

# Rainwater saving and use in households, Bremen <sup>[1]</sup>

Image from Climate Adapt about this case study

[2]

Autor: © Bremer Umwelt Beratung e.V.

In Germany, for a long time a single fee for both rainwater and wastewater was levied in all communities. After some German court decisions the fee for rainwater was separated from wastewater one and is now based on the extension of impervious property surface (m<sup>2</sup>), which directs water into the public sewage system. Collecting rainwater on private property with e.g. rain barrel or infiltration system (as for example green space) is then likely to reduce sewage costs due to lower loads to be treated by the treatment plant. According to the court decision these cost savings have to be passed to the property owners resulting in lower rainwater fees per m<sup>2</sup>. For several reasons (including saving of natural resources, reduction of pressures on the sewer systems, reduction of drinking water consumption, preservation of the natural water cycles and adaptation to climate change), Bremen has decided to take new approaches in rainwater management. On one hand Bremen is also applying this split fees and gives a refund if properties are less sealed and rainwater can filtrate into the soil or rainwater is used. In addition the city is subsidising investments into rainwater use in toilets, garden irrigation, collection tanks up to 12.000 Euro or a maximum of 1/3 of the total investment costs per household.

## Case Study Description

### Challenges:

For the area of Bremen climate projections are predicting higher temperatures and a change in precipitation. By the end of the century (2100), projections consistently indicate a significant increase in winter precipitation of up to 44 percent and a significant summer decline of up to 22 percent. For the middle of the 21st century inconsistent trends are projected in terms of precipitation and the number of rainy days. On the other hand, the temperature in all seasons is expected to constantly increase over the next century by up to 3.1 °C in the annual average.

During the winter period also more frequent extreme rainfalls are expected. In addition flood risk from sea and land side (including river, rain and groundwater flooding) are expected to increase. These changes will have an impact on the sewer system, in particular on its future design. Also more water retention measures for flood management will be needed. Therefore Bremen has decided to invest in decentralised rainwater management.

### Objectives:

The overall objective of actions taken by the city of Bremen is to establish a natural water balance and to reduce the rainwater discharge into the sewerage system, supporting its use. At the same time drinking water consumption for certain uses in households should be decreased (e.g. toilet flushing).

### Solutions:

The solution provided to improve rainwater use in Bremen household is a combination of technical and economic approaches and applies to all private property owners. On one hand a rainwater cistern system is applied. Such a system of gutters and downspouts directs the rainwater collected by the roof to a storage cistern. The cistern, mostly located in the underground, may be constructed of various materials including cinderblock, reinforced concrete, precast concrete, fiberglass, or steel. The cistern supplies water to the household through a standard pressurized plumbing system. The rainwater can be used either for toilet flushing, but also for watering the garden. The installation of such systems in existing buildings requires adaptation of the piping system and some earthworks and is therefore sometime quite costly. In order to increase the uptake of the system and lower the costs a subsidy on the investment costs is given to the property owner. This subsidy can amount to a maximum

of 12.000 Euros or a maximum of 1/3 of the total investment costs.

On the other hand the property owner gets the rainwater fee (0.63 €/m<sup>2</sup>/year) refunded if rainwater use is applied or the ground is kept permeable, as the fee is calculated on the sealed area. For properties larger than 1,000 m<sup>2</sup> the fee has to be split between rain and wastewater. Smaller properties can voluntarily decide if such a split is feasible and convenient. In practice the larger the property is and the more water can be kept on the ground the more cost savings in comparison to sealed properties can be achieved.

**Importance and relevance of the adaptation:**

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Additional Details

**Stakeholder engagement:**

The design of the measures part of the approach taken by Bremen has not included stakeholder participation. However, citizens are among the main actors directly responsible for their implementation.

**Success and limiting factors:**

The main success factor for using rainwater in households is the funding scheme (i.e. subsidies for the installation of the rainwater use system) provided by the Federal State of Bremen which enhances the environmental behaviour of house owners. According to information from the Bremer Umweltberatung (environmental consulting for Bremen), several citizens would like to have more eco-friendly houses, but without a proper funding they are rarely taking any actions concerning rainwater management.

The main barrier is that not all rainwater use solutions that could be established in households lead to a cost saving. Some house owners are also afraid of having construction works on their property. Therefore the implementation of such rainwater use systems is more easily when houses are newly constructed. High investment costs are also a significant barrier, which can be relieved by subsidies.

**Budget, funding and additional benefits:**

The rainwater fee for sealed and overbuilt area is 0.63 €/m<sup>2</sup>/year for the rainwater not discharged to the sewage system due to infiltration or use this fee is refunded. This refund is based on the individual circumstances on the property.

The costs of installing a rainwater use system are depending on the local context and amount at least to 6,000 Euros. The investment subsidy provided by the Federal State of Bremen amounts to a maximum of 12.000 Euros, and in any case cannot exceed 1/3 of the overall costs incurred by a property applying the rainwater use system.

**Legal aspects:**

The treatment of wastewater (including rainwater) is within the responsibility of the German communities; the costs of these services need to be paid by the property owner. Before 2010 communities have not been obliged to split the fees for the service between rain and wastewater. After some German court decisions the fee for rainwater needed to be separate from any wastewater fee and has now to be based on the size of impervious property surface, which directs water into the public sewage system.

**Implementation time:**

The funding scheme was set up in the 1990s and has been developed further since then. The current scheme exists since 2016. The split of the fees for rain and wastewater are legally required since 2010.

Reference Information

**Contact:**

Bremer Umwelt Beratung e.V.  
Am Dobben 43a  
28203 Bremen  
E-mail: [info@bremer-umwelt-beratung.de](mailto:info@bremer-umwelt-beratung.de) [3]

**Websites:**

<http://www.bremer-umwelt-beratung.de/foerderprogramme-regenwassernutzung...> [4]

<https://www.bauumwelt.bremen.de/umwelt/abwasser/regenwasser-25593> [5]

<https://www.hansewasser.de/wir-fuer-bremen/leistungen-fuer-die-bremer-bu...> [6]

**Sources:**

Federal State of Bremen

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