

# INTRODUCTION HOW TO DEAL WITH THE COMPLEXITY OF THE URBANIZED DELTA

This book is an attempt to completely reexamine how to think about and to deal with the complexity of the Dutch Delta. In general, urbanized deltas are extremely complicated. These regions contain a complex ecosystem shaped by highly variable rivers and the sea, and they must deal with the complexities of urban, agricultural, and industrial land use and its relationship to the economy, culture, and society. Further, a highly complex system of agencies and institutions governs many critical aspects of life in the delta, such as flood defense and water management, spatial planning, urban development, port development, and environmental protection.

Until recently, the Netherlands seemed to deal with this extreme complexity quite successfully. The Dutch approach of “drain, dredge, reclaim” has been a model for other countries. Dutch hydraulic engineers have been invited to apply their technical expertise to deltas around the world. In addition, the quality of Dutch spatial planning, urban design, and land-use policy is regarded as an international standard.

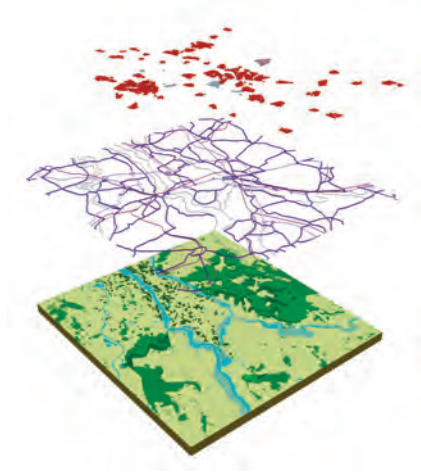
However, new insights and serious discussions are leading to a wholesale reconsideration of the fundamentals of flood defense, water management, and urban development policies. A serious paradigm shift is taking place. Instead of the adage “*fighting against the water*,” a new one, “*working with nature*,” is appearing.

This change is not simply the result of an increased awareness of climate change and rising sea levels. The first signs of it date back to the 1970s, when the first attempts were undertaken to consider the quality of the natural environment in the development of policies concerning flood defense, water management, and spatial planning. In the 1990s, climate change only accelerated the adoption of this new approach. The

l:1 (opposite page): Urban patterns, rivers, coastlines, and deltas in northwest Europe. Map by S. Nijhuis and M. T. Pouderoijen, Delft University of Technology.

I.2: "Layer cake" model.

Image by S. Nijhuis, Delft  
University of Technology.



2008 report of the second National Delta Committee, "Working Together with Water," supports this approach but does not say how to implement it. There is no broad or coherent consensus about how to relate new methods of flood defense and water management to issues such as urbanization, economic development, and changing land use in agricultural areas. The report focused on the environment and hydraulics but hardly paid attention to the consequences of urbanization and economic development.

Making these connections is the big task right now. There are several new experiments under way that aim to develop a comprehensive approach to managing the delta in ways that improve systems of flood defense, protect the environment, create high-quality urban development and attractive landscapes, and support a prosperous economy. In that sense, the Netherlands is a laboratory.

The necessity of finding a method that enables us to understand both the relative autonomy of several areas of deltaic complexity and the relationships among them has resulted in the development of the "layer cake model," which regards the spatial environment as a composition of three layers (Fig. I.2). The bottom layer is the land itself and its substratum, which includes soil, water, and rock. The middle layer is made up of infrastructural networks that create conditions for settlement, development, economic activities, and transportation. The top layer is one of



human occupation, urban patterns, and economic activities.

In this model, the bottom two layers should provide a sustainable and stable foundation for the development of the top layer of urban settlement.

This approach was developed by landscape archi-

1.3: Catchment areas of the Rhine, Meuse, and Scheldt.

Map by M. T. Pouderoijen,  
Delft University of Technology.

pects and urbanists, and national planning institutions have adopted it.<sup>1</sup> In 2005, the National Memorandum on Spatial Planning (*Nota Ruimte*) adopted this approach as a guiding principle. However, this “official” adoption has not resulted in clear answers to several important planning and design questions related to the complexities of the Dutch Delta.

In this book, we try convey the latest, “state of the art” thinking about deltaic complexity and illustrate critical planning and spatial development issues in the Netherlands. This book has two parts. The first part is dedicated to understanding the complexity of the delta by analyzing its historic development and present-day conditions in five different layers, presented in five chapters: on the natural environment of the territory, the development of hydraulic infrastructure, the creation of the urban built environment, the patterns of urbanization in the region, and the management and administration of this complex, urban, deltaic landscape.

The second part of the book demonstrates how the layer approach produces important new spatial planning and design concepts. It does this in three chapters that focus on three areas in the Netherlands: the *Randstad*, which forms the central part of the Netherlands between the closed but sometimes weak coastline and several rivers; the southwest delta, which was almost completely closed in the 1960s and 1970s by the Delta Works but is now under new scrutiny; and the Rotterdam region, which contains rivers, a sea-coast, a densely urbanized region, and the largest port in Europe and thus exhibits all of the complexity of the modern Dutch Delta.

We hope the book will stimulate discussion about other urbanized deltas worldwide and inspire further studies and innovative concepts that combine hydraulic engineering, spatial planning, urban design, and landscape design.

—*The Editors*

## ENDNOTE

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1. Sijmons and Venema, eds., = *Landscape*.