

A Comparative Analysis of Plot Housing Schemes and Multi-Storeyed Apartment Block Housing Schemes in Dhaka: Land Economisation and Urban Community Services in the Context of Post *Private Housing Land Development Rule, 2004* Scenario of Bangladesh

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Abstract:

In Bangladesh major share of urban land for housing is supplied through spontaneous development and the rest is planned development through government agencies, housing cooperatives and private companies. These developments provide mostly Housing Plots and do not leave enough land for urban community facilities. To ensure minimum quantity of land for urban community facilities in private housing, a law has been enacted in 2004. Though, the ‘Multi-Storeyed Apartment Block Housing Schemes’, inherently capable of freeing up more land for urban community facilities is less used in Bangladesh. A comparative analysis of these two approaches has been done through a design exercise for housing 20,000 people on a hypothetical site for the post Private Housing Land Development Rule 2004 scenario of Bangladesh. It shows that the ‘Multi-Storeyed Apartment Block Housing Schemes’ saves greater amount of valuable urban land that could be utilized for urban community facilities.

Keywords: Urban land and housing, plot housing scheme, multi-storeyed apartment block housing scheme, urban land development, density, urban community facilities.

1. Urban Housing and Urban Community Facilities in Bangladesh; Current Situation

Bangladesh is a country of low land man ratio. Population pressure on land is high, particularly on urban land is very high. An estimated density of population in developed areas of Dhaka city (old Dhaka and adjacent areas) was 34598 persons per square kilometer in 2006 (World Bank 2007). So, it is of great importance to be cautious and visionary in the use of urban land. Shelter is one of the primary needs for human being and a major share of urban land is used for housing. Beyond housing we need urban community facilities for a livable city environment. According to Amos Rapoport, ‘The house is an institution not just a structure, created for a complex set of purposes. ..If provision of shelter is the passive function of the house, then its positive purpose is the creation of an environment best suited to the way of life of a people-in other words, a social unit of space.’ (Rapoport, Amos, 1969).

In Bangladesh major part of urban development is happening in an unplanned manner. The unplanned urban areas of Bangladesh are the example of grave unhealthy environment. The streets are narrow and winding, houses are built very densely without the breathing open spaces around them, there is no proper drainage and sewerage facilities, no adequate provision for educational, shopping, recreation and open spaces. Children do not have playgrounds and adults cannot find a park to visit. So, all activities are happening on the streets. Congestion, noise and air pollution has become a regular scenario.

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The scenario of planned urban areas is slightly better than this. The public agencies and private companies frequently use the "Plot housing schemes" for residential development. As an example, Dhanmondi, Banani, Gulshan, Mohammadpur, Lalmatia falls under this category. The primary difference between the planned and unplanned residential development is that roads are wider and straight, building plots are of regular shape. There are some urban community facilities in the planned areas of public agencies but often these are absent in the projects of private companies. For this reason in 2004, a Law called 'Private Housing Land Development Rule, 2004' has been enacted to ensure minimum land for urban community facilities in private housing developments (RAJUK, 2013). This rule stipulates the minimum space standards for Urban Community Facilities which will improve the quality of our cities.

2. General Characteristics of Plots Housing Schemes

In the plot housing scheme a big area is acquired by the public agencies and then subdivided into building plots and roads. Open spaces schools, markets are provided if plenty of land is available. The building plots are sold out to the individual owners. Usually the plots remain vacant years after year until it is economically profitable to the owner to construct a building. Individual owners don't have always the capability to build houses timely after buying the land and if so may not have the 'capability to build houses up to the stories to achieve an optimum population density.

To give access to every individual plots the road network become very elongated often with numerous road crossings. In this way a considerable amount of valuable urban land is eaten up by roads and diminishes the possibility of open spaces for other uses. It also results long travel distances and road crossings resulting more congestion, air and noise pollution.

The set-back spaces between the buildings are narrow well-shaped which is not enough to penetrate adequate air and light. The windows of adjacent buildings become so close to each other that it hampers privacy. These spaces are not easily accessible and not suitable for tree plantation either and eventually turn into a dead space. The practical situation is even worse when the landowners don't follow the set-back rules properly and build encroaching on the land supposed to be vacant.

As a result, the streets remain as the only open spaces and they become the hub of all sort of shopping, playing, social gathering and other activities, eventually hampers smooth traffic flow resulting in congestion, noise and smoke pollution. Again, it is not desirable streets without people specially, in residential areas. While describing about Dense Walk-Up housing model Kevin Lynch mentioned, 'the streets are full of life, and the 'eyes on the street'' in Jane Jacob's phrase, tend to regulate behaviour there.' (Kevin Lynch, Good City Form, 1996)

3. General Characteristics of Multi-Storeyed Apartment Block Housing Schemes

In the multi-storeyed apartment block housing scheme a number of dwellings (flats) are clustered together in a multi-storeyed building block without sacrificing the daylight and air flow within the buildings. Here the stairs, lifts and other building services are shared by several flats. The number of the flats/dwellings in an apartment block depends on the design. It may be a "point block" which is a cluster of 4 to 6 dwellings per floor. Or it may be an 'elongated block' when the number of dwellings could be much more.

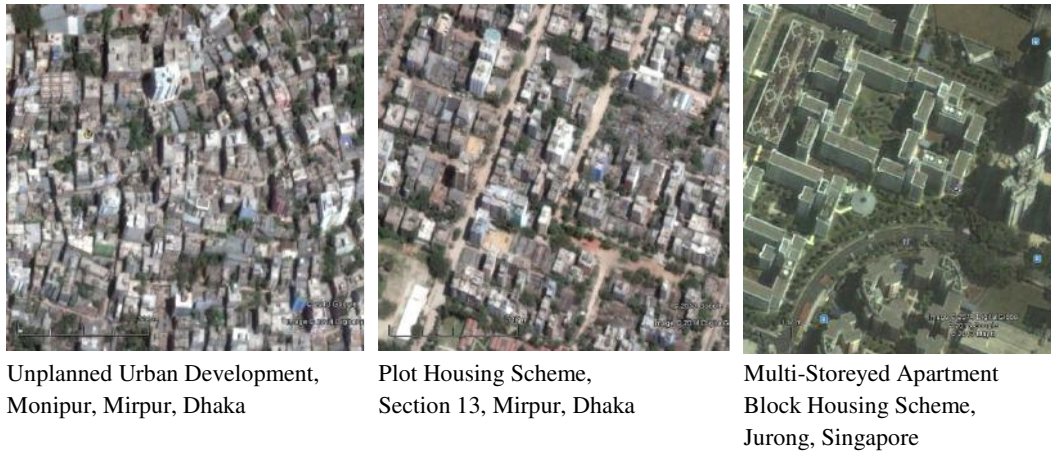


Figure1. Various Urban Development Patterns. (Source: Google Earth)

Here the owner of an individual flat owns his respective flat as well as a percentage of land on which the dwelling block is situated. The heights of the buildings are generally more than six stories which is the maximum walk-up limit considered in Bangladesh. By clustering and piling up the dwellings, spaces are saved and a higher density could be achieved by the multi-storeyed block housing scheme as opposed to individual plot housing scheme. Entry to a block of apartments provides entry to several flats and thus reduces the need for circulation network by many folds than the plot housing scheme where circulation network becomes elongated to provide entry to each plots.

So, multi-storeyed apartment blocks cover less land surface for buildings and roads and can release more lands for play fields, parks, shopping, community centre, educational and other facilities. Living in apartment blocks creates community feeling among the residents, by sharing stairs, community spaces, parks, playgrounds, parking lots, mailboxes, security, and other services. Since they are high rise housing they have the disadvantages of the High Tower housing model; 'The internal corridors and lifts do not encourage neighbourly interaction. Small children cannot go directly out of the house to play, under their mother's eye. But the tower, even the crowded tower, has proved acceptable for the well-to-do, for young couples, singles, or the elderly.' (Kevin Lynch, 1996)

4. Methodology of the Comparative Study

To examine efficiency of land utilization and other urban amenities of the two approaches of 'Plot Housing Scheme' and 'Multi-Storeyed Block Housing Scheme' a hypothetical site has been taken to accommodate 20,000 people assuming a population density of 350 persons per acre which is the highest gross residential density according to 'Private Housing Land Development Rule, 2004'. It may be useful to mention that actual density of planned Reazbagh area of Dhaka is 307 persons/acre (Ishrat, 2013), the proposed density of UTTARA third phase project is 300 persons/acre, (RAJUK, Current Project, 2013). To accommodate 20,000 people total area of land required is 57.14 acre. For 20,000 people the stipulated minimum land area for Urban Community Facilities is 20 acres; which includes land area for education, health, community organization, recreation, commercial and residential access roads (according to Private Housing Land Development Rule, 2004).

Two indicative housing lay-outs have been designed ensuring minimum 20 acres of land area for urban community facilities to perform the comparative analysis. One for the 'Plot Housing Scheme' (Fig. 2) and the other of 'Multi-Storeyed Apartment Block Housing Scheme' (Fig. 3 and Fig. 4). Both lay-outs are designed on an optimum land parcel measuring 1396 feet wide and 1810 feet long of 58.01 acres for the exercise.

The vital parameters of comparative analysis are density achieved, land area available for urban community facilities, ground coverage, average floor area available for each family, area required for access roads to the plots/ housing units, wastage set back spaces, availability of air and light, community feeling etc. Table-1 of Annex-1 shows the comparative picture of the analysis at a glance.

5. The Comparative Analysis

Assuming average family size 5.6 persons total number of families for 20,000 people is 3571. The first design is of plot housing scheme (Fig. 2), offers total 450 building plots. Assuming average 8 families on each plot this scheme can accommodate total 3600 families. The second design is of multi-storeyed apartment block scheme (Fig. 3 and Fig. 4) can accommodate 3624 flats on the same piece of land.

Here 6 flats are clustered carefully in the same floor to form a point block. There are 14 blocks, among them 8 are 12 storeyed high and rest is 10 storeyed high. The ground floors of half of the blocks are vacant for parking and circulation. In this particular example four of such point blocks are grouped around a central children playground. There are enough open spaces (min' 24', max' 152') between two-blocks. These spaces are not wasted as negative set-back spaces. Trees can be planted, shrubs can be grown up to create gardens at these spaces.

A group of 4 blocks are then tied up with an efficient circulation network (both vehicular & pedestrian) and by series of open spaces like play field, park and educational, shopping, religious, community and other facilities. Vehicular and pedestrian traffic has been segregated as far as possible. Vehicular roads are shorter in length and without few crossings. The parameters are compiled up in Table-1 in Annex-1 for the convenience of comparison.

The gross residential density achieved per acre of land in plot and multi-storeyed apartment block scheme are 347.53 and 349.54 respectively.

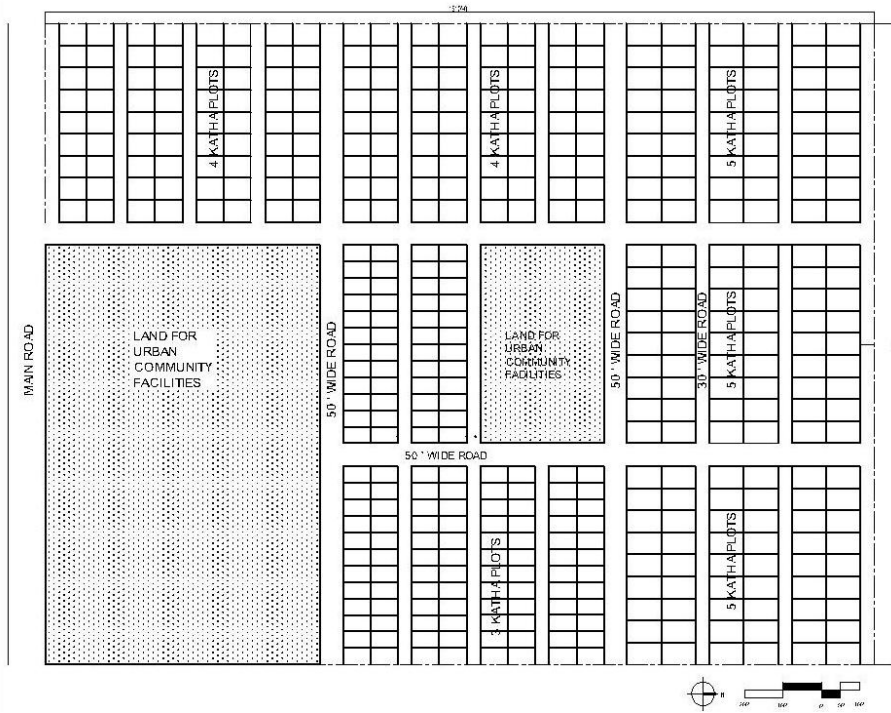


Figure 2. Block Housing Scheme for 20,000 people

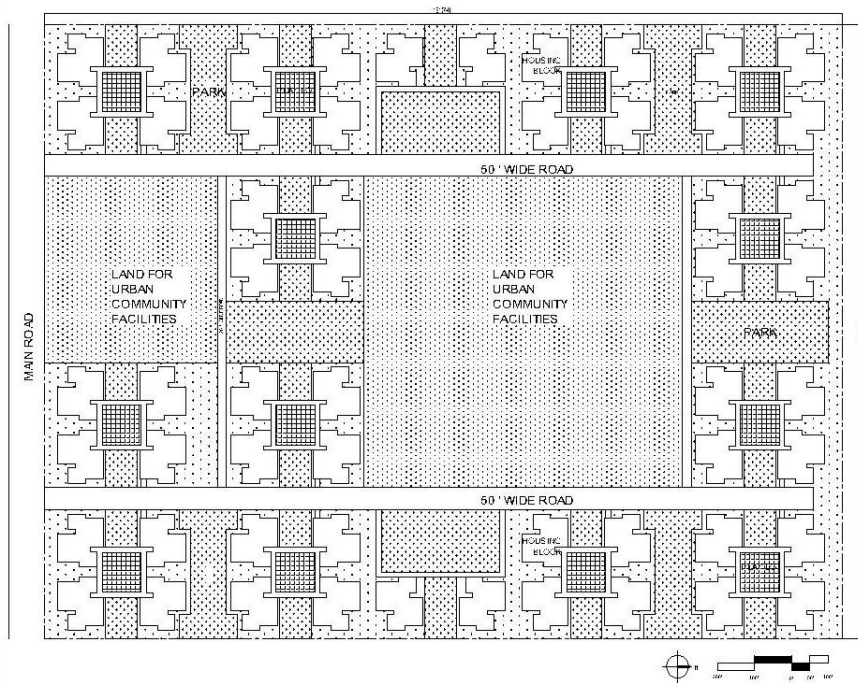
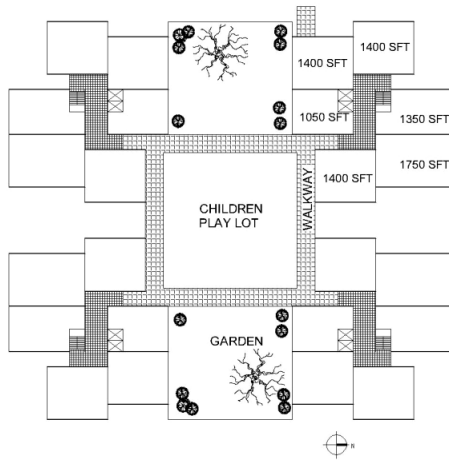


Figure 3. Multi-Storeyed Apartment Block Housing Scheme for 20,000 people



Though the amount of buildable land for housing is almost same for plot and multi-storeyed apartment block scheme (30.05 and 29.43 acres), maximum buildable floor area for the later much more (176.58 acres) than the first one (108.52 acres). This is because of the stipulated floor area ratio (FAR) of current building construction rule. So, the maximum average floor areas for each family for plot and multi-storeyed apartment block scheme are 1313.10 square feet and 2122.47 square feet respectively.

Figure 4. Cluster of Four Apartment Blocks

Comparison of Land Economisation: From the exercise it is evident that a major share of total land is required for circulation as primary and residential roads (22.51%) in plot housing scheme, where as only 11.35 % land is required in multi-storeyed block housing scheme (Table 1, Annex-1). There is also huge set back area of 20.01% of total land in plot housing scheme which have no practical use. On the other hand the spaces (26.01 %) in-between the apartment blocks are wide and ensure light, air and privacy (please see Table 1, Annex-1). So, in multi-storeyed block housing scheme total (22.5-11.35+20.01) %=31.16% land saved that could be utilized as community facilities land.

Comparison of Urban Community Facilities: In the multi-storeyed block housing scheme space for urban community facilities (education, health, community organization, recreation, commercial and residential access roads) is 24.58 acres (42.37%), on the other hand it is 21.81 acres (37.60%) in plot housing scheme. Chart-1 shows this in slightly different way; here residential access roads are excluded from urban community facilities. In this way space for urban community facilities in plot and multi-storeyed apartment block scheme are 26.31 % and 37.91% respectively.

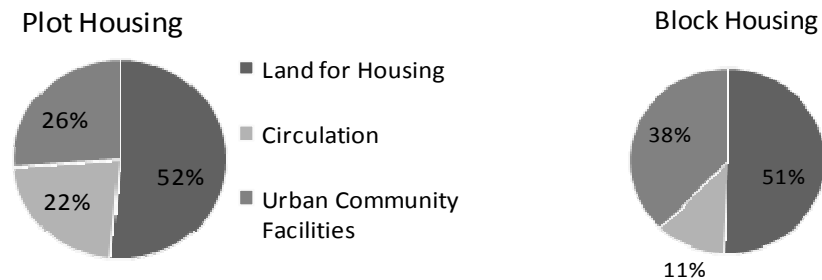


Chart 1. Land Uses of Plot Housing Scheme and Multi-Storeyed Apartment Block Housing Scheme

If we reconcile and compare the achievements by the two approaches in the context of post *Private Housing Land Development Rule, 2004* Scenario of Bangladesh it is clear that with the conventional plot housing schemes; larger building footprint, elongated road networks and dead set back spaces are the major disadvantages. The allowable floor area ratio is also lower here. But with the multi-storeyed block housing scheme we can achieve buildings with less land coverage with desired density, shorter and efficient circulation networks and useful open spaces.

In the multi-storeyed block housing scheme the dead set-back spaces have been converted into gardens and children play areas. In this way more playgrounds, parks, and other urban community facilities are available within the same 58.01 acres of land. The allowable floor area ratio is greater for multi-storeyed block housing scheme, so, it is possible to construct more floor space for each family here.

6. Conclusion

Though current unplanned and planned (by government agencies and private companies) land supply mechanisms for housing are supplying plots for individual owners, the land ownership pattern is highly unequal. In Dhaka city 4.14 percent hold 27.29 percent of the city's land, while 56.63 percent have no land at all (Islam, 2005). Another study shows that in Dhaka city between the year 1990 to 2010 the land price escalation is 1833% and the apartment price escalation is 378% (REHAB, 2012). It shows that it is very difficult to become an owner of a piece of land in Dhaka. But it may not be so difficult to own an apartment in Dhaka if adequate housing finance is being made available. Considering the rate of land price hiking and the comparative advantages of multi-storeyed apartment block housing schemes in land economisation and provision of urban community facilities the authorities may need to shift the practice of supplying lands towards multi-storeyed apartment block housing schemes from the conventional plot housing schemes. Then again, in spite of the issue of land there are other important factors for successful housing, these are effective demand, design concept, finance, subsidy, and developer (Smith, 2013). Thorough investigation about their adequacy and influences on the housing market of a particular place is necessary before arriving to the final conclusion. It is encouraging that current land development projects of public agencies in Bangladesh are allocating a part of the projects for multi-storeyed apartment block housing schemes. RAJUK has allocated 49.50 acres from its 381.11 acre JHILMIL project (13 %), 10.68 acres from its 2150 acre UTTARA 3rd Phase Residential Model Town project (0.50 %) and 338.79 acres from its 6150 acre Purbachal New Town project (5.50 %), (RAJUK, 2013, Projects). However, the trend is still dominated by plot housing schemes benefitting a small percentage of individuals. It may be recommended to review the impact of allocating more lands for multi-storeyed apartment block housing schemes in creating a successful housing market in Bangladesh and also to find out the administrative, financing and construction procedure for the multi-storeyed apartment block housing schemes to achieve a livable and equal urban environment.

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Annex-1

Table 1. Comparison Parameters of the Two Housing Schemes

Sl.	Features	Plot Housing	%	Block Housing	%	Comments
1	Land area (acres)	58.01 acres 1396' x 1810'	100	58.01 acres 1396' x 1810'	100	According to design
2	Total population accommodated (persons)	20160		20294		@ 5.6 persons/ family
3	Families accommodated (nos)	3600		3624		8 family/plot
4	Density achieved (persons /acre)	347.53		349.54		According to design
5	Total number of Plots	450		NA		According to design
		3 katha 144 nos, 4 katha 144 nos 5 katha 162 nos				
6	Total number of flats in Block Housing Scheme	NA		3624		According to design
7	Total land area of Plots (acres)	30.05	51.80	NA		According to design
		3 katha 7.14 acres, 4 katha 9.52 acres 5 katha 13.39 acres				
8	Total buildable land for housing (acres)	30.05	51.80	29.43	50.73	According to design
9	Maximum buildable floor area (acres)	108.52		176.58		According to FAR limit of Dhaka Building Construction Rules 2008
10	Maximum average buildable floor area/ family (sft)	1313.10		2122.47		
11	Actual floor area/ family (sft)	Depends on design		1600		According to design
12	Maximum ground coverage (acres)	18.44		14.72		Act 2008
13	Actual ground coverage (acres)	Depends on design		12.34		According to design
14	Land for urban community facilities (acres)	15.27	26.32	21.99	37.91	According to design
15	Play-lots (acres)			2.36		Included in housing land
16	Land for residential roads (acres)	6.54	11.27	2.59	4.46	According to design
17	Land for primary roads (acres)	6.56	11.31	4.00	6.89	According to design
18	Set back (acres)	11.61 (min)	20.01	15.09	26.01	According to design
19	Allowable FAR	3.5, 3.75		6		Act 2008
20	Actual FAR	Depends on design		4.52		According to design

Source: Calculation based on the housing lay-outs designed by the author.

Annex-2

Table 2. Space Standards for Urban Community Facilities in acres by Population size

Community Facilities	Size of Population									Facility per 1000 Population
	2500	5000	10000	15000	20000	25000	50000	100000	150000	
EDUCATION										
Nursery	0.2	0.4	0.8	1.2	1.6	2.0	4.0	8.0	12.0	0.08
Primary School	0.3	0.6	1.0	1.2	1.6	2.0	4.0	8.0	12.0	0.08
Secondary School			1.2	1.5	2.0	2.5	5.0	10.0	15.0	0.10
College*				1.2	1.6	2.0	4.0	8.0	12.0	0.08
HEALTH										
Small Clinic*				0.6	0.8	1.0	2.0			0.04
Hospital*								4.0	6.0	0.04
COMMUNITY ORGANIZATION										
Community Center/Mosque	0.1	0.2	0.5	0.6	0.8	1.0	2.0	4.0	6.0	0.04
RECREATION										
Play-Ground/ Play-field	0.5	1.0	1.0	1.2	1.6	2.0	4.0	8.0	12.0	0.08
Park	0.5	1.0	1.5	1.8	2.4	3.0	6.0	12.0	18.0	0.12
COMMERCIAL										
Corner Shop/ Market/Kutch Bazar*	0.2	0.3	0.5	0.6	0.8	1.0	2.0	4.0	6.0	0.04
ROADS										
Residential Roads**	0.9	1.7	3.5	5.0	6.8	8.5	17.0	34.0	51.0	0.34
Total Area for community Facilities (minimum)	2.7	5.2	10.0	14.90	20.0	25.0	50.0	100.0	150.0	1.00
Net Residential Area	4.44	9.08	18.5	27.95	37.14	46.43	92.85	185.71	278.57	
Gross Residential Area	7.14	14.28	28.57	42.85	57.14	71.43	142.85	285.71	428.57	
Persons per Area	350	350	350	350	350	350	350	350	350	

*land for such facility may be sold by the developer.

**Includes only internal /access roads. For primary and secondary roads and utility facilities land should be earmarked separately.

Source: Private Housing Land Development Rules -2004, Government of Bangladesh, (Tafsil-3). Retrieved from RAJUK website on 19,12, 2013.