

How sustainable are high-rises in Dhaka?

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THE journey of high-rise started in Chicago, the city of Sullivan and Wright, about a century ago. Sustainability of high-rise buildings is now more talked about along with other unresolved factors – for example Ken Yeang's bio-climatic high-rise for tropical climate. Scarcity and high cost of land and commercial pressure are obstacles to sustain developments in the major cities throughout the globe, truer particularly for this region with several large high-density agglomerations expanding vertically.

Dhaka, the tenth largest city on the world, faces an acute land crisis due to the growing activities, topographical constraints, and lack of management. However, the apparent scarcity is due to 'political reasons' than 'technical' as more people could be provided within the present conurbation with proper planning and infrastructure development. Densification by going high has been taken as the only way of closing the gap between the demand and supply of land. This, based on little evidences, has been taking place with no need to planning guidelines, development control rule and construction and operational management, and hence would be unsustainable in the long run.

Concerns for regulating the high-rises in the city apprehending the threat to the lives of even the non-users are on rise. A "High-rise Building Construction Code" is going to be adopted. Another "National Building Construction Code" for general buildings is also in the pipeline. The first one used Floor Area Ratio to protect the physical environment of the city by maintaining needed open spaces, and included adequate provisions for car parking, fire precaution and electro-mechanical services and utilities. After its enforcement, all buildings will have to seek re-approval to enable RAJUK to make a high-rise building database.

Dhaka has largely experienced an un-controlled growth. A weak Master Plan on questionable basis, unable to control and guide developments after the independence, was out-paced. The 1981 Programme was never adopted. The city was without any 'Plan' during two decades of the most volatile urbanisation and diversification period. Even most of the 1995-2015 Structure Plan recommendations are not implemented, and rampant violations are affecting the environmental aspects most, threatening the sustainability of all present and future developments. None of the Area Plans as integral part of the Plan has yet been done, and thus the enforcement by one of the most corrupt systems in the world has become difficult. Studies on flood or

transport provided guidelines for sustainable developments of the city's infrastructure, service and environment. Partly implemented, these recognised the link between the land use and transport that yet remained disintegrated.

But profit-motivated growth of high-rises irrespective of the location or availability of required amenities and services is transforming the city into a concrete jungle eating up the environmental resources. Vertical expansion lacking adequate access or frontage adversely affects transportation system. Planning principles, standard and provisions of roads and parking capacity were ill considered at various parts of the city. Indiscriminate conversion of residential buildings to commercial uses, often high-rises, led to an unbalanced use pattern that deteriorated environmental quality. The authorities are envisioning flyovers and multilevel parking, which can only bring temporary respite. High-rises generate large traffic creating congestion. The unplanned shopping centres hinder traffic and reduce road capacities by occupying the right of way.

High-rise building warrants special construction to withstand earthquake, wind, etc. Many of these in Dhaka lack earthquake measures; about 90 per cent are vulnerable to earthquakes measuring above 7 on the Richter scale; 50 per cent would be destroyed if the magnitude is above 6; all would be destroyed if the quake measures 8+. Of Dhaka's buildings, 65 per cent are of non-durable construction; more than 50 percent use flammable materials. Also inaccessibility of many roads increases the vulnerability. The authority responsible for permitting developments in Dhaka is unaware of the number of threatened buildings. The City Corporation is responsible for the maintenance and thus also for identifying vulnerability. A perennial lack of integration and cooperation between the public bodies kept the above unresolved.

The changes in land-use, activity pattern, population density and built environment were rarely shaped by these agencies. This encouraged the mal-practice in high-rise developments, many of which did not follow the approved plans, height restrictions, setback, structural need, lighting, ventilation parking, safety and security after and during construction, earthquake protection, utilities and accessibility requirements to make them efficient, comfortable and risk-free.

Ways to low energy consumption in architecture are use of appropriate materials and components, supplier economics and design. The designs are not responsive to the requirements of a hot-humid climate where the



desired comfort could be achieved through orientation, shading devices, fenestration, etc. Dependence on artificial lighting and ventilation is common in all high-rises. Increases in hard surfaces in the new developments adds to energy consumption; power shortage means more use of fossil fuel. Ill ventilation and lighting and over-consumption of power contribute to phenomena like acid rain, green house effect, destruction of biodiversity, over consumption of non-renewable resources, etc.

Office designs have become more standardised bringing space and cost economisation and awareness that the use of cheap materials does not always bring economy. Flat slab construction brought flexibility and lucidity. Yet, high-rises maximizing the floor area became non-contextual boxes. Glamour and global promotion of imported technologies and materials are threatening the local labour and material market. All efforts were concentrated on the facade only; borrowed motifs and elements without functional and contextual relevance created absurd architectural expression, facades were unrelated to the functions and the inherent purpose of elements used. The decadent

architectural expression of commercial buildings was dominated by superficial un-aesthetic un-functional elements. Shading devices were used without exploiting their potential.

Sustainable development is the balance between environment friendliness, economic viability and

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social acceptability that meet the needs of the present without compromising the ability of future generations to meet their own needs. Its principles of equity, welfare and futurity consider all strata and welfare of the society including the women, children, disabled etc. instead of being driven by financial benefit only. The environment must not be affected by the development that should be designed to reduce the consumption of non-renewable resources to ensure safety from its negative impacts. The indifference in design to indigenous values in the form of social and human needs and cultural aspirations is unfair to posterity who has to pay for it.

The scale and harmony, view, sun, natural lighting, living quality, hygiene, technique, fire safety, technical and energy installations, crime users' psychology, privacy, plot coverage, open space, density, cost-return, circulation, context, culture, climate, materials, technology, labour, etc. should be duly considered in the design and construction of high-rise buildings, and site selection, building orientation, energy consumption, material selection, indoor environment, water consumption, construction method, and life cycle costing for environmental sustainability. 'Intelligent Building Design' has progressed further through

various mechanisms factor – disabled ramp, voice lift, coded switch for the blinds etc. Basic justifications for the bioclimatic approach are comfort and low energy. Solar panel, natural ventilation, green areas, natural lighting etc. can reduce the use of fossil fuel. Today architects are beginning to share the concern for an ecological architecture created within realistic, economic market conditions. Post-modernism has exposed its volatile nature by unrestrained use of architectural symbolism, frivolous multiplication of surface area of the built envelope, prodigious use of unnecessary building materials, indifference to engineering economy, extravagant use of land, and irrational subservience to whim and history instead of the allocation and restriction of excessive consumption of energy resources.

Development is supposed to ensure the welfare of the society as a whole. Economic benefit must be prioritised rather than mere profit alone. It has rather created a vast social disparity where pockets of wealth co-exist with slums. The symbolic, economic and functional values of building height are motivated by the urge to demonstrate social or economic power, to profit from maximum utilisation, and the ambition to create a

monument with both positive and negative impacts. Dhaka is transforming like other world cities by adopting international style to attract investors' confidence, develop new economic order, and present a corporate look. This is often fraught with counter-productive infatuations that ask for the elements without understanding their contextual validity.

Thus the cities eroded cultural identity to look identical in catching up with 'modernity'. These became victims of sweeping globalisation and lost much of the local image. This resulted in a loss of identity and separation between the past and present, as well as concern for their future. Nevertheless, deeply rooted values of society that lie in the past must not be forgotten. While modernity and progress are desirable, humankind has different civilizations, climates languages religions and environments that should be retained and respected. The reinterpreted local architectural elements in a contemporary language blending modern architecture and local historical forms are more relevant now. Indifference to honouring indigenous values in the form of social and human needs and cultural aspirations in design will be unfair to posterity paying for it.

In the globalisation era, it is imperative that we reduce travel needs with the aid of modern inventions in communication technology – many businesses can be run mostly from home. Integration with local and global network can avoid congestion or vertical expansion in the CBD areas. Mass transport and integrated cyber network can decentralise the land-use activities, starting with the government institutions and implementing the 'smart growth' of urban planning and management. The following are a few basic suggestions to make the high-rise

development in Dhaka more sustainable:

- λ Develop contextual (use indigenous spatial arrangement, manpower, local material and technology, consider local climatic factors etc) high-rise buildings;
- λ Enforce integration between land use and transport planning;
- λ Review the master plan (redistribution of land use, zoning, height restriction);
- λ Decentralise administrative functions (begin with the government institutions);
- λ Encourage low density (aided by communication technology) commercial hub, decentralised economic activities;
- λ Reduce natural resource consumption (preserve fossil fuel, use eco-friendly and mass transport, introduce pedestrian and peddlers network);
- λ Empower the public bodies (planning agencies), ensure implementation and enforcement; Maintain and revise development control rule, introduce other instruments;
- λ Observe the structural and environmental standard and codes in design and construction without exception;
- λ Introduce institutional specialisation/training for architects, engineers, planners and other stakeholders (developers, city officials) on high-rise plan, design and construction.

Coordinated Urban Land Use Management and Transport Demand Management methods could integrate land use and transport to solve the problems of haphazard growth.

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