

To flow, or to Fortify?

Water, Development, and Urbanism in Building a Deltaic Metropolis

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Abstract

More than half of the world's population live in urban areas, many of which are located in vulnerable regions along the edge of water. Water is the life-blood of these settlements, but, at the same time, poses a huge potential threat as the pace of urbanisation and climate change intensify. Historically, Dhaka (in Bangladesh) had a symbiotic relationship with water, but today this rapidly urbanising metropolis is facing critical everyday stresses from water, which are being compounded by the onset of climate change. Dhaka is one of the most densely populated urban centres in the world, with more than fifteen million people concentrated at the centre of the low-lying delta of the world's largest river system. Thus far scholarship on Dhaka has tended to promote a somewhat impressionistic conceptualisation of 'water urbanism' to explain the physical and socio-cultural history of the city. However, the cultural and administrative (institutional) histories of water management in the context of urban development, along with the complex plan-making processes that have shaped them, have not as yet been sufficiently explored so as to explain how Dhaka is increasingly failing to live sustainably with water.

How water was managed in the past informs both present and future practices. The aim of this research is to shed light on the changes and continuities in the urban design practices in relation to water in Dhaka, with a particular focus on the development agencies and actors involved between the colonial and contemporary era. To explain the transformation from traditional to modern water cultures, the project has sought to identify and interpret changes in lifestyle, modern mobility and infrastructure, and the scale of modern urban development.

Adopting a mixed methodology, comprised of interpretive historical research and case studies, the primary research was conducted in Dhaka. The research employs a range of tactics, including a questionnaire survey of local residents; semi-structured interviews with various agents in the realms of design, planning, and policy; and a documentary survey and analysis of relevant historical maps and archives.

The final thesis begins by examining the hydrological history of Dhaka and its larger context within the Bengal Delta, in order to discern the historical pattern of human settlement in the region, which has been influenced by the consequences of constantly shifting water courses. The discussion then considers the typical architectural responses to water at the urban scale, which

became features of Dhaka's evolving water culture in the modern era (between initial colonial urban development and the accelerating growth and expansion of the city in the early post-independence period). Interpretation of relevant archival evidence and documentation identifies a paradigm shift from flow to fortification over the course of these early modern developments, where the natural forces of floods and river-flows were ultimately controlled through the introduction of increasingly hard and instrumental engineered features. These features include cordon system embankments and box-culvert drainage works, which have radically altered the pattern of urbanisation in Dhaka in recent years.

In the current development scenario two opposing tendencies are evident. One is to construct new parcels of land suitable for development by filling up low-lying wetlands. The other involves reconstructing, or even creating new wetlands, to ensure drainage and capture additional value from retained water for aesthetic and recreational use, and even as infrastructure for transportation and mobility. Taking two examples of these respective tendencies, Bashundhara Township and Hatirjheel-Begunbari Integrated Development Project, as comparative case-studies, the later chapters of the thesis investigate the embedded factors of planning that give direction and shape to these opposing tendencies. By unravelling the planning process the thesis seeks to explain the deep-rooted logic and influences upon such urban developments, which may not otherwise be self-evident. The interview findings explain how development agencies and actors who are part of the development system comprehend water in design. In contrast, the questionnaire survey reveals how differently people who live in the two developments relate to water today in comparison to the water culture of previous centuries.

The research underscores the need to rethink Dhaka's water urbanism and water culture, if it hopes to sustain further urban development. Questioning the sustainability of both passive traditional approaches and invasive modern engineering, the research indicates that a more flexible approach to urban water management, amenable to both flow and fortification, may be a more realistic and effective strategy.

The research addresses a gap in previous scholarship on the history of architecture and urban development in South Asia. With a particular focus on the planning process, it explains how the development agencies and actors operating in a changing political context, but deeply influenced by a technocratic mind-set that goes back to the colonial era, have sought to manage water in ways that have ultimately changed both the culture and the physical pattern of urban development.

This original research on Dhaka's urban history and culture, in relation to water, provides a platform for further research on related issues in the disciplines of Architecture and urban planning. It informs us about future policy and shows us how the future might be better framed, if water is kept in mind. Analysing the extreme case of Dhaka may provide lessons for the future development of cities in comparable situations.

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List of Acronyms and Abbreviations

ADB	Asian Development Bank
BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka (Bangladeshi currency)
BNBC	Bangladesh National Building Code
BUET	Bangladesh University of Engineering and Technology
BWDB	Bangladesh Water Developmental Board
CEGIS	Centre for Environmental and Geographic Information Services
CIA	Central Intelligence Agency
CUS	Centre for Urban Studies
DAP	Detail Area Plan
DCC	Dhaka City Corporation
DIFPP	Dhaka Integrated Flood Protection Project
DIT	Dhaka Improvement Trust
DMA	Dhaka Metropolitan Area
DMDP	Dhaka Metropolitan Development Plan
DNCC	Dhaka North City Corporation
DND	Dhaka Narayangong Demra
DoA	Department of Architecture

List of Acronyms and Abbreviations

DoE	Department of Environment
DSCC	Dhaka South City Corporation
DU	Dhaka University
DWSA	Dhaka Water Supply and Sewerage Authority
ECNEC	Executive Committee of the National Economic Council
EWDP	East West Development Properties
FAP	Flood Action Plan
GoB	Government of Bangladesh
GDP	Gross domestic production
GSB	Geological Survey Bangladesh
HDI	Human Development Index
GHG	Greenhouse gas
IDCOL	Infrastructural Development Company Limited
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IWFM	Institute of Water and Flood Management
IWM	Institute of Water Modelling
JICA	Japan International Cooperation Agency
LGED	Local Government Engineering Department
PWD	Public Works Department

RAJUK	Rajdhani Unnayan Kartripakkha (Capital City Development Authority)
REHAB	Real Estate & Housing Association of Bangladesh
SWO	Special Works Organization
TI	Town Improvement
UN	United Nations
UNB	United News of Bangladesh
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
WB	The World Bank

Declaration

I, Fahmid Ahmed, certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Fahmid Ahmed

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