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# MULTIFUNCTIONAL FLOOD DEFENSES: CHALLENGES FOR GOVERNANCE

## REFLECTION

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Over the past centuries, numerous examples of what we now call multifunctional flood defenses (MFFDs) have emerged in the Netherlands, ranging from houses or even entire villages built on polder dikes, to large scale developments in urban areas like Rotterdam, Dordrecht and Scheveningen. These developments were not planned as such, but emerged as a consequence of often-unforeseen events.

We are now considering more deliberate functional combinations, but working towards planned MFFDs is no small task. One reason is that, over time, responsibilities in different sectors have become more specialized and complex, leading to different institutions and traditions in fields like flood protection, land use planning, and economic/urban development. The importance of flood protection, for example, has led to the assignment of clear responsibilities and strict rules designed to guarantee the reliability of flood protection; as a result, there is often strong resistance to combining secondary functions with primary flood protection infrastructures. Yet, there are good reasons to explore combinations of functions, combinations that do not necessarily lead to threats to the flood protection function.

The various contributions in this book provide a cross section of perspectives on the challenges for planning and design of MFFDs, and on possible ways forward. Most of the contributions in the governance part of this book focus on the challenges of connecting and intertwining knowledge from different sectoral traditions and from different disciplines. As experience in Policy Analysis shows, there is no single approach to do this. Typically, a combination of approaches is needed: for example, a process design that stimulates frame-reflection (such as the world café or a game-like setting), an appropriate boundary object (such as a dilemma cube, a map, a touch table, or a joint 'model'), and adequate facilitation or knowledge brokerage. But while integrating knowledge is crucial, similar attention must be paid to including and integrating stakeholder perceptions and interests. Societal stakeholders bring their own perspective and knowledge, in addition to specific means and desires, some of which may be incompatible or even conflicting. For most MFFD situations, a variety of public organizations will be involved, including water boards, municipalities, regional planning agencies, and these will also come with their own sometimes implicit frames and preferences (Carton, 2007; Carton and Thissen, 2009).

Ideally, knowledge or science-based inputs can be used to identify the boundaries of feasible solutions, assess the pros and cons of alternative solutions or designs, and create innovative solutions or designs that benefit most, if not all, stakeholders. However, as several authors in this book have pointed out, establishing a basic level of trust between the different parties involved is a conditio sine qua non. Without trust, different participants will not be open to the perspectives of others. Still, establishing trust is challenging, as actors may be inclined to use their knowledge selectively, and behave strategically to further their own interests.

On top of the challenges of multi-actor, multi-stakeholder, multi-disciplinary processes comes the challenge of complexity and uncertainty: complexity, because MFFDs display interdependencies, both technical and managerial, in their daily development and evolution. Uncertainty comes in because both physical and socio-technical conditions may change significantly, and in unpredictable ways, over the lifetime of a MFFD. This will require, on the one hand, attention to including flexibility and adaptive capacity in the design phase of a MFFD, and on the other, the capability of the management and governance system to acknowledge uncertainty, and to be flexible, to learn and adapt in response to future changes, something which is at odds with the traditional culture of establishing fixed rules in flood management.

Moving towards a situation in which effective cooperation and integration across disciplines, sectors and stakeholders is the rule instead of the exception takes significant time. It is essential to establish learning communities that build on experience in practice, and innovative educational programs that prepare future generations for cross-disciplinary cooperation.

While this remains challenging, a recent visit to Bangladesh and Indonesia made me realize once more that the Netherlands can build on 50 years' experience and development towards systems thinking, integration, participation and co-design in water and coastal management, as exemplified, for example, by the success of a program like Room for the River, and parts of the Delta Program. The STW-sponsored research program underlying the contributions to this book provides building blocks for further steps. While the academic setting of the program and the requirements for PhD research do not provide the incentives (or the setting) for full knowledge integration, creating a community of young researchers who have been exposed to the knowledge and perspectives of other disciplines related to MFFD is an important contribution.



*Figure 1. Multifunctional flood defense in Dusseldorf, Germany; with at the left the northern car traffic tunnel entrance and at the right the Rheinwerft quay along the river Rhine.(Photo courtesy Mark Voorendt)*