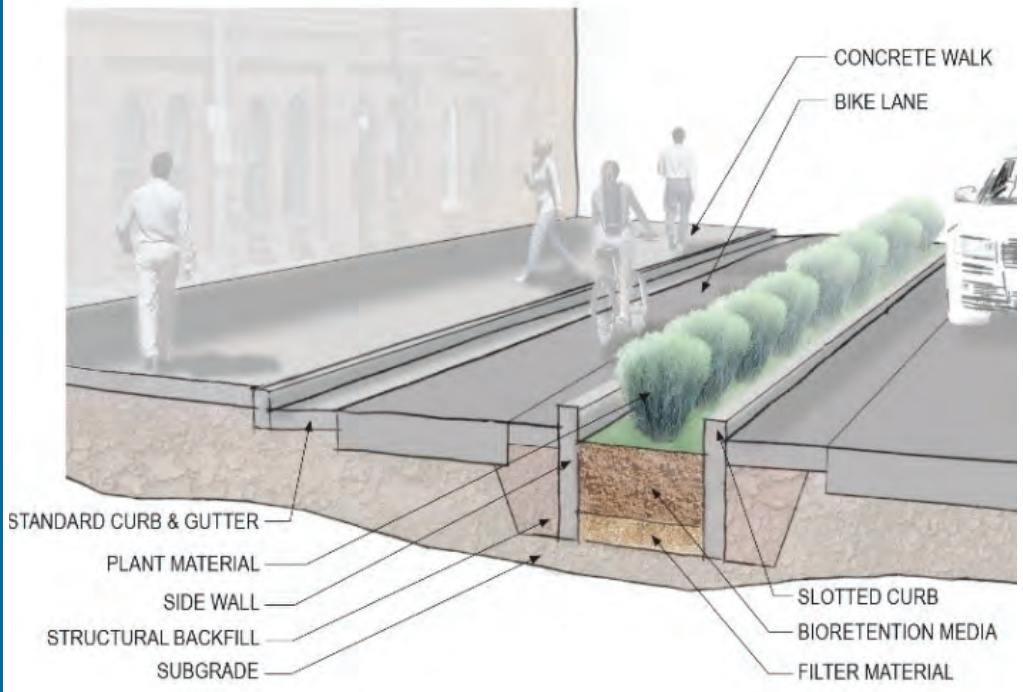
CLEVER Cities

water management



Gutters

Gutters are a wide and shallow simple form of channels, which are above ground that carry the storm runoff in excess of the capacity of the minor drainage system from streets and squares.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators


Expected Co-Benefits

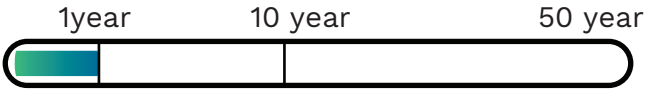
WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

CLIMATE CHANGE ADAPTATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $	$	environment

Best practice example

Wadis, in Leidsche Rijn - Netherlands

CLEVER Cities

water management

Ditches

A ditch is a small to moderate channel depression created to channel water, installed as a mean of managing storm waters, improving water quality in surface and protecting fish habitat.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators


Expected Co-Benefits

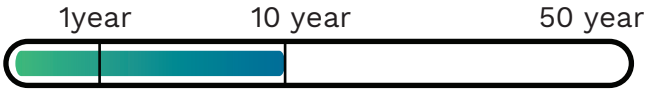
WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

IMPROVE SAFETY AND SECURITY

CLIMATE CHANGE ADAPTATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $	$	environment

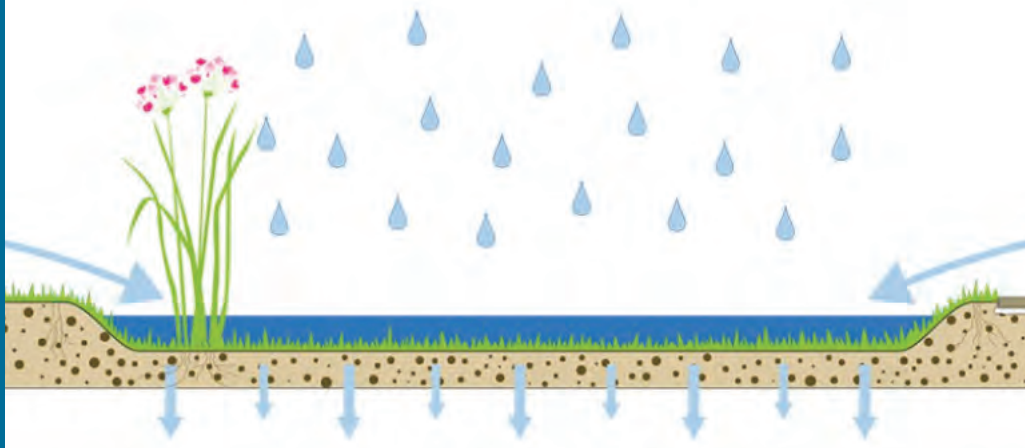
Best practice example

Little River Ditches Projects in Craighead, Mississippi, and Poinsett Counties - USA

CLEVER Cities

water management

Infiltration Strips and Meadows



Infiltration strips and meadows are green or permeable areas that provide opportunities for slow transportation and infiltration of water.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

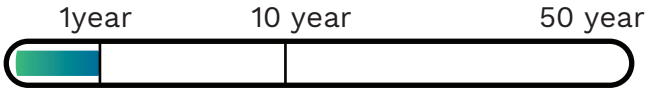
WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

CLIMATE CHANGE ADAPTATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$	$	environment

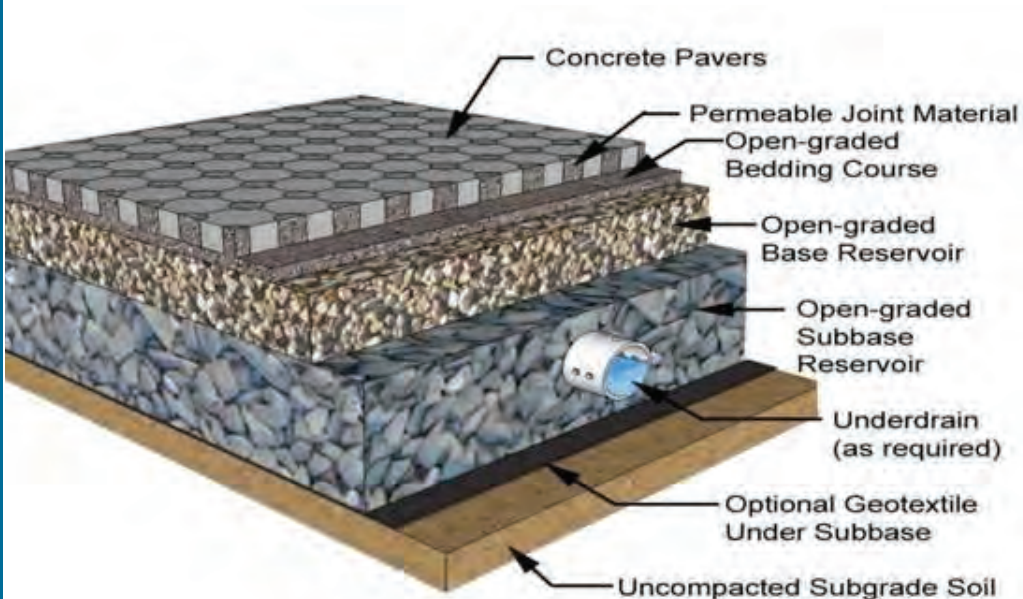
Best practice example

City of Portland, Stormwater Management

CLEVER Cities

Porous Paving

sustainable surface material



Porous or permeable paving is a type of paving that allows fluids to seep through them and are commonly used on pedestrians and light vehicle pathways.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

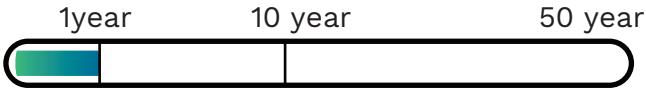
WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

CLIMATE CHANGE ADAPTATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$	$	environment

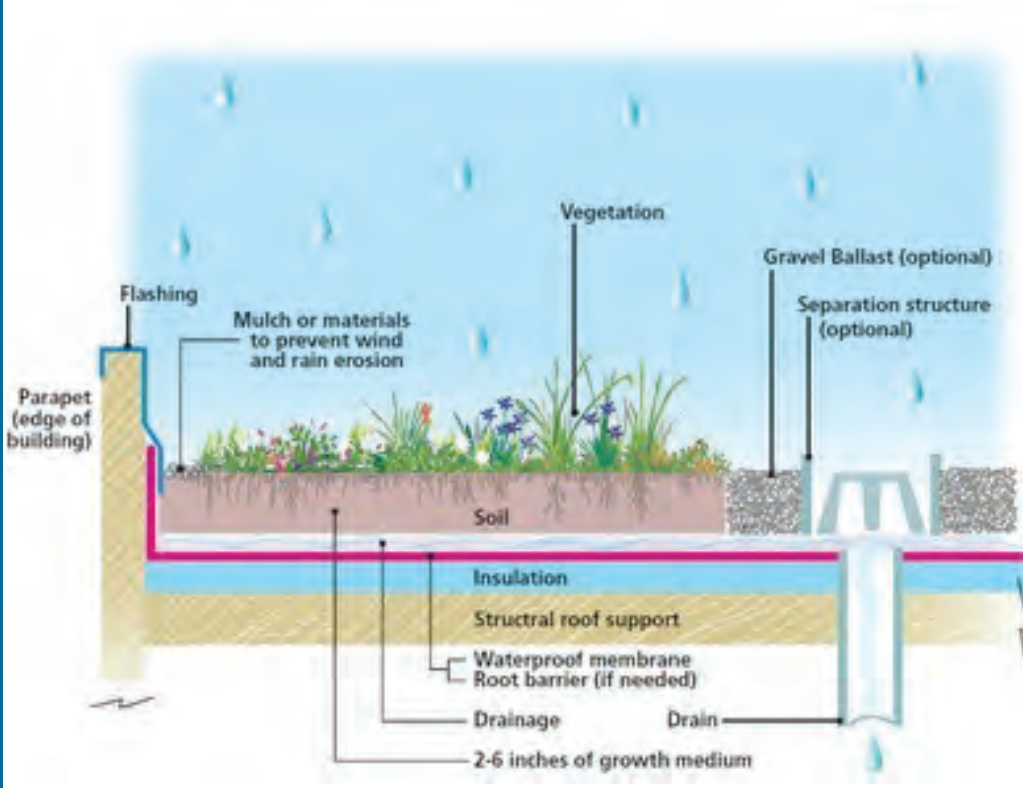
Best practice example

Lindenhurst, Long Island, New York (PERMEABLE PAVEMENT)

CLEVER Cities

Water Ground Infiltration

water efficiency



The capacity of the soil to allow water movement into and through the soil profile, and revealing its quality, making it available for root uptake, plant growth and habitat for soil organisms.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

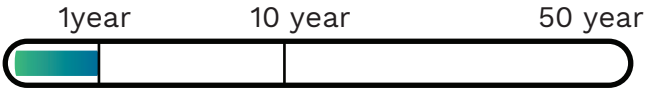
WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

CLIMATE CHANGE ADAPTATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$	$	environment energy people

Best practice example

City of Portland, Stormwater Management

CLEVER Cities

Urban Wetland

A wetland is a zone where the distribution of living beings is mainly characterised by the presence of water, whatever its degree of salinity or its persistence during the year.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

WATER MANAGEMENT

LAND PRODUCTIVITY

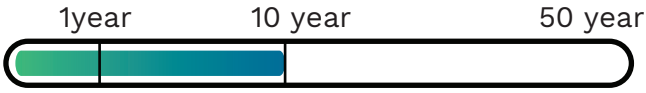
ECOSYSTEM RESTORATION

MICROCLIMATE IMPROVEMENT

CLIMATE CHANGE ADAPTATION

CO2 REDUCTION

Process of impact measure



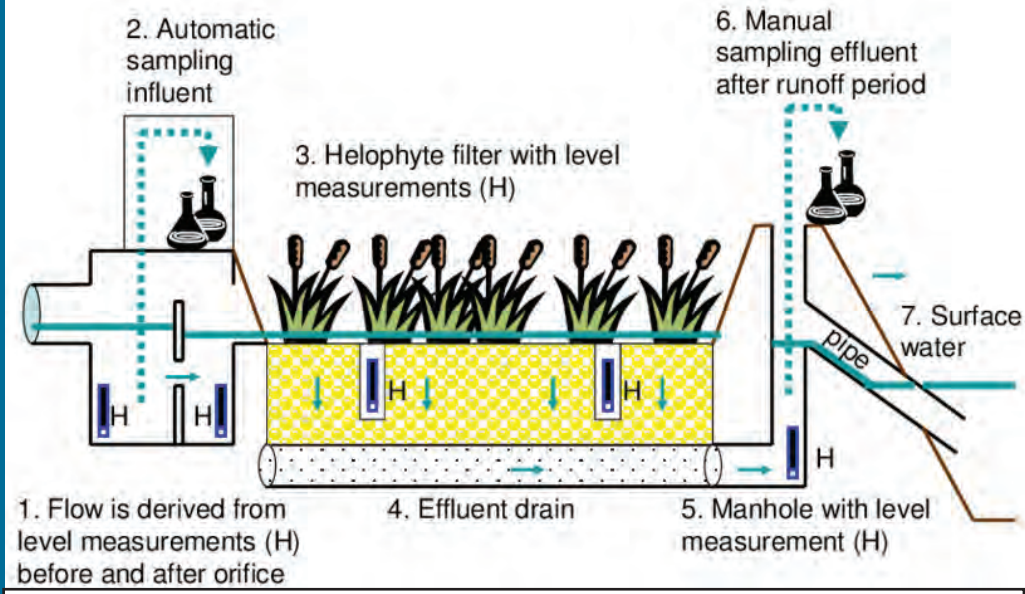
Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $	$	environment people

Best practice example Wetland in Reims, France

CLEVER Cities

Helophyte Filters



Helophyte filters, also known as planted soil filters, is a sand filter that is generally planted with reeds. Bacteria living in the roots do the actual treatment.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

WATER MANAGEMENT

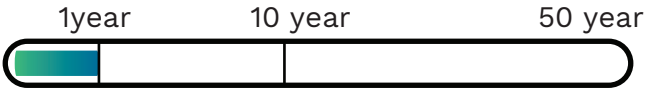
MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

CLIMATE CHANGE ADAPTATION

ECOSYSTEM RESTORATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $	$	environment energy people

Best practice example

Helophyte filter on Erasmusgracht, Amsterdam

CLEVER Cities

Reconnecting Rivers to Floodplains

rainwater management

Give space to the river to expand safely during heavy rains periods

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

WATER MANAGEMENT

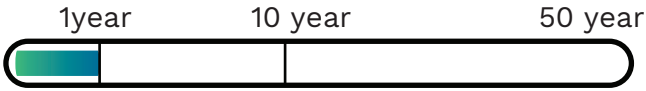
MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

CLIMATE CHANGE ADAPTATION

ECOSYSTEM RESTORATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $ $	$	environment people

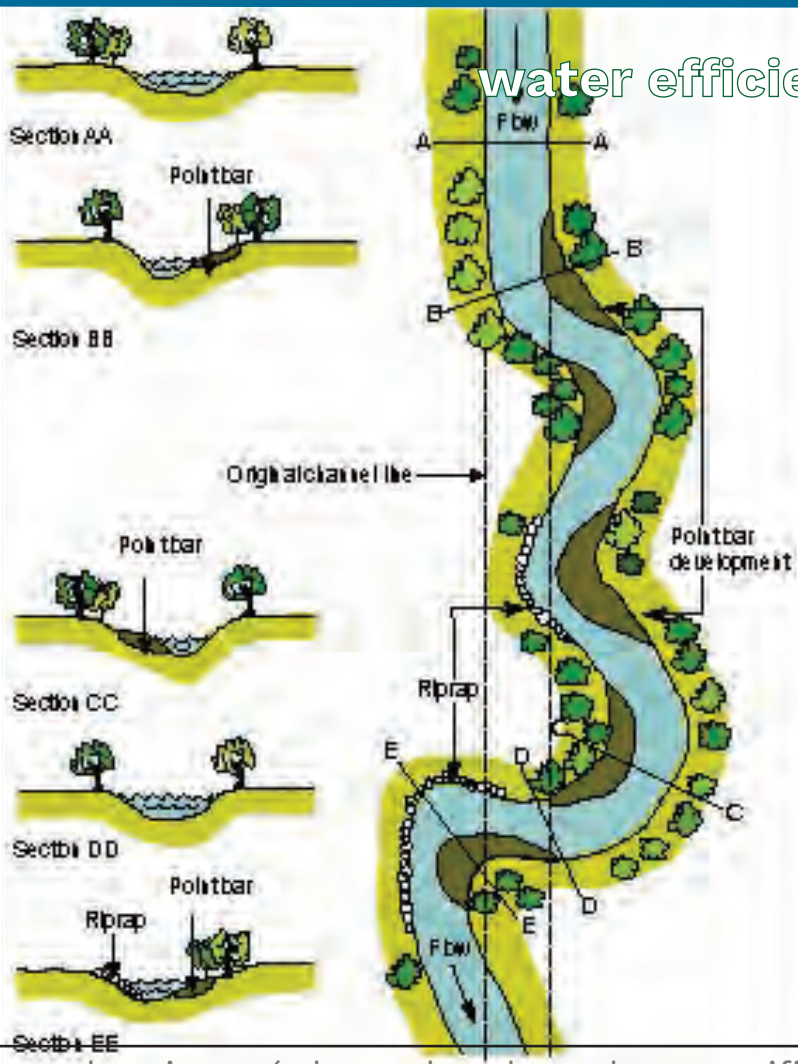
Best practice example

Room for the River program in the Netherlands

CLEVER Cities

Re-meander Rivers

water efficiency



Re-meander rivers (where they have been artificially straightened) to help reduce the speed and height of flood peaks.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

CLIMATE CHANGE ADAPTATION

ECOSYSTEM RESTORATION

Process of impact measure

Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $	$	environment

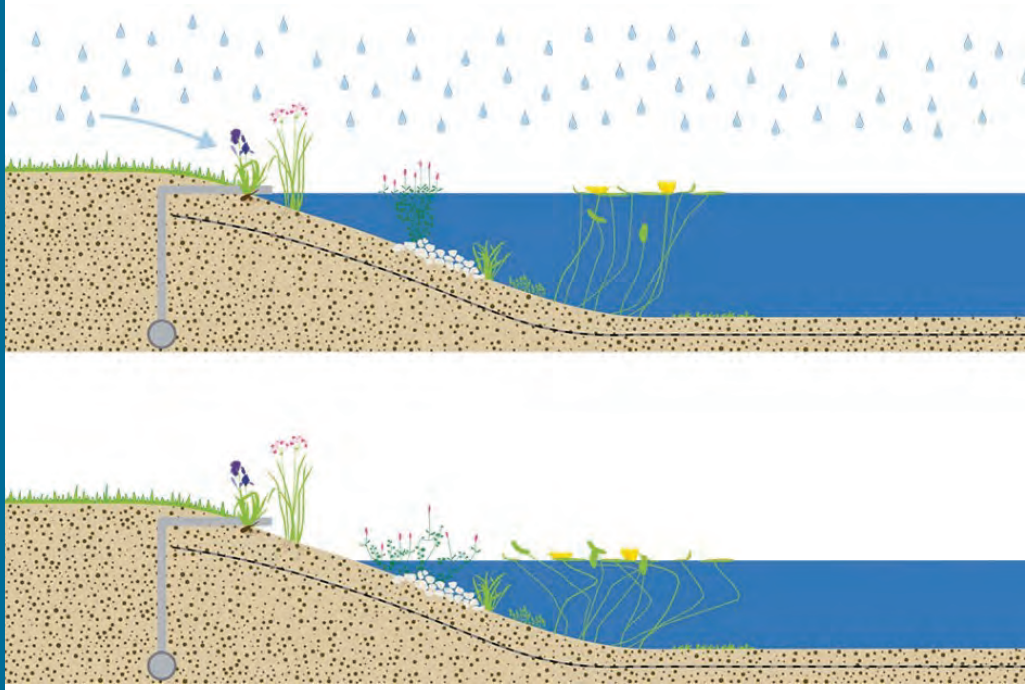
Best practice example

River Somer - Somerset, England

CLEVER Cities

rainwater management

Rainwater Run-off Ponds



A system for purifying polluted rain and run-off water, preventing direct infiltration.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

WATER MANAGEMENT

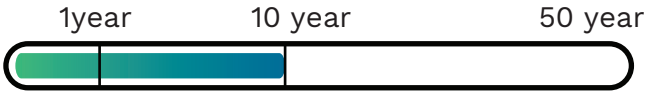
MICROCLIMATE IMPROVEMENT

CLIMATE CHANGE ADAPTATION

ECOSYSTEM RESTORATION

Process of impact measure

Lifespan of the solution



Construction cost	Maintenance cost	Adressed themes
$ $ $	$	environment

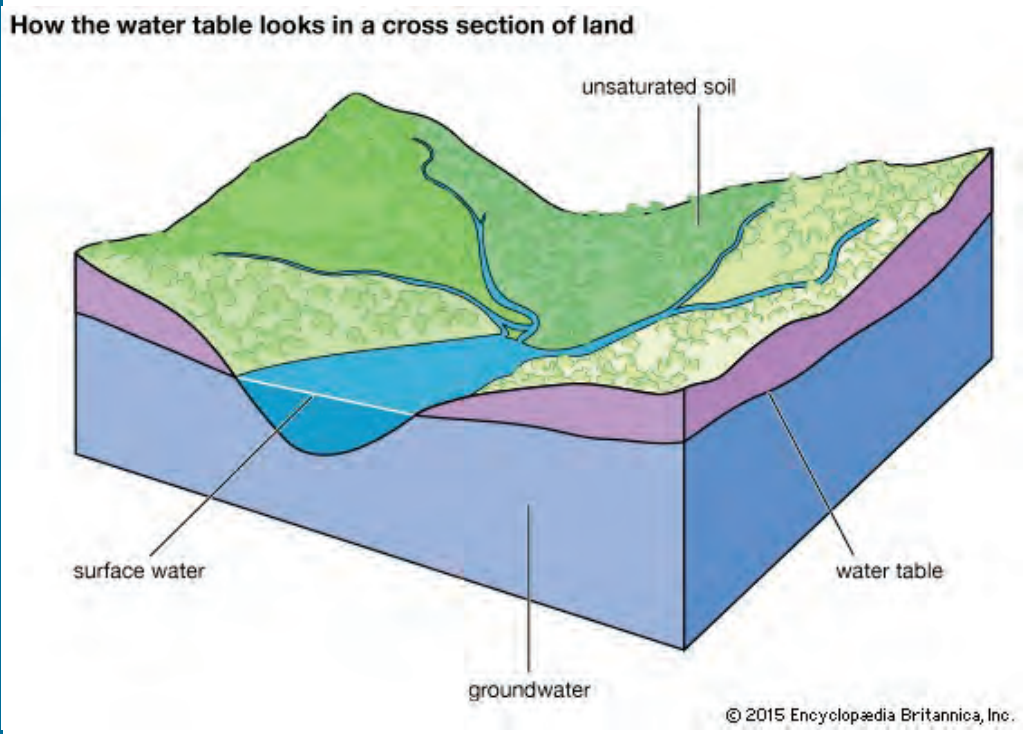
Best practice example

EVA-Lanxmeer, Culemborg, The Netherlands

CLEVER Cities

Usage of Treated Surface Water

water usage



Surface water typically contains a high suspended solids content, bacteria, algae, organic matter, creating bad taste and odour. Normally the surface water needs to be treated before it has the required water quality.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators

Expected Co-Benefits

WATER MANAGEMENT

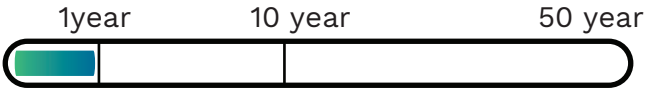
MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

CLIMATE CHANGE ADAPTATION

ECOSYSTEM RESTORATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $ $	$ $ $	environment people

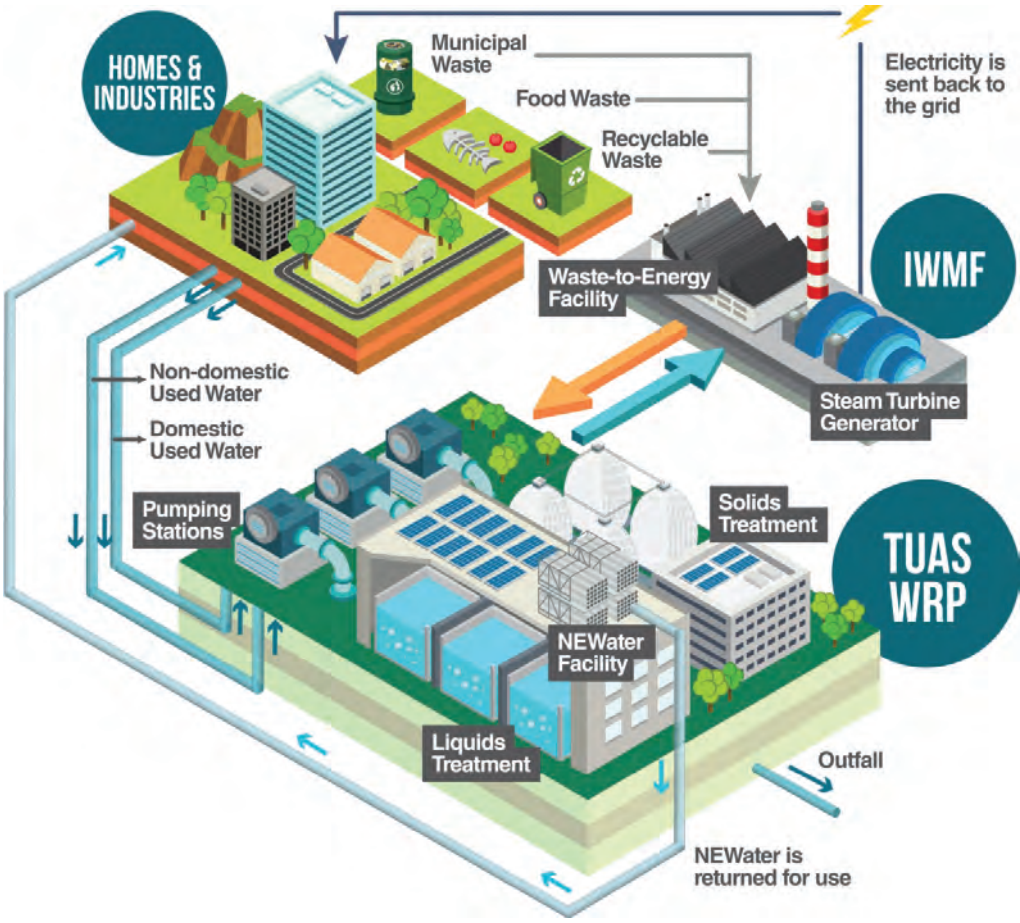
Best practice example

Sungai Terip water treatment plant, Malaysia

CLEVER Cities

Biological Waste Water Treatment

water treatment



Wastewater, which is used water, is also a valuable resource, especially with recurring droughts and water shortages in many areas of the world. Thus, the importance of wastewater treatment is: to restore the water supply and to protect from toxins.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators


Expected Co-Benefits

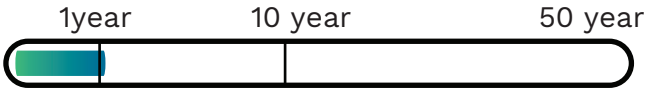
WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

CLIMATE CHANGE ADAPTATION

ECOSYSTEM RESTORATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $ $ $	$ $	environment energy

Best practice example

Wastewater treatment plant of the south of Isfahan, Iran

CLEVER Cities

Rainwater Storage Beneath Sport Fields

Water storage facilities that storing the rainwater in underground crates is an essential form of multifunctional use of a single space.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators


Expected Co-Benefits

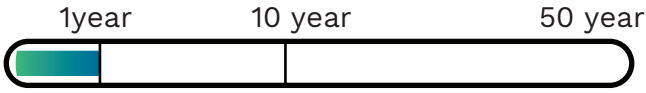
WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

LAND PRODUCTIVITY

HEALTH AND WELLBEING

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $ - $ $ $	$ $	environment

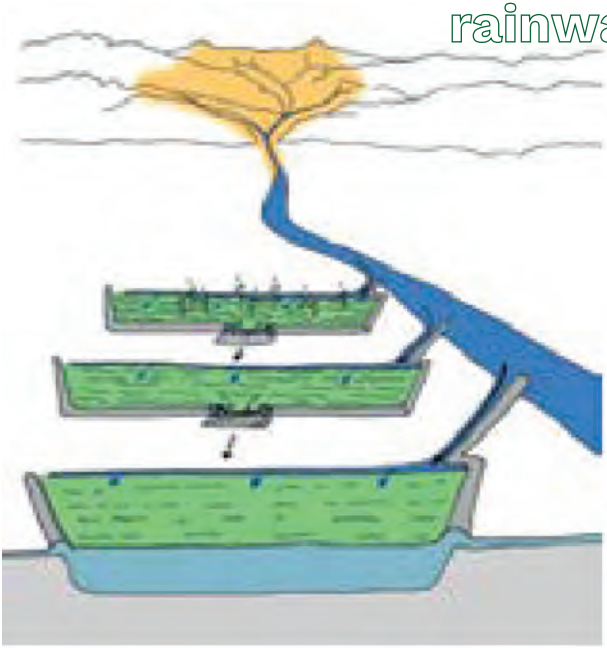
Best practice example

Drainage Filtration and Water Storage at World Cup Stadium, Maracana sports stadium in Rio

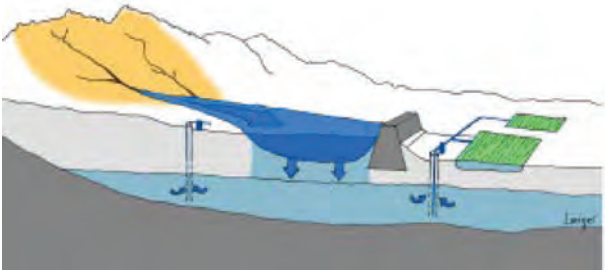
CLEVER Cities

Rainwater Harvesting

rainwater harvesting



Flood Water Harvesting



Macrocatchment Water Harvesting

Collecting, filtering, storing and reusing the rainwater in production systems, daily life and other type of needs by using technical equipment to avoid water shortages.

Interventions in Water Bodies and Drainage Systems

Related Main Indicators


Expected Co-Benefits

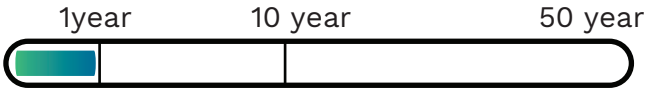
WATER MANAGEMENT

MICROCLIMATE IMPROVEMENT

CLIMATE CHANGE ADAPTATION

ECOSYSTEM RESTORATION

Process of impact measure



Lifespan of the solution

Construction cost	Maintenance cost	Adressed themes
$ $ $	$	environment people

Best practice example The Eritrean spate irrigation system