



# The Urban Water Buffer: Combating the effects of heavy rainfall and drought in The Hague

## *The Hague, The Netherlands*

### IN A NUTSHELL

*Due to its location, The Hague is one of the European cities currently suffering a heavier rainfall in winter. In summer, heatwaves and drought have become more common. These extreme weather events are forcing the city to adapt and manage the imbalance of water supply and demand. The Hague has become a pioneer in the creation of urban water buffers.*

### **Adapting to extreme weather events and accumulating fresh water**

Many European cities are suffering from extreme precipitation, heat and drought. Due to its location, The Hague has one of the highest rainfalls in Europe. Moreover, because of climate change, extreme temperatures and dry periods are more common in summer, which causes an imbalance between water supply and demand. Wet periods cause localised flooding, resulting in nuisance and damage to public spaces and buildings. During dry periods, fresh water is needed to irrigate the plants in the urban green infrastructure. To prevent flooding and conserve scarce drinking water in the dry months, The Hague collects and re-uses rainwater.

With its goal of adapting to climate change by 2050, The Hague has been focusing on assessing its ability to cope with extreme weather events. In doing so, the city has become a pioneer in developing urban water buffers (UWBs). While the Netherlands has developed several water buffers for the agricultural sector, an urban version existed in only one city before The Hague – Rotterdam. The UWB in The Hague is part of a new community park that features enhanced climate responsiveness and biodiversity while offering citizens a healthy and enjoyable green public space.

### **The development and functioning of the urban water buffer**

In early 2019, The Hague City Council joined the Nature Smart Cities consortium. A grant from the EU Interreg 2 Seas Programme was used to develop an Urban Water Buffer (UWB) as part of the redevelopment of the Cromvliet community park. The project was completed in 2022.



The Urban Water Buffer information board – © Henriëtte Guest

## THE HAGUE



The Hague – © Jurriaan Brobbel

#### **Population:**

482,510

#### **Area:**

98.13 km<sup>2</sup>

#### **Signatory to the Covenant of Mayors since:**

25/11/2008

#### **Overall CO<sub>2</sub> emission reduction target:**

Climate neutrality by 2030

The UWB is currently composed of a 70 m<sup>3</sup> crate system to temporarily retain water, which is then channeled to a 30m<sup>2</sup> biofilter, where it is filtered before being infiltrated into a 35,000 m<sup>3</sup> deep underground aquifer. The UWB collects, purifies and stores rain and surface water. This increases the sponge effect of the environment and reduces the risk of waterlogging following severe downpours. During warm periods, the water is pumped up and used to irrigate vegetation in the urban farm and the park's kitchen garden. This allows the plants to evaporate more water and produce additional cooling to ease temperatures during heatwaves.

Thanks to this system, the city council has managed to disconnect a ground-level surface area of 7,000 m<sup>2</sup> from the sewer system. In cooperation with the housing corporation Staedion, an additional 1,000 m<sup>2</sup> of rooftops have been disconnected. Not only is this the first urban water buffer to be installed in a public space, it is also the first with the ability to filter both rain and surface water.

## Turning grey into green – a community-led park

Before its redevelopment, Cromvlietplein Square was an expanse of asphalt surrounded by fences. Because the aim for the new community park was to improve the liveability of the neighbourhood, the city council involved a wide range of local stakeholders in its creation. Residents, businesses and children were involved in the brainstorming phase to ensure their needs and desires were included in the development of the public space. This co-design process took place between 2017 and 2018 and was a collaboration between the Coalitie Laak community association, the landscape architects Buro Sant en Co. and local residents. Local authorities organised individual interviews to collect as much information as possible.

The Laak district is one of the most socially and environmentally vulnerable neighbourhoods in The Hague. Its residents face challenges relating to housing, health, safety and a lack of outdoor spaces. The involvement of all residents in the design of the water buffer was necessary to create a sense of ownership of a public space adapted to the effects of climate change. This participatory process prompted the residents to launch other local initiatives. One of the most popular was the collection of rainwater from balconies to be reused on plants during dry periods. Local residents partnered with housing corporations to make this idea a reality.

## Lessons learnt and next steps

With the redevelopment of the community park and the Urban Water Buffer, the neighbourhood has acquired a much greener space that benefits both citizens and the environment. Seventy new trees have been planted and 25,000 m<sup>2</sup> of greenery have been added. The roads have been narrowed and some footpaths have been replaced with plants and flowers. The city acknowledges that the collaboration with residents was one of the strengths of the project, since it fostered a sense of belonging and encouraged the local population to be more proactive.

The test phase of the UWB has ended. Rainwater is now being stored deep underground, so that re use can start in early 2024. The city council and its partners are monitoring water volumes and quality to ensure a sufficient supply of fresh water in the long term. The Hague is aiming to develop knowledge on how to adapt the whole city to climate change.

### KEY FIGURES

Project duration: 2017–2022

The Urban Water Buffer in numbers

**8,500 m<sup>2</sup>** water collected

**70 m<sup>3</sup>** of water storage to temporarily retain rain & surface water

**30 m<sup>3</sup>** BlueBiofilter matting to clean water

**25,000 m<sup>2</sup>** park surface incl. additional green surfaces, trees, allotment gardens, urban farm, playground, etc.

**7,000 m<sup>2</sup>** of disconnected surfaces at ground level

**1,000 m<sup>2</sup>** of disconnected roofs – detached from sewer system



### FINANCING THE PROJECT

- + **Interreg 2 Seas:** €650,000
- + **The Hague City Council:** €3,000,000

### USEFUL LINKS

- » <https://naturesmartcities.eu/pilots/75>
- » <https://klimaatadaptatienederland.nl/@255365/cromvlietplein-square-urban-water-buffer/>



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