REUSING RAINWATER

HAZARD

RAINFALL AND FLOODS

HEAT

GEOTECHNICAL DROUGHTS

WILDFIRES

IMPLEMENTATION STEP

CONSTRUCTION

RENOVATION

AREA OF ACTION

GROUND FLOOR

ENVELOPE

OUTDOORS

COST

€ € €

low medium high

LEVEL OF SKILL

medium

Installing a rainwater reuse system is part of a strategy to improve the resilience of buildings, which includes making them more autonomous. In a context where extreme climate events are multiplying and intensifying while water resources are becoming increasingly scarce, the aim is to harvest rainwater, generally on the roof, then store it for use in the building, excluding food and sanitary uses (currently prohibited by French legislation).

IMPACTS

By capturing rainwater, harvesting and reuse systems help to **reduce flooding** during periods of heavy rain and **limit the congestion of sewage networks**.

Installing these systems not only **saves water resources**, but also saves money and provides water reserves to deal with increasing heat waves and drought. In high-rise buildings, the water recovered can be used to **supply fire-fighting systems** using gravity flow, such as high-rise water storage pools.

In addition, because it improves the building's autonomy, the reuse of rainwater can preserve the building's uses and **reduce the time it takes to return to normal** in the event of a major climate event.

INSTALLATION GUIDE

The installation must be designed to preserve or even improve the quality of the rainwater collected. A rainwater harvesting system is made up of:

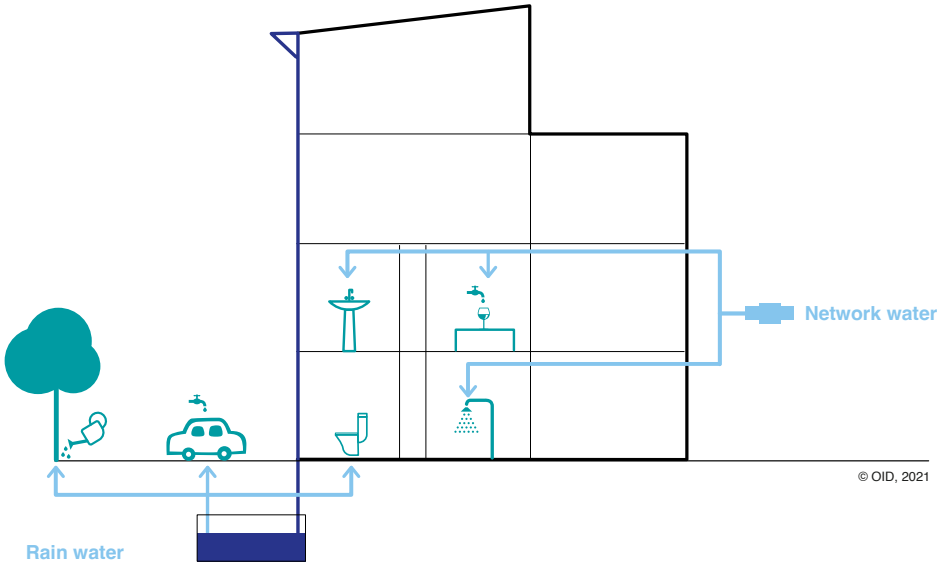
- Rainwater collection (green roof, gutters, etc.)
- Water purification (grids, settling tanks, fine filtration, etc.)
- Rainwater storage (buried or above-ground tank, outdoor basin, etc.)
- Redistribution (pipes, pump)

A sign with the wording "not drinking water" accompanied by a clear pictogram must be installed close to all rainwater supply points and all toilets fed by this water source.

When rainwater is reused inside a dwelling, a declaration must be made to the local council, including an assessment of the volumes of water used. Inside the home, rainwater can be used where there is no risk of ingesting it (toilet flushing, floor cleaning). Outside the building, rainwater can be used for watering plants and washing vehicles. In the vast majority of cases, **rainwater cannot meet all the water needs** of the building's occupants, as traditional tap water must be used for food consumption (washing up, cooking) and personal hygiene.

CLICK HERE TO CONSULT THE GUIDE TO ACTION FOR CLIMATE CHANGE ADAPTATION

DIAGRAM OF HOW RAINWATER AND TAP WATER ARE USED IN FRANCE



WEAK POINTS AND STRONG POINTS

⊖ **Collected rainwater cannot be considered potable** because of its chemical contamination, in particular the presence of pesticides in the rain, as well as metals or asbestos on the roof. It is strictly prohibited to use rainwater that has run off a roof containing asbestos cement or lead inside a dwelling.

⊕ This adaptive solution can be **part of a strategy to control rainwater run-off** at plot level, which should reduce the flow rate at the outlet (quantity of water redirected to the sewerage system).

⊕ A number of **financial incentives** are available both **locally** (regional water agencies, subsidies from local authorities) **and nationally** (**10% VAT**, etc.).

! MALADAPTATION

Maladaptation can result from the following:

Rebound effect of water consumption

When rainwater is reused, overuse of this alternative resource can occur, sometimes with the impression of an unlimited availability of drinking water. In addition, rainwater is often perceived as abundant, particularly in regions with high rainfall, which can lead to complacency about water conservation and an underestimation of water stress. It is therefore essential to use collected rainwater responsibly, avoiding wastage and planning its use according to real needs, especially in the context of climate change and uncertainty about future water availability.

Ecological disturbance

The installation of underground tanks frequently involves excavation work (pits, trenches) which can have an impact on local ecosystems and biodiversity, particularly in areas where vegetation and natural habitats are sensitive or fragile. Disturbance can include cutting down trees, removing herbaceous vegetation, and transplanting plants to allow construction and access to the tanks.

Tank rupture

In the event of a break in the rainwater collection system, the leaked water can cause major structural damage, such as the deterioration of roads and building foundations. Ground movements linked to shrink-swell tend to exacerbate this damage. In addition, it can lead to a potential interruption in the normal operation of the infrastructures affected.

CLICK HERE TO CONSULT THE GUIDE TO ACTION FOR CLIMATE CHANGE ADAPTATION

MONITORING INDICATORS

MONITOR MY ACTIONS FOR CLIMATE CHANGE ADAPTATION

+/− : Quantitative indicator ★ : Qualitative indicator

INDICATORS OF MEANS	INTERPRETATION
+/− Volume of water to be managed (m^3)	N/A
+/− Percentage of volume removed by infiltration into the surface soil of the plot (%)	To be maximised as a priority
+/− Percentage of volume removed by green roofs on the building (%)	To be maximised as a secondary solution
+/− Percentage of volume removed by storage tanks on the plot (%)	To be maximised, as a third solution
+/− Rate of reuse of recovered rainwater (%)	To be maximised

INDICATORS OF RESULTS	INTERPRETATION
+/− Percentage of the building's water requirements met by reusing rainwater (%)	To be maximised, only in the context of authorised uses and conditions
+/− Volume of water saved (m^3)	To be maximised

CONCEPT / DEFINITION

- **Volume of water to be managed:** volume of rainfall that runs off impermeable surfaces and must be intercepted to be infiltrated, evapotranspired or discharged at a regulated rate to an outlet.
- **Volume removed:** volume of rainwater applied to a reference surface area that is not discharged into the sewerage system (measured as the cumulative height of water over 24 hours). This volume must be reduced, i.e. recovered in full on the land concerned, within a maximum of 24 hours.

REGULATION

- The **reuse of rainwater for domestic purposes** inside and outside buildings is governed by Article L1322-14 of the French Public Health Code and the Order of 21 August 2008.
- Decree no. 2023-835 of 29 August 2023 creates section 8 of the French Environmental Code: Uses and conditions of use of rainwater and treated wastewater (Articles R211-123 to R211-137). Article R211-126 specifies that the use of rainwater or treated wastewater is prohibited inside :

- health establishments and social and medical-social establishments for the elderly;
- doctors' surgeries, dental surgeries, medical laboratories and blood transfusion establishments;
- kindergartens, nursery schools and primary schools;
- other establishments open to the public during public opening hours.

FIND OUT MORE

Association scientifique et technique pour l'eau et l'environnement (ASTEE) (2015), *Guide sur la récupération et utilisation de l'eau de pluie*

Guide bâtiment durable Brussels (2016), *Récupérer l'eau de pluie*

French Government (2023), *Les 53 mesures du plan eau*

French Ministry of Health and Sports & Ministry of Ecology, Energy, Sustainable Development and the Sea (2009), *Systèmes d'utilisation de l'eau de pluie dans le bâtiment - Règles et bonnes pratiques à l'attention des installateurs.*

CLICK HERE TO CONSULT THE GUIDE TO ACTION FOR CLIMATE CHANGE ADAPTATION