Building Tokyo by the Sea. Visions, strategies and projects on the edge of the water 1950-2020

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Since the time it became the new de-facto capital of Japan with the name of Edo in early XVII century, modern Tokyo has kept a special relationship with its waterfronts and on several occasions the expansion of the city has been pursued by looking at the sea as potential new habitat for growth and development. At the dawn of 20th Century, and especially in the aftermath of the end of the Pacific War, bold architectural ideas and city planning schemes were proposed and enacted to convey a phase of unprecedented economic resurgence and urban sprawl articulated by an impressive process of infrastructure build-up and industrial modernization. Looking at the different stages of city development in the 70 years from 1950 to 2020s, the paper will shed light on several aspects of the process of urban development of the waterfronts of Tokyo during this period. It will provide a critical account of the transformation of the city and the various innovative visions, ideas and projects from the initial stage of economic boom of the 1960s and 1980s, to the end of the "Bubble" in the 1990s, and the phase of relative decline at the start of the New Millennium, until the current new phase of urban regeneration and new wave of large-scale urban development projects driven by new national ambitions in the context of the competition with other East Asian megacities.

Keywords: Tokyo, waterfront development, Asian urbanism, marine city, Japanese architecture

Introduction: Tokyo Waterfront as Avant-Garde

Water has been crucial for a city's foundation since ancient times. Historians like Frank Broeze have even depicted port cities as "Brides of the Sea,"[1] broadly highlighting the strict relation between the liquid bodies of rivers, canals, and seas and a society's cultural, economic, social, political, and technological development.

The presence of water has always propelled the birth and the growth of cities worldwide, later favouring intense interactions of goods and ideas, development of cultures and urban identities, also embodying strategic survival places for entire territories and nations. Facing the ancestral importance of the seminal threshold between waterfronts and port cities, between water, land and communities, many critics have recently underlined the renovated and recurrent relevance of water at the core of many current social and political issues.[2] Contemporary water threats—such as flooding, dryness, and sea/river level rise—reposition humans into a different perspective on the environment, with a "profound alteration of our relation to the world."[3] The ecological crisis forces an environmental ethic shift from anthropocentric (human-centred) to eco-centric (earth-centred)[4], urging different disciplines to focus on a new way of living with water.

This becomes crucial in Asian cities facing the Pacific, where increasing urbanisation imposes 2.1 billion people to live with high pressure on urban water resources.[5] In particular, in Japan, waterfront design has remained a crucial topic in the face of water threats, both in the past and nowadays. If in the 20th century, the pressure of the city on water became a central topic for urban experimentations in the Japanese capital, nowadays, the fear of the pressure of water on the territory seems to propel even more drastic and critical solutions. For example, the 400 km seawall recently built on the northern east coast to defend against tsunamis opens new questions on the dismissed social and ecological "porosity"[6] of the waterfront, which is instead an important contemporary feature for urban regeneration of port cities.

Faced with these urgency and contradictions, this paper prompts the importance of deepening our knowledge of Tokyo's historical development as a primary case study to rethink the urban relation with water also nowadays. The history of Tokyo Bay profoundly embodies the waterfront's design as an avant-garde of urban design and architectural thinking, which influenced architecture worldwide. Tokyo's bay became the place of radical experimentation and proposals for the expansion of the city and urbanisation of the sea, which had never been explored so far. The paper traces the history of Tokyo Bay—from its natural-sustainable "marriage" between the ancient urban structure of Edo and the canals to its more atomic-aged, technological, megastructural-utopian proposals by Metabolism's architects—allowing us to reflect upon the transformations of relations between society

and water, uncovering roots and pivotal references for future developments of our built environment on waterscapes.

Urban Traditions from Edo to Tokyo

Before being named “Tokyo” 東京 in 1863, the city was “Edo” 江戸, literally meaning "bay-entrance" or "estuary,” exemplifying the symbiotic relationship established between urban and nature. During this period, Edo was defined by scholars as the “city of water,” featuring a network of rivers and canals taking advantage of topographical elements, valleys and hills as they facilitated its early development. The relationship between water and the development of Edo is multilayered and rooted in socio-economic and spatial decisions through which the water’s infrastructure flourished over the years, along with urban expansion and human behaviors.
The urban configuration of Edo is based on duality: the 'upper city' and the 'lower city', on the hill and the city on the water, recognizing the topography as the generating element of urban and social space. It is thus originally divided into two parts, Yama-no-te 山の手 (the mountain hand) and Shita-machi 下町 (the lower city). The city's topography clearly shows socio-spatial organization and segregation, creating a clear link between social class and residential typologies in relationship to water, and topography. On one hand, the daimyō, the most relevant feudal lords, with the samurai were located in the higher topography, and their settlement typology was wider and organic. On the other hand, the traders and the proletariat lived in the lower topographical part, near the sea, characterized spatially by a narrow and dense urban grid [7]. Each social class corresponds to a predefined dialectic settlement typology: feudal owners dominated the topographically higher and western areas of Yamanote, although they occupied 3/4 of the urban surface in smaller numbers. The lower classes, the majority of the population, were concentrated in the lower city, the city of water, Shitamachi. These two urban structures are still recognizable in today’s Tokyo, a latent morphology that resiliently survives wars, fires, and deconstruction.
The water and the channels, now mostly undergrounded, characterized ancient Edo and served as transport routes, vital arteries for the economy, and mercantile activities. Edo was based on distributing goods and activities along waterways, such as the Sumida River, canals, and the bay. Subsequently, some of the most important stations, Shinbashi, Ryogoku, and Iidamachi, were built along the main canals. For this reason, on the edge of the bay, in general, warehouses and markets were concentrated on the quays where land and water met, which gave the “city of water” a palpably lively and congested image full of activities. Especially in the Shitamachi, the city of water and density where the largest number of inhabitants reside in the smallest available space, transportation and trade occurs. Here, both people and goods oriented their movements toward the waterfront, becoming the favorite subject of many artists, including Hiroshige Utagawa, and visible in the traditional paintings and vistas of Edo. This environment “truly provides a barometer for measuring the urban activities, from trade and distribution to recreation, proper to each area.” [8]

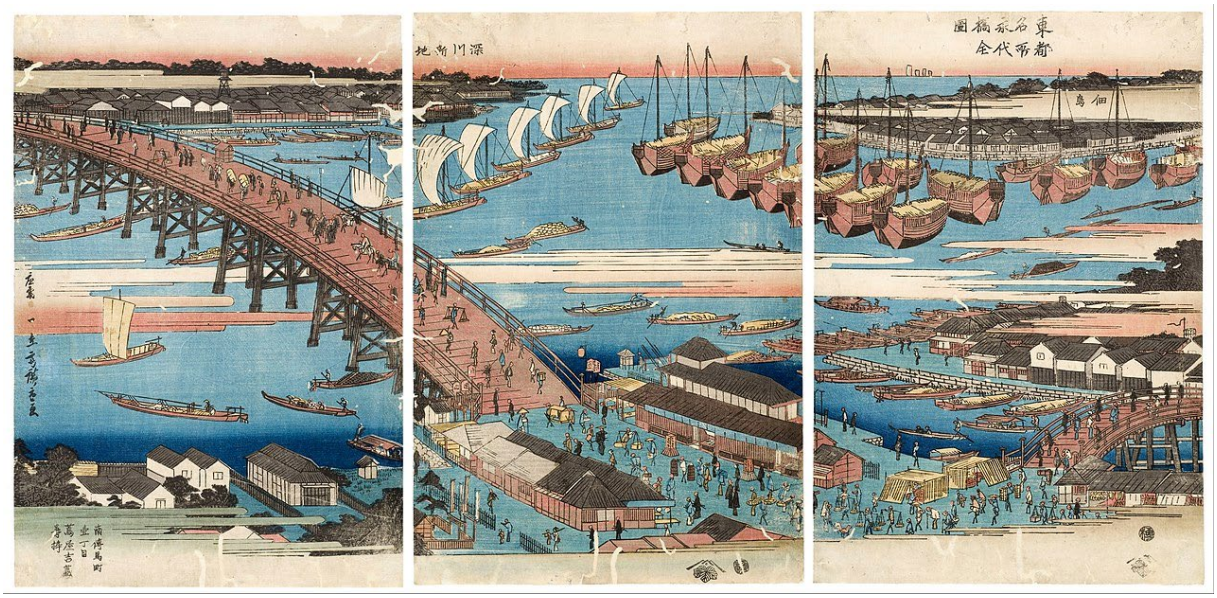

Figure 1 - View of Edo waterfront in middle of the 19th Century represented in a series of woodblocks prints (*ukiyo-e*) by Utagawa Hiroshige (1797-1858)

Another layer that arose from the city's connection to the water was the world of pleasures and entertainment. The Sumida River, in particular, was the cultural symbol of the floating world, with theaters, fireworks events, and houses where geishas resided were located. [9] The river, especially after dark, was Edo's most democratic public space, a “performative space, an “extraordinary” fiction where the populace gathered in search of a sense of

liberation, was thus associated with water and enveloped in an atmosphere that was both festival and emotive." [10] Thus, for some hours every day, social divisions between districts and classes were erased in a world of social interchange that escaped the control of government and military authority. Ultimately, the connection to water was not limited to living and livelihood but also to worship through various spiritual and cultural functions in religion, festivals, and theater.

The world of water gave rhythm to Edo's life, creating transportation networks, ensuring a reliable water and food supply, securing the strategic defense of Tokugawa's castle, and promoting the democratization of public spaces in a rigidly structured society. The case study of Shitamachi morphology is a concrete example of a mixed urban form with proximity between activities, architectures, inhabitants, and usages at the core of today's urban question. [11]

At the beginning of the 20th century, with the end of the isolation policy and the start of modernization, Japanese economic development changed the relationship between water and human habitat. During modernization, railroads needed to be constructed, but due to economic problems, the Japanese government could not purchase land. As a solution, they started to fill rivers and moats; therefore, river widths narrowed due to railroad construction, and moats were partly filled, but still, transportation by water was possible. [12] The second phase of the disappearance of rivers was at the end of World War II, which ultimately disrupted the ancestral relationship between the water environment of Edo and its inhabitants.

Postwar Tokyo and the Urban Growth 1945-1970s

Following the defeat in the WWII, and the consequent collapse of the economy, for five years Japanese cities languished in a state of despair and ruins. With the start of the Korean War and decision of the US military forces to utilize Japan as strategic ally against the common treat of the Communist expansion in the Far East, fresh capitals and substantial resources were poured in. During the 1950s many large-scale projects for the development of new industrial complexes and urban infrastructure were put in place to foster the rebirth of the economy and consolidate a process of urban reconstruction in all major Japanese cities. The fast economic recovery triggered a strong immigration process from the rural areas towards the main productive areas of Japan which were mostly located in the larger cities, especially the capital Tokyo. A fast rate of urban expansion and demographic growth resulted in the sprawl of the suburban fringes and the hyper densification of the core of the city capital, which became a haphazard, largely unregulated, and chaotic patchwork of industrial zones, residential areas, and extensive and intricated systems of mass transport and mobility infrastructures. In spite the accelerated and largely unplanned urban development, there were many early efforts to control the vigorous growth of Tokyo.

In 1956 the "National Capital Region Development Law" was approved with the intent to control the development of the whole Kanto Region (all the territory economically and functionally connected with the capital) up to a radius of 100 km from Tokyo Prefecture. The committee prepared the 'National Capital Region Development Plan' which was approved in 1958 with the goal to develop a constellation of new towns around the main metropolitan area but separated from the central urban. While this project, inspired by the 1943's Greater London Plan by P. Abercrombie, was proposed with the clear intention to contain the problem of traffic congestion and to limit further concentration of industrial plants and residential complexes through a policy of decentralization, other projects aimed instead at the creation of artificial land, for instance by filling in many of the ancient water canals built during the Edo Period and turning them into road arteries, or by expanding the waterfronts by land reclamation and proposing bolder visions for the future of the capital into the sea. Since 1958 Tokyo and Tokyo Bay became a huge urban laboratory for the development of radical urban ideas and experiments, which went on pair with innovative architectural and urban models proposed by a new generation of architects and planners which would echo the cultural and social changes of postwar Japan driven by its economic miracle.

It is certain that the Japanese government strongly encouraged the concentration of factories and industrial complexes in the Pacific Belt region to foster the efficiency gained from the agglomeration economies and achieve higher exports. Heavy and chemical industrialization, sophistication of the industrial structure and general strengthening of the foundation of industry became the goals of the "New Long-Run Economic Plan" promoted during the years 1958-1962. A large share of public investments for the construction of roads, ports, land reclamation, and railways development was concentrated along the Pacific Belt coasts, aiming at fostering the expansion of strategic industrial sectors such as steel, petrochemicals and shipbuilding production. The direct intervention of the State was pivotal in the development of integrated industrial complexes on extensive landfills on the waterfronts of the Pacific Belt region, providing large sites at low cost for the expanding factories. Pime minister Ikeda's "Double Income Plan" of 1960 became functional in achieving the rapid economic growth of Japan following massive public investments in social overhead capitals for the construction of roads, water supply and port installations in the main industrial areas of Tokyo, Osaka and Nagoya, contributing to the concentration of industries and activities especially in the area of Tokyo harbour. [13]

The provision of the new artificial land was achieved by adjusting and reclaiming the edges of the harbor to make room for the settlement of larger factories, gas plants, central markets, sewerage facilities and power houses which were progressively pushed out of the older part of the central city, forming extensive areas of "Kombinatos", clusters of industrial and residential complexes, along the waterfronts. In Tokyo Bay the amount of land reclamation during the period of so-called high economic growth (1956-1975) was 13.000 hectares, for a share of

27 % of the national total, and concentrated 44 % of all Petrochemical plants and 37 % of all Oil plants of Japan, making the capital the primary core of Japanese industrial economy.[14]
In the second half of the 1950s, as the national economy gained momentum, the requests for new lands to sustain the economic growth in Tokyo became more and more a priority. Apart from the need for new industrial facilities such as piers and chemical or cement plants, another important problem was the necessity to contrast the land speculation and the surge of land prices. In the April of 1958 the president of Japan Housing Corporation (JHC), Kuro Kano proposed the land filling of the North-East side of Tokyo Bay creating artificial land by means of atomic bombs blasts. Known as the "Kuro Kano Proposal", named after the JHC president who proposed the plan, this project was strongly criticized because it implied the radical destruction of the natural environment of the harbor, and it was doubtful that in the long run it could limit the congestion and the sprawl of Tokyo.
In this context new bold proposals for marine habitats based on urban prototypes built on artificial land took shape. The first to propose using offshore artificial islands for the design of marine cities were the architects Masato Otaka and Kiyonori Kikutake, both members of the avant-garde architectural movement Metabolist Group, whose manifesto of utopain megastractures for a new urbanism was presented at the Tokyo World Design Conference in May 1960. Otaka's "Neo-Tokyo Plan - City on the Sea", and Kikutake's "Marine City" represented the beginning of a completely new approach in the Japanese urban design and architecture envisioning and exploring especially the sea and cities waterfronts as potential areas for urban expansion. Their large-scale projects envisioned the extensive use of high density and super-rise residential buildings on reclaimed land or floating platforms in the sea as an alternative to traditional low-rise suburban development complexes built outside the fringes of the metropolitan centres, and, coherently with a general trend of the time, investigated new ways to connect the single architectural unit with the total urban infrastructural system. [15]

Figure 2 - Tokyo Plan 1960 by Kenzo Tange. The project was conceived as vast super-urban infrastructure designed around mass circulation systems for the linear expansion of Tokyo across Tokyo Bay.

At the same time, as an alternative to the decentralized model based on the redistribution of people and activities in a system of new towns proposed by the planners of the government, "Tokyo Plan 1960" proposed by architect Kenzo Tange emphasized instead the possibility of the city's future expansion occurring on the bay.[16] The fundamental characteristic of the project was the divergence from the traditional radial pattern of urban growth, which dated since the foundation of Tokyo, and the proposition of a linear model of development across Tokyo Bay along major vast and multi-level arteries of circulation. Tange proposed to convert the core of the city from a "civic centre" to a "civic axis". Tange's Tokyo Plan highlighted the importance of mobility channels based on mass-transportation systems and massive and huge structures of suspended bridges and artificial floating

platforms, Plan for Tokyo was a substantial a deepening of a study started with the research experience of Tange himself at MIT of Boston in 1959 and further refined during his association with the Metabolists.

Modern Developments in Tokyo Bay 1980-2020

The 1980s were among the most prosperous period in modern Japan due to undisputed economic prominence and global influence, which fuelled the ambition to turn Tokyo in a global city on pair with London and New York. During the "Bubble" in the late 1980s a new awareness of the importance of modern and more efficient public facilities and urban infrastructures for industrial cities, aimed to strength their competitiveness into a more globalized and interconnected world system of cities, resulted into the development of an impressive amount of new mega urban projects in all the major cities of Japan largely financed and supported by the government. [17]
In the 1986 the Tokyo Metropolitan Government proposed the creation of a "multi-polar metropolis plan" in order to limit the further spread of the city central business district, and in doing so to control its urban congestion and the excessive population density, balancing the business and residential functions in the metropolitan territory. The main features of the proposed scheme, known as the "Amano Proposal" after the name of the governor of the city council, was the development of a decentralized system of urban sub-centers, with particular attention at the physical and functional expansion of the areas on the West side of Tokyo Bay.

Figure 3 - Recent development of Tokyo Bay waterfronts. Old industrial spaces are progressively removed and converted into new residential complexes filled with high rise towers and green amenities.

The main core of this urban restructuring of Tokyo was located on the waterfront, between the Tsukishima and Daiba reclaimed lands, and was named "Tokyo Teleport Town" (named also "Tokyo Rainbow Town"). The construction of the new Tokyo waterfront sub-center developed over many years and absorbed consistent resources and capitals but several of the built urban and architectural projects resulted in what many critics decried as an anachronistic and unfitted late-modernist urban layout, with largely unused public open areas extremely distant from the bustling core of the city. [18] The reclaimed areas were filled with groups of large neo rationalist architectures and buildings scattered about vast empty spaces of reclaimed land and connected by long boulevard-like paths that lacked any formal relation to Tokyo's traditional urban streetscape and pattern of mixed land use. Especially problematic for Tokyo Teleport Town (as well as in other projects of new waterfront developments) was the connection with the mainland and other main urban district of the city in terms of transportation and working activities, which resulted in higher costs for islands' commuter residents and workers.
Sensitive to the spirit of the time and aiming at less commercial design schemes, other projects for the re-design of Tokyo Bay were proposed by renown architects. Among these there was Kenzo Tange and Kisho Kurokawa. Tange's 1986 project for a "Tokyo Bay City Plan", which proposed the creation of a system of large mixed use

artificial islands, following his comprehensive and social oriented approach to planning and suggesting again an open-ended and linear pattern of urban growth. Basically, the urban lay-out of the project was a softer and more up-to-date version of the monumental and strictly hierarchical structuralist order of spaces and movement networks that he had already put forward in his first earlier 1961 “Tokyo Plan”, but with minor visual impact and reduced concern for mass-housing issues. “Neo Tokyo Plan 2025”, proposed by Kisho Kurokawa in 1987, showcased a poetic but sterile vision of architect, simply translated on a grander scale many of his earlier Metabolist urban architectures, that were arranged as clusters of floating structures around and atop a doughnut-shaped area of reclaimed land built in the center of Tokyo Bay. Masato Otaka’s masterplan project for Yokohama Minato Mirai 21 (or MM 21 - City of the Future in the 21st Century) - was symptomatic of a process of urban development conceived for and structured around large commercial hubs which presented broad walkable promenades for shopping in largerly empty plaza-like open spaces. Overall, Tokyo Bay waterfronts projects development in the 1980s (e.g. Yokohama Minato Mirai MM21urban development and Odaiba and Chuo breakwater island projects) were conceived and designed as large and comprehensive urban master planned office, leisure and commercial enclaves fundamentally intended for a consumerist society (but also flagship of international corporations, and municipal or national governments expressions of their various local and global ambitions), which especially from the middle of the 1980s were sponsored and supported by means of capitals from many public corporations and private companies.

Figure 4 - Tokyo Bay waterfronts. The water canals once busy with the traffic of industrial products are now transformed in quite water promenades which provide relaxing views to high-rise residential buildings.

The burst of the Bubble and the subsequent economic ‘lost decade’ which started from the early 1990s put a stop to many of the often purely economic speculative and redundant large-scale urban developments and initiated instead a prolonged period of stasis of construction activities which persisted until the programming of the Tokyo 2020 Olympic Games (postponed 1 year later due to the Covid-19 Pandemic). In a fierce competition with other Asian rival megacities, Tokyo’s metropolitan government enacted programs to stress the city as a global multicultural centre through several new projects aiming at the upgarde of transport infrastructures and urban service provisions, and the showcase the most recent sustainable technologies, local ecology protection initiatives and disaster prepareness developments.This international event thus became an occasion to initiate projects to revitalize old areas and regenerate many urban spaces and facilities on the waterfront by retrofitting or transforming most to the obsolete and unused industrial factories and facilities, and other emptied service areas, into more attractive green and recreational zones (e.g. the relocation of the famous Tsukiji Fish Market and the reconversion of the old Harumi port ferry terminal into a park), suitable for new residential projects and the general use by the people in an improving natural environment. A widespread wave of environmental movements started from the 1960s at the pick of the economic growth, and had a very relevant role in exposing the sense of urgency

caused by the growing general pollution of the urban environment in Japan. These were directly responsible for the passing of strict environmental laws which together with the rise of public awareness for the neceassity of the recovery and the protection of the natural habitats, which in recent years have resulted in a improvement of the quality of the air and water in all the major industrial conurbations.
Currently a better natural environment and in general lessened pollution levels has promoted a renovated interest for living and leasure activities on the waterfronts of Tokyo. A new process of urban densification has prompted new high-rise residential developments which are now mushrooming on the edge of the water bringing the people back to the sea, in the joy of rediscovering the wonders and the beauty of Tokyo Bay and reviving the largely lost memories of this city on the water.

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Disclosure Statement

No potential conflict of interest was reported by the authors.

Notes on Contributors

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Images Sources

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Figure 3: Author's personal collection (Pernice Raffaele, 2023)

Figure 4: Author's personal collection (Pernice Raffaele, 2023)

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[16] See: Pernice Raffaele, "Japanese Urban Artificial Islands: An Overview of Projects and Schemes for Marine Cities during 1960s-1990s"; *Journal of Architecture and Planning*, (2009), pp. 1847-1855
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