Inspiration Card
Nature Based Solution

# N27 BIOFILTER (AIR PURIFICATION)


Biofilter

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | | | ✔ | | |

## Description

Air biofilters are facilities to control and purify biological waste gas. They are developed to reduce and eliminate biogenic odours and represent a relatively simple technical installation. The application of biofilters is diverse, including for example agriculture, sewage treatment plants, biogas plants, and composting plants. Bacteria and microorganisms are located on a filter medium (breeding ground) that absorbs odours of the air stream.

## Conditions for Implementation

- needs bacteria dependent conditions
- financial investment

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ○ ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ● ○ |
| | Air Biofiltration | ● ● ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ○ ○ ○ |
| | Connectivity | ○ ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ○ ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

Inspiration Card
Nature Based Solution

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Biofilter

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## Conditions for Implementation

- needs bacteria dependent conditions
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## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ○ ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ● ○ |
| | Air Biofiltration | ● ● ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ○ ○ ○ |
| | Connectivity | ○ ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ○ ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N22 BIOFILTER (WATER QUALITY)


Biofilter

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | | |

## Description

Biofilters are developed to collect and purify storm- and wastewater and represent a promising system for storm water treatment. Bacteria and microorganisms are located on a filter medium, which often consists of sand or granular activated carbon. The biofilm of bacteria degrades nutrients and contaminations in the wastewater that is piped through the filter material.

## Conditions for Implementation

- flat terrain
- space needed
- financial investment

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ● ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ● ○ |
| | Water Reuse | ● ○ ○ |
| Water Purification | Water Filtering | ● ● ○ |
| | Water Bio-remediation | ● ● ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ○ ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N22 BIOFILTER (WATER QUALITY)


Biofilter

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | | |

## Description

Biofilters are developed to collect and purify storm- and wastewater and represent a promising system for storm water treatment. Bacteria and microorganisms are located on a filter medium, which often consists of sand or granular activated carbon. The biofilm of bacteria degrades nutrients and contaminations in the wastewater that is piped through the filter material.

## Conditions for Implementation

- flat terrain
- space needed
- financial investment

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ● ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ● ○ |
| | Water Reuse | ● ○ ○ |
| Water Purification | Water Filtering | ● ● ○ |
| | Water Bio-remediation | ● ● ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ○ ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N15 BIOSWALE

Bioswale, Eindhoven

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | ✔ | |

## Description

A bioswale is a vegetated, linear and low sloped pit often established in urban areas near roads with the objective to reduce flood risk during or after heavy rain events. Bioswales absorb, store and convey surface water runoff and also remove pollutants and sediments, when the water trickles through the vegetation and soil layer. The choice of vegetation for bioswales is variable but deep-rooted native plants are common and preferred.

## Conditions for Implementation

- collecting system required
- space needed
- multifunctional use if possible

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ● ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N15 BIOSWALE

Bioswale, Eindhoven

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | ✔ | |

## Description

A bioswale is a vegetated, linear and low sloped pit often established in urban areas near roads with the objective to reduce flood risk during or after heavy rain events. Bioswales absorb, store and convey surface water runoff and also remove pollutants and sediments, when the water trickles through the vegetation and soil layer. The choice of vegetation for bioswales is variable but deep-rooted native plants are common and preferred.

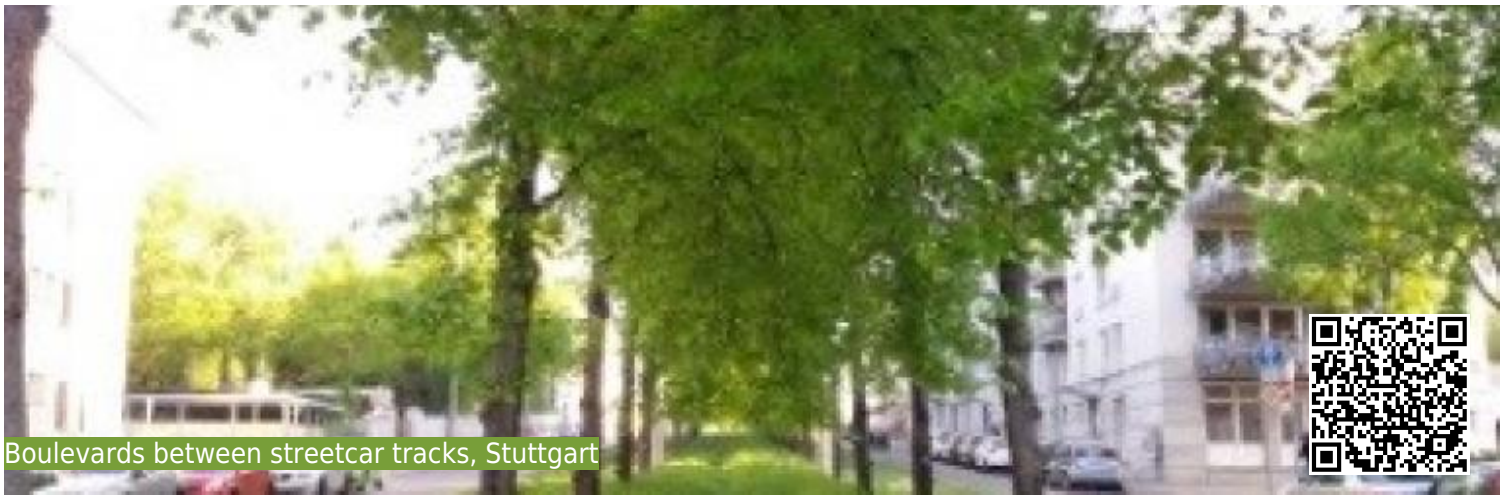
## Conditions for Implementation

- collecting system required
- space needed
- multifunctional use if possible

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ● ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N2 BOULEVARDS



Boulevards between streetcar tracks, Stuttgart

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Boulevards represent a possibility to establish several trees in cities amongst others to mitigate urban heat stress. Within boulevards, trees are commonly arranged along streets, bicycle paths and sidewalks. The treetops of opposite trees often form a nearly closed canopy. As a result, the street in die middle of two tree lines is protected, shaded and the air temperature is lowered.

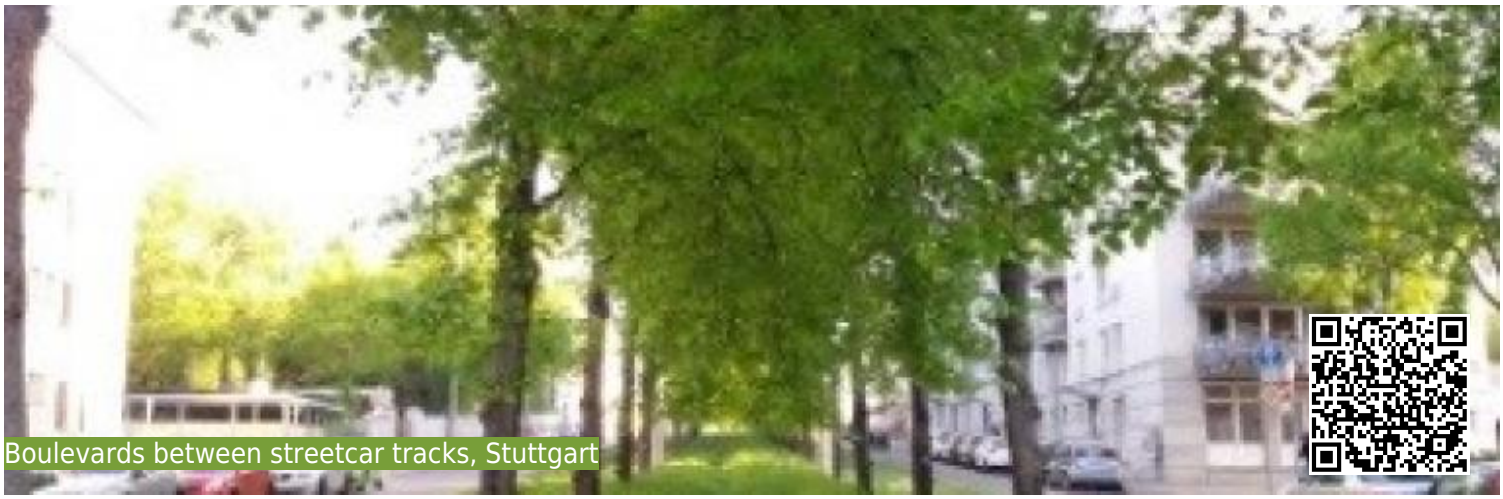
## Conditions for Implementation

- route characteristics
- soil material and depth
- enough space in the underground
- topography

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●● |
| | Shading | ●● |
| | Evaporation | ● |
| | Building (Insulation) | |
| | Reflection (Albedo) | ●● |
| Surface Water Regulation | Water Conveyance | |
| | Water Infiltration | ● |
| | Water Retention | ● |
| | Water Storage | |
| | Water Reuse | |
| Water Purification | Water Filtering | |
| | Water Bio-remediation | |
| Air Purification and Noise Reduction | Deposition | ● |
| | Air Biofiltration | ● |
| | Noise Reduction | |
| Biodiversity | Habitat Provision | ● |
| | Connectivity | ● |
| Socio-Cultural Services | Beauty / Appearance | ●● |
| | Usability / Functionality | ● |
| | Social Interaction | ● |
| | Education | |
| Provisioning Service | Food / Energy / Material | ● |
| Climate Regulation | CO2 Sequestration | |

# N2 BOULEVARDS



Boulevards between streetcar tracks, Stuttgart

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

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## Conditions for Implementation

- route characteristics
- soil material and depth
- enough space in the underground
- topography

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●● |
| | Shading | ●● |
| | Evaporation | ● |
| | Building (Insulation) | |
| | Reflection (Albedo) | ●● |
| Surface Water Regulation | Water Conveyance | |
| | Water Infiltration | ● |
| | Water Retention | ● |
| | Water Storage | |
| | Water Reuse | |
| Water Purification | Water Filtering | |
| | Water Bio-remediation | |
| Air Purification and Noise Reduction | Deposition | ● |
| | Air Biofiltration | ● |
| | Noise Reduction | |
| Biodiversity | Habitat Provision | ● |
| | Connectivity | ● |
| Socio-Cultural Services | Beauty / Appearance | ●● |
| | Usability / Functionality | ● |
| | Social Interaction | ● |
| | Education | |
| Provisioning Service | Food / Energy / Material | ● |
| Climate Regulation | CO2 Sequestration | |

# N14 CONSTRUCTED WET ROOF

Constrcuted wet roof

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

The idea of constructed wet roofs is to connect green roofs and constructed wetlands for domestic wastewater treatment. Besides, constructed wet roofs retain storm water for a certain period of time, gradually releasing rainwater and reducing the overall runoff. The plants are irrigated with storm- and wastewater to ensure the surface layer remains moist. Furthermore, constructed wet roofs have positive impacts on the microclimate.

## Conditions for Implementation

- Waterproofing surface/roof
- sufficient roof load-bearing capacity
- slope gradient to water outlets
- emergency overflows

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●● |
| | Shading | ● |
| | Evaporation | ● |
| | Building (Insulation) | ●● |
| | Reflection (Albedo) | ● |
| Surface Water Regulation | Water Conveyance | ● |
| | Water Infiltration | |
| | Water Retention | ● |
| | Water Storage | ● |
| | Water Reuse | ● |
| Water Purification | Water Filtering | ● |
| | Water Bio-remediation | ● |
| Air Purification and Noise Reduction | Deposition | ● |
| | Air Biofiltration | |
| | Noise Reduction | |
| Biodiversity | Habitat Provision | ● |
| | Connectivity | |
| Socio-Cultural Services | Beauty / Appearance | ● |
| | Usability / Functionality | ● |
| | Social Interaction | |
| | Education | |
| Provisioning Service | Food / Energy / Material | |
| Climate Regulation | CO2 Sequestration | ● |

# N14 CONSTRUCTED WET ROOF

Constrcuted wet roof

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

The idea of constructed wet roofs is to connect green roofs and constructed wetlands for domestic wastewater treatment. Besides, constructed wet roofs retain storm water for a certain period of time, gradually releasing rainwater and reducing the overall runoff. The plants are irrigated with storm- and wastewater to ensure the surface layer remains moist. Furthermore, constructed wet roofs have positive impacts on the microclimate.

## Conditions for Implementation

- Waterproofing surface/roof
- sufficient roof load-bearing capacity
- slope gradient to water outlets
- emergency overflows

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●● |
| | Shading | ● |
| | Evaporation | ● |
| | Building (Insulation) | ●● |
| | Reflection (Albedo) | ● |
| Surface Water Regulation | Water Conveyance | ● |
| | Water Infiltration | |
| | Water Retention | ● |
| | Water Storage | ● |
| | Water Reuse | ● |
| Water Purification | Water Filtering | ● |
| | Water Bio-remediation | ● |
| Air Purification and Noise Reduction | Deposition | ● |
| | Air Biofiltration | |
| | Noise Reduction | |
| Biodiversity | Habitat Provision | ● |
| | Connectivity | |
| Socio-Cultural Services | Beauty / Appearance | ● |
| | Usability / Functionality | ● |
| | Social Interaction | |
| | Education | |
| Provisioning Service | Food / Energy / Material | |
| Climate Regulation | CO2 Sequestration | ● |

# N20 CONSTRUCTED WETLANDS

Urban Constructed wetland

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Constructed wetlands represent artificial wetlands with the main objective to harvest, treat and store stormwater runoff in urban areas. Processes of natural wetlands are adapted to constructed wetlands focusing on water purification and storage. The established vegetation, the soil and microbiological activity play an important role for the filter performance of constructed wetlands.

## Conditions for Implementation

- suitable locations
- near source of wastewater
- compact soils
- topography

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ● ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ● ● ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ● ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ● ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ● ○ |
| | Education | ● ○ ○ |
| Provisioning Service | Food / Energy / Material | ● ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N20 CONSTRUCTED WETLANDS

Urban Constructed wetland

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Constructed wetlands represent artificial wetlands with the main objective to harvest, treat and store stormwater runoff in urban areas. Processes of natural wetlands are adapted to constructed wetlands focusing on water purification and storage. The established vegetation, the soil and microbiological activity play an important role for the filter performance of constructed wetlands.

## Conditions for Implementation

- suitable locations
- near source of wastewater
- compact soils
- topography

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ● ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ● ● ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ● ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ● ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ● ○ |
| | Education | ● ○ ○ |
| Provisioning Service | Food / Energy / Material | ● ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N23 DAYLIGHTING

Small stream after Dayligthing

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | ✔ | |

## Description

Daylighting describes the opening of buried watercourses, rivers or drainage systems by removing the soil layers above. Thereby the river gets more space for eventual expansion which can mitigate floodings. Furthermore, daylighting has positive effects on the environment and aesthetic of the surrounding.

## Conditions for Implementation

- restriction/limited possibilities in highly dense and build-up areas because of high cost for shifting of infrastructure/removing of infrastructure
- enough space to deculvert the watercourse
- certain channel width
- need to assimilate knowledge about soil types under/surrounding the channel to guarantee the performance of the daylighting measure

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ○ ○ |
| | Education | ● ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N23 DAYLIGHTING

Small stream after Dayligthing

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | ✔ | |

## Description

Daylighting describes the opening of buried watercourses, rivers or drainage systems by removing the soil layers above. Thereby the river gets more space for eventual expansion which can mitigate floodings. Furthermore, daylighting has positive effects on the environment and aesthetic of the surrounding.

## Conditions for Implementation

- restriction/limited possibilities in highly dense and build-up areas because of high cost for shifting of infrastructure/removing of infrastructure
- enough space to deculvert the watercourse
- certain channel width
- need to assimilate knowledge about soil types under/surrounding the channel to guarantee the performance of the daylighting measure

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ○ ○ |
| | Education | ● ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N12 EXTENSIVE GREEN ROOF

Extensive green roof Oversum- Winterberg

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | ✔ |

## Description

Extensive green roofs contain a thin layer of substrate and plants on top. The basic, light weight systems, characterized by minimum maintenance and management after establishment of the system. Appropriate plants for extensive green roofs are low growing, rapidly spreading like succulents such as sedums, herbs, wildflowers, grasses or mosses. They are able to survive with minimum nutrient uptakes and without additional nutrient supply.

## Conditions for Implementation

- solid, stable buildings (static requirements)
- flat or relatively flat roofs
- Waterproofing surface/roof

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ● ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ● ○ ○ |
| | Reflection (Albedo) | ● ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N12 EXTENSIVE GREEN ROOF

Extensive green roof Oversum- Winterberg

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | ✔ |

## Description

Extensive green roofs contain a thin layer of substrate and plants on top. The basic, light weight systems, characterized by minimum maintenance and management after establishment of the system. Appropriate plants for extensive green roofs are low growing, rapidly spreading like succulents such as sedums, herbs, wildflowers, grasses or mosses. They are able to survive with minimum nutrient uptakes and without additional nutrient supply.

## Conditions for Implementation

- solid, stable buildings (static requirements)
- flat or relatively flat roofs
- Waterproofing surface/roof

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ● ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ● ○ ○ |
| | Reflection (Albedo) | ● ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N5 GREEN CORRIDORS

Green Corridor along a cycle path

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Areas of derelict infrastructure, e.g. railway lines, that are transformed into linear parks play an important role in urban green infrastructure networks and help to re-nature cities. Also regeneration along waterways and rivers often results in linear interconnecting parks.

## Conditions for Implementation

- existing structures with enough surrounding space

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ● ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ● ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ● ○ |
| | Air Biofiltration | ● ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ● ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ● ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ● ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N6 GREEN FACADES

Vertical Garden Patrick Blanc, Paris

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Planted walls with controlled cultivation are called green facades. Facade greenings are divided in two types. The facade-bound greening which is a part of the facade or uses the facade for fixing panels and containers to it, as well as ground based facade greening using climbing plants.

## Conditions for Implementation

- requirment of the used plants
- not suitable in very dry/hot/cold areas
- risk of fire
- potential need of supporting frameworks

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●● |
| | Shading | |
| | Evaporation | |
| | Building (Insulation) | ●● |
| | Reflection (Albedo) | |
| Surface Water Regulation | Water Conveyance | |
| | Water Infiltration | |
| | Water Retention | |
| | Water Storage | |
| | Water Reuse | |
| Water Purification | Water Filtering | |
| | Water Bio-remediation | |
| Air Purification and Noise Reduction | Deposition | ● |
| | Air Biofiltration | ● |
| | Noise Reduction | |
| Biodiversity | Habitat Provision | ● |
| | Connectivity | ● |
| Socio-Cultural Services | Beauty / Appearance | ●● |
| | Usability / Functionality | ● |
| | Social Interaction | |
| | Education | |
| Provisioning Service | Food / Energy / Material | |
| Climate Regulation | CO2 Sequestration | ● |

# N8 GREEN NOISE BARRIER

Noise barrier as free standing living wall

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Noise barrier as free standing living walls are constructions of baskets or different elements covered/filled with soil substrate with the function to reduce noise emissions e.g. along highly frequented roads.

## Conditions for Implementation

- loadable underground
- limited design options
- little risk of fire at constant irrigation

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ● ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ● ● ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ○ ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ○ ○ |
| | Air Biofiltration | ● ○ ○ |
| | Noise Reduction | ● ● ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N3 GROUP OF TREES

Arboretum - A group of adult trees creates a microclimatic environment that mitigates heat stress on hot summer days

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Group of trees mimicking the shape of a forest in an urban setting. They may be an option for the design of shaded squares and places or as a contrasting element in densely built up areas or for court yard design.

## Conditions for Implementation

- different species for biodiversity
- soil material and depth
- enough space in the underground

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●●○ |
| | Shading | ●●○ |
| | Evaporation | ●○○ |
| | Building (Insulation) | ○○○ |
| | Reflection (Albedo) | ●●○ |
| Surface Water Regulation | Water Conveyance | ○○○ |
| | Water Infiltration | ●○○ |
| | Water Retention | ●●○ |
| | Water Storage | ○○○ |
| | Water Reuse | ○○○ |
| Water Purification | Water Filtering | ○○○ |
| | Water Bio-remediation | ○○○ |
| Air Purification and Noise Reduction | Deposition | ●○○ |
| | Air Biofiltration | ●○○ |
| | Noise Reduction | ○○○ |
| Biodiversity | Habitat Provision | ●●○ |
| | Connectivity | ●●○ |
| Socio-Cultural Services | Beauty / Appearance | ●●○ |
| | Usability / Functionality | ●○○ |
| | Social Interaction | ●○○ |
| | Education | ○○○ |
| Provisioning Service | Food / Energy / Material | ○○○ |
| Climate Regulation | CO2 Sequestration | ○○○ |

# N16 INFILTRATION BASIN

Infiltration basin

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | ✔ | |

## Description

Infiltration basins are flat areas planted with grass and normally dry. After a heavy rain the water fills up the basin and soaks into the ground.

## Conditions for Implementation

- available space
- local soil conditions (infiltration capacity)
- can be combined with other usage
- Highly specific rainwater intensities

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ● ● ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

# N11 INTENSIVE GREEN ROOF

Intensive green roof

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | ✔ |

## Description

Intensive green roofs are overcast by a thick amount of substrate which enables the growth of larger plants up to regular trees. These roofs are often accessible for public or recreation. To enable human activities on green roofs and the integration of larger plants, trees and architectural elements, suitable rooftops need to be relatively flat.

## Conditions for Implementation

- solid, stable buildings (static requirements)
- flat or relatively flat roofs
- irrigation system in dry periods
- Waterproofing surface/roof

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ● ○ |
| | Shading | ● ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ● ● ○ |
| | Reflection (Albedo) | ● ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ● ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ● ● ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

Inspiration Card
Nature Based Solution

Coastal Areas

# N29 LIVING BREAKWATER / SHORELINE


Example of a living breakwater

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | ✔ | | ✔ | |

## Description

Living breakwaters and shorelines are erosion control techniques that combine natural habitats with natural or engineered means of lowering waves energy in order to reduce the damages dealt by storm urge and costal erosion. Often standard breakwaters and shorelines are made of artificial materials such as stones and concrete. Living breakwaters and shorelines, on the other hand, are made from natural materials so that, beside their primary goal, they also can be used as artificial habitats in or

## Conditions for Implementation

- Existing types of habitats in the neighborhood
- site's slope, orientation, bathymetry, prevailing currents, waves, and fetch
- Extent of erosion problem
- Other hard shoreline stabilization structures adjacent or nearby

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●●○ |
| | Shading | ○○○ |
| | Evaporation | ●●○ |
| | Building (Insulation) | ○○○ |
| | Reflection (Albedo) | ○○○ |
| Surface Water Regulation | Water Conveyance | ○○○ |
| | Water Infiltration | ○○○ |
| | Water Retention | ○○○ |
| | Water Storage | ○○○ |
| | Water Reuse | ○○○ |
| Water Purification | Water Filtering | ●●○ |
| | Water Bio-remediation | ○○○ |
| Air Purification and Noise Reduction | Deposition | ○○○ |
| | Air Biofiltration | ○○○ |
| | Noise Reduction | ○○○ |
| Biodiversity | Habitat Provision | ●●○ |
| | Connectivity | ●●○ |
| Socio-Cultural Services | Beauty / Appearance | ●●○ |
| | Usability / Functionality | ●○○ |
| | Social Interaction | ○○○ |
| | Education | ○○○ |
| Provisioning Service | Food / Energy / Material | ○○○ |
| Climate Regulation | CO2 Sequestration | ○○○ |

Inspiration Card
Nature Based Solution

Systems for Erosion Control

# N24 LIVING FASCINE

Fascines as shoreline stabilisation in Templin, Germany

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | ✔ | |

## Description

Fascines are used for stabilization of riversides or hills. By using bundles of living wood, sometimes mixed with dead wood, fascines can be used as living space for plants and animals. In terms of stabilization, living fascines are superior in comparison to “dead” fascines, as roots can give additional protection.

## Conditions for Implementation

- timing for construction
- planting needed
- low water flow

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N9 LIVING PLANT CONSTRUCTIONS


Plane-Tree-Cube, Nagold

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Living plant constructions are inspired by this approach and aims at using living trees with all their biological services also for construction purposes in order to create living architecture.

## Conditions for Implementation

- may need building permissions
- static consideration

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ● ● ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ● ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ○ ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ● ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ● ● ○ |
| | Social Interaction | ● ○ ○ |
| | Education | ● ● ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

Inspiration Card
Nature Based Solution

Green Walls

# N7 LIVING WALL

Constructing a living wall, Ludwigsburg

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Verticalization of green spaces can increase vegetated surfaces with many ecological services in urban environments. Free standing living walls serve as adaptation measures for the urban heat island effect. They create space with high amenity value and potentially high biodiversity and reduce noise emissions. They are suitable to reuse runoff water and evapotranspirate highly. With extensive vegetation they sustain also longer periods of drought.

## Conditions for Implementation

- loadable underground
- little risk of fire at constant irrigation
- can be used as noise barrier

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●● |
| | Shading | ●● |
| | Evaporation | ● |
| | Building (Insulation) | |
| | Reflection (Albedo) | ●● |
| Surface Water Regulation | Water Conveyance | |
| | Water Infiltration | |
| | Water Retention | |
| | Water Storage | |
| | Water Reuse | |
| Water Purification | Water Filtering | |
| | Water Bio-remediation | |
| Air Purification and Noise Reduction | Deposition | ● |
| | Air Biofiltration | ● |
| | Noise Reduction | |
| Biodiversity | Habitat Provision | ●● |
| | Connectivity | ● |
| Socio-Cultural Services | Beauty / Appearance | ●● |
| | Usability / Functionality | ● |
| | Social Interaction | ● |
| | Education | |
| Provisioning Service | Food / Energy / Material | |
| Climate Regulation | CO2 Sequestration | ● |

# N10 MOBILE VERTICAL GREENING


Mobile Green Living Room

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | | | | ✔ | |

## Description

Mobile Vertical Greenings consist of living wall modules that are fixed to a hook lift container platform.The vegetation cover is very diverse in order to illustrate the high potential of living walls to increase amenity value and stimulate biodiversity. It can be used as a mobile demonstration for green infrastructure, as a test feature, a temporary green installation or as an open green office for information.

## Conditions for Implementation

- no fixed location
- use of onboard water tank for irrigation system
- needs space of loading and unloading
- needs flat surface

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ● ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ○ ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ● ● ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ● ● ○ |
| | Social Interaction | ● ○ ○ |
| | Education | ● ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N18 PERMEABLE PAVING SYSTEM

Permeable pavement, Eindhoven

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | | |

## Description

Permeable paving systems are known as surfaces that are able to absorb storm water and thus, minimize the surface water runoff. Different systems of permeable pavement surfaces exist. They are commonly installed on car parks, residential streets or sidewalks. On the one hand porous asphalt and permeable concrete improve infiltration providing a homogeneous surface. Other solutions increase the share of substrate / vegetation cover for better infiltration (e.g. vegetated grid paves) or they provide macropores for garvity driven percolation like permeable stone carpets.

## Conditions for Implementation

- Implementation on new or existing building sites
- Prior analysis of the soil is necessary
- Compatibility with all kind of street usage should be considered

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ● ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ○ ○ ○ |
| | Connectivity | ○ ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ○ ○ ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

Inspiration Card
Nature Based Solution

Systems for Erosion Control

# N26 PLANTED EMBANKMENT MAT

Planted embankment mat

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | ✔ | |

## Description

Planted embankment mats are a combination of mats and a vegetation/seeding layer. These mats are used to recultivate riversides and to prevent erosion. The construction is simple and fast. A combination with fascines is possible.

## Conditions for Implementation

- timing for construction
- planting needed
- low water flow

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N19 RAIN GARDEN


Small scale Raingarden, Minneapolis USA

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✓ | ✓ | | | ✓ | |

## Description

A rain garden is a kind of garden that primarily serves as area for water control on a small-scale, especially in urban areas. Rain gardens are established in artificial surroundings and catch water runoff from roofs, roads and other sealed surfaces. Storm water runoff is drained into rain gardens, where it is stored for a certain period, and infiltrates either into the ground soil or flows into the sewage system.

## Conditions for Implementation

- space needed
- caring and maintenance
- adapted plant species

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ● ● ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

Inspiration Card
Nature Based Solution

Parks & Gardens

# N4 RESIDENTIAL PARK

Innocentia Park, Hamburg

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Residential Parks are part of the Green Infrastructure (GI) of cities and serve the residential areas as the nearest main entry point for nature based recreation. Larger spatial elements of GI are district parks that often deliver more functions and combine various uses (e.g. sport fields). Smaller green spaces are often playgrounds or connecting green strips of land.

## Conditions for Implementation

- Connectivity to the surroundings
- suitable size
- proportion of trees in relation to area

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ● ○ |
| | Shading | ● ● ○ |
| | Evaporation | ● ● ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ● ● ○ |
| Surface Water Regulation | Water Conveyance | ● ● ○ |
| | Water Infiltration | ● ● ○ |
| | Water Retention | ● ● ○ |
| | Water Storage | ● ● ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ● ● ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ● ○ |
| | Air Biofiltration | ● ● ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ● ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ● ○ |
| | Social Interaction | ● ● ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ● ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

Inspiration Card
Nature Based Solution

Coastal Areas

# N30 RESTORING MANGROVES, BEACHES AND DUNES

Example of a Mangrove

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | ✔ | | ✔ | |

## Description

Mangroves, beaches and dunes are natural buffer systems reducing negative effects of storms, highwater and so on. By this fact, restoring or preserving mangroves, beaches or dunes does not only provide the opportunity to create new habitats for species living in this environment, they also help to restore the resilience of the ecological system to face flooding and erosion. In this way, beaches can be seen as natural waterfront parks, dunes as natural levees and mangroves as natural breakwaters.

## Conditions for Implementation

- Regulations and plans for rehabilitation and maintenance

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ● ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ● ● ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ● ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ● ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

Inspiration Card
Nature Based Solution

Coastal Areas

# N32 RESTORING OFFSHORE HABITAT

Example of offshore habitat restoration

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | | ✔ | | ✔ | |

## Description

Most seagrass species form large “beds” of root and rhizome system which provide habitat for thousands of marine species and fix soil which leads into reduced erosion. Also, seagrass leads to slowed down water currents and reduced wave energy which reduces the impact of waves on the shoreline. Reefs represent natural breakwaters which leads to lower coastal erosion by reducing wave energy.

## Conditions for Implementation

- Technical and plant physiological restrictions

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ○ ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ● ○ |
| | Connectivity | ● ● ○ |
| Socio-Cultural Services | Beauty / Appearance | ○ ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

Inspiration Card
Nature Based Solution

Systems for Erosion Control

# N25 REVETMENT WITH CUTTINGS

Revetment under construction

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | ✔ | |

## Description

By covering eroded riversides with cuttings, riversides can be stabilized against further erosion and allow long-term stabilization by allowing plants to recultivate naturally. It is a simple method, which can be done with local material.

## Conditions for Implementation

- timing for construction
- planting needed
- low water flow

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ● ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ● ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

Inspiration Card
Nature Based Solution

Coastal Areas

# N31 SETBACK LEVEES AND FORELAND DEVELOPMENT

Example of a setback levee

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | ✔ | | ✔ | |

## Description

Setback levees are earthen embankments that are located at a distance from a river channel in such a way to allow the river to meander in a more natural manner and occupy some or all of its natural floodplain during high water events.
Setback levees also maintain a more natural river and stream dynamics, promoting a more ecologically healthy and dynamic river system. (http://nrcsolutions.org/setback-levees/)

## Conditions for Implementation

- Availability of sufficient land

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○○○ |
| | Shading | ○○○ |
| | Evaporation | ○○○ |
| | Building (Insulation) | ○○○ |
| | Reflection (Albedo) | ○○○ |
| Surface Water Regulation | Water Conveyance | ●●○ |
| | Water Infiltration | ○○○ |
| | Water Retention | ○○○ |
| | Water Storage | ○○○ |
| | Water Reuse | ○○○ |
| Water Purification | Water Filtering | ○○○ |
| | Water Bio-remediation | ○○○ |
| Air Purification and Noise Reduction | Deposition | ○○○ |
| | Air Biofiltration | ○○○ |
| | Noise Reduction | ○○○ |
| Biodiversity | Habitat Provision | ●●○ |
| | Connectivity | ●●○ |
| Socio-Cultural Services | Beauty / Appearance | ●●○ |
| | Usability / Functionality | ●○○ |
| | Social Interaction | ○○○ |
| | Education | ○○○ |
| Provisioning Service | Food / Energy / Material | ○○○ |
| Climate Regulation | CO2 Sequestration | ○○○ |

Inspiration Card
Nature Based Solution

Urban Network Structures

# N1 SINGLE TREE LINES


## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | |

## Description

Single line trees are arranged on one side along streets, bicycle paths and sidewalks. Trees have multiple effects on the local micro-climate conditions. They absorb particular matter, provide shade and are cooling the air. The effect of street trees in general depend on different factors such as tree size, canopy coverage, planting density, tree species, tree health, location, availability of root water or leaf area index.

## Conditions for Implementation

- different species for biodiversity
- route characteristics
- soil material and depth
- enough space in the underground

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ● ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ● ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ● ○ ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ○ ○ ○ |
| | Water Reuse | ○ ○ ○ |
| Water Purification | Water Filtering | ○ ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ○ ○ |
| | Air Biofiltration | ● ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ● ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ● ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

Inspiration Card
Nature Based Solution

Green Roofs

# N13 SMART ROOF

Smart roof, Amsterdam

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | ✔ |

## Description

Smart roofs are a special type of extensive green roofs. They are like extensive green roofs with an extension of conventional green roofs by an additional drainage system under the vegetation layer. The drainage layer retains storm water, which gets reused for watering in dry periods through capillary fibre cylinders' water. 100% of the storm water can be reused for irrigation.

## Conditions for Implementation

- waterproofing surface
- sufficient roof load-bearing capacity

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ● ○ ○ |
| | Shading | ● ○ ○ |
| | Evaporation | ● ○ ○ |
| | Building (Insulation) | ● ● ○ |
| | Reflection (Albedo) | ● ○ ○ |
| Surface Water Regulation | Water Conveyance | ● ● ○ |
| | Water Infiltration | ○ ○ ○ |
| | Water Retention | ● ● ○ |
| | Water Storage | ● ● ○ |
| | Water Reuse | ● ○ ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ● ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ○ ○ ○ |
| | Connectivity | ○ ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ● ○ ○ |
| | Usability / Functionality | ○ ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ● ○ ○ |

# N17 UNDERGROUND WATER STORAGE

Zollhallen Plaza, Freiburg

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| | ✔ | | | | |

## Description

Underground systems below public open spaces (sport fields) composed of modular elements to retain flash floods and to store water for irrigation purposes nearby. Depending on the Geology of an area underground storage capacity retains and stores water after flash floods

## Conditions for Implementation

- space for underground storage
- financial investment
- difficult to build for already existing spaces

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ○ ○ ○ |
| | Shading | ○ ○ ○ |
| | Evaporation | ○ ○ ○ |
| | Building (Insulation) | ○ ○ ○ |
| | Reflection (Albedo) | ○ ○ ○ |
| Surface Water Regulation | Water Conveyance | ○ ○ ○ |
| | Water Infiltration | ● ● ○ |
| | Water Retention | ● ○ ○ |
| | Water Storage | ● ○ ○ |
| | Water Reuse | ● ● ○ |
| Water Purification | Water Filtering | ● ○ ○ |
| | Water Bio-remediation | ○ ○ ○ |
| Air Purification and Noise Reduction | Deposition | ○ ○ ○ |
| | Air Biofiltration | ○ ○ ○ |
| | Noise Reduction | ○ ○ ○ |
| Biodiversity | Habitat Provision | ● ○ ○ |
| | Connectivity | ● ○ ○ |
| Socio-Cultural Services | Beauty / Appearance | ○ ○ ○ |
| | Usability / Functionality | ● ○ ○ |
| | Social Interaction | ○ ○ ○ |
| | Education | ○ ○ ○ |
| Provisioning Service | Food / Energy / Material | ○ ○ ○ |
| Climate Regulation | CO2 Sequestration | ○ ○ ○ |

Inspiration Card
Nature Based Solution

Parks & Gardens

# N35 URBAN GARDENS

Urban Gardening in Bremen, Germany

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | ✔ | | ✔ | ✔ | ✔ |

## Description

Urban gardening is a common way to establish garden space for citizens. There a different concepts of urban gardening, but mostly they are semi-private with a possibility to rent individual beds, or used by an association. The gardens are often built in raised beds, which makes it possible to establish them everywhere, most likely in courtyards or public spaces, and makes them easy to move if needed. They are sources for locally produced food and promote social interaction.

## Conditions for Implementation

- space needed
- caring community
- initiative
- organisation

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●● |
| | Shading | |
| | Evaporation | ●● |
| | Building (Insulation) | |
| | Reflection (Albedo) | |
| Surface Water Regulation | Water Conveyance | |
| | Water Infiltration | ● |
| | Water Retention | ● |
| | Water Storage | ● |
| | Water Reuse | |
| Water Purification | Water Filtering | ● |
| | Water Bio-remediation | |
| Air Purification and Noise Reduction | Deposition | |
| | Air Biofiltration | ●● |
| | Noise Reduction | |
| Biodiversity | Habitat Provision | ● |
| | Connectivity | |
| Socio-Cultural Services | Beauty / Appearance | ●● |
| | Usability / Functionality | ●● |
| | Social Interaction | ●● |
| | Education | |
| Provisioning Service | Food / Energy / Material | ●● |
| Climate Regulation | CO2 Sequestration | |

Inspiration Card
Nature Based Solution

Coastal Areas

# N28 WATERFRONT PARK


Example of a waterfront park

## Challenges

| Climate Mitigation & Adaptation | Water Resilience | Coastal Resilience | Outdoor Comfort | Greening the City | Self-Sufficiency |
|---|---|---|---|---|---|
| ✔ | | ✔ | ✔ | ✔ | |

## Description

Waterfront parks are terrains which getting intentionally flooded by floodwater in order to reduce the impact of the flood downstream. Damages caused by floodwater depend form the floodwater peak. The peak can be lowered by installing floodwater parks which capture and store floodwater.
By this way, damages occurring during a flood can be minimalized along the downstream shoreline while the water causes no damage to the waterfront park.

## Conditions for Implementation

- Available space
- Accessibility
- Information and evacuation plans

## Performance

| | | |
|---|---|---|
| Cooling Service | Transpiration | ●● |
| | Shading | ○○ |
| | Evaporation | ●● |
| | Building (Insulation) | ○○ |
| | Reflection (Albedo) | ○○ |
| Surface Water Regulation | Water Conveyance | ●● |
| | Water Infiltration | ●● |
| | Water Retention | ●● |
| | Water Storage | ●● |
| | Water Reuse | ○○ |
| Water Purification | Water Filtering | ●● |
| | Water Bio-remediation | ○○ |
| Air Purification and Noise Reduction | Deposition | ○○ |
| | Air Biofiltration | ○○ |
| | Noise Reduction | ○○ |
| Biodiversity | Habitat Provision | ●● |
| | Connectivity | ●● |
| Socio-Cultural Services | Beauty / Appearance | ●● |
| | Usability / Functionality | ●● |
| | Social Interaction | ●● |
| | Education | ○○ |
| Provisioning Service | Food / Energy / Material | ○○ |
| Climate Regulation | CO2 Sequestration | ○○ |