Urban Dynamics: An undervalued issue for water logging disaster risk management in case of Dhaka city, Bangladesh

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Abstract

An accelerated wave of urbanization and the rapid population growth are brutally transmuting the urban fabric of Dhaka city, Bangladesh. These rampant growth combined with climatic changes are triggering an increase in vulnerability of communities to hazardous events like flood, earthquake, fire hazards, water logging. In recent years water logging has become an increasingly prevailing burden for the city dwellers and is creating adverse social, physical, economic and environmental consequences by disruption of regular life, traffic paralysis, infrastructure damage, destruction of flora and fauna. Once long awaited monsoon now has become a nightmare of facing extensive water logging during the months from May to October (monsoon). Dhaka’s water web, which was once integrated into the city’s fabric as warp and woof had a major contribution in its drainage capacity. But due to unplanned growth and water body encroachment, the water bodies are rapidly disappearing and impermeable surface are increasing. Different development agencies and government organizations are working on this issue but incorporation of urban and landscape design to solve water logging of Dhaka is often ignored or overlooked. Current consideration primarily focuses on functional and operational aspects of the municipal infrastructure. Even if urban designers and landscape architects are incorporated in such projects, their contributions are mostly limited to the beautification without considering an integrated municipal network of rivers and their respective impacts. This underutilization of the respective professional intervention results in increased water logging disaster and pluvial flooding that is inundated for several days. The study attempts to explore the causes influencing the water logging disaster in Dhaka and understand its impacts on quality of life in order to utilize the scope of urban and landscape design at its fullest capacity to water logging disaster risk reduction as well as increase the quality life for city dwellers. Lastly, the paper recommends various scopes for inclusion of urban design-demonstrated framework such as revival and preservation of water bodies, introduction of rain garden, designing permeable and semi-permeable ground surface etc. to alleviate the risk.

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1. Introduction

Dhaka, as a capital of lower-middle income country, is failing to cope with the inexorable urbanization and population growth. Unplanned urbanization, land development through filling, encroachment of water bodies and lack of maintenance are changing the ecological balance of the city. As a result, the city is facing frequent natural and man-made disasters. Inhabitants of Dhaka are paying the price of rampant unplanned urbanization in form of insufficient coverage and delivery of urban facilities like water supply, garbage disposal and proper drainage. Water logging in Dhaka is one of the adverse evidences of unplanned urbanization which is getting hilarious day by day. In Dhaka Metropolitan area, basically two types of flooding are observed: river flooding and pluvial flooding. This study focuses on the pluvial flooding or water logging which is induced by high intensity rainfall runoff in the urban area. [1] Extensive impervious surface, inadequate drainage channels, lack of drainage system maintenance and encroachment of wet lands and natural drainage system, reduce the runoff concentration period and increase the peak flow which cause severe water logging. This complex issue cannot be solved in blink of eyes. Various governmental organizations like WASA (Water and Sewerage authority) and DCC (Dhaka City Corporation) are taking initiatives to solve this problem, but presence of urban designers and landscape architects is negligible in such water logging management project. In this context re-development of Hatirjheel project implies a ray of hope for water logging problem. About 18.72 km² of backwater effect from the surrounding rivers.

2. Objective of the study

This paper tries to focus on improving the water logging situation of Dhaka city in both macro and micro scale depending on the study, consultation and primary information that have been collected. The expected outcomes are-

- To identify the reasons for Dhaka city’s water logging situation.
- To evaluate the impacts on people, society and the city for this water logging.
- To propose some opinions for potential urban and landscape design to improve the condition.

3. Methodology

This study involves qualitative research methodology as successful urban design requires the participants’ voice to be heard. Both primary and secondary data, collected from several sources are used for this study. Data collection includes making interviews and analysis of various visual methods such as images, maps, videos, etc. Images are collected from different newspaper articles to analyse and illustrate the water logging related hardships and losses. Sample case study has been taken to make clear understanding of obstacles and its effects on water logging. Maps are studied from related literatures to understand the inherent cause of water logging: the change of canal networks and wetland area over the period of time in Dhaka. Literature review has been done in all stages of analyzing and proposing design solutions. Expert opinion has been collected through informal interview; newspaper and media interviews have also been considered for analysis and conceptualization of the design solutions. These data has been presented in the form of interpretative maps, sections, conceptual sketches.

4. Limitations

Inadequate published literature and lack of data regarding previous and present drainage system of Dhaka, acted as a major drawback to analyse and enrich the study. In some cases, the study had to conduct based on photograph rather than numeric information to understand the situation.
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