of windows.

20 Laurie Baker's Cost-Reduction Manual

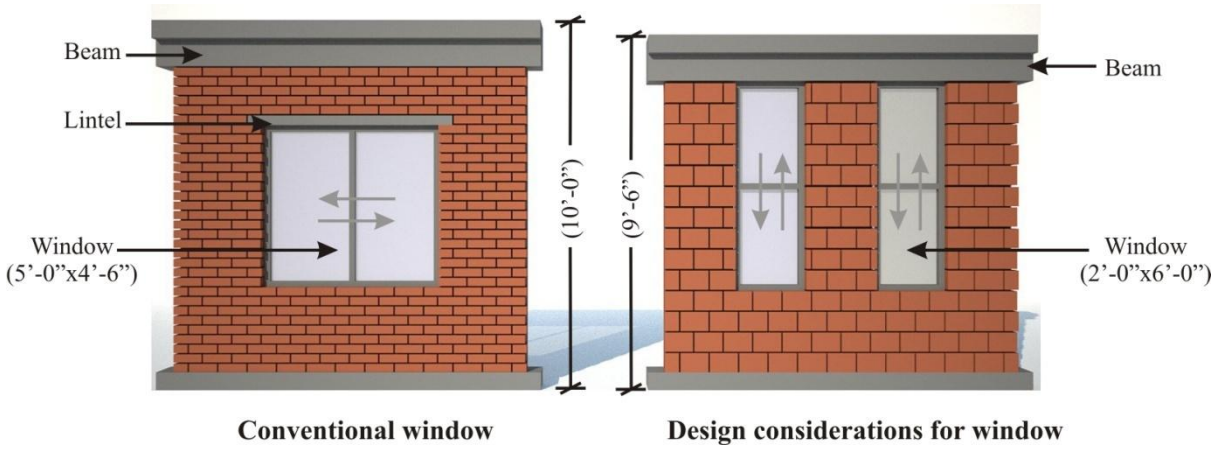


Fig 6.5 Design considerations for window which can reduce the cost

If these windows are considered without the lintel and with a decreased dimension then the cost is effectively reduced than a conventional one which has a lintel. According to present market price a window of Thai glass with aluminum section, its accessories cost around 280 Tk. per square feet. Besides, a lintel including its material, labor cost and shuttering material cost approximately 819 Tk. per cubic feet (Source: Field Survey, 2012).

Table 6.11: Comparative analysis of cost of window

Sl no.	Items	Window			Lintel (cft)	Cost of Lintel (TK)	Total cost (TK)	Reduction of cost (TK)	%
		Dimension	Tota l no.	Cost (TK)					
1	Conventional window	(5'-0"x4'-6")	1	6300	1.22	999.2	7299.2		
2	Window without lintel and decreased dimension	(2'-0"x6'-0")	2	6720	0	0	6720	**579.2**	**7.9**

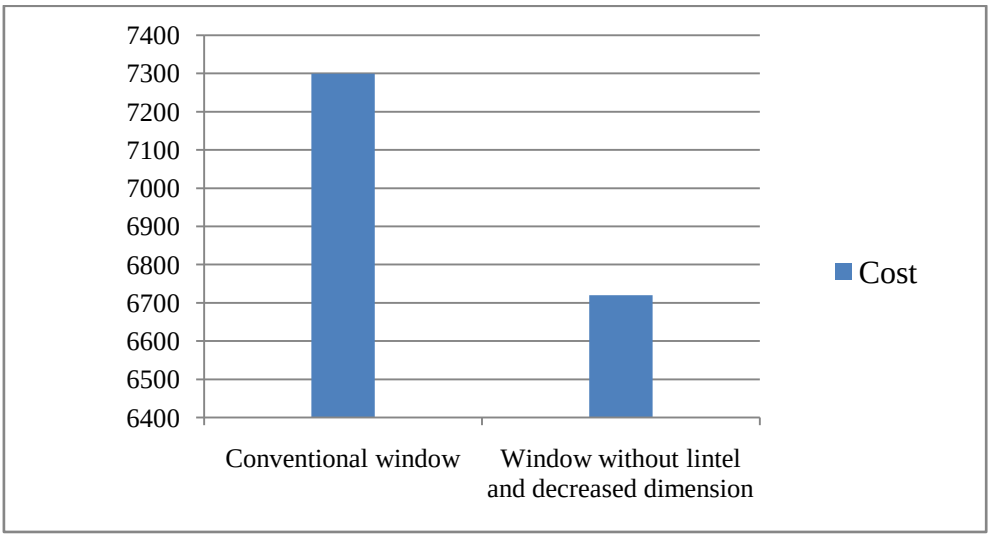


Fig 6.6 Comparative analysis of cost (TK) of window

Besides the cost, in the conventional sliding window, one part always remains close which impedes the ventilation. So if it is considered as vertically sliding and two no. of windows instead of one, it increases the ventilation and also light.

Hence, an appropriate selection of alternative building materials with proper design considerations and techniques are appropriate ways of reducing cost in buildings and consequently bring in affordable housing units.

6.3 Analysis of Unit sizes

Along with the availability, adjustments and, land price; cost involved with construction materials and techniques, discussed in the beginning of the chapter, unit sizes, built-up floor areas and height are also important considerations in reducing price of dwelling units. The size of a unit works as a major determinant of the purchase cost as stated by Stone (2006). This part analyses costs related to, unit sizes, built-up floor areas and height, another parameter of affordable housing having 'adequate' living space. The attempt is reduction of cost though having comfortable and adequate built- up optimized space.

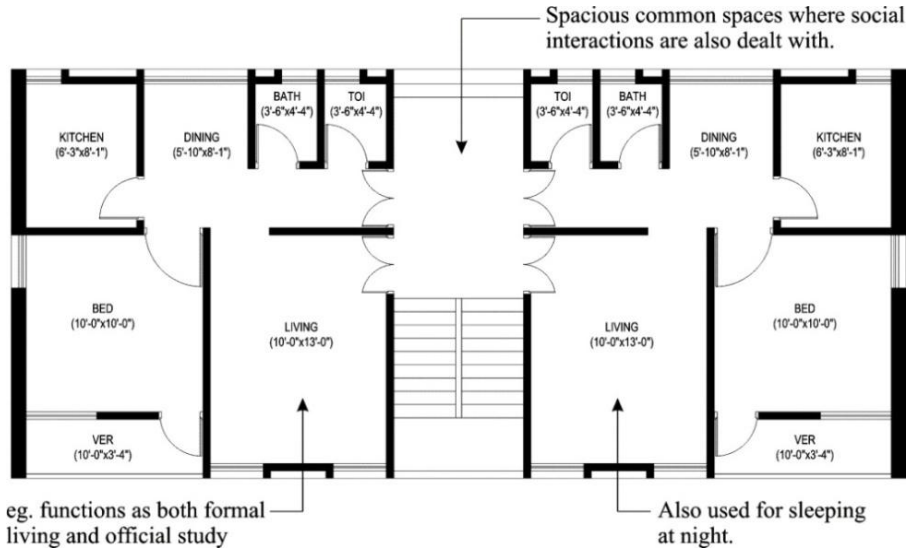
According to the statistics report of BBS (2010), in Dhaka city- the average household size is 4.6[21] people per dwelling. And this statement is not for any particular income group rather a generalized average. Hence, 5 membered household can be considered as the average household size of a low-middle income family in Dhaka city.[22]

The urban house was initially a modified version of the traditional rural homestead and household activities that followed traditional customs. Due to the limited availability of land and cost involved in the cities, it transformed into a compact version eventually going higher up from single story to three in due course to six storey walk ups.

In Azimpur Government Housing the traditional separation of public and private zones are visible and a spacious common space in the entry where two units are connected by a stair.

21 Zaman, K. A. and Akita, T. 2012

22 Since no data was found regarding the average number of members in a family of any income group, it has been considered from the questionnaire survey.



Area: 500 sq. ft. /unit

Fig 6.7: Dwelling Units at Azimpur Government Housing

Present day solutions as seen in the Case Studies corridors are brought in to have service from single stair case and living and dining space are inter linked and act as a continuous space. By providing some spacious common spaces as for example, landing of the stair, the constricted apartment or unit size can be substituted. As a result when privacy is a factor to maintain, the guests who come to the male member of the family can be dealt with in such spaces. Again social interactions are enhanced with the neighbor in such places. But now this is the most negligible design consideration where increasing density is the only concern by reducing the common spaces which results in dire neighborhood environment within a building.

Secondly, the size of dwelling unit is also representative of the financial strength and the status of the family (discussed in earlier chapters). Here dwelling size is considered, together with the household income, monthly house rent, the floor area they live in of questionnaire survey and also the aspirations of the households[23] . From the questionnaire survey, it has been found that about 50% households who have a range of their monthly income from Tk. 9000 to 11000 (Table 5.3) cannot afford a dwelling unit which has a monthly rent above 4000 Tk. It is also figured out that with such house rent about 83.3%, dwelling unit have a floor area of 400-500 sq. ft. and this appears to be inadequate to the dwellers (Table 5.7). In such condition they cannot manage an extra living space for any other member such as their parents or any other relative from their home town; even if they wish them to be living with

23 A respondent of questionnaire survey mentioned about the graduation of his son and daughters. Other respondents are also thoughtful of their wards higher education.

them. But 16.7% dwelling unit of 501-650 sq. ft. is found to be adequate to the said income group. According to the report of the Government of Bangladesh (GOB) 1996, house price to income ratio is 18.93 (Kamruzzaman, M, and Ogura, N. 2007). It means a medium income household needs 18.93 years annual income to own a house.

Table 6.12: Cost of new apartment units

Area	Price (TK)/sq. ft.
High land price area	10000-20000
Medium land price area	6500-7000
Low land price area	2500-3500

Source: Table 2.5, and figure 2.5

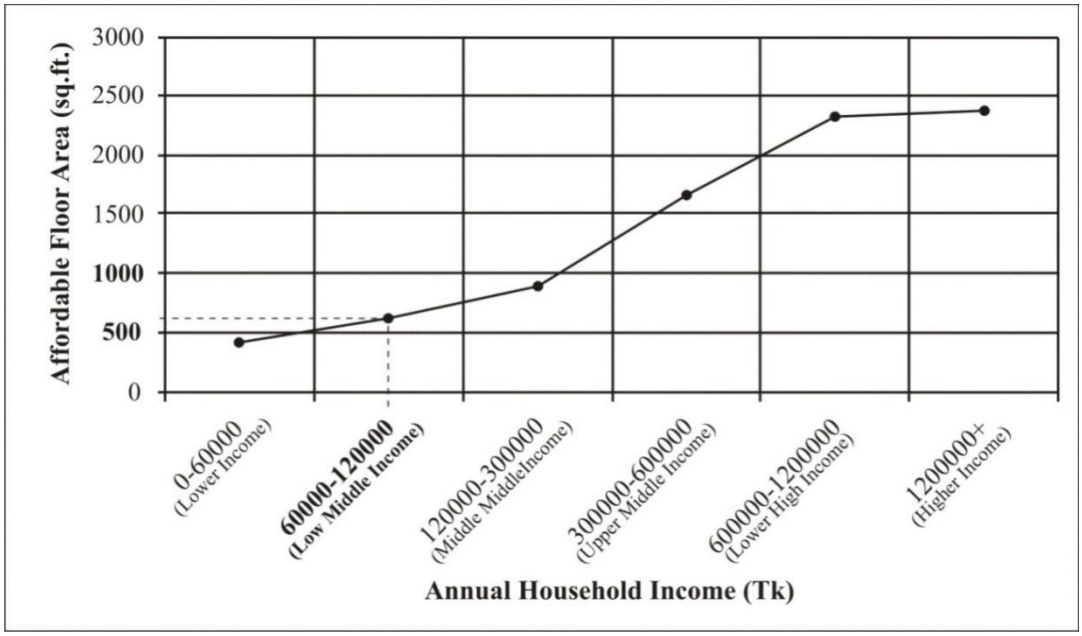


Fig 6.8: Households income and affordable floor area (estimated from table 2.3 and 6.12)[24]

24 (5000x12x18.93)/2500 = 454.32 sq. ft.

(10,000x12x18.93)/3500 = 649.02 sq. ft.

We know that,
House price (Total unit cost) / Cost per sq. ft. = Unit size
According to GOB, house price to income ratio is 18.93
So, the house price is = [5000 (min. monthly income of LMG) x 18.93 years annual income]
At first the house price is divided by 2500(min. cost per sq. ft. of a new apartment in low priced land area in respect of present market survey) which results 454.32 sq. ft.
And then the house price is = [10,000 (max. monthly income of LMG) x 18.93 years annual income] divided by 3500(max. cost per sq. ft. of a new apartment in low priced land area in respect of present market survey) which results 649.02 sq. ft.

So, an affordable floor area to all income groups can be determined by dividing the 18.93 years annual household income to unit cost of floor area. Figure 6.7 represents the affordable floor space graph. It appears that if floor area varies from 501 to 650 sq. ft, the households have a choice and is convenient enough to be paid by the low-middle income families. It would be even more convenient when the number of monthly installment increases. The other option to make housing affordable to low-middle income is decreasing the unit size. From the questionnaire survey, it can also be seen that about 50% low-middle income families spend on an average- 44% of their monthly income on housing (Inference of table 5.3) and about 77.8% families have shown interest to pay near about 7 lacs of taka at a time as a down payment (Table 5.8).

Table 6.13: Relation among household's housing expenditure, down payment, and affordable floor area

Monthly Household Income (TK) A	18.93 years annual household income (TK) (Ax12x18.93) =B	44% of 18.93 years annual income (TK) (Bx44%)= C	1st down payment (TK) D	Total (TK) (C+D)=E	At present the lowest unit cost (TK) F	Floor area (Sq. ft.) E / F	18.93 years =227.16 Month G	Required Payment per month (TK) C / G
10,000	22,71,600	9,99,504	7,000,00	16,99,504	2500	**679.80**	227.16	**4400**

Source: estimated from table 2.3 and 6.12

This table shows that in the present market price, purchasing an apartment (the Floor area exceeds the range of 650 sq. ft.) in Dhaka city is beyond the affordability of low-middle income people since the required installment per month is Tk.4400, exceeding their range of monthly housing expenditure.

The respondents of case studies and field research all aspired to own a two bedroom units. Moreover all the deductions show that floor space of 501-650 square feet is affordable to the low-middle income group. From different research run in the public and private sector housing project (existing/ ongoing/ proposed) for the low and middle income groups, a range of 200-850 sq. ft. unit size has been traced out among which it is found that units ranging from 501-650 sq. ft. are most preferable which is being shown in the following table:

Table 6.14: Different unit size that are provided by both public and private housing providers for low and middle income groups in Dhaka city

Housing delivery system	Housing Project Status	Housing Agency		Flat Size (sq. ft.)	Income Group
Formal System (Public Sector)	Existing	HSD[25]		(200-600)	LIG
				(550-850)	
	Ongoing	NHA[26]		534	LIG
				534	Poor
				670	LIG & MIG
	Ongoing	Rajuk Jhilmil Project		Minimum 600	LIG
	Proposed	**NHA PWD Rajuk (Phase wise development)**[25]	**(2008-2013)**	**(350-500)**	**LMG**
			(2013-2018)	**Minimum 500**	
			(2018-2025)		
Informal Sector	Existing	NGO Initiative [25]		(374-492)	Slum Dwellers & LIG
	Existing	Concord Lake City		(590-600)	LMG
Public Private Partnership	Existing	Bhashantk		(215-395)	Slum Dwellers & LIG

Again to identify the minimum dwelling size for the target group, it can also be observed that table 6.15, based on figure 6.9 shows a typical floor plan of 500 sq. ft. for low-middle income public employees is satisfactory.

1 Bed room	100 sft.
1 Multipurpose room	128.56 sft.
1 Dining room	47.66 sft.
1 Kitchen	50.75 sft.
1 Toilet and bath	30.58 sft.
1 Verandah	33.33 sft.
Sub Total	390.88 sft.
Add 7.5% for circulation	29.31 sft.
Add 20% wall area	78.17 sft.
Grand Total	**498.36 sft.**

Table 6.15: Space allocation

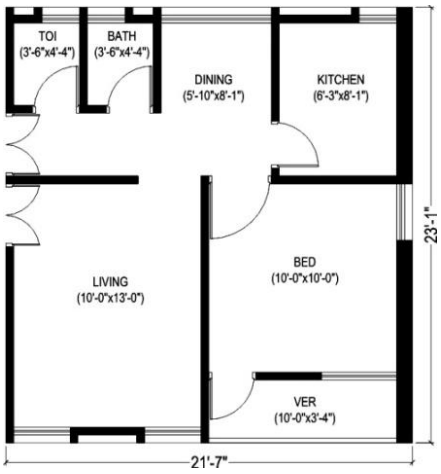


Figure 6.9: Floor plan of a unit at Azimpur Government Housing (Rasid, M., 2000)

Source: Author's Analysis, 2012

25 Islam, N and Shafi, S.A., 2008
26 Appendix I

6.3.1 Unit Area and Its Layout

It may be concluded that unit sizes from within 501 to 650 sq. ft. is satisfactory for low-middle income families in Dhaka city. Having two bedrooms also meets their privacy, need and desire. Through different alternative design solutions unit sizes may vary as 501 sq. ft., 550 sq. ft., 600 sq. ft., and 650 sq. ft., accommodating 2 bed rooms, one or two toilets, a kitchen and a separate dining cum living space. Depending on land area attempts may be there to comfortably accommodate a number of families in a building with children's play area and socializing space.

6.4 Building Height Analysis

Building height is another issue in cost efficiency. With the ever increasing price of land in Dhaka city the multi-family units have become the predominant house-types. A typical perception might be that tall structures are solutions when the land is scarce and price is high but construction cost rises with height. Also mechanical devices are required in high rise buildings as well as distance between buildings need to be bigger. Selections of theories from building economics literatures demonstrate view on height and cost:

> Prices per square foot tended to rise as the number of storey's increased in Britain. Housing in tall multi-storey blocks is around 50 percent more expensive than those in two-storey dwellings. (Stone, 1967)

> The cost of a building per square meter of floor area increases with a rise in the number of storeys. (Bathurst and Butler, 1973)

> It is more expensive to build high-rise buildings than low-rise buildings, which offer the same accommodation. (Ferry and Brandon, 1999)

> Rise in construction cost with the increase in the building height is more prominent in Bangladesh as it has entered into high-rise building era only recently, per square meter construction cost of a 7 storied building is 56% higher than that of a 4-storied walk-up building. Unit cost of 4-storied

building is doubled in a 10-storied building and is multiplied almost 250% in a 15-storied building. (Mamun ur Rashid, 2000)

A high-rise building requires a different technology, workers, and expertise. Labor cost for each floor in a high-rise building is 5% higher than that of a normal walk-up building due to material carrying charges. A high-rise building also requires installing lift and maintaining the lift, fire escape, and fire protection which further raise the cost. On the other hand, walk-up buildings have also become an instant and acceptable solution for government housing which was gradually adapted by the city. Thus, during the last half of a century, walk-ups have become a new trend of urban housing for mass population. Walk-up is a concept which was considered modern and appropriate also to our urban context. (Mamun ur Rashid, 2000)

The walk-up building is limited in height; apparently, comfort in climbing up is the main factor. But the need for density and economy generally do not permit the ideal of only four storied building. So, when dwelling units are placed above each other and the upper level access, the maximum comfortable vertical walk determines the height. Floor to floor height reduction and a maximum six floors was attempted in a government housing scheme in Baily road, Dhaka City. Here the reduction of floor height to 8 ft. 6 inches 'does not permit installation of a ceiling fan very essential in the hot-humid climate of Bangladesh' (M. S. Ameen et.el., 1984). Yet again, it is very important to identify the optimum building height with floor area taken together to reduce the housing cost. Rahman (2001) established the relation between building height with apartment's unit cost which is presented in table 6.16. It is seen that total cost of a dwelling unit decreases when the building height increases up to a level of 5 storeys. Afterwards, the trend of dwelling unit cost appears to be upward. So, with the house price to income ratio of 18.93, a low-middle income family can easily afford a unit size of 501-650 sq. ft. of a 5 storied building. But the need for increased density, it is required to determine the maximum comfortable vertical walk-ups. As it is pointed out from the table 6.16 that unit cost raises after 5 number of floor; thus, addition in floor can make housing unaffordable to the said income group.

Table 6.16: Cost of dwelling unit at different height in Bangladesh

Type	Number of floor	Cost/sq.m. US $	Rise in unit cost	Dwelling cost US $ (1)	Land cost/ dwelling US $ (2)	Savings in land cost (3)	(4)	Total cost (5)	Change in unit cost (6)
Low rise walk up	1	100	---	7,200	9,500	---	---	16,700	---
	2	114	12.2%	9,576	5,544	41.6%	41.6%	15,120	-9.4%
	4-5	125	8.8%	10,500	2,770	70.8%	50.0%	13,270	-12.2%
Medium -rise	6-7	192	34.8%	17,280	1,980	79.1%	28.5%	19,260	+31.1%
	8-9	212	9.4%	19,080	1,485	84.3%	25.0%	20,565	+6.3%
High -rise	10-12	240	11.6%	22,800	1,140	88.0%	23.2%	23,940	+14.0%
	15-20	291	17.5%	27,645	790	91.7%	30.7%	28,435	+15.8%
	20-24	355	18.0%	33,725	570	94.0%	27.8%	34,295	+17.0%

NOTES:
1) Staircase added for (2-6) stories, lift added for (7-24) stories (price excluded), habitable space 72m^2 ;
2) Developed land at intermediate location costing US $ 88/m^2 2/3rd of built-up coverage assumed ;
3) Percentage savings on the price of single-unit land (US $ 9500);
4) Percentage savings on immediate lower building's land price;
5) Cost of a single dwelling unit + cost of the land;
6) Percentage change in total price on immediate lower type;

Source: Rahman (2001)

But the construction cost can be minimized by reducing the floor height to 9 feet 6 inches[27]. As a result, above plinth a building height of 6 storied becomes 57 feet where a typical building height of 6 storeys is 60 feet as the floor height is 10 feet. Thus, construction cost is reduced at each floor while the building may have 24 to as much as 45 units depending on land area. From the questionnaire survey, it is also found that about 50% household (Table 5.10) preferred a 6 storied building as the highest level for walk-ups without introducing the use of a lift. Hence, 6 storied building with a decreased height can be the highest level for walk-up buildings.

As comfort in climbing up is one of the salient factors for a walk-up building; those who want to reach the highest level of floor, they have to climb up about (47'-6") and to the roof they have to climb up (57'-0"). According to the Building Construction Act, 2008, the building with a height above 18 meter or (59'-0") should have a lift to be installed. The above suggestion shows that the total building height does not exceed (59'-0"). So the rule also supports the concept and the building does not require a lift to be installed.

From the analysis presented above, it is visible that floor areas of 501-650 sq. ft. with a decreased floor to floor height (i.e. 9 ft. 6 inches) a walk-up building of 6 storey would reduce the cost and would make the housing affordable to the low-middle income group. The above mentioned floor to floor height, floor areas with choices and overall building height

27 According to rule 58, KA-2.of the Building Construction Act 2008, the minimum clear height of a room which is naturally ventilated is 2.75 m (9'-1"). So 9'-6" is the minimum Floor height of any building.

would effectively reduce housing cost and would make housing affordable to the target group.

However there cannot be a single ultimate solution, as Prof. K. Ekram mentioned, "There is a need for innovative solutions both in site layouts and in unit designs. Cost reduction in different components and elements of built-forms does not necessarily imply sacrifice of quality. To obtain effective cost reduction in built-forms requires extensive and appropriate researches. Cost reduction in built-forms has become even more essential to compensate to high land price. A variety in multi storied houses, in clusters, in core provisions, in row houses and in other options must be tried out"[28].

6.5 Down Payments and Recovery Period

In Bhashantek Rehabilitation Project (the case study) it is seen that for a low income household, the time limit that the providers offer, which 2 years, is not enough to own a housing unit by giving installments. In fact, for that case a limit of 5.6 years was required for owning a house as shown in Page (68-69), Chapter 4.

Calculation[29] shows how low-middle income people can get a housing unit at an affordable price if the above considerations are maintained. Thus the housing providers can sell the apartment 1230 Tk. / sq. ft. without any benefit. But a low-middle income family can afford up to 1700 Tk./ sq. ft. (Page 95) to buy a housing unit. With such price the housing providers

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29 . **Location:** Demra

Land Price (8 Katha): 8×(7,50,240) Tk./ Katha

= 60,01,920 Tk.

Range of Flat Size: (501-650) sq. ft.

If it is considered that there are 4 numbers of units of 500 sq. ft. and 2 numbers of units of 650 sq. ft. in each floor of a six storied building, the total number of apartments are 35 (In the ground floor the total numbers of apartments are 5) and the total apartment floor area is 19,150 sq. ft.

Total construction cost by using 3 hole/ hollow brick with some design consideration: 17,554,990 Tk.

Total cost: Land price + Construction cot

= (60,01,920 + 17,554,990)
= 23,556,910 Tk.

So, the price per sq. ft. is: 23,556,910÷19150 = 1230.12 Tk. / sq. ft.

can attain minimum 27.6% profit from each housing unit. If the housing providers want to achieve more than 27.6% profit by selling a housing unit then they should increase the scope of paying the total price in installments. Therefore, the providers should augmented Numbers of Installments.

6.6 Conclusion

Almost all literatures on affordable housing evidently pronounce the significance of land. Dhaka city being predominantly built up availability of vacant land is a challenge. Through Land Assembly and Land Swap the unavailability of land for housing may be mitigated. From the discussions above it can be concluded that availability of land and its cost, high price of building construction materials, unit size, and building height etc. affect the cost of a housing unit and increases its price at such a rate that it becomes unaffordable to the low-middle income families. Therefore, for making housing affordable within Dhaka City for the low-middle income group, it is important that in all components – land, building construction materials, building heights and size of units are to be taken into account and every attempt is to be made to reduce cost in them as much as is feasible.

Chapter 7

Recommendations

As Quigley (1991) puts, 'Housing is 'peculiar' because it is complex; it is fixed in space (which means housing is a package including location, services, work, status), it is expensive to produce, it is heterogeneous, it has a long lifetime, and it is a necessity for any individual'. Housing allocation is one of the highest sectors in Bangladesh's national perspective. Nevertheless, though the Constitution of Bangladesh considers 'shelter as one of the basic necessities of life', if Bangladesh tends to regard housing more as a social service and the basic need that is solely governments responsibility then, considering the financial sponsorship of the country, Bangladesh would not make any head way. Housing has to be seen as a productive investment (Malpezzi, 1990). For this, taking into deliberation the current situations of Dhaka City and all existing housing parameters housing needs to be redefined for the context. For Dhaka City 'Housing' must be envisaged as dwelling units where families have the provision of safety and security with their least physical requirements satisfied, thus have mental comfort and may have choices and are also benefited by the environment where essential facilities are nearby[30].

There is a need of deviation from previous trends of 'housing', provision of serviced plots, flats, easy loan etc., and also of envision of housing as somewhat a project of mega nature. Mega projects require mega sites, mega financial involvement and mega time period. Moreover mega attempts are always numbered; seldom realized. If private sector's commitments are considered in mega projects, then only the limited mega initiators can participate. In the backdrop of more than a million housing backlog limited input is undesired. NHA in its policy encourages the private developers' input to meet the need so to say demand of affordable housing of different income groups. It is the responsibility of the government to be aware of the quantity of the required housing for the households of different income groups, including the categories that are there within the groups, of this metropolitan city and set framework accordingly. As already mentioned earlier small scale developments, as advocated by Mahatma Gandhi and later by Schumacher, are less time consuming, have less financial commitments, lesser land requirement, lesser complications

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and can be laid out in different localities. The main objective of field research in three different study areas was to ascertain the possibilities of small scale affordable housing developments. Based on the previous chapters (specially Chapter 5 and 6's), analysis and calculations, and taking into account definition of housing by Ekram, K., for the Dhaka City's context, it may be concluded that till now there exists a prospect of affordable housing for low-middle income families in Dhaka City.

The following particular recommendations are meant to meet both the affordability and expectations of the low-middle income group and the proposals could be considered as paths of making the housing accessible to this target group of Dhaka City in the present high-priced housing market.

Land availability and land's lower price is a guiding factor to affordable housing. It has been observed in previous chapters that in Dhaka city, in the peripheral areas, i.e. Mirpur, Badda, and Demra, land is still available at a lower rate. More to the point, there are many unutilized and underutilized residential plots. Proper initiatives such as exact enumeration of every single land, location, and measurement of the residential plots must be recorded accurately. In addition to these, different land readjustment tools and techniques should be adopted. For example, land assembly and land swap should be promoted and the residential plots which are left vacant or are under-utilized till now because of inaccessible transits should be developed by the tools. It can be perceived well that through land assembly technique, the area of buildable land gets increased. As discussed in detail on pages 104-107, Chapter 6 'Land Assembly' that merges, say when two plots are joined together, there is an increase in FAR, provides an extra buildable area which also is equal to some housing units. Additionally, land availability within the city is also an important factor. 'Land Swap' can be proved to be a helpful tool to increases the scope of land availability within the city. Moreover, land's location and condition in respect to existing infrastructure, facilities and services available also play a vital role in selecting a land for housing construction. These attempts will not only make land available rather will benefit the housing providers to offer a reduction in the price of housing.

The use of Alternative Building Materials is another great possibility in reducing the construction cost. It should be promoted more and more since conventional building materials are expensive. Discussions at subhead 6.2.1, Chapter 6 it is found that the

construction cost of traditional clay brick is higher than 3 hole/hollow brick and concrete hollow block. The larger size of 3 hole/hollow brick and concrete hollow block reduces the number of required brick and mortar joints for which less quantity of cement and sand are required. It is also found that the overall weight of 3 hole/hollow brick and concrete hollow block is significantly lower than the solid burnt clay brick which reduces the entire load on foundation. The tables and figures under Chapter 6's sub-heading 6.2.1, confirm that the use of alternative building materials is very much effective in reducing the construction cost up to roughly 15%.

It is necessary to promote Alternative Design Considerations and Techniques like as for example construction of windows without lintel, combined uses of PVC doors and flush doors. Table 6.11 and figures 6.5 and 6.6, show that if the windows are considered without lintels and with a decreased dimension then the cost is effectively reduced than conventional windows with lintels. Along with the high price of the conventional sliding windows, it is also noticeable that one part of the sliding windowpanes always remains closed which impedes the ventilation (Page 114). So if it is considered as a vertically sliding and two no. of window instead of one, it's not obstructing the ventilation and also light. These are also cost effective.

It has been found out that provision of floor area of 501 to 650 sq. ft. in different variations is the most apposite answer for this target group. From the discussions of Chapter 6, under the title of 'Unit Sizes and Building Height Analysis" and of Chapter 5 "Questionnaire Survey" it can be seen that the Size of the units and room number of housing units are determined by the social and economic factors like household income, status, and household size of the family. The proposition showed only two unit sizes of 501 and 650 sq. ft., further variations in the sizes, i.e. 501, 550, 600, or 650 sq. ft. would provide wider choices to the families. It is imperative that for all income groups, including the divisions within it, appropriate unit sizes with choices in them are fixed. This would stop 'over housing, focus on 'adequacy' enable affordable aspect.

Construction cost rises with height. Six storied building with a compressed height of 9 feet 6 inches from floor to floor that eventually forms walk-up building, can reduce the construction cost and is effective in providing affordable housing to the low-middle income group. The Building Construction Act, 2008 also endorses it as walk ups needing no elevators. With

careful design play area for children can be incorporating in the built-form and common spaces with landings may be used for socializing.

It is an important factor that there are methods by which reduction in cost can be achieved. Firstly, the effect of changes in location like low priced land area is the most vital element to control the overall achievement in cost reduction. Secondly, the application of innovative, new low-cost construction materials and techniques should be adopted. Additionally, reduction in floor areas and constructing six storied walk-up buildings with a decreased floor height should be encouraged. Cost Reduced Units and Affordability must be seen as complementary to one another.

As discussed in 6.5 sub-heading of Chapter 6, increasing the number of installments to be paid seems to be effective enough both for solving the housing affordability problem and making a reasonable profit on the providers' part. They should offer 50-168 numbers of installments for low-middle income families. In case of Lake City Concord the purchasers provided the money in lump sums which is very lucrative to the developers. BRP, Mirpur is another example of corrupt means of housing delivery. Regarding installments and owning of certain unit sizes NHA should be having strict and effective rules and regulations to stop 'downward filtration'.

The government possesses the power of acquiring or readjusting land or controlling its price, and on the other hand the real estate developers might further develop the skill and technique to make housing affordable. Construction industries can profusely contribute to this aspect. Public and Private Sector Partnership can step forward to increase the housing stock and thus move ahead towards development.

Conclusion:

In Dhaka city the present trend of housing development is not only unaffordable but also inadequate to the demand. High land prices, the present trend of high-rise buildings with no fixed floor area, the unavailability of innovative building materials, lack of skills and knowledge in the use of alternative building materials and techniques, raise the building cost and make housing unaffordable to the most. But still people are aspiring to buy a housing unit to live in Dhaka city whenever it comes to their grip. While recommending on the possible solutions through mostly quantitative indicators, the qualitative aspects were not neglected,

although a bigger sample size could have given more authenticity to the results. It is true the social, physical, and economic hindrances of urban existence cannot totally be demolished; it is neither feasible nor expected. Anticipations and proper planning might be a good remedy to the anomalies to some extent and then again authentic and relevant information is required.

With the utilization of land in most efficient and effective way and a deviation from present practices in the parameters of physical requirements of housing such as floor areas, building height, construction materials, techniques and change in payment mode housing can be made accessible to the low-middle income group within Dhaka city.

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APPENDIX-A:

Questionnaire Survey, 2012

A STUDY ON PHYSICAL REQUIREMENTS OF HOUSING FOR LOW MIDDLE INCOME FAMILIES IN DHAKA CITY-AN ATTEMPT TOWARDS AFFORDABILITY.

1. Survey Identification

Location of survey _____ Date of survey _____

2. Personal Information of Respondent

a. Name of interviewed person Mr. / Mrs. / Ms

_____

b. Age ☐ (25-35) years ☐ (36-45) years ☐ More than 45

c. Occupation _____

d. Monthly household income:

☐ (5001-7000) TK ☐ (7001-9000) TK ☐ (9001-11000) TK ☐ (11001 to less than 13000) TK

e. Family status: ☐ Head ☐ House wife ☐ Other earning member

f. No. of family member:

☐ 3 Nos. ☐ 4 Nos. ☐ 5 Nos. ☐ 6 Nos. ☐ More than 6 Nos.

g. No. of earning member in the family:

☐ 1 Nos. ☐ 2 Nos. ☐ 3 Nos. ☐ More than 3 Nos.

3. How many years you are living in Dhaka city?

☐ (Less than 5) years ☐ (6-12) years ☐ (13-20) years ☐ (21-30) years
☐ (31-40) years ☐ Permanent resident

4. How long are you staying in this house?

☐ (Less than 1) year ☐ (2-4) years ☐ (5-7) years ☐ (8-10) years
☐ (10-15) years ☐ More than 15 years

5. What is the type of your ownership for the house you are living in?

☐ Owner ☐ Rented

6. Monthly house rent:

☐ (2000-3000) TK ☐ (3500-4000) TK ☐ (4500-5000) TK ☐ (5500-6000) TK
☐ (6500-7000) TK ☐ (7500-8000) TK

7. Reason for being a renter:

☐ Not possible to afford a new apartment under the existing financial circumstances
☐ New accommodation has not been constructed yet
☐ Transferable job ☐ Want to go back to home town ☐ Others

8. Do you have ___ in Dhaka city?

☐ A house ☐ A plot
☐ A house and a plot ☐ None

9. When would you like to be a house owner?

☐ When can afford ☐ After getting the children graduated
☐ After retirement ☐ Others

10. Would you prefer ____?

☐ To buy an apartment ☐ To build a house on your own

11. What is the floor area of your present residence?

☐ (400-500) sq. ft. ☐ (501-650) sq. ft. ☐ (651-750) sq. ft

12. Is the floor area of your present dwelling _____?

☐ Adequate ☐ Inadequate

13. Which floor area would you prefer for your new dwelling?

☐ (400-500) sq. ft. ☐ (501-650) sq. ft. ☐ (651-750) sq. ft
☐ (751-850) sq. ft. ☐ (851-950) sq. ft.

14. Layout of present dwelling:

a) Number of bed room:

☐ 01 Nos. ☐ 02 Nos. ☐ 03 Nos. ☐ 04 Nos.

b) Number of Toilet:

☐ 01 Nos. ☐ 02 Nos. ☐ 03 Nos. ☐ 04 Nos.

c) Availability:

☐ Kitchen ☐ Kitchen cum dining
☐ Dining cum living ☐ Living

15. Which level of floor would you prefer to live?

☐ Ground floor	☐ 1st floor	☐ 2nd floor
☐ 3rd floor	☐ 4th floor	☐ 5th floor

16. If lift is unavailable then which maximum level of floor would you prefer to live?

☐ Ground floor	☐ 1st floor	☐ 2nd floor
☐ 3rd floor	☐ 4th floor	☐ 5th floor

17. What amount are you willing to pay at a time as a down payment for buying an apartment?

☐ (500000-700000)	☐ (800000-1000000)	☐ (1100000-1500000)

APPENDIX-B (1)

Basic Information about the Respondent and their Housing

A STUDY ON PHYSICAL REQUIREMENTS OF HOUSING FOE LOW MIDDLE INCOME FAMILIES IN DHAKA CITY-AN ATTEMPT TOWARDS AFFORDABILITY.

Mirpur Area

Sl.no.	Respondent Name	Age (Years)	Occupation (Head)	Monthly Income (BDT)	Family Status (Interviewee)	No. of Family Member	No. of Earning Member	Years of Living in Dhaka City (Years)	Years of Living in the Present Residence (Years)	House Ownership Type	Monthly House Rent (BDT)	Reasons for being a Renter	Ownership	Desired Time of Ownership	Possession Option	Floor Area of Present Residence (sq. ft.)	Sufficiency (sq. ft.)	Preference Dwelling Size (sq. ft.)	Dwelling Layout			Floor-Height Preference (without lift)	Willing to Pay at a Time as a Down Payment (BDT)
																			No. of Bed Room	No. of Toilet	Other Function		
M-01	**Nurunnahar**	(25-35)	Bussines	(7001-9000)	House wife	4	1	More than 30	(05-07)	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
M-02	**Shahida**	(25-35)	Service Holder	(9001-11000)	House wife	5	2	(06-12)	(05-07)	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(551-650)	1	1	Kitchen	5th floor	(500000-700000)
M-03	**Ranjan Das**	(36-45)	School Teacher	(11001 to less than 13000)	Head	6	3	(01-05)	(02-04)	Rented	(7500-8000)	Want to go back to home town	Neither a house nor a plot	After getting the children graduated	To build a house on your own	(651-750)	Adequate	(651-750)	2	2	Kitchen+Dining cum Living	3rd floor	(500000-700000)
M-04	**Billal**	(25-35)	Service Holder	(7001-9000)	Head	4	1	(01-05)	(02-04)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
M-05	**Mosharof**	(25-35)	Service Holder	(7001-9000)	Head	4	1	(13-20)	(02-04)	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
M-06	**Nizam**	More than 45	Service Holder	(9001-11000)	Head	5	2	More than 30	(02-04)	Rented	(3500-4000)	Think later	Neither a house nor a	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(800000-1000000)
M-07	**Monira**	(25-35)	Service Holder	(9001-11000)	House wife	5	2	(21-30)	(05-07)	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	4th floor	(500000-700000)
M-08	**Jannatul**	(25-35)	Service Holder	(9001-11000)	House wife	5	2	(13-20)	(02-04)	Rented	(3500-4000)	Transferable job	Neither a house nor a plot	When can afford	To build a house on your own	(400-500)	Inadequate	(501-550)	1	1	Kitchen	4th floor	(500000-700000)
M-09	**Rajia**	(25-35)	Bussines	(9001-11000)	House wife	5	2	(21-30)	(05-07)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	4th floor	(1100000-1500000)
M-10	**Hafiz Uddin**	(36-45)	School Teacher	(11001 to less than 13000)	Head	5	3	(01-05)	1	Rented	(4500-5000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(651-750)	Adequate	(551-650)	2	2	Kitchen+Dining cum Living	3rd floor	(500000-700000)
M-11	**Shiuly**	(25-35)	Bussines	(7001-9000)	House wife	4	1	(01-05)	(05-07)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	4th floor	(500000-700000)
M-12	**Rojina**	(25-35)	Bussines	(9001-11000)	Other earning member	5	2	(06-12)	(08-10)	Rented	(3500-4000)	Want to go back to home town	Neither a house nor a plot	When can afford	To build a house on your own	(400-500)	Inadequate	(551-650)	1	1	Kitchen	3rd floor	(500000-700000)
M-13	**Momtaj**	(25-35)	Service Holder	(9001-11000)	House wife	5	2	(21-30)	(05-07)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	4th floor	(800000-1000000)
M-14	**Jebunnahar**	(36-45)	Service Holder	(9001-11000)	House wife	5	2	More than 30	More than 15	Rented	(3500-4000)	Think later	A plot	When can afford	To build a house on your own	(400-500)	Inadequate	(501-550)	1	1	Kitchen	3rd floor	(500000-700000)
M-15	**Kamrunnahar**	(25-35)	Service Holder	(9001-11000)	Other earning member	5	2	(21-30)	(05-07)	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(551-650)	1	1	Kitchen	5th floor	(500000-700000)

APPENDIX-B(2)

Basic Information about the Respondent and their Housing

A STUDY ON PHYSICAL REQUIREMENTS OF HOUSING FOE LOW MIDDLE INCOME FAMILIES IN DHAKA CITY-AN ATTEMPT TOWARDS AFFORDABILITY.

Badda Area

Sl.no.	Respondent Name	Age (Years)	Occupation (Head)	Monthly Income (BDT)	Family Status (Interviewee)	No. of Family Member	No. of Earning Member	Years of Living in Dhaka City (Years)	Years of Living in the Present Residence (Years)	House Ownership Type	Monthly House Rent (BDT)	Reasons for being a Renter	Ownership	Desired Time of Ownership	Possession Option	Floor Area of Present Residence (sq. ft.)	Sufficiency (sq. ft.)	Preference Dwelling Size (sq. ft.)	Dwelling Layout			Floor-Height Preference (without lift)	Willing to Pay at a Time as a Down Payment (BDT)
																			No. of Bed Room	No. of Toilet	Other Function		
B-01	**Nazma**	(25-35)	Service Holder	(9001-11000)	House wife	4	2	(21-30)	(02-04)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(800000-1000000)
B-02	**Zamirul**	(36-45)	Bussines	(11001 to less than 13000)	Head	6	3	More than 30	(05-07)	Rented	(4500-5000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	4th floor	(1100000-1500000)
B-03	**Dulal**	(25-35)	Bussines	(11001 to less than 13000)	Head	6	3	More than 30	(02-04)	Rented	(4500-5000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(551-650)	1	1	Kitchen	4th floor	(800000-1000000)
B-04	**Rubaia Ali**	(36-45)	School Teacher	(9001-11000)	Head	4	2	(13-20)	(02-04)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(501-650)	Adequate	(501-550)	2	2	Kitchen+Dining cum Living	5th floor	(500000-700000)
B-05	**Sultana**	(25-35)	Service Holder	(11001 to less than 13000)	House wife	6	3	(21-30)	(02-04)	Rented	(3500-4000)	Transferable job	Neither a house nor a plot	When can afford	To build a house on your own	(400-500)	Inadequate	(651-750)	1	1	Kitchen	5th floor	(500000-700000)
B-06	**Shamima**	(36-45)	Service Holder	(9001-11000)	House wife	5	2	(21-30)	(05-07)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
B-07	**Ferdous Ara**	(36-45)	Service Holder	(11001 to less than 13000)	House wife	6	3	More than 30	(05-07)	Rented	(4500-5000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(501-650)	Adequate	(551-650)	2	2	Kitchen+Dining cum Living	4th floor	(500000-700000)
B-08	**Fatema**	(25-35)	Service Holder	(9001-11000)	Other earning member	5	2	(13-20)	(02-04)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(800000-1000000)
B-09	**Kabir**	More than 45	Bussines	(11001 to less than 13000)	Head	6	3	More than 30	(08-10)	Rented	(7500-8000)	Think later	Neither a house nor a plot	When can afford	To build a house on your own	(651-750)	Adequate	(551-650)	2	2	Kitchen+Dining cum Living	3rd floor	(500000-700000)

APPENDIX-B(3)

Basic Information about the Respondent and their Housing

A STUDY ON PHYSICAL REQUIREMENTS OF HOUSING FOE LOW MIDDLE INCOME FAMILIES IN DHAKA CITY-AN ATTEMPT TOWARDS AFFORDABILITY.

Demra Area

Sl.no.	Respondent Name	Age (Years)	Occupation (Head)	Monthly Income (BDT)	Family Status (Interviewee)	No. of Family Member	No. of Earning Member	Years of Living in Dhaka City (Years)	Years of Living in the Present Residence (Years)	House Ownership Type	Monthly House Rent (BDT)	Reasons for being a Renter	Ownership	Desired Time of Ownership	Possession Option	Floor Area of Present Residence (sq. ft.)	Sufficiency (sq. ft.)	Preference Dwelling Size (sq. ft.)	Dwelling Layout			Floor-Height Preference (without lift)	Willing to Pay at a Time as a Down Payment (BDT)
																			No. of Bed Room	No. of Toilet	Other Function		
D-01	**Sharmin Akhter**	(25-35)	Service Holder	(90001-11000)	House wife	5	2	(06-12)	(02-04)	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To build a house on your own	(400-500)	Inadequate	(551-650)	1	1	Kitchen	4th floor	(500000-700000)
D-02	**Falguni**	(25-35)	Service Holder	(7001-9000)	House wife	4	1	(01-05)	1	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
D-03	**Kakoli**	(25-35)	Service Holder	(7001-9000)	House wife	4	1	(06-12)	(02-04)	Rented	(2000-3000)	Think later	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
D-04	**Moshiur Rahman**	(36-45)	Service Holder	(90001-11000)	Head	5	2	More than 30	(08-10)	Rented	(3500-4000)	Want to go back to home town	A plot	When can afford	To build a house on your own	(400-500)	Inadequate	(651-750)	1	1	Kitchen	3rd floor	(500000-700000)
D-05	**Shah Kamal**	(25-35)	Bussines	(9001-11000)	Head	5	2	(21-30)	(05-07)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To build a house on your own	(400-500)	Inadequate	(551-650)	1	1	Kitchen	4th floor	(500000-700000)
D-06	**Aleya**	(25-35)	Service Holder	(11001 to less than 13000)	House wife	6	2	(06-12)	(02-04)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(800000-1000000)
D-07	**Nasrin**	(25-35)	Service Holder	(9001-11000)	House wife	5	1	(06-12)	(02-04)	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	3rd floor	(500000-700000)
D-08	**Momtaj (2)**	(25-35)	Service Holder	(7001-9000)	House wife	4	1	(06-12)	1	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
D-09	**Zakia Sharmin**	(25-35)	Service Holder	(9001-11000)	Other earning member	5	2	(13-20)	(05-07)	Rented	(2000-3000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
D-10	**Bijoy Chandra**	(36-45)	Bussines	(11001 to less than 13000)	Head	6	3	(13-20)	(08-10)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(501-650)	Adequate	(551-650)	2	2	Kitchen+Dining cum Living	4th floor	(1100000-1500000)
D-11	**Zakir Hossain**	(25-35)	Bussines	(11001 to less than 13000)	Head	5	2	More than 30	(05-07)	Rented	(3500-4000)	Not possible to afford a new apartment under the existing financial circumstances	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)
D-12	**Parvin**	(25-35)	Service Holder	(7001-9000)	House wife	5	1	(01-05)	(02-04)	Rented	(2000-3000)	Think later	Neither a house nor a plot	When can afford	To buy an apartment	(400-500)	Inadequate	(501-550)	1	1	Kitchen	5th floor	(500000-700000)

APPENDIX-C

Table 1.1: Dhaka Urban Area (DMA+Tongi+Demra), Existing Housing Sub-Systems by Income Group, Land Tenure Density, Provider and Finance

Sub-system category	Income group (% of city population)	Tenure characteristics (Type of land tenure)	Housing characteristics (Sub-systems)	Usable space	Location (Dominant areas only)	Range of approximate density (PPA)	Provider/ Facilitator/ Manager	Source of finance
Formal System (40%)	Upper income group (10%)	Public (rental) housing in planned areas (on public land)	Duplex, triplex	Min. 2000 sq. ft. Max. 5000 sq. ft. or more	Rampura, Sher-e-Bangla Nagar	30-60	Govt., Private builder, Real estate companies, PWD & RAJUK Self-built	MoF, Private Banks, Own source, Financing institutions.
		Private luxury apartment housing, owner occupied and rental (with freehold/shared freehold tenure)	High class apartments		Intermediate and inner suburbs	150-250		
		Private owner occupied housing in unplanned areas (with freehold land tenure)	One storied bungalow		Old town, intermediate zone	30-100		
		Private owner occupied and rental housing in planned areas (with leasehold tenure)	Two and three storied mansion		Intermediate and outer zones (Dhanmondi, Gulshan, Baridhara, Banani, Uttara)	30-100		
	Middle income group (30%)	Public housing (rental and ownership flats)	Row houses in high density old areas	Min. 1000 sq. ft. Max. 2500 sq. ft. or more	Ramna, Azimpur, Motijheel, Dhaka University and BUET Campus	50-150	Government, Private Builders, Few Real Estate Companies, NHA, Other Agencies, Self-built.	MoF, Own source, Private Banks, HBFC, NHBs.
		Private owner occupied and rental housing sub-system in planned areas mainly developed by RAJUK (with leasehold land tenure)	Six-storied apartments (up to six stories)		Intermediate and outer zones (Mohammadpur, Lalmatia, Khilgaon, Shajahanpur)	100-250		
		Private owner occupied and rental housing sub-system in unplanned area (with freehold land tenure)	Two to multi-storied walk-up		Old town, intermediate zone, outer and suburban zones (Dhanmondi, Uttara, Mirpur, Shyamoli, Moghbazar, Ramna, Wari	100-250		
		Private multi-storied apartments and co-operative both owner occupied and rental (with freehold and co-operative form of tenure)	Multi-storied apartments		Inner, intermediate and fringe zones (Agargaon, Kallyanpur, Mohakhali, Kamlapur and other locations)	150-400		
	Lower income group (<1.0%)	Resettlement colonies by NHA Government lower grade employees housing	Pucca structures of two and three stories, Housing plots	Min 300 sq. ft. to Max. plot 700 sq. ft.	Mirpur, Mohammadpur, Tongi, Bashabo, Wari	1500-2500	PWD, NHA, DCC, others	HBFC, Own source, NGO funds
Informal System (60%)	Low-middle income group (20%)	Private owner occupied and rental housing in unplanned areas Conventional inner city tenement slums	Pucca structures of two and three stories Housing plots, Kuccha, semi-pucca, and occasional pucca structures of two and three stories,	Min 300 sq. ft. to Max. plot 700 sq. ft.	-Fringe areas unplanned inner city neighborhoods -Inner, intermediate and fringe zones (all along the rail line between Gandaria and Mhakhali, University Area, Kamlapur and other locations)	1000-2000	Self-built, Private owners	Own source, Private money lenders, Micro-credit funds of NGOs.
	Lower income group (40%)	Slums Squatters Accommodation in non-residential space (Pavement dwellers)	Almost 98% are unplanned and unauthorized, Those in non-residential units live in owner provided buildings.	Min 100 sq. ft. to Max. 300 sq. ft.. or more	-Intermediate and fringe zones, [Mohammadpur, Mirpur, Bashabo, Dattapar (Tongi), Demra] -Extensively located in inner, intermediate and fringe zones (Keranigonj, Kamrangirchar) -Mostly inner city zone (Kalyanpur, Karail) -Mostly suburban and intermediate zones -Diverse location (Tongi, Badda)	2500-3500		

Source: Islam, N and Shafi, S. A. (2008)

Table A. 1: **(Continued)** Proposal for shelter programme during the **FIRST PHASE (2008-2013)**

Target income group (Base 2007) Monthly hh income		Present Shelter and Housing Type	Number of Target Group Shelter Units (million)	Proposed Type of Shelter Scheme	Proposed Tenure	Proposed Location	Proposed floor space (sft./unit)	Estimated Unit Cost at 2007 (Land Cost is not included)	Provider/Source of Supply (Land/Housing)	Source of Finance and Mode of repayment (Period)
1.		2.	3.	4.	5.	6.	7.	8.	9.	10.
Middle Income Group			**(55.0%)**							
Lower Middle/Middle Middle/Upper Middle (5000-50000) [50%]	Lower Middle = 5000-10,000	▪ Private owner occupied in planned and unplanned areas ▪ Tenants in shared housing ▪ Owners and tenants in new multi storeyed apartments	**4,40,000**	Provide developed land for- ▪ Multi storeyed apartment housing in planned areas ▪ Redevelopment and reconstruction in old housing areas ▪ Real estate development in urban fringe areas	▪ Rental system ▪ Ownership through higher purchase ▪ Owners through direct investment of land and finance	▪ Renewal of old housing areas ▪ RAJUK developed existing housing areas ▪ New satellite towns ie., (Purbachal, Jhilmill, Ashulia, Uttara Phase III)	Minimum 350 sft/unit to 500 sft.	Tk. 1500/sft	Provider of land ▪ RAJUK **Housing** ▪ Private Developers ▪ Private Housing Finance Institutions **Land & Housing** ▪ Public-Private Partnership of land and housing development	Finance ▪ House Building Financing Institutions ▪ Private housing finance institutions ▪ Commercial Banks ▪ Land equity ▪ Housing Banks (Govt./private) ▪ Private leasing institutions **Repayment : 15-20 Yrs** ▪ Hire purchase ▪ Monthly payment
	Middle Middle = 10,000-25,000		**4,40,000**				▪ Minimum 350 sft./ unit ▪ Maximum 650 sft./ unit	Tk. 2000/sft		
	Upper Middle = 25,000-50,000		**2,20,000**				Min 750 sft./unit to 1000 sft./ unit	Tk. 3500/sft		
Upper Income Group			.08 **(4.0%)**							
Upper Lower/Upper Upper(50000-100,000+) [10%]	Lower – Upper = 50,000-100,000	▪ Private owner occupied housing in planned and unplanned areas ▪ Tenants who are prospective home owners	**56000**	▪ Redevelopment of old housing areas ▪ High rise complex in central areas ▪ Low rise housing (bungalows) in fringe locations ▪ Serviced homes (for retired people, non-resident Bangladeshis)	▪ Ownership ▪ Rental System	▪ Redevelopment in existing upper income housing areas ▪ New real estate development ie, (Basundhara, Baridhara Phase II) ▪ Holiday homes in outlying areas of GDA	▪ Upper limit 5000 sft./unit	Minimum Tk. 3000- to Minimum 5000/sft. (Depending on quality of finish)	▪ RAJUK ▪ Private Developers ▪ Land Equity	Finance ▪ Private Commercial Banks ▪ Housing Finance Institutions ▪ Private Financing agencies **Repayment : 5-10 Yrs** ▪ Rental ▪ Monthly payment
	Upper-Upper = 100,000+		**24000**							
Total			**2.00 (100%)**							

Source: Islam and Shafi, November 2007.

Table A.2 Proposal for housing programme during the **SECOND PHASE** in Dhaka City **(2013-2018)**

Target income group (Base 2007) Monthly hh income	**Present Shelter and Housing Type**	**Number of Target Group Shelter Units** (million)	**Proposed Type of Shelter**	**Proposed Tenure**	**Proposed Location**	**Proposed floor space** (sft./unit)	**Estimated Unit Cost at 2007 (Land Cost is not included)**	**Provider/Source of Supply** (Land/shelter)	**Source of Finance and Mode of repayment (Period)**
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Low income group **(Moderate poor 2500-5000)**	▪ Residents of slum and squatter settlements ▪ Majority tenants ▪ Home owners informal housing	.57 **(39.3%)**	▪ Small flat units in multi storied buildings ▪ Improvement of existing housing stock through reconstruction and renewal ▪ New real estate development	▪ Monthly rental system ▪ Ownership through hire purchase ▪ Direct purchase where feasible	▪ New areas north and south of DCC ▪ Satellite towns ie, ▪ Tongi ▪ Gazipur ▪ Savar ▪ Keraniganj	▪ Minimum 250 sft/unit ▪ Maximum 350 sft./unit	Tk. 700/sft. to Tk. 1000/sft.	▪ PWD ▪ NHA ▪ RAJUK ▪ DCC ▪ Private Developers ▪ NGOs ▪ Cooperatives ▪ Self	▪ Government Banks ▪ Donors ▪ Private Banks ▪ NGOs ▪ Rental system ▪ Loans from Cooperative Institutions ▪ Long term repayment (25-35 yrs)
Middle Income Group Lower Middle = 5000-10,000	▪ Private owner occupied in planned and unplanned areas ▪ Tenants in shared housing ▪ Owners and tenants in new multi storeyed apartments	.80 **(55.1%)**	▪ Multi storeyed apartment housing in planned areas ▪ Redevelopment and reconstruction in old housing areas ▪ Real estate development in new areas	▪ Rental system ▪ Ownership through higher purchase ▪ Owners through direct investment	▪ Upgrading and urban renewal in old residential areas ▪ New Satellite Towns at Tongi, Gazipur, Savar, Narayanganj, Keraniganj.	▪ Minimum 500 sft./unit ▪ Maximum 1500 sft./unit	Tk. 1500/sft.	▪ RAJUK ▪ Private Developers ▪ Public-Private Partnership ▪ Self	▪ House Building Financing Institutions ▪ Private housing finance institutions ▪ Commercial Banks ▪ Hire purchase ▪ Easy Bank Loans ▪ Mid term repayments (15-25 Yrs)
Middle Middle = 10,000-25,000							Tk. 2000/sft		
Upper Middle = 25,000-50,000							Tk. 3500/sft		
High Income Group Lower – Upper = 50,000-100,000	▪ Private owner occupied housing in planned and unplanned areas ▪ Tenants who are prospective home owners	.08 **(5.6%)**	▪ Redevelopment of old housing areas ▪ High rise complexes in central areas ▪ Low rise housing in peripheral areas	▪ Ownership ▪ Tenants	▪ Upgrading and urban renewal of old residential areas ▪ Peri urban high class real estate at Savar, Ashulia, Yousufganj.	▪ Upper limit 5000 sft./unit	Tk. 4000 to 6000/sft. (Depending on quality of finish)	▪ RAJUK ▪ Private Developers ▪ Public Private Partnership ▪ Self	▪ Commercial Banks ▪ Housing Finance Institutions ▪ Rental ▪ Short term repayment (5-10 yrs)
Upper-Upper = 100,000+									
Total		**1.45 (100%)**							

Table A. 3 continued.....

Proposal for housing programme during the **THIRD PHASE** in Dhaka City **(2018 - 2025)**

Target income group (Base 2007) Monthly hh income	Present Shelter and Housing Type	Number of Target Group Shelter Units (million)	Proposed Type of Shelter	Proposed Tenure	Proposed Location	Proposed floor space (sft./unit)	Estimated Unit Cost at 2007 (Land Cost is not included)	Provider/Source of Supply (Land/shelter)	Source of Finance and Mode of repayment (Period)
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Low income group Moderate poor 2500-5000	▪ Residents of slum and squatter settlements ▪ Majority tenants ▪ Home owners of informal housing	.42 **(42.0%)**	▪ Small flat units in multi storied buildings ▪ Improvement of existing housing stock through reconstruction and renewal ▪ New real estate development	▪ Monthly rental system ▪ Ownership through hire purchase ▪ Direct purchase	▪ Planned housing areas in the outer regions of DMDP area of Keraniganj, Tongi, Savar.	▪ Minimum 250 sft/unit ▪ Maximum 350 sft./unit	Tk. 1000 to 1500/sft.	▪ Government ▪ NGOs ▪ PWD ▪ NHA ▪ RAJUK; DCC ▪ Private Developers ▪ Cooperatives ▪ Self	▪ Government Housing Bank ▪ Loans from NGOs ▪ Loans from Cooperative Institutions ▪ Rental System ▪ Hire purchase ▪ Long Term Repayment (25-35 Yrs)
Middle Income Group Lower Middle = 5000-10,000 Middle Middle = 10,000-25,000 Upper Middle = 25,000-50,000	▪ Private owner occupied and rental housing in both planned and unplanned areas ▪ Informal settlements ▪ Home owners	.50 **(50.0%)**	▪ Construction of new housing complexes ▪ Redevelopment and reconstruction in urban fringe areas	▪ Tenants on monthly rental system ▪ Direct purchase ▪ Ownership through higher purchase	▪ Regeneration of old city areas ▪ New satellite towns in Tongi, Gazipur, Savar, Keraniganj, Narayanganj.	▪ Minimum 500 sft./unit ▪ Maximum 1500 sft./unit	Tk. 2000-3000/sft Tk. 3500 to 5000/sft	▪ Government ▪ Cooperatives ▪ Private Developers ▪ Public-Private Partnership ▪ Self	▪ Hire purchase ▪ Bank Loans and Employees Loans ▪ Medium term repayment (15-25 Yrs)
High Income Group Lower –Upper = 50,000-100,000 Upper-Upper = 100,000+	▪ Private owner occupied housing in planned and unplanned areas	.08 **(8.0%)**	▪ Redevelopment of old housing areas ▪ High rise complexes in city centre ▪ Low rise in peripheral areas	▪ Ownership ▪ Tenants	▪ New city centres ▪ High class sub-urban real estate in outlying municipalities of DMDP ie, Gazipur, Munshiganj, Narsinghdi.	▪ Upper limit 5000 sft./unit	Tk. 5000-7500/sft. (Depending on quality of finish)	▪ Private Developers ▪ Public Private Partnership ▪ Self	▪ Self finance ▪ Private Bank Loans ▪ Short term loans (5-10 Yrs)
Total		**1.00 (100%)**							

Source: Islam, N and Shafi, S. A. (2008)

APPENDIX-E

Shelter Needs by Income Groups and Estimates over a Time Period of 2008-2025

Income Groups	Shelter Provisions in 2008	Shelter Requirements Over Time*[1] (million units)			Total Requirements (Million units)
		2008-2013	2013-2018	2019-2025	
		1st Phase (5 years)	2nd Phase (5 years)	3rd Phase (7 years)	
Low-income groups	The homeless or shelter less*[2] (150,000 persons)	0.15*[3] (persons)	No backlog	No backlog	0.15 (persons)
	Occupants in non-residential buildings*[4]	0.40*[5] (persons)	No backlog	No backlog	0.4 (persons)
	Migrants*[6]/New comers to the city every year*[7]	.50	.25	.10	.85
	Natural growth*[8]	.02	.02	.02	.06
	Housing which need replacement or relocation*[9]	.20	.20	.20	.60
	Upgrading and standardizing *[10]	.10	.10	.10	.30
Total		**.82**	**0.57**	**0.42**	**1.81**
Middle-income groups	Migrants/New comers*[11] to the city every year	.75	.50	.25	1.5
	Natural growth *[12]	.15	.15	.10	.40
	Upgrading and standardizing *[13]	.20	.15	.15	.50
Total		**1.10**	**0.80**	**0.50**	**2.40**
High-income groups	Natural growth *[14]	.08	.08	.08	.24
Grand Total		**2.00**	**1.45**	**1.00**	**4.45**
Grand Total (Including homeless and people in non-residential units)		2.00 million +0.55 persons	1.45	1.00	4.45 million units + 0.55 persons

*[1] Three Phases of 15 year programme.

*[2] The homeless number is estimated as .15 million by taking a small fraction (>.001%) of 7.5 million of the city as pavement dwellers.

*[3] 50 structures.

*[4] Approximately 400,000 people who are living in non-residential buildings as

staff/workers in institutional, commercial, industrial establishments.

*[5] Dormitory housing units.

*[6] Migrants/Newcomers in the LIG is taken as 30,000 households per year who will need shelter support throughout the plan period (2008-2025).

*[7] An approximate number of 250,000 migrants (0.1 m hh.) enter the city every year. With the target implementation of decentralization policy this number may be reduced to less than half by 2025.

*[8] Natural growth and new addition to existing household is to be considered at the rate of 2.3 percent per annum is optimistically reduced to 1 percent. Natural growth is taken 20,000 hh per year and new shelter provision needed for this group.

*[9] Out of 3.4 million LIG (.67 million hhs) about .6 million reside in settlements existing as slum and squatters. About .4 million hh will need to be relocated.

*[10] Of the 3.4 million those living in private slums approximately one third (.3 m) can be upgraded.

*[11] Middle income group in Dhaka is the biggest percentage. About 15000 hh are considered as new comers every year. Their number will decrease over the years and tentatively taken as 10,000 in the interim and 5000 in the final stage.

*[12] Natural growth of a base population of 1 million hh at 2 percent increase is 20000.

*[13] Out of an approximate 1 million MIG households living on owned or rental household predominantly in the informal system at least 50 percent will require upgrading or standardizing.

*[14] For the HIG at a natural growth of 2 percent are considered for new housing.

Source: Islam, N. and Shafi, S.A., 2008

APPENDIX-F

The Relentless Pursuit of Quality

Price List
(Ex-Factory Price)

Date : 01/04/2012

Sl.	Products	Nominal Size (mm)	Weight/Pc. (Kg)	Price/Pc (Tk)	Requirement (Pcs)
A	**Partition Block**				
	Conpac-B-70P	390x190x70	7.58	27.00	113 / 100 sft
	Conpac-B-90P	390x190x90	10.70	34.00	113 / 100 sft
	Conpac-B-140P	390x190x140	13.90	44.00	113 / 100 sft
	Conpac-B-190P	390x190x190	18.00	60.00	113 / 100 sft
	Conpac-B-140-15	390x190x140	14.50	60.00	118 / 100 sft
	Conpac-B-190-15	390x190x190	18.25	76.00	113 / 100 sft
	Conpac-B-190-25	390x190x190	18.75	86.00	113 / 100 sft
	Conpac-B-190-28	390x190x190	18.75	88.00	113 / 100 sft
B	**Ceiling Stone**				
	Conpac-C-300	600x200x300	31.00	130.00	50 / 100 Sft
	Conpac-C-250	600x200x250	26.00	105.00	50 / 100 Sft
	Conpac-C-200	600x200x200	20.00	95.00	50 / 100 Sft
	Conpac-C-150	600x200x150	16.00	88.00	50 / 100 Sft
C	**Roof Tiles**				
	Conpac-RT-17	418x330x17	5.00	70.00	90 / 100 Sft
	Ridge	425x245x15	4.10	120.00	100 / 100 rft
D	**Facing Block (Paving)**				
	Conpac-UP-7-15 G	222x110x70	3.22	13.00	356 / 100 Sft
	Conpac-UP-7-15 C	222x110x70	3.33	23.00	356 / 100 Sft
	Conpac-UP-10-35 G	222x110x100	5.45	27.00	356 / 100 Sft
	Conpac-UP-10-35 C	222x110x100	5.45	37.00	356 / 100 Sft
	Conpac-TP-6-15 G	196x196x60	3.43	13.00	380 / 100 Sft
	Conpac-TP-6-15 C	196x196x60	3.43	23.00	380 / 100 Sft
	Conpac-RP-8-35 G	200x100x80	3.65	20.00	465 / 100 Sft
	Conpac-RP-8-35 C	200x100x80	3.65	30.00	465 / 100 Sft
E	**Road Curb**				
	Conpac-KS-K-1 -15	380x550x150/120	62.00	195.00	80 / 100 rft
	Conpac-KS-K-2 - 15	600x200x100	26.00	85.00	50 / 100 rft
	Conpac-KS-K-3 - 15	600x300x100/60	32.00	140.00	50 / 100 rft
	Conpac-KS-K-6 - 15	500x400x120/65	51.00	180.00	60 / 100 rft
	Conpac-DKS-15	650/400x325x185	22.00	80.00	14 / 100 rft
F	**Bricks**				
	Conpac-FB-65	215x100x65	3.20	9.00	534/100 Sft.

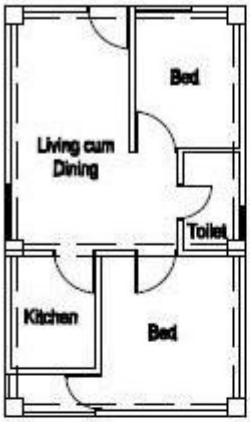
Price Shown Including VAT

CONCORD READY-MIX AND CONCRETE PRODUCTS LTD.
CONCORD PRE-STRESSED CONCRETE & BLOCK PLANT LTD.
Marketing Office: House # 56/A, Road # 132, Gulshan-1, Dhaka-1212.
Tel: 8814112, 8828516, 01711679910, 01911344388 & 01913531506 .
Fax: 88-02-8819086, Email: gmconcordgroup@gmail.com
Head Office : Concord Centre, 43 North Commercial Area, Gulshan-2.
Tel: 8814028, 8814030, 8815466, Fax: 88-02-8823552, Web: www.concordgroup.net

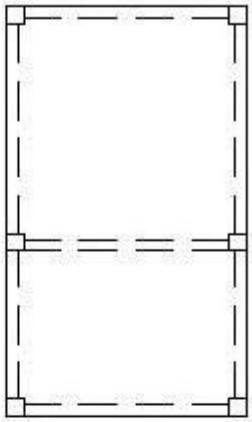
APPENDIX-G

This computation is done by: Eng. Abu Mohammad Zubaer
MIEB: 27757

Comparative Analysis of Foundation Cost
(Between Solid Burnt Clay Brick and 3 Hole/Hollow Brick)



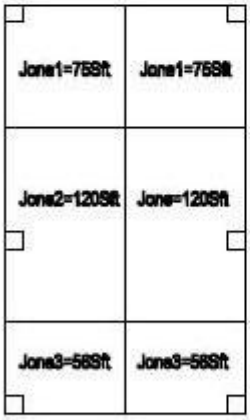
Type A



Beam layout

#Assuming the Beam section is 10"x15"
#For that type A floor :
1st class brick is needed-4679 nos; which caused 4679x3.6=16845 kg partition wall load in the 499.24 sft floor area [33.74kgsf (kg per square feet)or 16.87psf (pound per square feet)]

3 hole brick is needed-2171 nos; which caused 2171x4.1=8901 kg partition wall load in the 499.24 sft floor area [17.83kgsf (kg per square feet)or 8.91psf (pound per square feet)]



Influence Area

Caculation for Footing :

Load :

Dead Load =Self weight+Floor finfsh+Partition wall load
Self weight =(Slab tickness x150)psf
=(6/12x150)psf [Assuming Slab thickness=6"]
=75psf
Floor finfsh =30psf

Estimation of footing (for 1st class brick) :

F 1 :

Casting : 4.92x4.92x1.08=26.14 Cft(wet density)
Wet densityx1.5=39.21 Cft(Dry density)

Assuming the ratio of concrete is 1:2:4
Cement=Dry Density / 7
=39.21 / 7
=5.60 Cft
=5.60 / 1.25 Bags
=4.48 Bags

Sand=Dry Density x2/ 7
=11.2 Cft

Stone=Dry Density x4/ 7
=22.4 Cft

Rod=20 nos x 4.42' = 88.4'
= 88.4x0.26=22.98 Kg

F 2 :

Casting : 6.25x6.25x1.29=50.39 Cft(wet density)
Wet densityx1.5=75.59 Cft(Dry density)

Assuming the ratio of concrete is 1:2:4
Cement=Dry Density / 7
=75.59 / 7
=10.8 Cft
=10.8 / 1.25 Bags
=8.64 Bags

Sand=Dry Density x2/ 7
=21.6 Cft

Stone=Dry Density x4/ 7
=43.2 Cft

Rod=32 nos x 5.75' = 184'
= 184x0.26=47.84 Kg

F 3 :

Casting : 4.25x4.25x.96=17.34 Cft(wet density)
Wet densityx1.5=26.01Cft(Dry density)

Assuming the ratio of concrete is 1:2:4
Cement=Dry Density / 7
=26.01 / 7
=3.72 Cft
=3.72/ 1.25 Bags
=2.98 Bags

Sand=Dry Density x2/ 7
=7.44 Cft

Stone=Dry Density x4/ 7
=14.88 Cft

Rod=16 nos x 3.75' = 60'
= 60x0.26=15.6 Kg

Name of the Footing	Number of the Footing	Total Casting			Rod(Kg)
		Cement	Sand	Stone	
F 1	2	2x4.48=8.96 Bags	2x11.2=22.4 Cft	2x22.4=44.8 Cft	2x22.96=45.96 kg
F 2	2	2x8.64=17.28 Bags	2x21.6=43.2 Cft	2x43.2=86.4 Cft	2x47.84=95.68 kg
F 3	2	2x2.98=5.96 Bags	2x7.44=14.88 Cft	2x14.88=29.76 Cft	2x15.6=31.2 kg
Total	6	32.2 Bags	80.48Cft	160.96 Cft	172.84 Kg

Estimation of footing (for 3 hole brick) :

F 1 :

Casting : 4.81x4.81x1.04=24.06 Cft(wet density)
Wet densityx1.5=36.09 Cft(Dry density)

Assuming the ratio of concrete is 1:2:4
Cement=Dry Density / 7
=36.09 / 7
=5.15 Cft
=5.15/ 1.25 Bags
=4.12 Bags

Sand=Dry Density x2/ 7
=10.3 Cft

Stone=Dry Density x4/ 7
=20.6 Cft

Rod=18 nos x 4.31' = 77.58'
= 77.58'x0.26=20.17 Kg

F 2 :

Casting : 6.08x6.08x1.25=46.2 Cft(wet density)
Wet densityx1.5=69.3 Cft(Dry density)

Assuming the ratio of concrete is 1:2:4
Cement=Dry Density / 7
=69.3 / 7
=9.9 Cft
=9.9 / 1.25 Bags
=7.92 Bags

Sand=Dry Density x2/ 7
=19.8 Cft

Stone=Dry Density x4/ 7
=39.6 Cft

Rod=28 nos x 5.58' = 156.24'
= 156.24x0.26=40.62 Kg

F 3 :

Casting : 4.16x4.16x.96=16.61 Cft(wet density)
Wet densityx1.5=24.92 Cft(Dry density)

Assuming the ratio of concrete is 1:2:4
Cement=Dry Density / 7
=24.92 / 7
=3.56 Cft
=3.56 / 1.25 Bags
=2.85 Bags

Sand=Dry Density x2/ 7
=7.12 Cft

Stone=Dry Density x4/ 7
=14.24 Cft

Rod=14 nos x 3.67' = 51.38'
= 51.38'x0.26=13.36 Kg

Name of the Footing	Number of the Footing	Total Casting			Rod(Kg)
		Cement	Sand	Stone	
F 1	2	2x4.12=8.24 Bags	2x10.3=20.6 Cft	2x20.6=41.2 Cft	2x20.17=40.34 kg
F 2	2	2x7.92=15.84 Bags	2x19.8=39.6 Cft	2x39.6=79.2 Cft	2x40.62=81.24 kg
F 3	2	2x2.85=5.7 Bags	2x7.12=14.24 Cft	2x14.24=28.48 Cft	2x13.36=26.72 kg
Total	6	29.78 Bags	74.44 Cft	148.88 Cft	148.3Kg

Comparative Percentage of decrease in material

Cement	=[100-(29.78x100/32.2)]=7.52%
Sand	=[100-(74.44 x100/80.48)]=7.51%
Stone	=[100-(148.88 x100/160.96)]=7.51%
Rod	=[100-(148.3 x100/172.84)]=14.2%

APPENDIX-H

Pages from the Brochure of Mirpur Ceramic Works Ltd. & Khadim Ceramics Limited.

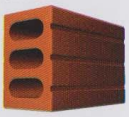
Quality Engineered Bricks

For centuries architects have long understood the beauty of simplicity. If you are looking for bricks that will not age, our fair faced brick range is the ideal choice. Seek a richness of experience through simplicity.

SL No. 01

10 Hole Engineering Brick
Size: 9 1/2" x 4 1/2" x 2 3/4"
Required Pcs. Per Sft: 5 pcs.
Crushing Strength: 4,500PSI
Water Absorption: 8% (Approx)

SL No. 02



3 Hole Brick
Size: 9 1/2" x 4 1/2" x 6 1/2"
Required Pcs. Per Sft: 2.32 pcs.
Water Absorption: 8% (Approx)

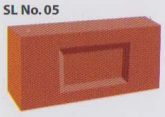
SL No. 03

3 Hole Re-inforcing Brick
Size: 9 1/2" x 4 1/2" x2 3/4"
Required Pcs. Per Sft: 5 pcs.
Crushing Strength: 4,500PSI
Water Absorption: 8% (Approx)

SL No. 04

Cable Cover - Brick
Available Size: 2", 3" & 4"
Excellent if used for cable coverings as it protects pvc pipe coverings

SL No. 05



STD. Size Solid Brick
Size: 9 1/2" x 4 1/2" x 2 3/4"
Required Pcs. Per Sft: 5 pcs.
Crushing Strength: 3,500PSI
Water Absorption: 10% (Approx)

SL No. 06

Bull Nosed - 10 Hole Brick
Size: 7.75 " X 3.75" X 3.75"
For landscaping design work and walk way edges

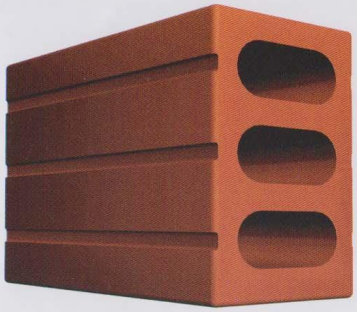
* Serial numbers are according to the price list. Please ask for the latest copy.

All our products are made by mixing natural clay from different parts of the country and are batch fired. The shades that come across after firing are unique to the batch they are fired in and create more room for your building project to be unique.

High Strength, low porosity, high durability 05

Quality Engineered Bricks

This is not a simple brick, it is a Wonder brick



The 3 Hole Brick
Ideal for any construction

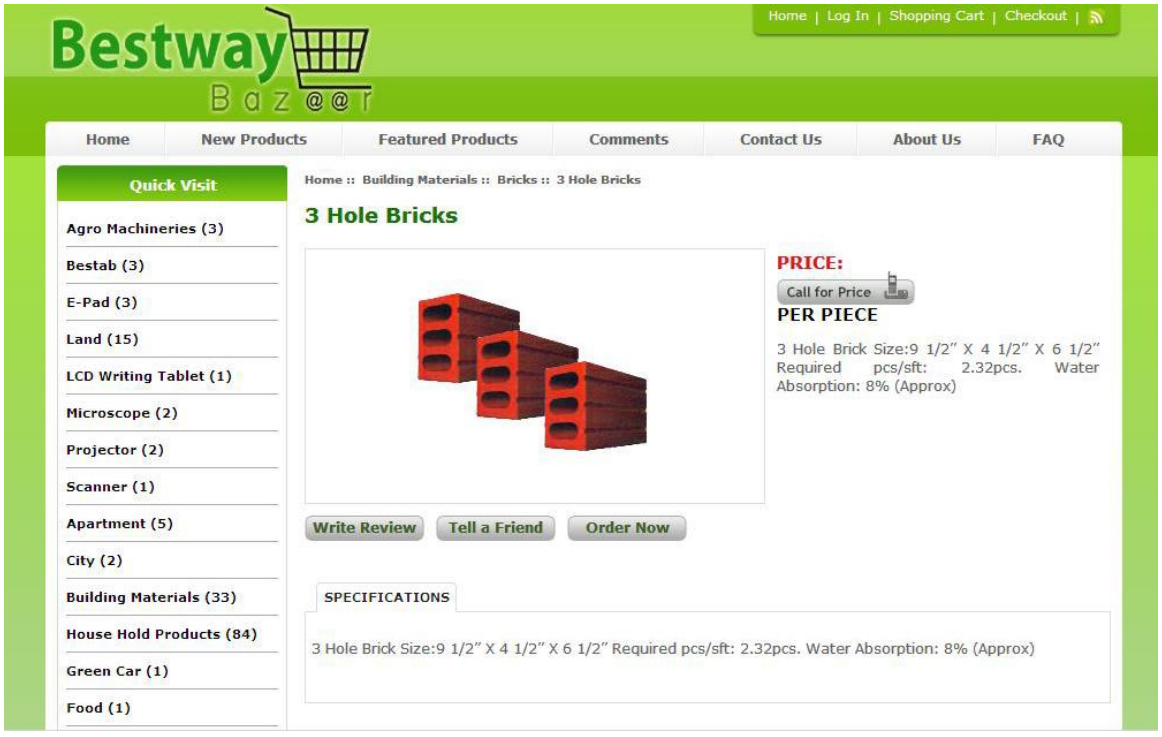
The 3 Hole Brick is an **environment friendly** product and it comprises perforated clay block structures in vertical and horizontal shapes. **3 Hole Bricks** can be used for non load bearing exterior and interior walls, as well as for non load bearing partition walls or fill in work. These blocks have proven to sustain earthquakes and are specially recommended for use in earthquake prone regions like Bangladesh.

One good news is that the enlarged size of the blocks and the light weight means that construction costs can be cut down by as much as 20 percent.

Our 3 Hole Bricks have other benefits. The holes of these blocks allow for favourable exchange of humidity between indoor and outdoor environments and is thus good for ARTHRITIS, RHEUMATISM AND ASTHMA PATIENTS. The block's ability to absorb indoor moisture leaves the indoor atmosphere to be dry across all seasons. Additionally, they are fire resistant and superb sound insulators. That is why architects say, "It's not a simple brick, it's a wonder brick."

06 The Right Choice for high-rise construction


Quality Engineered Bricks
An overall savings of 20% in wall construction cost is achievable.
The other benefits due to its usage are added bonuses
Same Building after it has been completed
Building under construction with the Wonder Brick
Our 3 Hole Bricks (Wonder Bricks) effectively reduce building load which is essential for earthquake zones like Bangladesh
The Right Choice for high-rise construction
07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Quick Visit
Agro Machineries (3)
Bestab (3)
E-Pad (3)
Land (15)
LCD Writing Tablet (1)
Microscope (2)
Projector (2)
Scanner (1)
Apartment (5)
City (2)
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House Hold Products (84)
Green Car (1)
Food (1)
Home :: Building Materials :: Bricks :: 3 Hole Bricks
3 Hole Bricks
PRICE:
Call for Price
PER PIECE
3 Hole Brick Size:9 1/2" X 4 1/2" X 6 1/2" Required pcs/sft: 2.32pcs. Water Absorption: 8% (Approx)
Write Review
Tell a Friend
Order Now
SPECIFICATIONS
3 Hole Brick Size:9 1/2" X 4 1/2" X 6 1/2" Required pcs/sft: 2.32pcs. Water Absorption: 8% (Approx)

জাতীয় গৃহায়ন কর্তৃপক্ষের প্রস্তাবিত ফ্ল্যাট নির্মাণ প্রকল্প

ক্রমিক নং	প্রকল্পের নাম	প্রকল্পের মেয়াদ কাল	প্রাক্কলিত ব্যয়	ফ্ল্যাটের আয়তন	ফ্ল্যাটের সংখ্যা	সর্বশেষ অবস্থা
ঢাকা বিভাগ						
১।	ঢাকা জেলার মিরপুর হাউজিং এস্টেট ১১ নং সেকশনে নিম্ন আয়ের লোকদের জন্য ফ্ল্যাট নির্মাণ প্রকল্প। (স্ব-অর্থায়ন)	জুলাই/১০-জুন/১৩	২৫৮৮.৫৪	৫৩৪.৫০ বঃফুঃ	১৭৬ টি ফ্ল্যাট	আশুঃমন্ত্রনালয় সভার অপেক্ষায় আছে। ২৭/১২/১১ ইং তারিখে ব্যয় যুক্তিকরন সভা অনুষ্ঠিত হয়েছে।
২।	ঢাকা জেলার মিরপুর হাউজিং এস্টেট ১১ নং সেকশনে বাস্তুহারাদের জন্য ফ্ল্যাট নির্মাণ প্রকল্প। (জিওবি)	আগস্ট/১০-ডিসেম্বর/১৪	৯৩৫৬.৮৬	৫৩৪.৫০ বঃফুঃ	৫৯৪ টি ফ্ল্যাট	মন্ত্রনালয়ের চাহিদা অনুযায়ী বাস্তুবায়ণ কাল, প্রকিউরমেন্ট পন্থ্যান হাল নাগাদ করে পূনর্গঠিত ডিপিপি প্রেরণ করা হয়েছে।
৩।	ঢাকার মিরপুর-৯ সেকশনে স্বপ্ন নগর আবাসিক ফ্ল্যাট নির্মাণ প্রকল্প।	জুলাই/১০-জুন/১৩	৫২৫৭৯.০০	১৬২৫.০০ বঃফুঃ, ১৩৮৬.০০ বঃফুঃ, ১০৪০.০০ বঃফুঃ	১১২৬৪ টি ফ্ল্যাট	পি.ই.সি. সভার সিদ্ধান্তের আলোকে পূনর্গঠিত ডিপিপির উপর ১১/০১/১২ ইং তারিখে ২য় পি.ই.সি. সভা হয়েছে। ১৭/০২/১২ইং তারিখে ডিপিপি সংশোধন পূর্বক প্রেরণ করা হয়েছে।
৪।	ঢাকার মোহাম্মদপুরস্থ জেনেভা ক্যাম্পের অবাঙ্গালীদের বসিলায় পূর্ণবাসনের জন্য আবাসিক ফ্ল্যাট নির্মাণ প্রকল্প।	জুলাই/১০-ডিসেম্বর/১৩	২০৬০০.০১	৭৫০.০০ বঃফুঃ	১০০৮ টি ফ্ল্যাট	পি.ই.সি. সভার সিদ্ধান্ত মতে জরিপ কার্যক্রম প্রক্রিয়াধীন আছে।
৫।	ঢাকা জেলার ধামরাই উপজেলা সদরে বিভিন্ন আয়ের লোকদের মধ্যে বিক্রয়ের জন্য ১৪৪ টি আবাসিক ফ্ল্যাট নির্মান প্রকল্প (১ম পর্যায়)	সেপ্টেম্বর/১১-ডিসেম্বর/১৪	৬৬০২.৯৬	১৩৮৬.০০ বঃফুঃ	১৪৪ টি ফ্ল্যাট	২৭/১২/১১ ইং তারিখে ব্যয় যুক্তিকরন সভা অনুষ্ঠিত হয়েছে।
৬।	ময়মনসিংহ শহর সংলগ্ন ময়মনসিংহ-টাঙ্গাইল সড়কের পার্শ্বে গনপূর্ত অধিদপ্তরের পরিত্যাক্ত ইট ভাটার যায়গায় আবাসিক ফ্ল্যাট নির্মান প্রকল্প।	---	-----	---	---	প্রকল্পের লে-আউট প্রনয়ন কার্যক্রম চলছে এবং গনপূর্ত অধিদপ্তরের সম্মতির জন্য প্রধান প্রকৌশলী, গনপূর্ত অধিদপ্তরকে লেখা হয়েছে কিন্তু অদ্যাবদি আর কোন পত্রালাপ হয়নি।
৭।	ঢাকা জেলার নবাবগঞ্জ উপজেলায় ১২ তলা বিশিষ্ট আবাসিক কাম বানিজ্যিক ভবন নির্মান প্রকল্প	মে/১২ জুন/১৫	৩৬৬১.৮৩	১১৩০.০০ বর্গফুট	৩৯ টি	১৪/০৫/১২ ইং তারিখ ডিপিপি মন্ত্রনালয়ে প্রেরন করা হয়েছে।
খুলনা বিভাগ						
৮।	বরিশাল জেলায় ১০০০.০ বর্গফুট আয়তনের আবাসিক ফ্ল্যাট নির্মাণ প্রকল্প।	জুলাই/১২-জুন/১৪	১৭৭৩.৮৭	১০০০.০০ বঃফুঃ	৯০ টি ফ্ল্যাট	৩/৫/২০১১ইং এর ব্যায় যুক্তিযুক্ত করন সভার আলোকে মাঠ পর্যায়ে **Soil Test** এবং সংশোধিত **Lay Out Plan** কাজ চলমান।
৯।	বরিশাল জেলায় ১২৪০.০ বর্গফুট আয়তনের আবাসিক ফ্ল্যাট নির্মাণ প্রকল্প।	মার্চ /১০-ডিসেম্বর/১৩	৫৭৫৬.৩৩	১২৪০.০০ বঃফুঃ	১৯২ টি ফ্ল্যাট	৩/৫/২০১১ইং এর ব্যায় যুক্তিযুক্ত করন সভার আলোকে মাঠ পর্যায়ে **Soil Test** এবং সংশোধিত **Lay Out Plan** কাজ চলমান।
১০।	বরিশাল হাউজিং এষ্টেটে ০৫ তলা বিশিষ্ট বানিজ্যিক ভবন নির্মাণ প্রকল্প।	জুলাই/১২-জুন/১৪	২৬০৪.৮৮	১০৫০ বঃফুঃ	৯০টি ফ্ল্যাট	২৭/১২/১১ ইং তারিখে ব্যয় যুক্তিকরন সভা অনুষ্ঠিত হয়েছে। ২৪/০৭/১২ ইং তারিখে ডিপিপি মন্ত্রনালয়ে প্রেরন করা হয়েছে।

১১।	যশোর জেলায় মধ্যম আয়ের লোকদের জন্য ১০ তলা বিশিষ্ট ফ্ল্যাট ভবন নির্মাণ প্রকল্প ।	এপ্রিল /১১-ডিসেম্বর ১৩	৪৯৯০.৭২	১২২৪.০ বঃফুঃ	১৪৪ টি	অর্থ মন্ত্রনালয় হতে Liquidity Certificate প্রাপ্তির অপেক্ষায় আছে।
চট্টগ্রাম বিভাগ						
১২।	চট্টগ্রাম জেলার ফিরোজশাহ্ এবং হালিশহর হাউজিং এস্টেটে স্বল্প ও মধ্যম আয়ের লোকদের জন্য ফ্ল্যাট নির্মাণ প্রকল্প।	জুলাই/১০-জুন/১৩	৬৮০৮.৮৫	৬৭০.০০ বঃফুঃ	৩৬০ টি ফ্ল্যাট	১৬/০৫/১২ ইং তারিখে ডিপিপি মন্ত্রনালয়ে প্রেরন করা হয়েছে।

APPENDIX-J

We know that,

Total Unit Cost (House Price)/ Total Unit Size= Cost per sq. ft.

Now since at what rate of the total unit cost or the cost per sq. ft.; the unit will be affordable for a low-middle income family is difficult to find out from any literature survey therefore, on the basis of the questionnaire survey and its outcome an estimated rate is proposed which will make housing affordable to the low-middle income group within the city.

And for this the total unit cost= Min./max. amount of payment[1] (willing to pay at a time by a low-middle family) + 48 installments[2] (the maximum number of installments have to pay per month in respect of present market survey)
And the unit size = Desired min./max. unit size by low-middle income family

So we get:

$$\frac{\text{Amount (willing to pay at a time)+ 48 installments (the maximum number of installments have to pay per month in respects of present market survey)}}{\text{Desired unit size or Desired sq. ft. of the unit}}$$

= Affordable cost per sq. ft. of low middle income family

Table 3.9 shows that, 77.8% families wish for paying Tk. (5,00,000-7,00,000) for a housing unit at a time. So

The minimum value for payment = 5,00,000 Tk.
The maximum value for payment = 7,00,000 Tk.

Again from Table 3.8 it is visible that the desired unit size of a low-middle income family ranges from (501-650) sq. ft.

So,

Desired minimum unit size = 501 sq. ft.
Desired maximum unit size = 650 sq. ft.

[1] From questionnaire survey
[2] Author's field survey, 2012

Now if we calculate the equation first with the minimum value then we get,

$$1)\quad \frac{5{,}000{,}00 + 1{,}92{,}000\ (\ 48 \times 4000;\ \text{from the analysis of table 5.3 we know, about 50\% low middle income family spend maximum 44.43\% of their income on housing which is almost 4000 Tk per month})}{501}$$

$$= \frac{6{,}92{,}000}{501} = 1381\ \text{Tk/sq. ft.}$$

Secondly, if we calculate with the maximum value of payment and with the desired minimum unit size then we get,

$$2)\quad \frac{7{,}00{,}000 + 1{,}92{,}000}{501} = 1780\ \text{Tk/sq. ft.}$$

And thirdly If we calculate with the maximum value then,

$$3)\quad \frac{7{,}00{,}000 + 1{,}92{,}000}{650} = 1372\ \text{Tk/sq. ft.}$$

[Note: In every step, the amount of monthly installment does not exceed the range of 4000 Tk. which is the highest house rent of a low-middle income family (Table: 5.3). That's why these obtained costs per sq. ft. are considered as affordable cost per sq. ft. for a low middle income family.]

So, it is found that the low-middle income families generally wish to pay Tk. (1372-1780) per sq. ft. to buy a housing unit.

APPENDIX-K

Comparison of cost between Reinforced Concrete Brick Masonry (RCBM) structure and RCC frame with brick wall structure

Type of building	A-3	
Name of the building	Baishakhi of Lake City	
Area per floor	11070	sft
No of apartment per floor	16	nos
No of car parking	62	nos
Total apartment floor area	177120	sft

		RCBM		FRAME STRUCTURE	
Sl. No.	Description of items	Amount/sft (TK)	Amount (TK)	Amount/sft (TK)	Amount (TK)
GP-1	Foundation upto P.L. level	103.72	18370713.81	130.82	23171719.48
GP-2	Framed structure inc. form work				
a)	RCBM	131.07	23215468.15		
b)	Superstructure	146.71	25984646.18	407.77	72224305.84
c)	Material for form work	7.59	1344637.15	27.63	4893006.61
d)	Labour for form works			21.83	3866158.13
	Sub-total	**285.37**	**50544751.48**	**457.23**	**80983470.58**
GP-3	Block wall	18.21	3225826.6		
	5" Brick work			48.6	8607548.44
GP-4	Door frame & Door shutter				
a)	Door frame	3.88	687932.11	3.88	687932.11
b)	Door shutter	12.98	2298675	12.98	2298675
c)	Upvc door, steel door lock etc.	8.09	1432800	8.09	1432800
	Sub-total	**24.95**	**4419407.11**	**24.95**	**4419407.11**
GP-5	Aluminium works	17.49	3097253.4	17.49	3097253.4
GP-6	Floor finish				
a)	Terrazo	6.78	1200721.75	6.78	1200721.75
b)	Ceramic	37.01	6556005.45	37.01	6556005.45
c)	Situ mosaic	2.78	492747.12	2.78	492747.12
	Sub-total	**46.57**	**8249474.32**	**46.57**	**8249474.32**
GP-7	Other finishing works				
7A	Ceramic tiles	11.93	2112386.23	11.93	2112386.23
7B	Plaster, pointing & paint	41.08	7276966.11	41.08	7276966.11
7C	Marble works	-	-	-	-
7D	Others	33.8	5987366	33.8	5987366
	Sub-total	**86.81**	**15376718.34**	**86.81**	**15376718.34**
	Sub-total (GP-3 to GP-7)	**194.03**	**34368679.77**	**224.42**	**39750401.61**
	Total cost (GP-1 to GP-7)	**583.12**	**103284145.1**	**812.47**	**143905591.7**
GP-8	Sanitary & fire fighting	41.55	7359732.9	41.55	7359732.9
GP-9	Electrical internal	25.1	4445922	25.1	4445922
GP-10	Electrical external	10.55	1868880	10.55	1868880
GP-11	Lift & Escalator	20.06	3552198	20.06	3552198
GP-12	Central aircondition	-	-	-	-
GP-13	Project overhead	20.79	3682512.41	20.79	3682512.41
Total construction cost (GP-1 to GP-13)		**701.17**	**124193390.4**	**930.52**	**164814837**

Source: Design Section, Concord Real Estate, 43, North C/A, Gulshan, Dhaka, 2006