

Fragile and Resilient Cities on Water

Fragile and Resilient Cities on Water:

*Perspectives from Venice
and Tokyo*

Edited by

Rosa Caroli and Stefano Soriani

Cambridge
Scholars
Publishing



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This book first published 2017

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

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ISBN (10): 1-4438-7338-1

ISBN (13): 978-1-4438-7338-3

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FOREWORD

ROSA CAROLI AND STEFANO SORIANI

The onset of modernization, especially during the twentieth century, has brought about dramatic changes that have first and foremost impacted coastal cities and cities on water. The push for efficiency and functionality has profoundly affected coastal and urban landscapes, and gigantism in the port industries have contributed to the degradation and depletion of environmental resources and habitats; modernization processes have marginalized local cultures and historical community-based values, thus causing original features and local specificity to disappear from the majority of historical waterfronts. In the last few decades, however, a reverse trend has also gradually emerged with the restructuring of port and industrial activities, along with the growth in the leisure and tourism sectors and an increasing attention towards environmental conditions. This convergence of factors has led to the “rediscovery of water” and to the design and implementation of new urban policies aimed at redeveloping urban waterfronts. In this perspective, cultural characteristics along with local history and identity are being re-discovered and valued as fundamental assets for future development. New approaches, based on the concept of working with—and not against—ecosystems, are currently re-orienting environmental management approaches in coastal areas and cities, in the attempt to increase social and environmental resilience.

Against this background, however, the intrinsic fragility that characterizes cities that live on water becomes most apparent, due to the technological, economic, social and environmental dynamics affecting the urban structure and landscape. A crucial challenge that urban policies have to deal with is how to transform *fragility* into *resilience*—the capability to proactively adapt to changes and challenges. Resilience requires new forms of planning, novel approaches to environmental governance, as well as new initiatives in urban policy through effective involvement of both economic and social actors, in order to harmonize top-down and bottom-up approaches and projects. Whereas traditional top-down, centralized and state-directed approaches have historically driven the economic growth of many cities on water, these dynamics are no longer appropriate. New bottom-up, more inclusive and place-based initiatives are needed to

improve livability and resilience of communities and cities on water.

Water is the central player in this landscape, but its role is intrinsically ambivalent, as it is both a vital resource and a potential threat. For cities on water this element is profoundly dualistic in nature, as it functions simultaneously as an isolating and a connecting element between places both in a physical and in a symbolical sense. Water sustains urban life but it is also a potential threat to it, especially in an age of climate change.¹ Issues surrounding water are becoming high stakes in the relationship between urban policy and local communities, particularly those living in fragile and liminal spaces between land and water. Indeed, the necessity to reconsider the link between water and the city has become even more urgent in the face of the challenges brought about by climate change and the resulting increase in vulnerability and risks. As a consequence, cities on water have to identify and implement effective actions aiming at strengthening the risk governance capacities at the local, regional and national levels. This requires not only an improvement in technological expertise and capital investments, but also new attitudes towards the economy of the cities, their culture of the environment and the very way in which the political process is designed—its capacity to involve the social, economic and cultural actors in search of a shared vision of the future. At the same time, it is worth pointing out that the re-discovery of a more balanced and sustainable use of water can represent a driving force for the economy of cities on water allowing them to both attract new investments and promote new jobs. The safeguard of water and land are closely linked, as both define character, identity and memory, thus contributing to resilience itself. Overcoming the traditional barriers between water management and land governance, and finding added value in the multi-dimensional character and complexity of the relationships between the city and water lead to a paradigm shift with respect to the traditional relationship conceived during the modernization phase of cities on water, when a land-centered perspective rapidly took over, and coastal areas were converted into industrial and residential lands, thus serving new uses and users. This also implies a re-evaluation of waterfront spaces both from an historical and environmental viewpoint, thus giving back to water its central role and opening up new ways of governing, living, and imagining it.

Representing paradigmatic cases of the reciprocal link existing between water management and urban planning, namely between water

¹ Cf. Terje Tvedt and Terje Oestigaard, eds., *A History of Water: Water and Urbanization* 1, series 3 (London: I.B. Tauris, 2014).

and land governance, of the peculiar and deep relationship linking water and society, as well as of the challenges that urban governance in cities on water has to deal with, Venice and Tokyo well exemplify the complex relationship that exists between fragility and resilience and, at the same time, offer interesting insights on feasible options and actions to address such a complex relationship. Despite the differences in size, population, age and origins, the history of Venice and Tokyo is that of two capital-cities, which developed in an intimate relationship with water, where the latter molded the urban fabric and vice-versa, thus creating articulated and complex functional and landscape structures, and typifying their world wide image.

In both Venice and Tokyo, flood control and water management played a formative role in their development and their resemblance as water capitals was perceived by foreign travelers who visited Tokyo in the second half of the XIX century.² The cities share common features and problems and face similar challenges and opportunities. The presence of water made—and still makes—space a rare commodity in both the cities, and analogous techniques were employed to claim water for land use by using timber floating in rafts down the rivers to be piled into the mud and sand as the initial foundation for solid spaces in the two cities. Similar flood management strategies were adopted to divert major rivers flowing into the Venetian lagoon and the Tokyo bay and for the construction of embankments of different heights, while a water administration system was established to prevent flooding, which was—and still is—a requirement for safety, economic activities and quality of life, and thus a main concern for governors and citizens of both the cities. The prosperity of Venice and Tokyo (called Edo until 1868) widely relied on water as an important element for strategic defense, a means to transport goods and pursue trade, and an engine for their commercial dynamism. Both the cities developed fishing industries and hosted prominent fish markets around which entertainment, recreation and pleasure activities developed. They issued precise rules to regulate the times and places where fishing could take place, as well as regulating the size of nets and the equipment to be used. They invented techniques to cook and preserve fish the legacy of which still characterizes their respective local food cultures. City dwellers'

² For example, Douglas Sladen (1856-1947), who was in Japan between the late 1889 and July 1890, noted that “busy quarters of the town which centres around the Nihon-bashi [...] which is considered the hearth of the capital and the hearth of the country [...] has the same hog’s-back bridges, the same busy water life” of Venice, and came to realize “how Venetian Tokyo is.” Douglas Sladen, *Queer Things About Japan* (London: A. Treherne, 1904), 338.

movement and leisure activities along aquatic routes, as well as seasonal events, festivals and processions on water, gave rhythm to local life and specific features to the townscape, thus testifying to the deep relationship between water and society. The central role played by water in the lives of both Venice and Tokyo is apparent in the ways it has shaped political, social and cultural institutions, forged religious practices, written and visual production, collective images and imaginations, all attesting to how water is reciprocally interwoven with human activities and attitudes.

Massive landfill projects and the development of a network of rail and road in modern and postwar Tokyo have often removed a discontinuity between water and land that still typifies Venice's landscape. Nevertheless, despite the varying role that water has played in the history and evolution of Venice and Tokyo, the various forms of technological interventions in water management and usage, and the changing means of participation and perception of water, the latter still remains a constant presence in their townscape, as well as a threat which continues to challenge these cities and their governance. Not differently from other cities on water, crucial issues for Tokyo and Venice thus include how to define a broad strategy to integrate risk reduction and resilient approaches and initiatives into sustainable urban planning schemes; to raise awareness about the relevant role of cultural heritage in the building of resilient communities; to harmonize efficiency and functionality with livability and sustainability in urban transport and port-maritime activities; to implement robust but flexible adaptation strategies to climate changes; to better integrate water, in all its historical, social, political, economic, environmental and cultural dimensions, into the contemporary urban fabric; to preserve and manage ecosystem services; to recover the complex nature of the relationship between the city and its surrounding aquatic spaces which has been strongly 'simplified' during the XX century's modernization; to revitalize and re-qualify tourism and leisure industry in a sustainable way; to bring water and water-related recreational activities back to the local citizens. These observations demonstrate the legitimacy of a comparative approach to the study of the two cities on water, however such studies are more widespread and popular in Japan rather than in Italy—probably in part because of Venice's worldwide claim to fame as the water capital.³

³ Cf. for example Hidenobu Jinnai, *Tokyo: A Spatial Anthropology* (Berkeley: University of California Press, 1995); original edition in Japanese (Tōkyō: Chikuma shobō, 1985). Yutaka Takahashi, *Toshi to mizu* [City and water], (Tōkyō: Iwanami, 1988); Hosei Daigaku-Eko chiiki dezain kenkyūjo, ed., *Future Vision no keifu. Mizu no toshi no miraiō* [Genealogy of future vision. Future images of a

This volume aims to contribute to identifying the critical issues concerning the relationship between city and water in these two capital cities, in a comparative, multidisciplinary and inter disciplinary approach, in an attempt to understand how fragility can be translated into resilience. In doing so, this volume places special attention to the various implications of living with water in Venice and Tokyo, where natural risks and social and economic vulnerability are particularly high, and where the process of re-interpretation of water is re-orienting—although at a different level—urban policy and governance, as well as social attitudes and values towards the presence of water and its use. As Hidenobu Jinnai argues in the Introduction to this volume, the necessity to reevaluate waterfront spaces in order to increase self-reliance requires a reconsideration of the importance of cities on water “from the viewpoints of history and environment, overcoming the theory of land that has explored efficiency and functionality using massive energy, and reexamine cities from oceans and rivers in order to restore richness of nature to our environments.” In this perspective, the volume addresses the different functions that waterfronts have played and still can play in the urban fabric, as well as the different responses that these two cities offer to the old and new problems and challenges deriving from the presence of water, providing some insights for the analysis and management of similar issues in other cities on water.

With respect to the case of Venice, the volume pays particular attention to some relevant issues related to fragility and resilience: the imposition and impact of mass tourism in the city’s fabric and the problem arising from this in both social and environmental terms; the complex and difficult relationship between the city and the port activities, which have represented for centuries the engine driving urban and environmental transformation; the growing role that bottom-up initiatives are playing in the design of new resilience strategies.

Since the 1980s tourism has represented one of the most important levers to counteract the economic decline the Venice area experienced as a

city on water] (Tōkyō: Kajima shuppankai, 2006). Comparative studies on Tokyo and Venice as cities on water also appear in the series *Suitogaku* (Water Cities Studies), edited by Hidenobu Jinnai and Masahiko Takamura, and published by Hōsei daigaku shuppankyoku (2013-). In Italian, cf. Rinio Bruttomesso, “Acqua e Città. Venezia e Tōkyō: il paradigma e le eccezioni”, in *Atti del XXXI Convegno di Studi sul Giappone*, ed. Rosa Caroli (Venice, 2008), 9-38; Hidenobu Jinnai, “Città d’acqua: l’immagine di ‘Venice’ riflessa nella città di Tokyo”, in *1968. Italia Giappone: intrecci culturali*, ed. Rosa Caroli (Venice: Cafoscarina, 2008), 87-114.

result of the crisis of port-industrial activities in the lagoon over the past decades. The city has strengthened its touristic appeal and has become one of the most famous destinations on the global market. Both the historical city in the lagoon and the entire urban functional areas around Venice have greatly benefited from this development, in terms of jobs, income and investments. At the same time, the case of Venice illustrates all too well how growth in tourism, if not properly managed, can represent a threat to a balanced territorial, economic and social development. Today, about 28 million visitors a year reach the city on the lagoon, while the city's population has declined to less than 60,000. Congestion, transport inefficiency, increasing costs of living and crowding-out are the most important negative consequences brought about by such disruptive and exploitive forms of tourism.⁴ Not surprisingly, in 2006 the former director of the Association of Venice Hoteliers, Marco Michielli, argued that "Venice will end up being crushed by swarms of 'eat and run' tourists, long before it is flooded by high water."⁵ Against this background, Jan van der Borg's chapter analyzes the theoretical aspects of the process of "Venetianization", namely the negative impact produced by a dramatic growth in terms of the number of visitors on the social, economic and even environmental urban structure. Van der Borg analyzes the different implications of this process, that many historical cities have recently started being affected by, as well as the main consequences of the "tourism dictatorship" on Venice's urban system. What emerges from his analysis is the need for a coherent strategy for the management of tourism, based on a mix of technological, economic and organizational tools.

With regards to the evolution of the relationship between the port and the city, it is useful to remember that the port and associated maritime activities have always played a fundamental role in the transformation and management of the Venetian lagoon. For centuries, the lagoon was maintained in a form that ensured navigability. The port and its maritime activities were the real engines that inspired the way the lagoon was transformed and managed. The city experienced an important modernization process during the XIX century; however, it was the industrial development of the XX century that took place in the interior edge of the lagoon with the realization and development of Porto Marghera leading to

⁴ Cf. Harry Cocosis and Alexandra Mexa, eds., *Challenges of Tourism Carrying Capacity Assessment* (Aldershot: Ashgate, 2004); Jan van der Borg, *Tourism and Urban Development* (Amsterdam: Thesis Publishers, 1991).

⁵ Cit. in Stefano Soriani, "Networks and Trust in Venice: the Port as a Social Agent," in *Social Capital and Urban Network of Trust*, eds. Jouni Häkli and Claudio Minca (Farnham: Ashgate, 2009), 151.

a period of dramatic environmental, economic and social change. In the 1960s, Venice's port and industrial area constituted one of the largest coastal industrial regions in the Mediterranean Sea. The 1970s and 1980s marked a period of economic decline and environmental degradation. UNESCO and other private committees launched the "save Venice" campaign, which mobilized public attention and private funds. At the same time, the national legislation for Venice started to pay greater and greater attention to the need to restore and preserve the lagoon ecosystems, whose dynamics strongly suffered from industrial transformation throughout the XX century.⁶ In such a context, port and industrial activities experienced a period of deep distrust and found increasing problems in terms of social legitimacy. Port and industrial activities were more and more regarded as the only factors responsible for the degradation of the lagoon. This perception developed and strengthened alongside with the dramatic growth in the flux of tourism into the city of the lagoon. Not surprisingly, Porto Marghera was considered a very important port and industrial area, but situated in the "wrong place". This situation changed during the 1990s, thanks to the increasing dynamism of the commercial sector of the port and the growth of the cruise market. These elements worked together to rejuvenate the local port industry and contributed to improve the port's image in the local political and cultural context. The port was increasingly being depicted as "a safer and a clearer port", in comparison to the old Porto Marghera's specialization.

Moreover, the so-called "new port" came more into favor starting in the mid-1990s as a potential lever to counteract the negative social and economic effects brought about by the "tourism dictatorship". The situation has since changed and any gains obtained in improving the relationship between port and city are once again under question - a new phase marked by conflict is coming to the fore. The dynamism of the commercial port risks being undermined by the trend towards gigantism in the container sector, which is posing new threats to many regional ports, such as Venice. Another serious threat is the entering into operation of the MOSE project—the system of mobile barriers to protect the city against flooding and rising sea levels—slated for 2019. Finally, the dramatic increase in the size of the cruise ships is questioning the very future of cruising activities in the lagoon. These points underscore the fact that the combined effects of market trends, restructuring processes in the port and

⁶ Stefano Soriani, "The Venice Port and Industrial Area in a Context of Regional Change," in *Cityports, Coastal Zones and Regional Change: International Perspectives on Planning and Management*, ed. Brian Hoyle (Chichester: John Wiley and Sons, 1996), 235-48.

maritime industries, along with technological changes all pose new threats to the port-city relationship. These can only be effectively addressed through new approaches to governance, new initiatives and tools. At the local level the port industry is looking for solutions, which are mainly based on the realization of new infrastructures and up-scale programs.⁷ Stefano Soriani's chapter analyzes the most important trends driving the evolution of the port-city relationship. It points out that solutions to the most important problems the city and the port sector are currently experiencing require above all new organizational schemes, new entrepreneurship, a more transparent and participatory decision-making process, and the capability to design and develop new partnerships and new development coalitions, through networking approaches. The case of Venice illustrates very clearly that the definition of the spatial scale is a crucial aspect: problems and opportunities can be properly addressed, thus transforming fragility into social and economic resilience, only if they are analyzed through a multi-scale approach. Multi-scale approaches are essential not only to find solutions but also to correctly define the very nature of the problems and opportunities that have to be addressed.

The definition of effective adaptation policies to climate change and forecasted rising sea levels⁸ is addressed in Giovanni Cecconi's chapter who examines how in the Venice context, new bottom-up approaches are being designed and implemented to address the issue of building and increasing resilience. The chapter reports the recent experience of the Venice Resilience Laboratory and underlines that resilience cannot rely exclusively on top-down approaches and Government-driven plans and projects, but requires the concomitant effective involvement of both citizens and social groups, through actions aimed at linking local-embedded networks with global initiatives.⁹ The underling belief is that citizens cannot expect the State and the "formal" politics to solve all problems. Coastal communities must be involved in the definition of new approaches to "adaptive co-management in the form of a friendly exploration of territories", with the active participation of "artisans and artists", which Cecconi defines "a special sub-set of society

⁷ It is worth noting that Venice is one of the Mediterranean ports considered by the Chinese Government as an important node of the *New Maritime Silk Road*.

⁸ On this regards, cf. Karen O'Brien, Bronwyn Hayward and Fikret Berkes, "Rethinking social contracts: building resilience in a changing climate," *Ecology and Society* 14, 2 (2009): 12

[online] URL: <http://www.ecologyandsociety.org/vol14/iss2/art12/>.

⁹ Laura Elsler, *Venice Ventures: Modeling social-ecological co-evolution for resilience* (Stockholm: Stockholm Resilience Center, MA Thesis, 2015).

which is usually deeply concerned about the custody and cultivation of nature". New initiatives for sustainable cooperation have to be identified, based on the acknowledgement that "*trust* between individuals and organizations is the dominant factor" required to transform fragility into resilience. Interestingly, the chapter points out how the development of new methods of adaptive co-management can also contribute to increased social and economic resilience, through the exploitation of local expertise and values, capable of counterbalancing the negative effects of mass tourism. To this aim, the Author argues that new demonstration projects are needed, which are locally driven but included within a global network of initiatives designed by the coastal cities which are the ones most likely to suffer from climate change and sea level rise. In particular, these projects should aim at developing new "green and blue" infrastructures, for the beneficial reuse of every by-product, in line with the principles of the circular economy.

With respect to the Japanese case, the revaluation of water as a constitutive element in Tokyo's urban fabric involves different aspects: the rediscovering of both water and its cultural dimension as a lever for tourism development; a greater attention paid by urban policies to the relationship between citizenship and water-based recreational activities through plans, projects and initiatives aiming at re-conciliating land and water by re-opening rivers and canal banks to public uses; the potential of water transportation in conceiving a more sustainable city also for tourism purposes; the revaluation of water as a magnet for new metropolitan marketing strategies, also in the context of the design and promotion of "small and big" events. At the same time, this revaluation also contributes to develop more integrated environmental management strategies, better suited to cope with the potential implications of climate change and expected sea level rise, through the involvement of local communities and the rediscovery of the complexity of water landscapes which were concealed by the modernization process.

A new strategy to build resilience with respect to the increased risks associated with both climate change and metropolitan development is provided by Nobuyuki Tsuchiya's chapter, who points out the importance of adopting new flexible and reversible approaches to water management. This includes recovering waterways that were gradually transformed through landfill operations, drying and covering up of river beds for transport infrastructure development, and the artificialization of river and canal banks. Reaching these aims implies the incorporation of technological principles into a new environmental strategy better able to *imitate how ecosystems work* by promoting *building with nature*

approaches and initiatives. It also entails increasing citizens' awareness of the importance of recovering water ecosystems, also through "hydrophilic" projects and initiatives such as water parks.

The social, political and cultural implications of the paradigmatic change in the way ecosystems are managed in Tokyo—a city so exposed and vulnerable to hazards, including "water disasters",¹⁰ and characterized by "a human ecology of great fragility"—are considered by Paul Waley's chapter. After considering the evolution of the planning framework that accompanied the urban transformation in the postwar decades, the Author pays particular attention to the changes in urban policy since the 1970s, starting from a greater attention given to the greater engagement with local residents in "more community-based planning", and to activities aimed at bringing back "citizens into contact with water", based on a "new ethos" for both water use and water control.¹¹ Considering the several implications of this renewed approach to the relationship between water and urban governance, means to reaffirm the multifaceted nature of the concept of resilience, which can be properly addressed by emphasizing the link existing between ecosystem and society.

There are important economic implications to this social and cultural rediscovery of water both in terms of its role in urban development and composition, and as an element that is central to redefining the concept of public space. This rediscovery is becoming a key element in the metropolitan area's marketing, where new water parks, the recovery of rivers and canals, and the re-use of waterways for urban transportation contribute to define a new water landscape. New recreational activities and new cultural services for the metropolitan population are developing, thus contributing towards diversifying the functional profile of Tokyo. Against this background, the chapters by Yusaku Imamura and Iwao Takamatsu confirm how the above elements, combined with the emergence of new environmental governance approaches, stand central in the metropolitan development vision.

¹⁰ Cf. Shigeo Takahashi, "Social geography and disaster vulnerability in Tokyo," *Applied Geography* 18, 1 (2008): 17–24; Ian Davis and David Alexander, *Recovery from Disaster* (London; New York: Routledge Taylor & Francis Group, 2016).

¹¹ Robert B. Olshansky, ed., *Urban Planning after Disasters: Critical Concepts in Built Environment* (Abingdon, Oxon; New York, NY: Routledge, 2017); Paul Waley and Martin Purvis, "Sustaining the flow: Japanese waterways and new paradigms of development," in *Exploring Sustainable Development: Geographical Perspectives*, eds. Martin Purvis and Alan Grainger (London: Earthscan, 2004), 207–29.

Moreover, this gains relevance in the marketing of urban events, not only for the small and middle size ones, but also for big events such the 2020 Olympic Games, which will be mostly concentrated in waterfront areas. Even from different perspectives, both the Authors illustrate the fundamental role that a new water landscape can play in improving Tokyo's touristic attractiveness on a local, national and global scale. This represents a further demonstration of how policies aimed at increasing resilience can contribute to a more diverse economic structure in the metropolitan area and improve its competitiveness. Together with a new water landscape, a new transit and mobility system emerges for people and for metropolitan logistics. This contributes not only to reduce the environmental impact of land transportation, but also to stimulate new strategies for land-water transport and economic integration.

When it comes to considering the best strategies to build resilient communities, a central point is to raise citizens' awareness about the potential of cultural heritage. In this perspective the safeguarding and promotion of cultural heritage represents not only an engine to propel new economic development processes, but also a lever to raise a communities' identity and resilience. Although the worldwide image and perception as a gargantuan postindustrial megalopolis, Tokyo still contains a few but significant examples of the fertile relationship that can exist among cultural heritage, community identity and resilience. As Hidenobu Jinnai's chapters shows, revitalization of the waterfront requires both the implementation of sustainable strategies for urban development and the preservation of the characters of diversity, or better a "dynamic diversity" able to overcome the stereotypical model that has too often driven urban policies on waterfronts.¹² Building the future of our water cities on local values and community identities is crucial. The shift back to a water-based perspective is essential to regain what was mostly lost with the modernization processes. The case considered in Rosa Caroli's chapter confirms the importance of conjugating urban development with diversity: although rarely recognized as both a man-made island and a rare heritage site, Tsukudajima offers an example of the values that have to be maintained in order to contribute to building resilience in social, economic and environmental terms. Here, the engagement of the local community has proved to be fundamental in maintaining Tsukudajima's distinct character based on diversity, and in opposition to the homogenization

¹² Rinio Bruttomesso, ed., *Waterfronts. A New Frontier for Cities on Water. The International Dimensions of Waterfront Redevelopment* (Venice: International Centre for Cities on Water, 1993).

process characteristic of market-driven tendencies in the real estate industry.

The volume collects most of the papers presented at the international conference on *Fragile and Resilient Cities on Water: Perspectives from Venice and Tokyo*, held at Ca' Foscari University in Venice in January 2015. The Conference brought together scholars and experts on cities on water with different backgrounds, and represented a further step towards consolidating the tradition of scientific, academic and cultural cooperation between Ca' Foscari University and Japanese universities and research centers. This conference, organized by the Department of Linguistics and Comparative Cultural Studies and the Department of Economics of Ca' Foscari University of Venice, was made possible through the generous support of the Toshiba International Foundation-TIFO, to whom we express our sincere gratitude.

CHAPTER ONE

INTRODUCTION:
PROPOSING SUITOGAKU—
TOWARDS A COMPARATIVE STUDY
OF CITIES ON WATER

HIDENOBU JINNAI

Over the past four years, our study group at Hōsei University, Tokyo, has been engaged in a research project titled, “A Comparative Study of Water Cities from an Historical and Environmental Perspective” (2011–15), which has been funded by Grant-in-Aid for Scientific Research (S) by JSPS (Japan Society for the Promotion of Science). As part of this project, we are proposing a new discipline, “The Study of Water Cities (Suitogaku).”¹ Let me begin by giving an overview of the academic background and the purpose behind our research.

Most water cities are located along the coast or beside rivers, where economic activities and the distribution of goods, using ship transportation, have ensured prosperity, thus fostering original landscapes and colorful cultures. However, with the onset of modernization, especially during the twentieth century, in every country, city, and territory, urban development has been promoted and beautiful coastal areas have been transformed into industrial or port zones.

With this in mind, it is necessary to reconsider the value of water cities from the viewpoints of both *history* and *the environment*, transcending previous studies of land which have mainly focused on efficiency and functionality, through the harnessing of large amounts of energy.

Our study will: a) outline and clarify the historical characteristics of individual spatial structures from a typological point of view; b) consider

¹ Jinnai Hidenobu and Masahiko Takamura, eds., *Suitogaku I* [The Study of Water Cities, 1] (Tōkyō: Hōsei University Press, 2013).

the environmental transformation arising from both urban/architectural engineering and economic/industrial policies; and c) combine a) and b) to propose a methodology and framework of research on water cities based on history and the environment that is suitable for the twenty-first century.

Here, I would like to highlight several important points on the methodological approach used for the study of water cities (*Suitogaku*) in this comparative study of Tokyo and Venice.

In the study of water cities, the two main criteria used for comparison are the original location and the type of natural environment in which development took place.

For Venice, a distinctive environment within an extended shallow stretch of lagoon was formed by both its west and east sides. On the west side, many rivers running through the hinterland (*terraferma*) carried soil and sand into the sea, forming shallows, while the east side was characterized by the surging waves of the Adriatic Sea. An intricate network of waterway canals meanders through the lagoon, making boat navigation possible. Furthermore, the twice daily movements of the rising and falling tide cleanses the water in the lagoon. Without a doubt, the construction of Venice was conceived in the water and developed through its deep ties with water.² This type of delicate topography was explicitly drawn on many maps of the sixteenth century³ (Fig. 1).

Tokyo Bay, on the other hand, is not a closed inland sea—a lagoon. However, its delicate natural conditions were also similar to those of a shallow stretch of water. Boat navigation was limited to deep waterways that were called Miosuji (navigable water routes). In Edo (Tokyo was called Edo until 1868) too, maps showing the sea conditions and coastal regions were formulated during the mid-nineteenth century⁴ (Fig. 2).

It is also necessary for us to study the hinterland, the backbone of the water city, in order to understand how construction work was carried out to protect the water city from natural disasters, such as floods and epidemics, and to build a navigational network. In Venice, when the sand and soil carried by the rivers collected at the mouth of the lagoon, this

² Piero Bevilacqua, *Venezia e le acque. Una metafora planetaria* (Rome: Donzelli, 1995). For Venice's history and development as a city on water see Eugenio Miozzi, *Venezia nei secoli: La città* 1 (Venice: Il Libeccio, 1957); Guido Perocco and Antonio Salvadori, *Civiltà di Venezia* 1–3 (Venice: Stamperia di Venezia Editrice, 1973–77).

³ Giovanni Caniato, Eugenio Turri and Michele Zanetti, eds., *La Laguna di Venezia* (Verona: Cierre, 1995).

⁴ Hidenobu Jinnai and Masahiko Takamura, eds., *Suitogaku III* [Study of Water Cities, 3] (Tōkyō: Hōsei University Press, 2015).

often led to the outbreak of disease. For this reason, after the sixteenth century, flow channels were built along the major rivers, such as the Brenta, Sile, and Piave rivers, to henceforth direct the sand and soil away from the lagoon for drainage into the Adriatic Sea.⁵ This waterway was also used for boat transportation.

In Edo, it was originally the river Tone that drained the soil and sand into Edo Bay (Tokyo Bay). Here too, a flow channel was built on the east side. Rivers in Japan occasionally flood, so this channel was built to protect Edo from water disasters. Also, another major objective was to secure a boat navigation route from the Tōhoku region, which entered at Chōshi and followed the river Tone, to safely reach Edo⁶ (Fig. 3).

These two cities developed as land reclamation progressed.⁷ It is important to understand the similarities and differences between the two land reclamation processes.

Both cities were built over a foundation of soft soil. This prompted the development of a method of construction in which timber piles were hammered all the way down into the hard ground, beneath the soft foundation, onto which buildings were then constructed. Although Venice is well-known for this technology,⁸ it has also been used in Tokyo since the Edo period (1603–1867). Piles were often hammered into the stone walls of castles. Also, many types of modern, western-style architecture from the Meiji period (1868–1912) to the early Shōwa period (1926–89) also used pile foundations.

Hence, a scheme to procure the necessary lumber for these piles was very important. It is interesting to note that in both Venice and Edo the timber from felled trees in the mountains was rafted along the rivers to the cities⁹

Another aspect that needs to be considered is the role of the hinterland (*terraferma*). The produce from the hinterland was transported

⁵ Vito Favero, Riccardo Parolini and Mario Scattolin, eds., *Morfologia storica della Laguna di Venezia* (Venice: Arsenale Editrice, 1988).

⁶ Noboru Kawana, *Kashi ni ikiru hitobito* [People who live on the river banks] (Tōkyō: Heibonsha, 1982); Kyōsuke Namba, *Edo-Tokyo o sasaeta shuun no michi: Uchikawa mawashi no kioku o saguru* [Navigation route for Edo-Tokyo: Research for the memory of inner water connection system] (Tōkyō: Hōsei University Press, 2010).

⁷ Masao Suzuki, *Edo no kawa, Tokyo no kawa* [Rivers in Edo, rivers in Tokyo] (Tōkyō: Nihon hōsō shuppan kyōkai, 1978).

⁸ Giorgio Gianighian and Paola Pavanini, *Venezia come* (Venice: Gambier Keller, 2010).

⁹ Antonio Bondesan, Giovanni Caniato, Francesco Vallerani and Michele Zanetti, eds., *Il Piave* (Verona: Cierre, 2004).

on the river, either by rafts or boats, to the waterside cities, Venice and Edo/Tokyo. In Venice, the lumber which was rafted on the river Piave was stored in Fondamente Nuove, while the lumber that was carried on the river Brenta was stored in Zattere. In Edo/Tokyo, a huge timber yard was built in the Kiba district of Fukagawa.

Furthermore, both cities were blessed with natural resources which were able to support their growing populations.¹⁰ Both also had a robust fishing industry and a fishing area rich in species and quantity. In Venice, from early on, many fish farms (*valle da pesca*) were built in the water close to the mainland of the lagoon.¹¹ In Edo/Tokyo several fishing villages developed along the bay. Even today, religious festivals are held at waterside shrines, such as the Sumiyoshi Shrine at Tsukudajima and the Ebara Shrine at Shinagawa, demonstrating the closeness of community life.¹²

Unlike Venice, where salterns were built near Chioggia, the saltern in Gyōtoku played a major role in Edo's history. In Venice, vegetables were grown on many lagoon islands, such as Sant'Erasmo, and were delivered to the Rialto Market by boat.¹³ In Edo/Tokyo, small, hand-drawn, two-wheeled carts were used to transport vegetables from nearby farming villages on the west side. From the northeast, they were transported by boat on the river Onagi to the urban areas around Fukagawa.¹⁴

Let us now turn our attention to the close connection between these water cities and their hinterlands.

On the one hand, water is a blessing. Yet, for human beings, it can also be a destructive force, causing many disasters. In Venice, floods have been a common phenomenon since the Middle Ages. Thus, to prevent flooding from the Adriatic Sea, an embankment was built by piling up

¹⁰ Nobuyuki Yoshida, *Toshi: Edo ni ikiru* [Live in a city: Edo] (Tōkyō: Iwanami shoten, 2015).

¹¹ Antonio Fabris, *Valle Figheri: Storia di una valle salsa da pesca della laguna veneta* (Venice: Filippi Editore, 1991); Paolo Rosa Salva and Sergio Sartori, *Laguna e pesca: Storia, tradizioni e prospettive* (Venice: Arsenale Cooperativa Editrice, 1979).

¹² Hidenobu Jinnai, *Tokyo: A Spatial Anthropology* (Berkeley: University of California Press, 1995); original edition in Japanese (Tōkyō: Chikuma shobō, 1985).

¹³ Donatella Calabi and Ludovica Galeazzo, eds., *Acqua e cibo a Venezia. Storie della laguna e della città*. Exhibition catalog, Venice, September 26, 2015 to February 14, 2016 (Venice: Marsilio, 2015).

¹⁴ Junzō Kawada, *Haha no koe, kawa no nioi* [Voice of mother, smell of river] (Tōkyō: Chikuma shobō, 2006).

rocks called *murazzi*.¹⁵ Yet, despite this, it continued to be difficult to protect the city from floods. In Tokyo, in the early seventeenth century, the small and medium-sized rivers flowing from the north were engineered to converge, and the flow channel was altered to run in an eastward direction. This flood control work, which directed the drainage into the river Sumida, proved effective for preventing further water disasters. It also served as a waterway for the transportation of goods, while the dredged sand was used for reclamation projects. Attempts were made to keep the overflow upstream during heavy rain to prevent water from suddenly gushing into the city center. Thus, embankments were built along the branched network of mid- and up-stream waterways on the river Sumida.

Hence, both Venice and Edo/Tokyo relied on human invention to protect themselves against flooding and as a result of such inventiveness they witnessed their splendid water-city culture flourishing. In both cities, water carried out many diverse and significant roles. In particular, in Edo/Tokyo, water was used for drinking, in agriculture, for fishing, in navigation and commercial activities, in religious festivals and rituals, for recreational purposes such as the theater, in tourism, for amenities, and in the landscape.

The water city developed around the market, built beside a major river or canal, which served as the commercial center. Rialto, at the center of the major Canal Grande, and Nihonbashi, at the center of the river Nihonbashi, both served as activity hubs for leading merchant families and acted as transportation centers.¹⁶ Also common to both cities was the major role of the fish market. Another similarity was the birth of the playhouse and an area uniquely used for entertainment, which grew up around these markets.¹⁷

Let us now examine the spiritual significance of water. Since time immemorial, the spiritual quality of water has been of great importance in Asia and Japan, and rituals such as bathing in water to purify one's body are common. In Tokyo, there has been the tendency for Shintoist shrines to be built near the water, to facilitate prayers for prosperity and protection

¹⁵ Nelli-Elena Vanzan Marchini, *Venezia da laguna a città* (Venice: Arsenale Editrice, 1985).

¹⁶ Nobuyuki Yoshida, "Ryuiki toshi Edo" [Waterside City Edo], in *Mizube to toshi* [Waterfront and City], eds. Takeshi Itō and Nobuyuki Yoshida (Tōkyō: Yamakawa shuppansha, 2005).

¹⁷ Roberto Cessi, *Rialto: L'isola, il ponte, il mercato* (Bologna: Nicola Zanichelli Editore, 1934); Donatella Calabi and Paolo Morachiello, *Rialto: Le fabbriche e il ponte* (Turin: Einaudi, 1987).

from floods. All over Tokyo, we can find sacred areas, sanctuaries, which were built either facing, or backing onto, the sea or a river. There is a certain myth surrounding Mokuboji Temple in Mukōjima, which is about a thousand years old. On the anniversary day of Umewakamaru, who died as a child, worshippers journey by boat from one bank of the river Sumida to the other to partake in the ceremony.¹⁸

A similar religious ceremony is held at Il Redentore, a church built in the late sixteenth century on the island of Giudecca in Venice. Boats float horizontally in the water to build a makeshift floating bridge that enables the worshippers to reach the church on the other side of the bank.¹⁹ Here, too, we sense the spiritual value of the water, and see the similarity between the two water cities.

Venice has no fishing community towns *per se*. On the other hand, until about 1960, Tokyo had several fishing towns where inhabitants engaged almost exclusively in fishing. Tsukudajima and Fukagawa appeared in the early Edo period,²⁰ while the fishing town of Shinagawa grew during the Middle Ages. Even today, a *mikoshi* (a portable shrine) is carried on a boat, accompanied by a procession, to the inlet of Odaiba Marine Park. There, people perform a traditional ritual in which the portable shrine is immersed in water (Fig. 4).

It is thought that this water procession has similarities with a religious ceremony called *Sposalizio del mare* (marriage with the sea), a Venetian tradition held in April²¹ (Fig. 5). The origins of this ceremony are thought to lie in the ancient pagan traditions from before the days of Christ.

Water was also indispensable for the existence and prosperity of theaters. Major theaters in Venice needed to be located on the canal front. Not only were the canals used to transport stage equipment, but also to bring the audience, the nobility and the affluent, who rode in their gondolas to the theater water entrance.²² In Edo too, the wealthy journeyed to the theater in their boats.²³

¹⁸ Hidenobu Jinnai, ed., *Edo-Tōkyō no mikata shirabekata* [How to observe and study Edo-Tokyo] (Tōkyō: Kajima shuppankai, 1989).

¹⁹ Bianca Tamassia Mazzarotto, *Le feste veneziane* (Florence: Sansoni, 1961).

²⁰ Shinji Nishimura et al., eds., *Edo-Fukagawa jōcho no kenkyū* [Study on sentiment of Edo-Fukagawa] (Tōkyō: Fukagawa kushi hensankai, 1925).

²¹ Edward Muir, *Civic Ritual in Renaissance Venice* (Princeton: Princeton University Press, 1981).

²² Nicola Mangini, *I Teatri di Venezia* (Milan: Mursia, 1974).

²³ Yukio Hattori, *Ōinaru koya: Edo kabuki no shukusai kūkan* [Grand theater: Festive space of Edo kabuki] (Tōkyō: Heibonsha, 1986).

Many of the water cities are port cities. A key point in this comparative study is the historical geographical shift of the port from the old town center to the area outside the center. It is also important to observe how the old city, once it had lost its function as a port, adopted different roles. With this in mind, let us compare Venice, Amsterdam, London, New York, and Tokyo.

In Venice, the logistics of transportation were spread out from Schiavoni, San Marco, Canal Grande, all the way to the *rio* (small canals). Thus, the entire old city served as a port. In modern times, a large harbor space was built in one corner of the newly reclaimed west side of the city (Fig. 6). Thus, although parts of the old town have maintained their original transportation function, carrying daily commodities to the city center for consumption, fully fledged logistical function was lost. A new use was found for the canal front and lagoon front, transforming them into a leisure space for inhabitants and tourists. For example, waterfront banks called *fondamenta*, which used to be used for cargo hoisting, are now lined with restaurants and outdoor cafés. Furthermore, the terraces that protrude onto the water, a unique feature of the hotels facing Canal Grande, actually date from the 1930s.²⁴

Turning now to Amsterdam, we see a similar story. The space alongside the canals, like Venice, also lost its boat-hoisting activities, enabling it to be used as a modern waterfront. Outdoor cafés were built with many houseboats moored along the banks—today this offers a charming spectacle and has become one of Amsterdam’s many tourist attractions.

In London during the nineteenth century, many locks were built along the Thames, a river with a large tidal range, so that the river could be more efficiently used for transport (Fig. 7). Optimizing the charm of this unique waterfront, docklands were redeveloped for modern use, building offices and residences, and space for cultural and entertainment purposes. The water city of London has, thus, been rejuvenated.

New York developed greatly during the modern era, eventually becoming a global port city. Many piers lined the waterfront of Manhattan, creating the typical scenery of an American port city (Fig. 8). With the logistics revolution, the construction of container wharfs moved beyond the port, leaving behind derelict space. However, the massive warehouses, factories, and suchlike that filled this area were renovated and converted

²⁴ Aya Hiwatashi, “A study on hotels located along the waterfront and construction of overhanging terraces on the canal in Venice,” *Journal of Architecture and Planning (Transactions of AIJ)* 80, 709 (2015): 755–63.

into venues for art, culture, fashion, and industry, emitting a whole new charm.

In the same way as Venice and Amsterdam, Tokyo, which developed from the hub of Edo, had an impressive transportation network of inland canals that were lined with warehouses. After the Great Kantō Earthquake (1923), the warehouses were moved to the banks of the river Sumida and Tokyo Bay. At the same time, land reclamation flourished, leaving the canal network between Shibaura and Shinagawa intact. Along the canals, blocks of warehouses were built. In the same way as during the Edo period, cargo was transferred from large ships to small boats and, until the 1970s, these were transported to the warehouses that faced the inland canals (Fig. 9). The question we are now faced with is how can we convert the waterfront space along the canals, which has lost its original function, into something creatively useful?²⁵

In Tokyo, there are very few major waterfront development projects that have been initiated by an administrative entity. This is very different from western cities. Yet, in Tokyo, there are various types of waterfront spaces associated with rich topographic conditions. At the same time, Japan has a cultural tradition which is deeply entrenched in water.²⁶ Optimizing these conditions may lead to the creation of a water city that is unique to Tokyo, one that may become world-famous. Thus, in this comparative study of water cities it is necessary to begin by highlighting the many diverse ways in which water has been actively used, in fishing, transport, religion, and amusement, until the beginning of the twentieth century, when water was most closely linked to the lives of the people.²⁷ Secondly, it is important to understand the characteristics of the form and structure of the urban waterfront space, which sets the stage for these activities. Thirdly, it is also relevant to discuss the unique structure of the modern harbor space that was shaped throughout the nineteenth and early twentieth centuries, when water still held importance for boat transportation and industry.

After the 1960s, with the advent of the logistics revolution and the transformation of the industrial sector, the waterfront space became obsolete. It was left abandoned. However, recently, all over the world we have been witnessing the revival of this space into something quite different, something charming. The revived modern waterfront space can

²⁵ Hidenobu Jinnai, *Mizube toshi: Edo-Tōkyō no wōtāfuronto tanken* [Water City: Adventure of waterfront of Edo-Tokyo] (Tōkyō: Asahi shinbunsha, 1989).

²⁶ Hidenobu Jinnai, ed., *Mizu no toshi Edo-Tokyo* [Water city Edo-Tokyo] (Tōkyō: Kōdansha, 2013).

²⁷ Jinnai, *Tokyo: A Spatial Anthropology*.

take various forms, which is appropriate considering the originally diverse nature of the port city.²⁸ The most important thing is to ensure that the waterfront is rejuvenated into a charming, cultural space by optimizing its history, cultural characteristics, and identity, which will all differ from country to country, and from region to region.

The following volume on water cities (Suitogaku) aims to explore these topics in greater depth.



Fig. 1) Lagoon of Venice, 16th century (Archivio di Stato di Venezia, 35/2017, Savi ed esecutori alle acque, Disegni, Diversi, n. 128/3)

²⁸ Franco Mancuso, Stella Mancuso and Christophe Carraud, eds., *Venise est une ville* (Paris: Éditions de la revue Conférence, 2015).

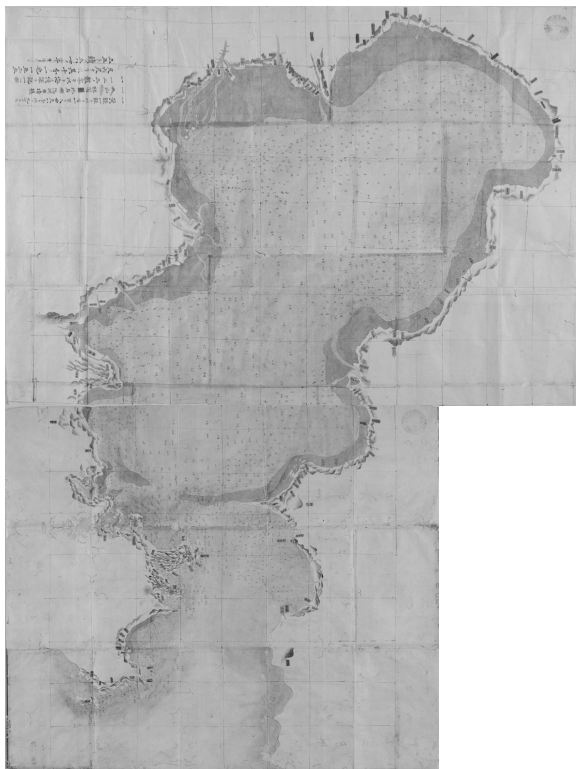


Fig. 2) Edo Bay in a map of the end of Edo period (Tokyo Metropolitan Central Library, Special Collection Room)



Fig. 3) Water route map of Kantō Region, 18th century (Funabashi Municipal Library)



Fig. 4) Procession in the water with portable shrine (Laboratory of Regional Design with Ecology, Hōsei University)



Fig. 5) Sposalizio del mare (marriage with the sea) (Photo by Aya Hiwatashi)

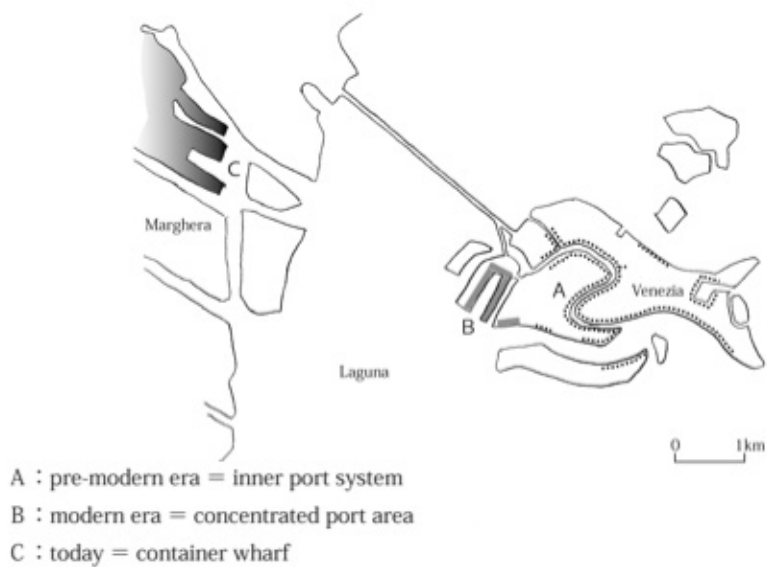


Fig. 6) Historical shift of the port functions in Venice (by H. Jinnai)