

## Chapter 93

# The Sustainable Waterfront

**Matthew Bradbury**

*Unitec Institute of Technology, New Zealand*

### ABSTRACT

*This chapter discusses how a methodology for the development of a sustainable waterfront might be shaped through an understanding and consideration of environmental remediation technologies. The chapter begins by considering the history of waterfront development in Europe and America and how this model has become codified into a generic real estate process. The author develops a critique of this model from an environmental perspective. The use of sustainability as an ideology to provide a framework for critique but also strategies and techniques for moving towards a new model of waterfront development are explored. The development of a possible hypothesis for the design of a sustainable waterfront is developed, followed by a speculative case study of a waterfront project that explores how the design hypotheses might be tested. The chapter concludes by speculating on the ways in which a study of urban ecology, in particular urban biodiversity, could enhance the finding of the case study towards the development of a waterfront design process that could contribute to the ecological health of the 21<sup>st</sup> century city.*

### INTRODUCTION

The massive growth in the development of cities is the global phenomenon of the 21<sup>st</sup> century, (Brugmann, 2010; West, 1993) already half the world's population live in urban environments. At the same time a growing awareness of the importance of the environment is increasing becoming part of every-

day consciousness. A growing consensus over the effects of CO<sub>2</sub> emissions on the global environment has important implications for the shape and core drivers of the world economy. (Hodson, 2010) The effects of this colossal urbanisation and the enormous consumption of resources in both the building and maintenance of the new cities, has had a deleterious effect on the environment. The challenge of finding a way for cities to become more sustainable is a subject that has increasing

DOI: 10.4018/978-1-4666-4852-4.ch093

occupied researchers and design practitioners. Contemporary waterfront development has been the lens through which many of these urban trends have played out. The way in which 19th industrial ports and infrastructure have been transformed to new kind of urban development, the waterfront, is a critical part of 20<sup>th</sup> century urbanisation. This mode of waterfront development, first presented in the Baltimore Waterfront project, (Norris 2003) has become a globally accepted model.

A new dialogue between sustainability and urban development has resulted in a rethinking of the waterfront building programme towards one that is directed by sustainable building guidelines.

The author will argue that the tools presently advanced to transform waterfronts to a more sustainable model ignore some specific issues that are unique to waterfront developments, in particular environmental issues. The underlying environmental problems of many waterfront developments, polluted stormwater, brown field sites, and polluted dredging, are often elided. The author argues that to develop a sustainable waterfront, the complex environmental problems that are present in many waterfront developments need to be brought forward, to be privileged, and the full array of known remediation technologies explored and utilised. It is in this way that the conventional urban waterfront programme; public building, apartments, offices, and public spaces, can be re-examined and re-invented to provide a more equitable and sustainable city.

The objectives of the chapter are;

- To demonstrate the importance of waterfront development in contemporary urbanism.
- To show how this development type relies heavily on a prescriptive and generic/real estate formula.
- To show the importance of the environmental/ecological investigation of waterfront sites, in particular the environmental problems of the contemporary waterfront

such as; terrestrial and marine pollution, stormwater flows, and sea level rise,

- To establish a new methodology of sustainable waterfront development that draws on four intersecting areas of research, waterfront development models, urban sustainability, environmental remediation, and urban ecology.

## **BACKGROUND**

The world wide structural transformation of waterfronts from ports to pleasure zones is still best described by Hoyle's (Hoyle, 1981) (five-phased development model. The five phases describe how the European port and waterfront has developed over the last 700 years. The first part is the primitive city port phase, from the medieval city port; most notable, the Italian trading ports, to the beginning of the European industrial port. The second phase is the expanded city port, the result of the territorial expansion of the traditional city port utilising the technology of the industrial revolution to build a new port infrastructure. The 19<sup>th</sup> century port became a heavily industrialised site that was a crucial part of the global supply chain developed by European colonialism in the 19<sup>th</sup> century. The port infrastructure assumed a common form around the world, an infrastructure of reclamation and wharfs, backed with warehousing, and surrounded by a new residential district of dockworkers.

The third phase, the modern industrial city port, is part of the development of the large-scale industrial infrastructural processes of the mid 20th century economy; manufacturing, oil storage and refining, and the start of containerisation. The consequences of containerisation were not only a new cargo typology, but the invention of a new port infrastructure with radical implication for the connection of port to city. With the necessity of a new waterfront infrastructure design, the huge sums of money that needed for this reorganisation,

16 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/the-sustainable-waterfront/95018](http://www.igi-global.com/chapter/the-sustainable-waterfront/95018)

## Related Content

---

### Social Technologies as a Social Sustainability Practice

Fernanda Salvador Alves, Eduardo De-Carli, Andrea Paula Segatto and Luiz Aurélio Virtuoso (2022). *International Journal of Social Ecology and Sustainable Development* (pp. 1-17).

[www.irma-international.org/article/social-technologies-as-a-social-sustainability-practice/288531](http://www.irma-international.org/article/social-technologies-as-a-social-sustainability-practice/288531)

### Image-to-Image Steganography Using Encoder-Decoder Network

Vijay Kumar, Ashish Choudhary and Harsh Vardhan (2022). *International Journal of Social Ecology and Sustainable Development* (pp. 1-12).

[www.irma-international.org/article/image-to-image-steganography-using-encoder-decoder-network/312181](http://www.irma-international.org/article/image-to-image-steganography-using-encoder-decoder-network/312181)

### Financial Inclusion in Sukuk and Green Sukuk: A Case Study Through Bibliometric and SLR

Sumiya Tahir and Farah Naz (2024). *Financial Inclusion, Sustainability, and the Influence of Religion and Technology* (pp. 133-163).

[www.irma-international.org/chapter/financial-inclusion-in-sukuk-and-green-sukuk/342239](http://www.irma-international.org/chapter/financial-inclusion-in-sukuk-and-green-sukuk/342239)

### Sustainable Development: A New Frontier for SMEs

Daniele Giordino and Edoardo Crocco (2022). *Management Strategies for Sustainability, New Knowledge Innovation, and Personalized Products and Services* (pp. 68-93).

[www.irma-international.org/chapter/sustainable-development/295133](http://www.irma-international.org/chapter/sustainable-development/295133)

### Adoption of Sustainability in Seaport Infrastructure: A Systematic Literature Review

Satya Shiva Saswat, A. Seetharaman, K. Maddulety and Priti Bakhshi (2024). *International Journal of Social Ecology and Sustainable Development* (pp. 1-12).

[www.irma-international.org/article/adoption-of-sustainability-in-seaport-infrastructure/333861](http://www.irma-international.org/article/adoption-of-sustainability-in-seaport-infrastructure/333861)