

Introduction

by

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Re-conceptualizing the Hydro Metropolis: New Modes of Urban Regeneration for Water Based Settlements

Urban Waterways: Evolving Paradigms for Hydro-based Urbanisms investigates the environmental, cultural, and economic future of cities on the water in the 21st century. Collected here are urban projects across the globe from 15 cities on 5 continents representing not only the complexities of urban life in the face of environmental concerns, global economic shifts, waste and energy management, and post-industrial legacies but also new thinking and practices that are emerging from a reconsideration of the value of hydro-based urbanism through a recalibration of our settlement patterns. Contexts range from coastal cities to cities associated with river, lake and wetlands ecologies and offer strategies from retrofitting and recovery to imagining new cities on the water. Although each of these urban projects proposes site specific responses that are locally relevant and respond to the city's distinctive landscapes, they are also linked through their reconceptualization of a land and water dialogue and in the manner in which they tap into the broader spectrum of what development in combination with water can encompass. In all cases, we find optimism and an opportunism that suggests alternative directions and visions for our urban futures.

By now it is clear that human activity is the dominant geologic agent and we can no longer easily draw a distinction between natural and human processes. Our urban forms and our urban artifacts are a hybridization of these processes; caught up in a complex process of cause and effect. Nowhere is this complex dynamic more evident than in coastal and fluvial cities where we often find a conflictual relationship between the needs of the metropolis- which is in search of developable land- and the facts of its hydro-environments and geological circumstances; and where, historically, the aquatic landscape is bent to human will transforming the balance between land and water, the very building blocks of ecology. The cities examined here have been chosen for their continuing relevance to debates about the relationship between urbanity and hydrology. The essays presented index some of the most viable strategies for contemporary hydro-urbanism utilizing water systems as the means to structure urbanity.

Over the next several decades, we will see a continued surge in urbanization and much of it will occur in coastal cities. Many of these coastal cities also have assets and population vulnerable to the impact of climate change. For many total retreat is not realistic. Instead, what is required are concrete and locally relevant proposals in

which the process of designing and the social impact of inaction are central. To accomplish this, *Resiliency and Coastal Cities* considers new forms of governance and policy making, ones that are open to creating alliances, dialogue and collaboration between the citizens and the various stakeholders involved in making cities—designers, administrators, politicians together with civic, cultural and community organizers—in order to share in an innovative transformation of their cities. In “Urban Reconstruction Lessons in Post-Sandy New York City”, Brown outlines the impact of the Post-Sandy Initiative, a collaborative effort of multiple disciplines—orchestrated by the Design for Risk and Reconstruction Committee (DfRR) of the AIA New York City—to advance urban resiliency of waterfront communities. As he describes it, the results of their efforts were far-reaching. City agencies were able to put into action initiatives such as emergency changes to zoning and building regulations and the initiative created a heightened awareness and activism by government, professionals and citizens to address the issues surrounding making coastal neighborhoods more resilient to vulnerabilities associated with the regions’ climate risks. The process and organizational models the DfRR shaped in the New York City region is a convincing paradigm for innovative governance and community investment into a collective resilient future. For coastal cities at risk, it is also critical to think differently about how to live with and among water. “Florida’s Future; New Modes for Our Coastal Communities” discusses a series of urban design proposals that frame the need address the future of the hydro-metropolis in terms of community infrastructures and neighborhoods ecologies by imagining new communities responsive to the future environmental conditions, establishing new patterns of connectivity and navigability, and identifying development opportunities to create urban densities and new urban cores. These projects imagine a series of scalable adaptation strategies that can be deployed to address the current concerns and latent opportunities for waterway cities.

In *Regenerating Waterfront Cities*, we find examples of how regeneration of urban waterfronts can become a driving force for social regeneration. Often former industrial zones or ports, these neglected urban edges can be infused with flows and mobility, activities and spaces for meeting, and so forth to revive the identity of the locality and to revisit the community’s relationship with the sea. The articles articulate the range of circumstances in the history of coastal urban development. Although each context is distinct in a number of ways, we find recurring themes of disconnection and separation, a common set of opportunities to reengage city with the coast, set against a variety of strategies for reconnection. “Environmental Design Criteria for a Maritime Landfill” explores the consequences of waterfront highway and maritime developments on the city of Florianopolis. Highways built along the water’s edge during an auto-obsessed era overwhelmed the shoreline and severed the rest of the city from the waterfront. Based on the success of places like Seoul and San Francisco, many cities around the world are looking at them as a way to reclaim valuable public space. Zapatel critiques the cultural notion of city as front and waterfront as back by proposing projects to interconnect the city to the sea and introduce a new visual and physical porosity between the two. Two port cities – Vladivostok, Russia and Koper, Slovenia – are also discussed in this section. In both places, displaced port operations

have opened up new opportunities for civic and cultural activities and have created a need to revisit accessibility between city fabric and waterfront. In “Triangulating”, Kohen establishes a series of triangular relations between the historic town of Koper and the Port of Koper including geographical conditions of water/city/country, the role of tourism in tourist/busses/receptivity, and finally, a stakeholder’s triad of port/municipality/academia. These triangular set of realities lead to a series of interlacing strategies such as pedestrian connectivity, transit modal separation, and enriched commercial opportunities. In “The Study of Interfaces as a Method for Urban Renewal” Zaballos carries out an integrated diagnosis of Vladivostok’s historical, cultural and physical-spatial context in order to establish possible urban policies, programs and projects that reflect the complexity of the city’s waterfront development. The resulting plan suggests design interventions for the social, economic, and environmental development of downtown Vladivostok and its waterfront. The author proposes areas of social interaction, new green zones, safety zones against the city’s vulnerabilities to environmental risks, promenades, and renewed heritage sites.

The fluvial cities studied in *Reconsidering Urban Rivers and Wetlands* are all reintegrating their rivers, deltas, lakes, and wetlands into the urban landscape, converting their various hydrological systems from an urban problem into a strategic instrument to address future development and urban concerns of mobility, health, recreation, and economic opportunities. In each case, there is a clear recognition not only that water played a critical role in the creation of their cities but also that the pressures of urbanization disturbed the equilibrium between human settlement and fluvial systems. In the history of human settlement, it was necessary to transcend the physical circumstances of development and water was seen as an element to capture and transform to the benefit of cities. Yet this is unsustainable in light of the rapid urbanization and increased densities of our urban environments. Two overarching solutions emerge in this chapter: the need to reconnect the fluvial networks to each other and the city and the necessity to reestablish the balance of coexistence between the hydro and human systems. Once upon a time, over 50 canals flowed through the capital of Bangladesh with water linked to the daily life of the city. In Wuhan Province China, the city was once filled with many lakes interconnected with miles of streams and river ways. In both cities, the progressive development of the urban environment severed the hydrological ecosystem as a system into isolated parts leading to a vulnerability to extreme flooding and excessive pollution. Yang Shu and Jiaming Qin document the process of reconstruction of Wuhan’s lake system in “Transforming Waterfront: from Urban Renewal to Resilient Development”. Beginning in 2007, the city’s waterfronts once again began to play an important role in the urban planning policy. The authors argue that as a case study, Wuhan demonstrates that an urban waterfront should be more correctly envisaged as a network of places, functions, additions and hinges between the city and its water environment. By reconstructing the urban water network and wetland systems throughout the city, the pollution problem was resolved, the waterway was rediscovered by the citizens, and the waterfront again became a place for social and cultural interaction as an integrated part of the urban fabric and

the life of the city. In “Symbiosis between Water and Architecture: Towards Hydro-based Urbanisms in Keraniganj, Dhaka”, Hossain’s research compliments the lessons of Wuhan by addressing the conflict between wetlands and residential development needs. The author points to the short term response of urban planners to the ever increasing flood events due to the continued encroachment of residential developments upon the wetlands as the city expands. Opposing the emphasis of pumps and ponds, he presents project based research proposing another approach that reconnects waterbodies, requires soft edges between natural and man-made lands, and limits the percentage of development in sensitive areas through a matrix of highland and lowland developments.

Mexico City sits upon an ancient lake system that was desiccated by the Spaniards to make way for the settlement. Now a metropolis of 22 million, the legacy of the radical transformation of its hydro-systems has left the city in need of drinking water, vulnerable to extreme flooding, and slowly sinking. “Mexico City: Redefining its Waterscape” is one of three essays in this chapter that propose important design methods that would encourage the coexistence of urbanization and water ecologies and that confront the social dimension of hydro-engineering. In the case of Mexico City, Castro and Labiaga propose a new way of urban development based on three interrelated systems: hydric, agricultural and open space. The Tlaltenco Water Connective Tissue (TWCT) incorporates this strategy and is a prototype response to urban growth on the edges of cities. The authors offer a sustainable alternative that requires development to adapt to both the urban and natural conditions while creating a programmed territory for the community and a water system treatment for the metropolis. In “Architecture, City and Nature: Opportunities for Environmentally Vulnerable Areas”, the authors address a global problem commonly associated with the modification of urban rivers and wetlands. Often the most economically vulnerable populations in cities live in the most environmentally vulnerable areas. In the case of La Plata, Argentina as the city expanded, the poorer communities created informal settlements in the floodplain along the banks of the river running through the city. The authors describe a project that begins with reshaping these existing communities through a physical and social integration of the area along the river. Their work can serve as a model for other cities to consider how solving the hydro-engineering and urban development legacies of the past can also create an opportunity for social justice and equity.

The final chapter Hydro Infrastructures explores the opportunities inherent in deploying infrastructural thinking as an agent for future urbanisms. Just as the great public works projects of the past were essential to economic and urban growth in the 20th century, we must revisit thinking large about infrastructure in our cities in the 21st century to confront our new urban and environmental reality. The three projects discussed propose innovative hydro-infrastructure that not only mitigate environmental concerns but also performs a productive civic and social function in envisioning a future of the metropolis set in a new relationship with the water. In the first essay, Parque Texcoco is presented by Inaki Echeverria in “Soft Infrastructure: Parque Texcoco “a 35,000 acre city-landscape-infrastructure that reclaims the ancient Texcoco Lake Basin in Mexico City and reimagines it as the largest urban park in the world. The project will not only solve the ecological problems created by eliminating

the long standing conflict between the city and the valley lake system but will also promote recreation activities and accommodate transportation networks and cultural facilities. Second, the Hidroanel Metropolitano de Sao Paulo, as discussed by Alexandre Delijaicov in “Sao Paulo, a fluvial metropolis. The Metropolitan Water Ring of Sao Paulo” is a 170 km network of navigable canals created by the rivers Tiete and Pinheiros, the reservoirs Billings and Taiacupeba with the addition of an artificial canal connecting these reservoirs. As in the case of the Mexico City Valley Basin, the urban waterway ring is intended to contribute to a macro urban drainage system but will also accommodate routes for passenger and cargo transportation, public places for tourism and recreation, and new civic amenities. While each expresses the importance of the environmental vulnerabilities of their city, it is most interesting to note that both proposals bring infrastructural thinking into the 21st century by incorporating a social purpose to the engineering endeavor. The cultural meaning of water in the building of cities and communities is explored in “Revering Water: Learning from Intelligent Tradition”. Manupure discusses the lessons that can be drawn from the traditions of India for contemporary urban water management. What appears vital to Manupure is public participation in management of natural resources such as water. India in particular has historically had a water supply issues due to the circumstances of geography and has developed a cultural of respect for the value of water. While recognizing that direct application of traditional water systems is not practical, key guidelines can be formulated for integration in contemporary water management systems drawn from a careful study of this respect of water that has been achieved over time through an integration of activities and everyday rituals into an experience of water systems incorporated into built form and spaces of various scales from city to building element. From social justice to civic participation, the future of great public works must reconsider how energy, waste and mobility can combine with urban life to create a resilient city.

Urban Waterways: Evolving Paradigms for Hydro-based Urbanisms is intended to provide new paradigms for the future of 21st century cities on the water. The essays collected represent not only the complexities of urban life but also new thinking and urban practices. The projects discussed also demonstrate how changes in use and multiple uses can allow hydro-environments to flourish when implemented and integrated with the urban fabric. Within each story, we see a series of recurring strategies that reflect a shifting attitude about development patterns in relationship to hydro-landscapes, ones that harnesses and the influence of natural components in the recovery of urban areas to improve urban health, the quality of life, a sense of belonging and urban equity. These are the attitudes that are fundamental in the regeneration of waterway cities.