

How the High Population Density of Dhaka Should be Managed to Make the City More Sustainable?

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Introduction

Dominant urban agglomeration by administrative, economic and service sector in the capital Dhaka has resulted in a mono-centric development structure in Bangladesh. Dhaka, the capital of Bangladesh, has been ranked as the most densely populated urban area of the world according to Demographia in 2011. According to UN report titled "World Urbanisation Prospects: The 2014 Revision", Dhaka is the eleventh most populous city in the world with a current population of 1.7 crore and would become the 6th most crowded city by 2030 with a population of over 2.7 crore. Present population density of megacity Dhaka is approximately 8573 persons per sq. km. and the growth rate of Dhaka city is 5% per annum (BBS, 2011).

Planning and development actions in Dhaka so far have received a little consideration to utilize the potential of the national capital as a centre for multi-faceted development (Kalam, 2009). Over time, the city has grown with a huge population amidst continuous lack of quality services in most aspects of city life, such as transportation and utilities, housing and community facilities, social and recreational amenities, administrative infrastructures, central business district (CBD), industrial facilities and business services, parks and open spaces, and so on due to the continuation of the unsustainable development activities of the city. Therefore it is an urgent necessity to manage the high population density of Dhaka immediately to make the city more sustainable through introducing various planning approaches.

Definition of Key Terms

❖ Sustainability

Sustainability: Sustainability has come from a global political process that has tried to bring together, simultaneously, the most powerful needs of our time:

- ⇒ The need for *economic development* to overcome poverty,
- ⇒ The need for *environmental protection* of air, water, soil and biodiversity upon which we all ultimately depend, and
- ⇒ The need for *social justice and cultural diversity* to enable local communities to express their values in solving these issues.

Thus when the issue of sustainability is referred it will be the simple idea that means the simultaneous achievement of social, economic and environmental sustainability.

❖ Sustainable City

Sustainable cities will be those which are dynamic, manage their limited resources efficiently and effectively, have good governance, respond well to shocks and other adversaries, innovate and adapt quickly to economic, social, cultural, environmental and physical change and upheaval (Roberts & Kanaley, 2006).



Figure 1: Pillars for Achieving Sustainability of Cities

Source: UN/DESA, Development Policy and Analysis Division

Sustainable Development

Sustainable urban development is thus a process that is ceaselessly dynamic and concerned with managing and responding to changing economic, environmental, governance and social pressures and circumstances. The World Commission on Environment and Development in 1987, defined sustainable development as, “Mankind have the ability to ensure a sustainable development, meaning that the present necessities are met without compromising the ability of future generations to meet their own needs”.

Dimensions of Sustainable Development

Sustainable development is not to be perceived as a permanent state or a static image, but rather as a continuing process that implies the integration of the three essential and inseparable aspects of development: the Environmental, Economic and Social dimension.

- **Environmental Sustainability**-Environmental Sustainability can be defined as the capacity to preserve over time the three basic functions of the environment: the resource supply function, the waste receiver function and that of direct usefulness. In other words, within a territory (area / region), environmental sustainability means the capacity to increase and bring up the value of the environment and its peculiarities, while assuring the protection and the renewal of natural resources and the environmental patrimony.
- **Economic Sustainability** – Economic Sustainability can be defined as the capacity of an economic system to generate a constant and improving growth of its economic indicators. In particular, the capacity to generate incomes and employment in order to sustain the populations. Within a territorial system, economic sustainability means the capability, through the most efficient mix of resources, to produce and maintain the highest added value, in order enhance the specificity of territorial products and services.
- **Social Sustainability** –Social Sustainability can be defined as the ability to guarantee welfare (security, health, education), equitably distributed among social classes and gender. Within a territory, Social Sustainability means the capacity of the different social actors (stakeholders), to interact efficiently, to aim towards the same goals, encouraged by the close interaction of the Institutions, at all levels.



Figure 2: The Interconnections among the Three Dimensions of Sustainable Development and the “Three E’s Balance Rule”

Density

The Oxford Dictionary defines density as the ‘closeness of substance, crowded state, and in physics, the ratio of mass to volume or by quantity of matter in unit of bulk’. In the spatial sciences, density is a measure of the concentration, grain, tightness of pattern, cluster or intensity of beings or substance within a defined space or territory.

Urban Density

Urban density is a term used in urban planning and urban design to refer to the number of people inhabiting a given urbanized area. Urban density is a term used to describe the dimensions of relationships between attributes of urban substance and being. Measurements of urban density provide important baseline information for monitoring and evaluating the performance of urban plans, sustainability targets and impacts of development on environmental, social and economic systems.

Population Density

Population density is a measurement of population per unit area or unit volume. Population density can be defined as the number of people living per unit of an area (e.g. per square mile); the number of people relative to the space occupied by them.

Relationship between Population Density & Sustainability

Table: Relationship Between Density and Sustainability

Sustainability Dimension	Built	Economic	Governance	Natural	Social
Demographic	Settlement	Incomes	Accountability	Consumption	Cohesion
Spatial	Form	Employment	Representation	Diversity	Ethnographies
Mass	Space	Investment	Democracy	Concentration	Community
Utility	Serviceability	Productivity	Rules/Values	Replenishment	Logistics
Time Space	Accessibility	Efficiency	Responsiveness	Resilience	Activity
Perceived	Habitability	Profitability	Accountability	Beauty	Wellbeing

Source: Robert, 2007

Way of Population Management for Sustainability in Dhaka

Dhaka, the capital of Bangladesh is experiencing rapid growth of its population density due to rapid urbanization and an influx of people from across the nation, making it one of the fastest growing metropolitan areas in the world. Therefore the high density population of the city should be properly managed by incorporating various planning approaches to ensure sustainable and long-term development of Dhaka city.

Way of Population Management for Social Sustainability in Dhaka

❖ Adequate Housing

Adequate and secured shelter is a basic human right, and is vital for the fulfilment of human aspirations. Yet a staggeringly large number of inhabitants in the metropolitan city of Dhaka do not have any shelter. The housing condition of Dhaka is truly miserable. This city contains more than 1.7 crore people of which only 15% have their own house. 18% people live in colonies, 13% live in slums and 34% live in rented houses and the left 20% is floating. Every year the population of Dhaka increases by 1 lakh 60 thousand but the housing increases by 10 thousands which is

1/16th of the demand only (Mowla and Afrin, 2008). The urban poor have not enough money to build their own shelter. But everyone wants to live at the centre of the city for his livelihood which resulted necessity of accommodation for the urban inhabitants. Therefore to ensure social sustainability for the densely populated inhabitants of Dhaka city the government should provide adequate housing especially to the middle income and lower income peoples.

❖ **Better Transportation**

The only mass transit mode in Dhaka City is bus and the service provided by bus is insufficient in terms of safety capacity, comfort and convenience. The transportation system of Dhaka City is predominantly road based and NMT (mainly rickshaws) has a substantial share. According to STP, 2004 about 51% of the total trips in Dhaka city are shared by non-motorized modes and motorized transport modes contribute to the rest 49% trips in Dhaka City. The environment of public transport in Dhaka City is characterized by traffic congestion and delays, inadequate traffic management, unaffordable and inaccessible public transport for majority of the people, high accident rates and increasing air pollution problems. Although the public transport sector of Dhaka city is beset with various problems but the city government should develop road based public transport, introducing various mass transit options and pedestrian friendly walking in the city by reducing car dependence to ensure sustainable transportation system for its highly dense population.

❖ **Basic Utility Service Access**

Dhaka has experienced rapid urbanization in recent decades. One of the notable features of Bangladesh's urbanization is that there is an overwhelming primacy of Dhaka city that alone accommodates 27.7% of urban population and hosts a quarter of economic activities (Islam and Khan 2012). This has led to rapid increase in demand for city's infrastructure and basic utility service provisions like water supply and sanitation, waste management, electricity, etc. in the city.

Bangladesh has made remarkable stride in increasing the share of its population with access to basic water supply and sanitation services. In Dhaka city per day water demand is 2240 million litre and water supply capacity of the responsible authority DWASA is 2150 million litre (DWASA,2011). Therefore to ensure social sustainability regarding the water supply access the highly dense population of Dhaka city should be provided with adequate water supply through using both surface and ground water sources. Given the rapid rise in urban population both in slum and non-slum areas of Dhaka city, generation of waste materials are also on the rise. The megacity generates around 3000 to 4000 tons solid waste everyday, of which 40-50 percent is disposed in the landfills and the rest left unattended and locally dumped. In Dhaka city it is estimated that 14% to 17% of the total municipal budget is used for solid waste management which is approximately Tk. 26 (\$0.35) per capita per year (Islam and Khan, 2013). Therefore proper waste management system as well as waste or refuse recycle and reuse approach should be taken by the city government to ensure social sustainability for its high density population. As Bangladesh economy is growing steadily for the past two decades, there is a concomitant rise in demand

for electricity. However, owing to mismatch between generation capacity and actual generation of electricity as well as growing demand for power, consumers face load shedding (power cut) on a routine basis. Therefore to ensure social sustainability the highly dense populations of the city should be provided with adequate electricity access through introducing alternative energy source integration in the power sector.

Way of Population Management for Economic Sustainability in Dhaka

❖ Decent Employment

Dhaka being the capital plays a central role in the Bangladesh economy. In recent decades, Dhaka has been experiencing an influx of people from across the nation, making it one of the fastest growing metropolitan areas in the world with a high population density. People from across the nation comes Dhaka for searching their livelihood because the capital city offers diversified employment opportunities for different class people. Therefore to attain economic sustainability of Dhaka city, the workers or employees of various sector should be provided with safe and decent conditions of work, safe and hygienic living conditions, and safe transport between the workplace and their accommodation, etc.

Way of Population Management for Environmental Sustainability in Dhaka

❖ Wetland Conservation

Wetland constitute a major part of ecological sensitivity and are vital for preventing urban flood and groundwater recharge. But wetlands around Dhaka city alike have long been ruthless prey to encroachment and pollution. The annual rate of loss of wetland in Dhaka during the period 1989-1999 was 1.23%; whereas the annual rate of loss was 5.67% over the period 1999-2003 (Nilufar and Shahjahan, 2006). However in Dhaka city there is 19.3% of wetland is still left (The Daily Star, 2006). But the remaining percentage of wetland that is left is gradually filled by illegal encroachment. Therefore the city government should take necessary steps in protecting the wetlands around Dhaka city to ensure environmental sustainability for the city's high population.

❖ Reviving the Rivers & Canals In & Around Dhaka City

Dhaka city is surrounded by the distributaries of the two major rivers i.e. the Brahmaputra and the Meghna. The surrounding rivers are Buriganga in the south, Turag in the west, Tongi khal in the north, and Balu in the east. Canals in and around the Dhaka city are used as the connecting channels of rivers surrounded by the greater Dhaka district. Even now whatever is left of the canals is used as the primary drainage system for Dhaka. But most of these canals have vanished due to a variety of reasons: unplanned urbanization, encroachment, dumping of solid wastes, lack of co-ordination between the government agencies and lack of maintenance to the system. The few canals which are left are on the verge of extinction as they have lost their flow, blocked by either roads or unauthorized structures. Therefore the rivers and canals in and around Dhaka city should be revived and preserved to ensure environmental sustainability for the high population of Dhaka city.

❖ **Open Space Management**

One of the major components of urban environment is its open spaces. At present there are about 54 registered parks and 11 playgrounds in Dhaka city under the Dhaka North & South City Corporation. But these parks and open spaces makes up only an average of 14.5% of total land area whereas any city requires 25% for fresh environment and to maintain a sustainable land ecosystem (The Daily Star,2004). However most of the existing parks and playgrounds in Dhaka city are beset with various problem for want of proper management and people are deprived of its facilities (Rahman and Sajib, 2013). According to World Health Organization (WHO) there should be 9 sq. meter green space per city dweller for ensuring better life. FAO (2008) pointed out that Dhaka city has 21.57% open space of which city parks occupy 0.89%, urban forestry 0.02%, gardens 0.90% and 12.12% belongs to agriculture. The green space has been reducing gradually while increasing is the number of buildings without considering environmental protection. As we know, parks and open spaces act as the city's lungs. Therefore to ensure environmental sustainability in Dhaka city for its high population, the city government should take necessary steps to manage the existing open spaces of the city and stop its illegal encroachment.

❖ **Air Pollution Control**

Dhaka is one of the fastest growing megacities in the world with a high population density. The air of Dhaka City is regularly being polluted by motor vehicle emissions, small industries, dumping of solid waste, brick burning and tanneries. As per the guidelines of the World Health Organization, the maximum allowable airborne particulate matter is 150 microgram per cubic meter. But according to the Department of Environment, the density of airborne particulate matter reaches 463 microgram per cubic meter during dry season in Dhaka. Frequent exposure to high level of air pollution is causing serious damage to the health of its densely populated inhabitants. Therefore to ensure environmental sustainability for the high population density of Dhaka city urgent measures like air pollution source control, enforcement of regulations, etc. should be taken to reduce the level of air pollution in the city.

Ten (10) Ways to Improve Dhaka As A Sustainable City

Plan for Long-Term Growth and Renewal –A highly dense city like Dhaka usually does not have much choice but to make efficient use of every square inch of its scarce land. Therefore, a combination of long-term planning, responsive land policies, development control and good design should be enabled in Dhaka city to have dense developments that do not feel overly crowded, and, in fact, are both functional and aesthetically pleasing.

Embrace Diversity, Foster Inclusiveness – There is a need to ensure that diversity is not divisive, particularly in a densely populated city like Dhaka where people live in close proximity to one another. Diversity of work in Dhaka should be focused on creating a sense of inclusiveness through encouraging greater interaction.

Draw Nature Closer to People – Blending nature into the city helps soften the hard edges of a highly built up cityscape and provides the city dwellers pockets of respite from the bustle of urban life. By adopting a strategy of pervasive greenery and by transforming the parks and water bodies into lifestyle spaces for community activities, development of Dhaka city should integrate nature with its dense developments, which will not only make the city aesthetically pleasing, but also will improve the air quality and mitigates heat from the tropical sun.

Develop Affordable, Mixed-Use Neighbourhoods – The ease of living in a compact neighbourhood that is relatively self-contained can add to the pleasure of city living. With density, it becomes more cost effective to provide common amenities. Neighbourhoods of Dhaka city should be mixed with public and private developments which will serve a full range of facilities that are easy to access and generally affordable.

Make Public Spaces Work Harder – Often, parcels of land that adjoin or surround the city’s infrastructure are dormant, empty spaces. In Dhaka city such spaces should be sought to maximize the potential of these spaces by unlocking them for commercial and leisure activities. The idea is to make all space, including infrastructural spaces, serve multiple uses and users.

Prioritise Green Transport and Building Options – An overall reduction in energy consumption and car dependence should be added to city sustainability. Development of Dhaka city should adopt a resource-conscious growth strategy that relies on planning, design and the use of low-energy environmental systems for its buildings. It should also develop an efficient public transport system and well-connected walkways to give city dwellers transport alternatives to driving.

Relieve Density with Variety and Add Green Boundaries – A high-density city need not be all about closely packed high-rise buildings. In Dhaka city high-rise buildings should be interspersed with low-rise buildings to create a skyline with more character and reducing the sense of being in a crowded space.

Activate Spaces for Greater Safety – Having a sense of safety and security is an important quality-of-life factor. In Dhaka city the designs of housing estates should be modified to improve the “visual access” to spaces so that the community can collectively be the “eyes on the street,” helping to keep neighbourhoods safe.

Promote Innovative and Non-Conventional Solutions – As Dhaka city is getting more populated and built up day by day, it starts facing constraints on land and resources, and has to often look at non-traditional solutions to get around the challenges.

Forge “3P” (People, Public, Private) Partnerships – The city government of Dhaka city (North & South City Corporation) and all stakeholders need to work together to ensure the quality of life for its dwellers. Through launching partnerships with various stakeholders the city government would perform social and economic activity in a coordinated and sustainable manner.

Conclusion

Dhaka with its huge population has the potential to be a sustainable global city and should exercise its potential. To support its mission to become a sustainable city, the authorities at the national, regional and local levels must address Dhaka's planning needs for achieving quality development in and around the city through ensuring social, economic and environmental sustainability. As capital city of the world's eighth largest country, Dhaka must ensure planned development in both physical and socio-economic terms by managing its highly dense population. Professionals in the field of city planning have a lot to do in respect of Dhaka's planned development in guiding the sustainable development of the city.

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