



WATERSCHOOL



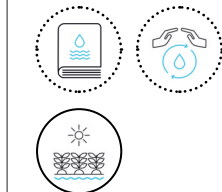
# An Experimental Catalyst for the Future Living and Working Environment: The WaterSchool

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Studio Makkink & Bey

*In the times of climate crisis, cities face acute challenges. Over 80 per cent of all climate change emergencies and disasters are water-related: floods and drought, pollution, water conflicts, rapid urbanization, a growing demand for food and energy, and migration. Many of these have historic roots in our lifestyle choices, our preference for specific kinds of technology, and energy usage. The omnipresence of water challenges and the way in which we have addressed them in the past give us the opportunity to treat water as leverage for comprehensive changes. The WaterSchool M4H+ in Rotterdam responds to this opportunity by raising awareness of our enormous water footprint and the ways we can reduce it through possibilities and solutions offered by design.*



## KEY THEMES



## WaterSchool M4H+

WaterSchool M4H+ is a part of the ongoing, self-initiated project of Rotterdam's Studio Makkink & Bey (fig.1). Utilizing water footprint as an urban design tool and considering water as the "ground" for rethinking the future of urbanism, WaterSchool proposes new approaches for the cultural, economic and infrastructural models of education.

Today, WaterSchool is a growing landscape in which we can place, shape and connect a wide range of related topics. Studio Makkink & Bey brings together private and public companies, designers and artists engaged in themes related to water and education, and asks them to share their expertise and vision. Water use and the way it has been embedded over decades into contemporary lifestyles becomes leverage for the collaborative exploration of a learning production landscape, creating an active archive and network. The studio's aim and dream is to set up the WaterSchool in the heart, and as a heart, of the old port site Merwe-Vierhavens (M4H).

## Why WaterSchool? And what is the M4H?

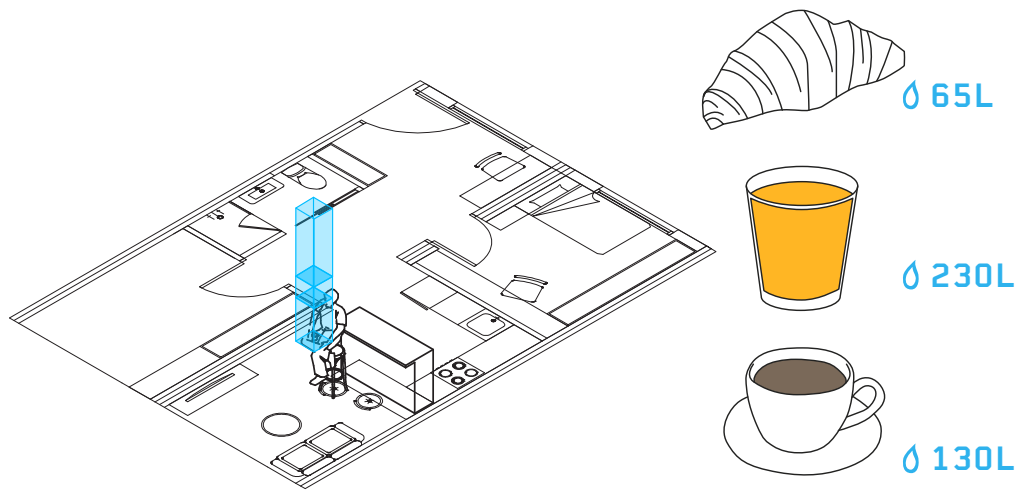
"The people of Rotterdam know a thing or two about living with and on water. About 90 per cent of the second-largest city in the Netherlands lies below sea level, making it vulnerable to rising waters," Elissaveta M. Brandon points out (Brandon 2021). Unfortunately, this dependence on water does not make the city's inhabitants treat it less extractively. An average Dutch person consumes 129 liters of water from the tap per day – around 47,000 liters per year – directly, for everyday use. The same Dutch person consumes another 4,000 liters of water per day – 1.45 million liters per year – indirectly as

a consumer of mostly imported goods such as food and clothing (Bakker et al. 2022). Ninety-five per cent of their water footprint is left in foreign countries because of the production of goods abroad, where the water conditions are often much worse than in the Netherlands.

Rotterdam is a low-lying city in a delta, but this is not the only distinctive feature of the city's water landscape. A global hub for international trade and home to some of the world's leading industrial clusters, Rotterdam is Europe's largest seaport, with the Merwe-Vierhaven, or simply M4H, being one of its latest expansions (Kimmelman 2017). A port area as large as the center of Rotterdam has been reinventing itself since 1900, when it transformed from a polder landscape to an industrial one, and later, from the biggest fruit port in the world to a future work-residential area. The rapid industrial transformations led to the release of toxic waste into the surrounding waterways, contributing to water and soil pollution (fig. 3) (Schouten 2020). Meanwhile, the focus was primarily on economic growth, with environmental concerns taking a backseat.

To this day, white refrigerated warehouses and business parks dominate Merwe-Vierhavens' landscape. The infrastructure from the harbor's times of "fruitful" splendor has been slowly fading away, giving the area an increasingly eerie appearance. Here, next to the remnants of green areas, by the neglected cargo train rail, with huge trucks often blocking window views, Studio Makkink & Bey has found its temporary home (fig. 4).

The city of Rotterdam and the Port Authority have ambitious plans for the (re)development of the M4H area (Jansen et al. 2021), including innovative manufacturing, 3000 houses for approximately 6,300 new residents, cultural and



^ Fig. 2 Indirect water consumption (Source: Studio Makkink & Bey, 2021).



^ Fig. 3 Aerial photo of old Mathenesse and Merwehaven in 1971, with cranes and gasworks on theright (Source: Group A, 2020).



^ Fig. 4 M4H area (Source: Studio Makkink & Bey, 2021).

educational facilities and mostly small businesses; what makes this an even grander vision is that by 2050, Merve-Vierhaven is supposed to be boasting of a fully circular society with a closed materials cycle. For this to be realized, test projects and coalitions need to be established to figure out how sustainable urban development can be combined with Rotterdam's position as a global port, burdened as it is with a huge amount of waste and countless raw materials and unfinished products crisscrossing the region.

### **WaterSchool: Making School through Design Thinking in M4H**

What do these grand plans mean for the local and global waters in a port environment, threatened by rising sea level, soon to be inhabited by 6,300 new water consumers? Studio Makkink &

Bey, commissioned by IABR (International Architecture Biennale Rotterdam), has taken on the task of responding to these challenges and contextualizing the WaterSchool in the M4H area and its hopeful circular future.

"IABR-Down to Earth: WaterSchool M4H" draws on the previously mentioned water footprint data: 6,300 new residents mean 749,700 liters of water usage per day. The starting point for the WaterSchool M4H+ was to translate these abstract numbers into imaginable and tangible knowledge that would help people realize the spatial enormity and environmental consequences of these numbers (fig. 5).

Insects, duckweed, seaweed, wood and mushrooms are the five resources that the WaterSchool has identified as potential supplies for shaping the future of living in M4H. Starting from the basic needs of an individual's body,

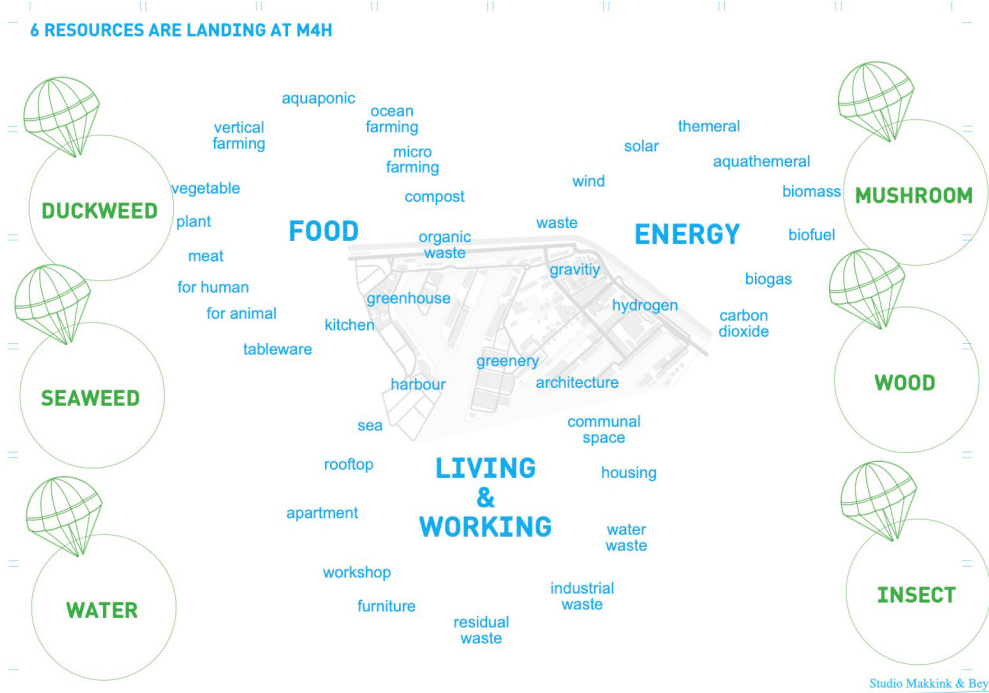


^ Fig. 5 WaterSchool Studio Covers – Invisible indirect water (Source: Studio Makkink & Bey, 2021).

such as nutrition and water use, these resources contribute to a new diet, suggesting the use of less water-extracting protein sources. When expanded to dwelling, living and working, and to energy and water consumption, they also generate new sustainable building materials and energy supplies, while suggesting new types of architecture and cultures of living (fig. 6).

Within the framework of the exhibition and temporary knowledge center (figs. 7 and 8), Water-

School M4H+ brings together experts, enthusiasts and small-scale manufacturing companies, connecting driving forces and combining methods and perspectives on water management. Following “research by design” and “learning by doing” principles, the WaterSchool M4H+ superimposes a cultural framework that recognizes the importance of local conditions, history and heritage, in a spatial framework that has been approved by the City and the Port Authority in 2019.



^ Fig. 6 WaterSchool research book - six resources (Source: Chester Chuang, 2021).



^ Fig. 7 IABR-WaterSchool M4H+ Exhibition (Source: Aad Hoogendoorn, 2021).



^ Fig. 8 Fungi scenario visualization (Source: Studio Makkink & Bey, in collaboration with Juhee Ham, 2021).



^ Fig. 9 Workshop Studio Makkink & Bey – Plot 003 Insect Larp (Source: Antoinette Veneman, 2021).



As a result, the WaterSchool M4H+ has been granted a permanent influence on the M4H area as a prime mover of the planned circular economy and as a curator of a public and living archive of multidisciplinary references that can continuously feed M4H with new insights for development.

The curriculum of this water-driven school is diverse and holistic, covering a wide range of related topics. From the basics of water conservation and management to more complex issues like water pollution and climate resilience, the school offers a comprehensive approach to understanding water and changing humans' relationship to it. The program is designed to be accessible to all, with activities and resources for children, adults and professionals alike.

## Conclusion

WaterSchool is an example of how design can be a catalyst for social change. It transcends traditional notions of education, blending art, science and community engagement to create a landscape for production and learning. By exploring the intricate relationships between water and society, WaterSchool questions our approach to resource management. In an increasingly water-stressed world, the makers of WaterSchool believe that such initiatives are offering hope and paving the way toward a more sustainable and resilient future.

The impact of WaterSchool extends beyond its physical location. Studio Makkink & Bey actively shares its knowledge and experience with communities around the world. The studio organizes workshops, conferences and exhibitions, spreading awareness, inspiring others to take action and promoting sustainable practices (fig. 9). By fostering a global network of like-minded individ-

uals and organizations, WaterSchool contributes to a collective effort to address water challenges and foster a sense of global citizenship and, consequently, responsibility.

## Acknowledgment

This contribution was peer-reviewed. It was edited by members of the editorial team of the UNESCO Chair Water, Ports and Historic Cities: Carola Hein and Carlien Donkor.



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**Rianne Makkink** is a Dutch architect and designer who graduated from Delft University of Technology in Architecture. In 2002 she co-founded Studio Makkink & Bey, a practice built on experimental research methods and collaborative approaches in public space projects, exhibition design, architecture, product development and interior and product design. This diversity in implementation reflects the notion that everything is inextricably linked. Her design strategy is to not only think about structure as an engineer would, but also to look at the context.

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**Barbara Kaczmarczyk** is a transdisciplinary educator, designer and writer based in Rotterdam. As an educator and designer, Barbara is committed to creating spaces for non-institutional knowledge production that challenge dominant histories. As a writer, she draws from diverse literary genres to propose non-anthropocentric, speculative narratives. In parallel, Barbara works as a movement and yoga therapist. This experience allows her to think through and with the body, and nourishes her interest in choreographic and performative dynamics of various environments. Currently, she has a work placement with Studio Makkink & Bey, where she looks at water through the lens of metaphor and symbolism, developing a program that proposes different attitudes to water.

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