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Comparative Analysis of Housing Patterns of Dhaka and Ways towards Sustainability

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ABSTRACT

Dhaka, the capital of Bangladesh, has a glorious past in its 400 years' history. Due to unplanned expansion over the last few decades, it is facing a tremendous environmental crisis. Lack of planning lobbed Dhaka towards settlements that are not sustainable and also will not be compatible with the future need of the residents. So, at this point, where we need to hold, think and start again with new plans and implementation strategies. This study was carried out to determine Dhaka's housing development pattern and to detect differences between Dhaka's housing developments and those of other industrialized countries. In this research, 3 local housings & 2 international decent housings have been studied and compared. Dhaka's housing settlements are lagging in many areas. The research identified those lacking where we need to focus. Desires of people from their society should be the prime concern for the planners. For our economic interest, we always focus on economic sustainability. Whereas social sustainability should be our main concern. This issue has also been highlighted in this research. The user group and some experts have been interrogated to know their views towards housing patterns of Dhaka. A desire list has been generated to list the expectations of dwellers from their housing. This research ends up with some suggestions to get socially sustainable housing.

1. Introduction

1.1 Background:

Dhaka is under immense strain as a result of the flood of migrants. The existing infrastructure facilities constructed in Dhaka megacity are incapable of meeting the mega-sized population's basic needs. Dhaka is plagued by a slew of urban issues.

1.2 Aim of the Research

- The purpose of this study is to look at the current state of Dhaka's housing pattern.
- To study some international good housing projects.
- To compare the situation of the housing projects of Dhaka with other countries' residential projects.

1.3 Research Objective

- To conduct extensive study on the social, environmental, and economic contexts of Dhaka's urbanization and human settlement.
- To identify the core causes of urban issues that citizens face (such as noise, congestion, pollution, a lack of essential amenities, and so on).
- To conduct a depth analysis of progressing trends of housing settlement.
- To determine methods to increase human settlement alternatives

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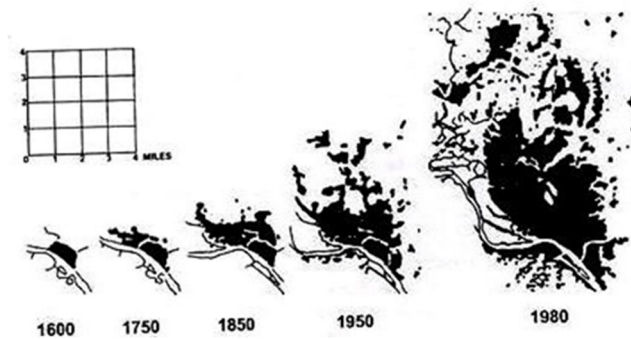


Figure 2.1- Dhaka's Urbanization
Source: Shankland Cox Partners and Others, 1981

2. Literature Review

2.1. Analyzing the Three Key Words:

- (A) **Human Settlement** – organized groupings of human habitation
- (B) **Dhaka** – a 400 years old city, Capital of Bangladesh
- (C) **Sustainability** – the point where development and environment meets.

2.1.1 Human Settlement:

In geography, statistics and archaeology, a settlement, locality or populated place is a community where people live. A settlement can range from a few clustered houses to major cities with surrounding urbanized areas. Settlements are defined as "a city, town, hamlet, or other agglomeration of dwellings where people live and work" in the field of geospatial predictive modeling. [8]

Settlement refers to organized human habitation. It can be a solo home or a busy metropolis. On basis of inhabitants' activity and available facilities, people often classify settlements as either urban or rural. Depending on density, settlements are classified as compact or dispersed.

2.1.2 DHAKA, context of the study:

History of Dhaka:

DHAKA, the capital of The country, was founded in 1608, and it is today a huge metropolitan city on the banks of the river Buriganga. Dhaka grew rapidly throughout its 400-year existence (Shown in Figure: 2.1). When this city was successively under Mughal and British authority, it was decorated with the honor of being the region's provincial capital. It was once recognized to be the city of mosques and rickshaws. It appears to be hectic these days,

with more automobiles on the roads and new structures springing up. People's hopes are depicted in paintings on buses and rickshaws, and the city is buzzing. [1]

Present Situation of Housing Pattern of Dhaka:

Dhaka has experienced the fastest population growth rate over the last decade, with 17 million people living in 1463.60 km². [1]

Dhaka has seen skyrocketing land prices, a massive slum population, abnormal traffic congestion, poor sanitation and drainage, and rising air pollution. The absence of an inclusive policy on urbanization aggravated all these problems [11].

As a result of the tremendous levels of environmental degradation, residents in Dhaka have continued to live in harsh conditions with a variety of life-threatening elements. [5]

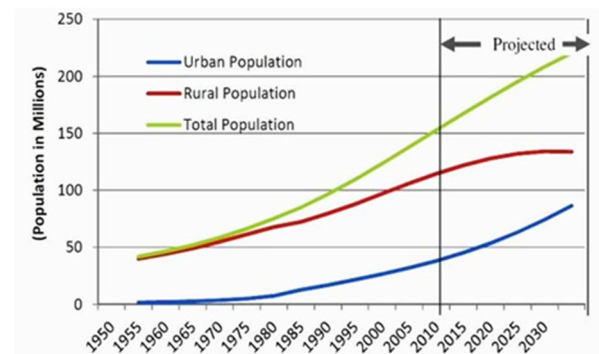


Figure 2.2- Population growth in Bangladesh
Source: United Nations, 2003

2.1.3 Sustainable Development:

Sustainability is the point where the environment (ecology and society) and development (economy) meets. So, while talking about sustainability, we should think about ecological, social and economic sustainability. The absence of any of these three can tend towards unsustainability.

The Brundtland Commission's widely used definition of sustainability elaborates:

- a. Development that fulfills current demands without jeopardizing future generations' capacity to satisfy their own.
- b. A reconciliation of environment and development resources for the society. [6]

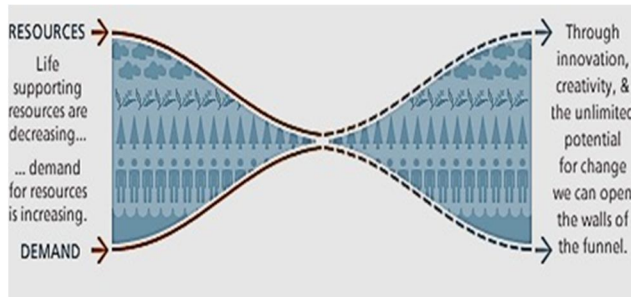


Figure 2.3- Opening the walls of the funnel
Source: <https://slideplayer.com/slide/14916424/>

Wheeler proposes a definition for sustainable urban development in his 1998 essay as "development that promotes the long-term social and ecological health of cities and towns." He goes on to describe a framework that may assist everyone better comprehend what a sustainable city would look like. These are some examples:

1. Compact, efficient land use;
2. Less car usage with improved access;
3. Efficient resource use, less pollution and waste;
4. Natural system restoration;
5. Adequate housing and living conditions;
6. A healthy social ecology;
7. Long-term economic viability;
8. Community engagement and involvement; and
9. Preservation of local culture and wisdom. [9]

Figure 2.3 depicts the current worldwide scenario. As the availability of basic life-sustaining resources declines, society's demand for such resources rises.

2.2 Some Concepts for Sustainable Housing:

2.2.1 Neighborhood:

The neighborhood unit was developed as a complete physical planning tool for constructing self-contained residential communities in order to foster a community-centric living "away from the noise of trains and out of sight of the smoke and ugliness of industrial facilities." [10]

Perry's Neighborhood Unit's guiding principles were as follows:

- a. The school should be located in the community such that a child's walk to school is no more than a quarter-mile and no more than a half-mile and may be accomplished without crossing a major arterial street. [2]
- b. Place arterial routes around the perimeter of the area to define and differentiate the "place" of the neighborhood and to avoid unwanted through-traffic. [2]
- c. Internal streets should be designed with a hierarchy that clearly divides local streets from arterial roadways, and curvilinear street design should be used for both safety and aesthetic reasons. [2]

d. Local retail districts should be restricted to the periphery. [2]

e. At least 10% of the neighborhood land area should be dedicated to parks and open space, offering opportunities for play and community engagement. [2]

2.2.2 MILU – Multifunctional Intensive Land Use:

Hong Kong is always looking for more space to create houses, workplaces, and recreational areas for its ever-growing population. Because to a lack of land, harsh geography, an expanding population, and a lack of time. Hong Kong's planners have little alternatives except to go vertical, and they have quickly constructed a tightly packed and mixed-use urban ecosystem crammed with closely built high-rise residences and workplaces whose heights astound the rest of the globe. But it's not simply the height that's impressive; it's also the density that's been created. [3]

The study covers four particular topics with MILU characteristics:

- More intense use of space, or more efficient use of space for the assigned function.
- Mixed-use space is one in which more than one function exists in the same place.
- Vertical utilization of space, both above and below ground level (the third dimension of space).
- The use of space in time (the fourth dimension of space). [3]

2.2.3. Woonerf:

It can be called a living street to enhance more pedestrian movement and minimum vehicular circulation. Shared space, traffic calming, and low-speed limits are examples of techniques. Motorized vehicles are not permitted in a woonerf or "recreation area". It is a good solution to ensure security in the internal streets of housing. Woonerf also increases the tranquility of housing. It enhances social relations as it creates recreational spaces.



Figure 2.4:- Woonerf

Source: <https://www.minnpost.com/the-line/2015/06/walk-woonerfs-rethinking-realm-bicyclists-pedestrians-and-cars/>

2.2.4. Land Reclamation:

- The concept of land reclamation is the acquisition of new land. It is frequently done around the seaside. It is also done in places like rivers and lakes. Typically, such regions are filled with sand, mud, and other materials by a natural process. [4]
- Reclamation of canals, rivers, and even parts of the sea using modern science and technology is an art form that allows us to tame nature and use the extra land for a variety of purposes, including the development of new residential areas, office buildings, schools and colleges, playgrounds, and parks. [4]
- Encroachment is unethical since it is done for personal gain and, more significantly, unlawfully and without regard for the harm it may bring to nature and the environment. [4]

3. Case Study:

3.1. Baily Square Officer's Quarter, Dhaka, Bangladesh:

This is a planned government housing project.

3.1.1. Strengths:

- Playground
- Prayer hall
- Club
- Children park
- Elementary school
- Self-electrical substation
- Water pump for water supply
- Sufficient Greenspace.
- Schools and Colleges at walking distance.

3.1.2. Flaws:

- The apartment size is too small
- Centrally placed playground divided the community into two parts.
- No shop nearby
- No welfare center
- No health care center
- The building capacity is not worthy enough as per the population density and land price of that area.
- The main road is adjacent to the site.

3.2 Dhupkhola Gandaria, Dhaka, Bangladesh:

It is a spontaneous development and an area from old Dhaka, so the essence of history is present there.

3.2.1 Strengths:

- Presence of the Dhupkhola playground is a strength of the area. It is a historical field and

very large in size compared to the other fields of Dhaka. Increasing the permeability of the field can encourage more people to use it.

- The water bodies are also a strength of the area. Water bodies can be turned into recreational spaces for the inhabitants of Dhupkhola. Removing the boundary around the water body can increase public access here.
- Shadhona Oushadhaloy and other Old structures make this area historically important.

3.2.2. Flaws:

- Girls cannot play in the field for the commercial development around the field like hardware shop, vehicle repairing garage, food vans etc.
- Very few of the total children in this area play at the field as the streets to come to the field is not safe enough for them.
- The only water body enclosed with grill.
- The water is dirty.
- Some buildings are built without any set back (See appendix 2).
- People throw plastic packets into the water which can pollute the water badly.
- Soil is filled from the corners of the water body; this can cause land encroachment.
- Increasing the market up to the 1st floor can make the field more impermeable.
- The old temples are not restored properly.
- As the drains are open, people throw waste there, which has blocked the drains.

3.3. Lake City Concord, Khilkhet, Dhaka, Bangladesh:

It is a private planned housing by Concord group.

3.3.1. Strengths:

- The high-rise buildings of Lake City Concord accommodate 4000 families in only 1.8 acres of land which is a desirable solution to support Dhaka's density.
- The housing supports its dwellers with an internal marketplace, mosque, junior school and playground.
- Shop for regular grocery is nearby.
- The buildings of Lake City Concord are made of blocks, which are more environmentally friendly than bricks.
- There are solar panels in the roofs which supports the electricity need of the inhabitants to some extent.
- The project has a future proposal of its own sewage treatment plants.

3.3.2 Flaws:

- Though this is called a planned township, after surveying the area some basic planning mistake is found, like the high-rise buildings are not maintained the minimum distance as per code.
- The playground is not adequate to support the necessity.
- There is no jogging track or park.
- No medical facility inside the housing.
- Buildings are very rigid, like solid concrete blocks, with no greenery inside the buildings to welcome nature inside.
- There is a vast amount of hard surface in the compound, which could be minimized with greens.
- The nearest bus stand is 3 kilometers from the housing.
- Some Buildings are orientated east-west, which is not appreciable as they will gain more heat and will be deprived of maximum south breeze.

3.4 Punggol breeze, Singapore:

This is a new town built by the Housing and Development Board (HDB) that now contains approximately 26,000 public housing units. Punggol's development will take time. Punggol will have 96,000 houses, making it one of Singapore's largest HDB towns.

They want to find and execute cost-effective and ecologically friendly urban solutions in order to realize Punggol's objective of being a waterfront eco-town for the

tropics. These solutions are divided into four categories:

- Energy
- Urban mobility
- Water resource and
- Waste management

An Even Greener Punggol

Punggol will have a "Green Heart" by integrating more green parks and green corridors with the waterfront promenades. In addition to improving the current Waterway, they will function as recreational areas for joggers and bikers.

Punggol Breeze also has a 7,000sqm common green that is covered with palm palms and willows and conjures a natural grasslands environment. Residents may take walks along the pedestrian routes and running track in addition to using the common facilities.

3.5 White Arkitekter's Copenhagen studio:

This was chosen as the winning design for 115 individual dwellings as part of a social housing project in Denmark's Allerød Municipality.

The initiative questions perceptions about inexpensive living while blurring the lines between public and private places.

To further blur the distinctions between public and private, each apartment has its own terrace that is enclosed on three sides, encouraging inhabitants to move their living rooms outside. Terraces can also be utilized as vegetable beds or as an outside meeting area. However, there are no barriers throughout the complex, providing the community an open and welcoming atmosphere. [7]



Figure 3.1- Images of Baily Square Officers' Quarter

Source: <http://dhakadailyphoto.blogspot.com/2006/12/govt-staff-colonies-from-late-40s-to.html>



Figure 3.2- Images of Dhupkhola
Source: <https://vymaps.com/BD/-59983/>



Figure 3.3- Images of Lake City Concord
Source: <https://www.localguidesconnect.com/t5/General-Discussion/Amazine-Nature-s-Fresh-Air-at-Lakecity-Concord/td-p/1909526> And
<https://www.daily-bangladesh.com/english/national/58062>



Figure 3.4- Images of Punngol Breeze, Singapore
Source: https://www.researchgate.net/figure/Example-of-a-large-scale-green-roof-development-in-Singapore-Source-Karlenzig-2015_fig2_330105284
And <https://foursquare.com/v/punngol-breeze-garden-terrace/4f9a48e0e4b03d83eb255c2b>



Figure 3.5- Images of Copenhagen Studio

Source: <https://blovstroed.dk/blog-nyheder/2017/8/14/ndret-lokalplanforslag-til-byggeriet-teglskoven>

4. Analysis:

4.1 Analysis of Key Informant's Information:

Views of Ar. Khandaker Md. Ansar Hossain: Town planner Khandaker Md. Ansar Hossain is a consultant of the Detailed Area Plan (DAP) and former general secretary of the Institute of Planners. As per him when human reside in a house it becomes his residence but housing is about belonging to that place. His definition of Housing is - „Housing is the spatial translation of emotions, culture, aspiration, values etc. of Human Community. Housing is a goal to fulfil the needs of community. The needs and values vary due to culture.

Then again, the desire of human being varies according to their age. If we want to Identify the desire of people

from their housing in detail, we can go for "Life time Approach" which is age- group wise sorting out the needs of people. To make Housing sustainable, we need to focus on the Society, the Environment and also on the Economy. In our loss profit based culture, we always focus on economic sustainability, but, whatever we are talking about is for Human being's welfare, so people's emotions should come to center and after that to fulfil their emotions Environmental and Economic sustainability is required.

4.2 Outcome of the Analysis:

4.2.1 List of Desires in “Life time Approach” is shown in Table 01.

Table 01-List of Desires in “Life time Approach”

AGE GROUP (years)	DESIRE	
	INDOOR	OUTDOOR
0-5	<ol style="list-style-type: none"> 1. Area to be fresh (toilet, diaper dumping, bath) 2. Playing zone 	<ol style="list-style-type: none"> 1. A safe play ground 2. Safe and Almost vehicle free internal streets 3. Nursery school
6-12	<ol style="list-style-type: none"> 3. Area to be fresh (toilet and bath) 4. Study Area 5. A place for entertainment (playing or watching television) 	<ol style="list-style-type: none"> 4. A safe play ground 5. Safe and Almost vehicle free internal streets 6. Junior school

13-20	6. Area to be fresh (toilet and bath) 7. Study Area 8. A place for entertainment (playing or watching television) 9. Place to gossip with friends	7. A park to walk and jogging 8. Safe streets for walking and cycling 9. A Super shop 10. A place for religious worship. 11. Physical fitness Centre. 12. Playground.
21-35	10. Space to prepare food 11. Area to be fresh (toilet and bath) 12. Study Area and work station 13. Place to gossip with friends	13. A park to walk and jogging 14. A super shop 15. A place for religious worship 16. Safe streets for walking and cycling
36-50	14. Space to prepare food 15. Area to be fresh (toilet, bath and ablution) 16. Study Area and work station 17. Place to gossip with friends 18. Prayer room 19. Elevator	20. A park to walk and jogging 21. A super shop 22. A place for religious worship 23. Safe streets for walking
50-65	24. Space to prepare food 25. Area to be fresh (toilet, bath and ablution) 26. Some 1 st Aid Facility 27. Place to gossip with friends 28. Prayer room 29. Elevator	23. A park to walk and jogging 24. A super shop 25. A place for religious worship 26. Safe streets for walking
65+	30. Area to be fresh (toilet, bath and ablution) 31. Some 1 st Aid Facility 32. Place to gossip with friends 33. Prayer room 34. An attendant 35. Elevator	27. A place for religious worship 28. Safe and Comfortable streets for walking 29. Health facility.
Common for All	36. A place to sleep 37. A place to Eat 38. Facility to clean and dry cloths 39. Utility facility (Water, Electricity, gas etc.) 40. Garbage dumping 41. Clean, germ free air 42. Proper ventilation 43. Clean water	30. A Community hall 31. A Clinic 32. Security 33. Greenery 34. Solar Panel 35. Substation 36. Water body 37. Buffer from noise 38. Nearby Vehicle Stand

5. Conclusion and Recommendations:

Dhaka City has been undergoing through rapid change. From here, if we look at the future of

Dhaka, we will find an unlivable city due to congestion, heavily polluted air, polluted water, noise & lack of utility. The discussed case studies can open our eyes towards how a housing project or area can be sustainable. Initiating

new planned projects and redesigning the previous projects in Dhaka can ease the problems which we are currently facing. To achieve the Sustainable Development goal of sustainable cities, following way can be followed:

- Safe internal streets or Woonerf (See appendix 1) to initiate.
- All the required daily facilities like grocery shop, field, park, jogging track, primary school, place for

worship etc. within housing premises.

- Access to all utility service equally and properly.
- Medical facility within the premises.
- Infrastructures with less energy consumption.
- Adequate amount of open space in housing
- Gain some more land within the city by proper land reclamation.
- Solar panel, rain water harvesting, reusing grey water for flush, maximum use of day light.
- Sufficient buffer from main road to reduce sound pollution.
- Insert greeneries as much as possible
- Proper drainage and sewerage system.
- Use technologies to reduce construction cost.
- To accommodate the huge number of population, Multifunctional Intensive Land Use (MILU) can be a proficient solution.

Appendices

- (1) **Woonerf:** It can be called a **living street**. It enhances more pedestrian movement and minimum vehicular movement. Shared space, traffic calming, and reduced speed restrictions are examples of techniques. Motorized driving is prohibited in a woonerf or "recreation area".
- (2) **Set-back:** A **setback** is the distance between a **building** or other structure and a roadway or road, a river or other stream, a beach or flood plain, or any other location regarded to require protection.

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