To flow, or to Fortify?

Water, Development, and Urbanism in Building a Deltaic Metropolis

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Thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

School of Architecture and Built Environment

May 2017

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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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 Aria 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

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

Acknowledgement

This research is indebted to many people. First and foremost, my sincere appreciation goes to my principal supervisor Associate Professor Peter Scriver and my co-supervisor Professor Jon Kellett, who constantly and patiently guided me through this ambitious PhD project. I sincerely acknowledge their enthusiasm, immense knowledge, selfless gift of time and genuine care. Without them, I could not have undertaken this research. Their critical comments immensely helped to enrich this research. I also acknowledge the contribution of my former co-supervisor Dr. David Ness, who supported me during the initial phase of my PhD research with his feedback.

I would like to acknowledge the University of Adelaide for granting me the ASI scholarship for three and half years without which, it would have been impossible to study and live in Australia. In addition, I am grateful to the University for providing me with the Research Abroad Scholarship that enabled me to conduct the field studies in Dhaka. My special thanks to the Building Science Organisation USA for granting me the Jeffry Cook Travel Grant to participate and present my paper at PLEA 2015 in Bologna Italy. I am also grateful to the School of Architecture and Built Environment at The University of Adelaide for providing the annual post-graduate allowance for thesis editing, conference participation fees and other research support. I express my deepest gratitude to the Kathleen Lumley College for offering subsidised rental as well as for granting Harold Rhoda Scholarship in 2013 and Cowan Bursaries in 2013, 2014, 2015 and 2016 without which, it would have been impossible to stay at that wonderful residential college. Apart from that, I thankfully acknowledge Bangladesh University of Engineering and Technology for granting me the study leave to pursue this PhD.

This research has involved a large number of people along the way, too many to mention here. However, I would like to especially thank Prof. Dr. Farida Nilufar, Professor Dr. Roxana Hafiz, Prof. Dr. Ishrat Islam, Prof. Dr. Mujibur Rahman, Prof. Dr. Abu Syed Saeed M. Ahmed, Dr. K. Z. Hossain Taufique, Prof. Dr. Shayer Ghafur, Ar. Kazi Nasir, Ar. Ehsan Khan, Ar. Iqbal Habib, Dr. Mohammad Shakil Akther, Ar. Atiqur Rahman, Kazi Habib Ullah, M. Ashraf Ali Akhand, Md. Emdadul Islam and Prof. Dr. Sharif Uddin Ahmed who gave their time for deeper discussion around their expertise and experiences on urban issues in the context of Dhaka.

I am very grateful to my research assistants Ar. Soniha Nuzrat and Ar. Tazrin Islam who sincerely conducted the questionnaire survey for this research with their team. I sincerely thank the interview participants who gave their time for long interviews. I appreciate the contribution of all the respondents of my questionnaire survey. I also acknowledge Dr. Sakrapee Paisitkriangkrai, Ar. Ashraful Azad, Ar. Reza Shahbazi, Dr. Tahmina Ahsan and Shamim Azad for helping me at various stages of this research such as field survey support, data entry and SPSS analysis. My special thanks to Prof. Felix Patrikeeff and Allyson Sandham for all kinds of support during my stay at the Kathleen Lumley College. I also thankfully acknowledge my thesis editor David Onley for his professional service.

Many thanks to Dr. Katharine Bartsch, postgraduate coordinator and the staff of the School of Architecture and Built Environment, who provided support to my research needs: Prof. George Zillante, Asso. Prof. Veronica Soeberto, Dr. Amit Srivastava, Stella Ho, Alison Bosnakis, Ian Florance, Melissa Wilson and Velice Wennan. My special thanks to my colleagues and friends at the university, particularly Kinda Tabba, Dr. Jessica Huang, Dr. Lyrian Daniel, Dr. Tahmina Ahsan, Dr. Mizanur Rashid, Farjana Rahman, Carolyn Wigg, Pragathi Sridhar, Gillian Armstrong, Jade Ridell, Dr. Martin Freney, Dr Ruidong Chang, Isidoro Malaque, Armin Mehdipour, Martin Larbi, Zahra Ranjbari, Sareh Abooali, Mansoureh Rajabi, Athanasios Lazarou and Dr. Rehnuma Parveen for providing me amazing support.

My special thanks to my best and closest friends Syed Ahsan Sharif, Ar. Ashraful Azad, Dr. Sakrapee Paisitkriangkrai, Dr. Farhan Sirajul Karim and Syeda Nuzhat-E-Ibrat for their moral support throughout my PhD study.

Last but not the least, I would like to express my deepest appreciation and love for my family, to whom this thesis is dedicated: my parents Mohyuddin Ahmad and Jahan-Ara Ahmed, my brother Tanveer Ahmed and my dear wife Dr. Rehnuma Parveen for their sacrifices, tolerance, concern and moral support. Particularly, I would like to thank my wife for lovingly enduring my PhD anxiety. Thanks, I love you all a lot.