

Climate-ADAPT case studies



AGENDA

Welcome address and introduction

José Ramon Picatoste, EEA

How Europe is adapting to climate change: the Climate-ADAPT collection of case studies

Emiliano Ramieri, ETC-CCA

Sand Motor – building with nature solution to improve coastal protection along Delfland coast

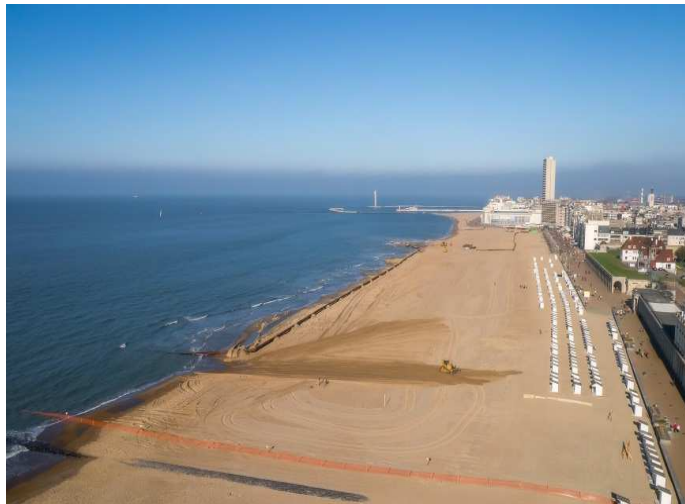
Chiara Castellani, ETC-CCA

Feedback, questions and answers

How Europe is adapting to climate change: the Climate-ADAPT collection of case studies

Climate-ADAPT case studies

Climate-ADAPT case studies showcase measures that are already being carried out in Europe to increase resilience to extreme weather and slow-onset events, and in particular to improve adaptation to climate change



Implementation of the integrated Master Plan for Coastal Safety in Flanders

Show that adaptation is occurring in Europe

Increase awareness on what is possible to do

Inspire new adaptation activities



Stuttgart: combating the heat island effect and poor air quality with green ventilation corridors

Criteria for case study selection

- ✓ **Clear relevance for climate change adaptation**
- ✓ **Actual implementation**
- ✓ **Accessibility to more detailed information**
- ✓ Recent and alive case studies
- ✓ Represent good practice, leaving out cases of maladaptation
- ✓ Ensure proper coverage of all European regions and EEA member states
- ✓ Cover all adaptation sectors and climate change impacts in a balanced way



Replacing overhead lines with underground cables in Finland



Moor protection in the Allgäu region (Germany) through a stakeholder-based approach



Social vulnerability to heatwaves – from assessment to implementation of adaptation measures in Košice and Trnava, Slovakia

How to find case studies

Climate ADAPT SHARING ADAPTATION INFORMATION ACROSS EUROPE

Search all site | Help | My Climate-ADAPT

ABOUT | EU POLICY | COUNTRIES, TRANSNATIONAL REGIONS, CITIES | KNOWLEDGE | NETWORKS

Climate-ADAPT search

Search term

Current filters: [Reset filters](#)

Type of Data (Match: any) Source Website (Match: any)

Case studies CCA

Results 1 - 30 of 91

Display as [Grid] [List] [Map] Order: Newest Download TSV Download CSV

IRRINET: IT irrigation system for agricultural water management in Emilia-Romagna, Italy

2019
Case studies

IRRINET is an IT irrigation system aiming to advise farmers on efficient water management. This web service was developed with public funding by the CER (Canale Emiliano Romagnolo, a water consortium located in the Emilia-Romagna region) based on a 1984 project which tested the use of telematic tools in agriculture in Emilia-Romagna. In 1999, with the arrival of Internet, IRRINET started to be developed in a web form and is still active and operative in this Italian region. Considering the increasing need for wise and efficient use of water and the impacts of climate change on water availability, the National Association of Land Reclamation Boards (ANBI) developed IRRIFRAME a similar IT ser...

Sand Motor - building with nature solution to improve coastal protection along Delfland coast (the Netherlands)

2019
Case studies

The Sand Motor is a 'mega-nourishment' implemented in the Delfland Coast (North Sea coast of South Holland, The Netherlands) as innovative pilot project to test the upscaling of regular sand nourishment along the Dutch coast, carried out by Rijkswaterstaat (the Dutch Ministry of Infrastructure and Water Management Works). The regular program is aimed at preservation of the coastline and protection against flooding. The Sand Motor also has the purpose to create (temporarily) space for leisure activities and nature development, as well as acquiring better understanding of the behaviour of the coastal system. These multiple purposes make it an example of a Building with Nature (BwN) solution th...

Adapting overhead lines in response to increasing temperatures in UK

Type of Data

Adaptation Sectors

Count	Value	Match an
8	Agriculture	<input type="checkbox"/>
26	Biodiversity	<input type="checkbox"/>
14	Buildings	<input type="checkbox"/>
20	Coastal areas	<input type="checkbox"/>
42	Disaster Risk Reduction	<input type="checkbox"/>
47	Ecosystem-based appr.	<input type="checkbox"/>
11	Energy	<input type="checkbox"/>
10	Financial	<input type="checkbox"/>
11	Forestry	<input type="checkbox"/>
11	Health	<input type="checkbox"/>

Climate Impacts

Count	Value	Match an
24	Droughts	<input type="checkbox"/>
43	Extreme Temperatures	<input type="checkbox"/>
61	Flooding	<input type="checkbox"/>
9	Ice and Snow	<input type="checkbox"/>
21	Sea Level Rise	<input type="checkbox"/>
27	Storms	<input type="checkbox"/>
20	Water Scarcity	<input type="checkbox"/>

Transnational regions

Count	Value	Match an
7	Adriatic-Ionian	<input type="checkbox"/>

Case studies: Climate-ADAPT European Environment Agency

ArcGIS World Geocoding S

EEA_ClimateAdaptCase...

Climate impacts: DROUGHT

Adaptation sectors: WATERMANAGEMENT

Case studies in same bioregion

Case studies in different bioregion

- Zaragoza: combining awareness raising and financial measures to enhance water efficiency ★ Featured
- Urban river restoration: a sustainable strategy for storm-water management in Lodz, Poland ★ Featured
- Lower Danube green corridor: floodplain restoration for flood protection
- Climate-adapted management of the Körös-Maros National Park
- Integrating climate change adaptation into coastal planning in Šibenik-knin County (Croatia)
- New locks in Albertkanaal in Flanders, Belgium ★ Featured

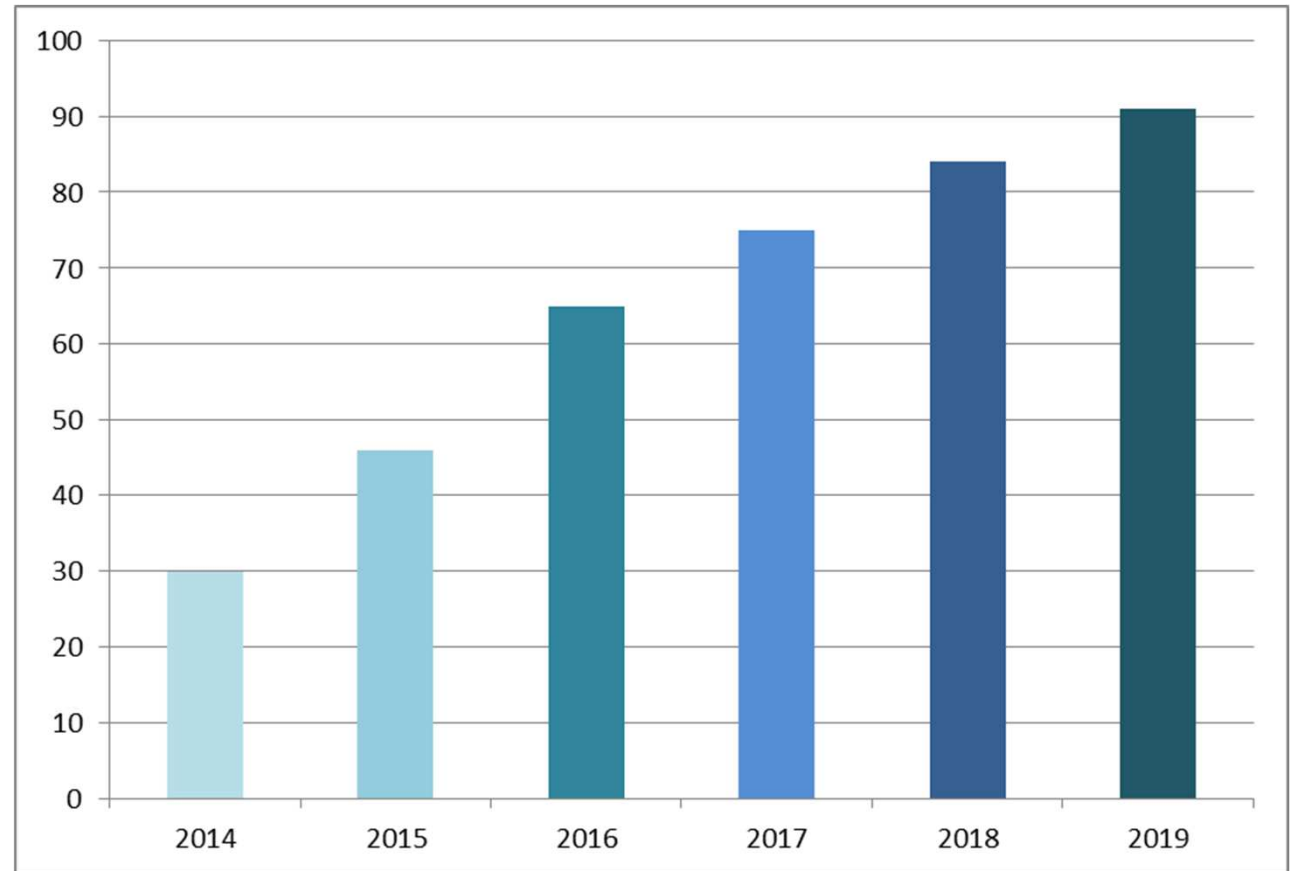
The current collection of CA case studies



IRRINET: IT irrigation system for agricultural water management in Emilia-Romagna



Flood risk management for hydropower plants in France



Example 1



Catchment management approach to flash flood risks in Glasgow

Objective: mitigate the flooding of residential and business properties in several areas of suburban Glasgow by the White Cart Water and the Auldhouse Burn

Adaptation measures: flood storage areas upstream the city, flow control devices into the dams at each storage area, and low walls and embankments in selected parts of the river corridor through the city

Example 2

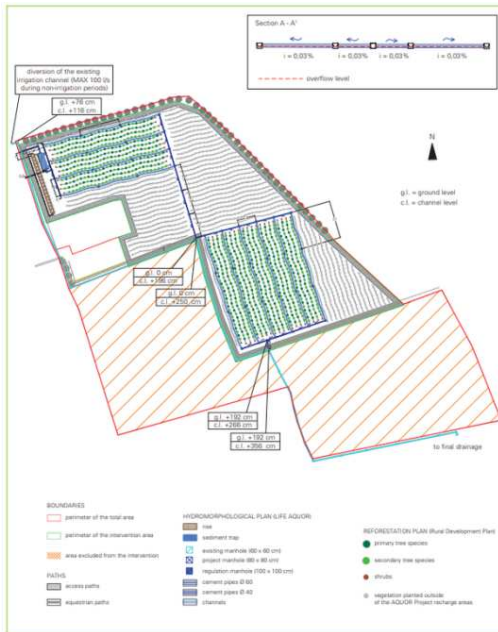


Stuttgart: combating the heat island effect and poor air quality with green ventilation corridors

Objective: facilitate air exchange in the city, thereby enhancing the potential for cool air flow from the hills towards the urban areas on the valley floor.

Adaptation measures: urban planning and prohibition of new construction to preserve existing ventilation corridors, limitation of the urban sprawl, expansion of green areas, green roofs

Example 3

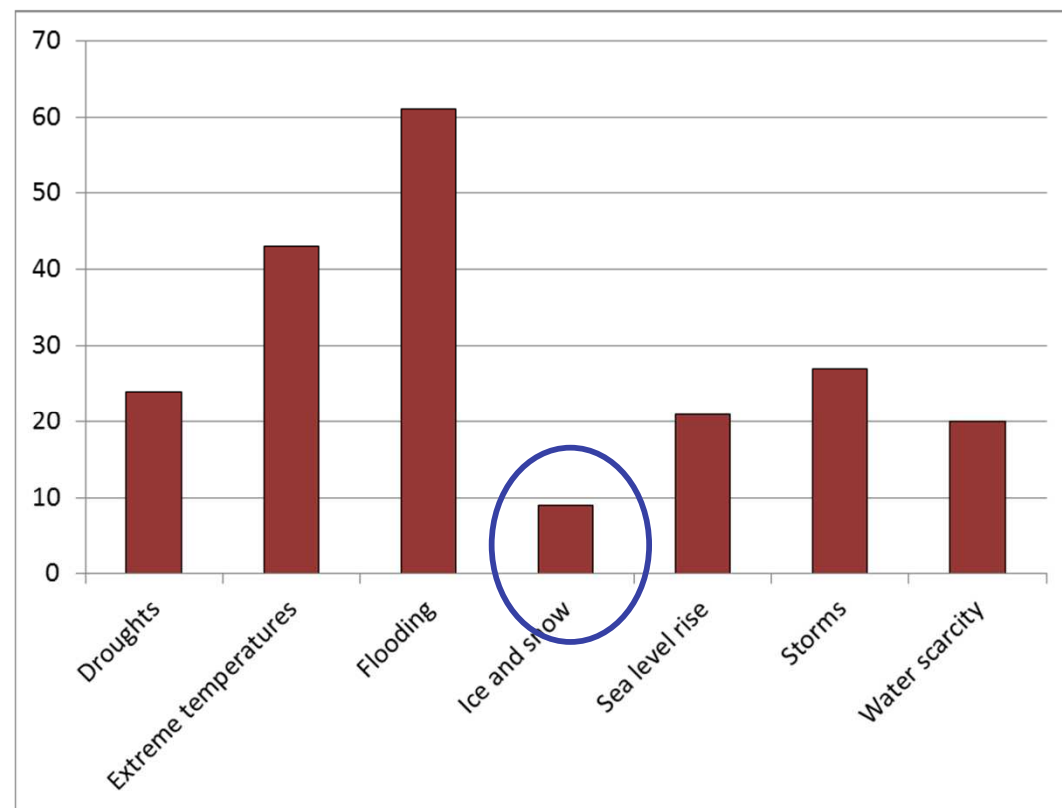
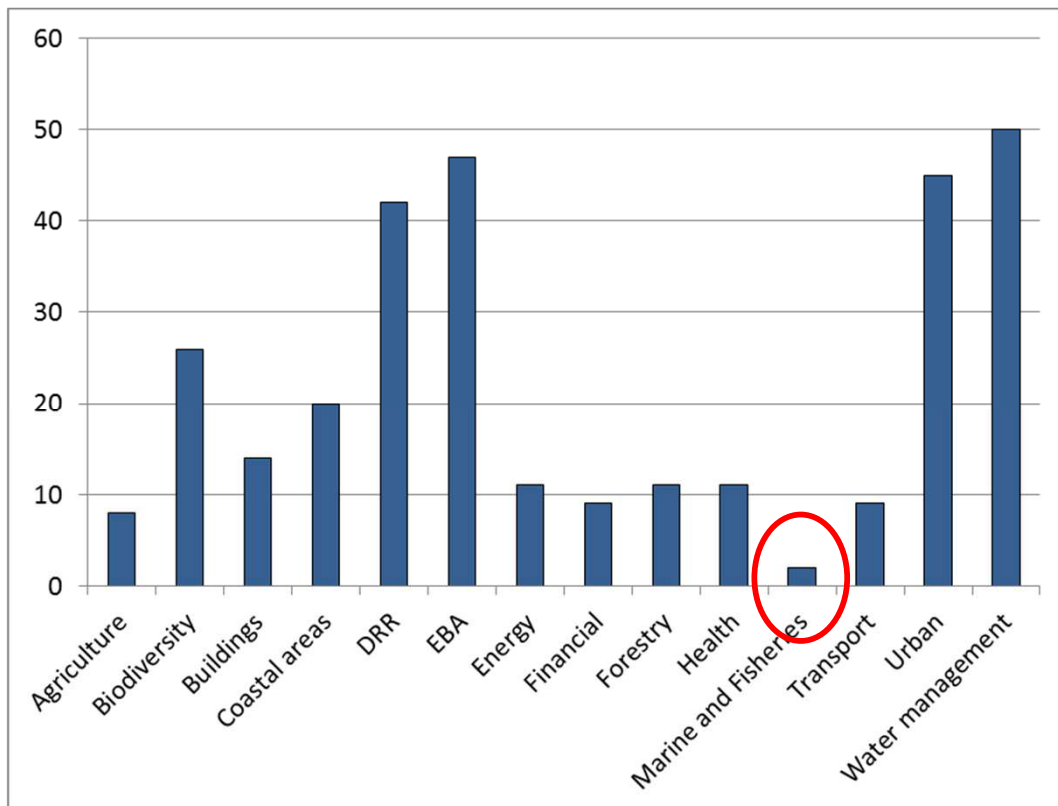


Bosco Limite - A participatory strategy of water saving and aquifer artificial recharge in Northern Italy

Objective: restore the natural dynamics of the aquifer recharge, also to cope with the increase in water demand and the variation in rainfall regimes

Adaptation measures: Forested Infiltration Area system: network of canals bringing water from the Brenta river – when available in excess - to a forested area consisting of native species of trees and shrubs

Coverage and gaps

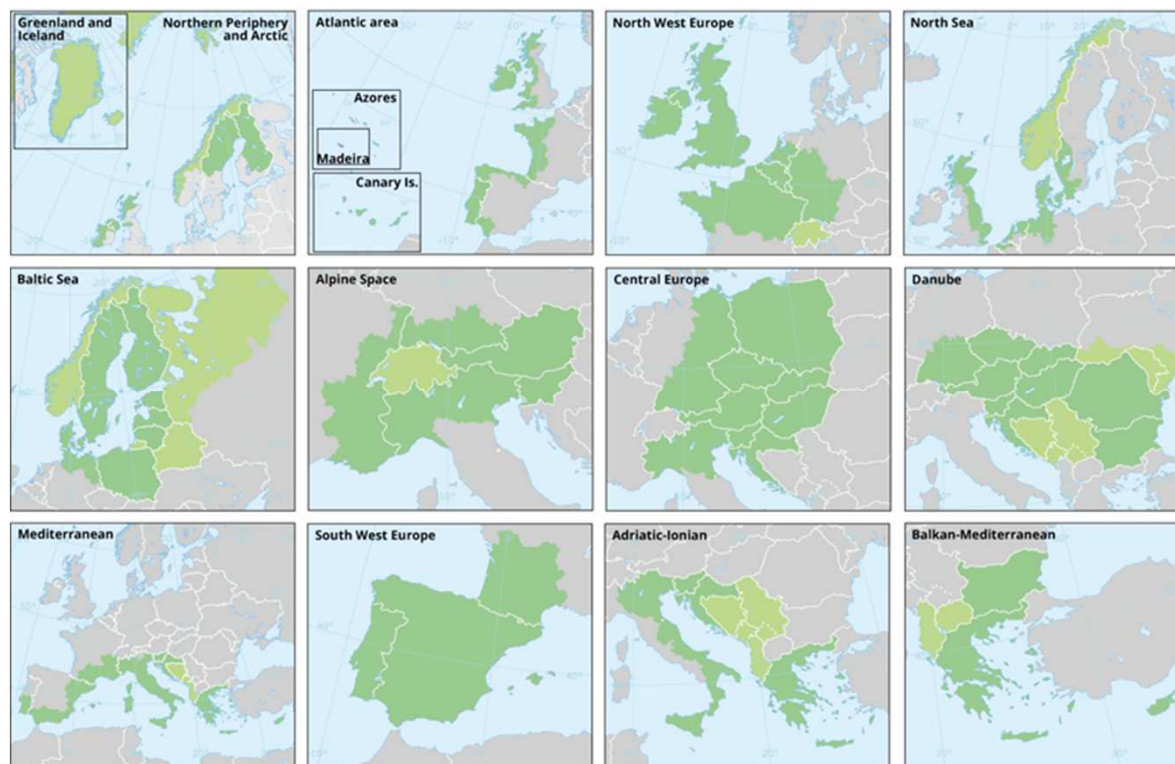
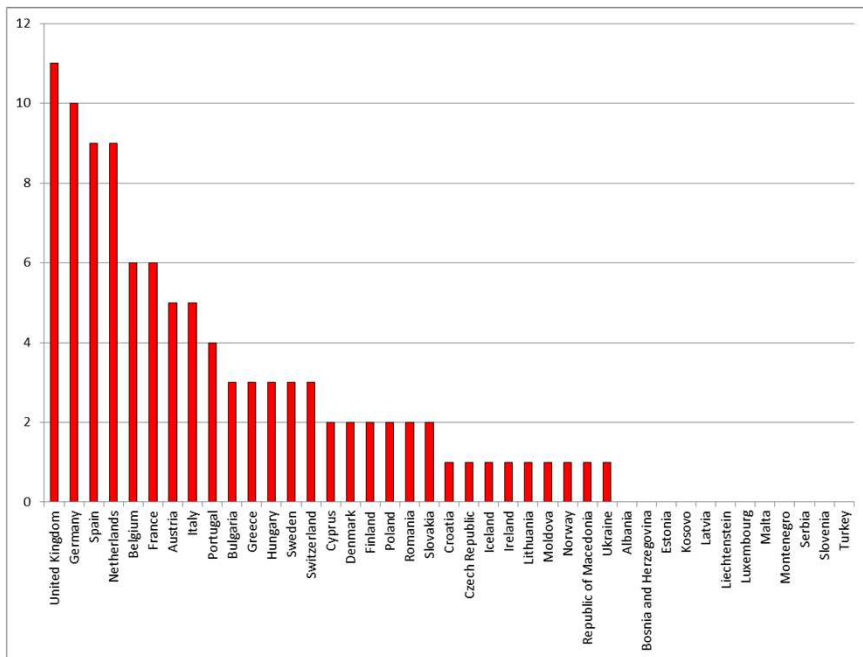
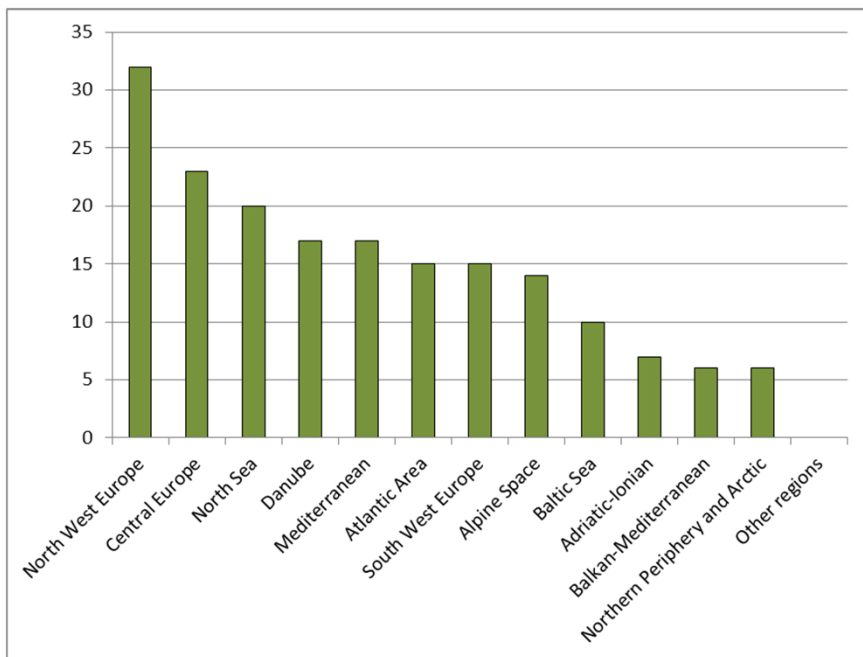


Gap category 1 - Missing scientific/practical evidence

Gap category 2 - Incomplete information gathering

Gap category 3 - Information is not eligible according to the CA database criteria

Geographic distribution



Local	53	58%
Regional	27	30%
National	12	13%
Transnational	3	3%

Case study development


Case studies can be directly submitted to Climate-ADAPT through the on-line function "Share your information" that is accessible on the home-page

However, case study elaboration is not straightforward; ETC-CCA develops most of the case studies and provides its support to external submitters:

- An user provides a short abstract to the ETC-CCA case study coordinator (emiliano.ramieri@thetis.it)
- Based on the feedback, the user develop the case study description through an offline template
- The case study coordinator reviews the case study description
- The user finalize the case study description
- EEA approves the off-line version of the case study and publish it on Climate-ADAPT

Case studies

Rainwater saving and use in households, Bremen (2018)




© 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 (m²), 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 m². 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](#)
 - [Objectives](#)
 - [Adaptation Options Implemented In This Case](#)
 - [Solutions](#)
 - [Importance and Relevance of Adaptation](#)
- **Additional Details**
 - [Stakeholder Participation](#)
 - [Success and Limiting Factors](#)
 - [Costs and Benefits](#)
 - [Legal Aspects](#)
 - [Implementation Time](#)
 - [Life Time](#)
- **Reference Information**
 - [Contact](#)
 - [Websites](#)
 - [Source](#)

Case Study Illustrations (2)



Updated:
2018-07-27

Keywords:
Green building, fee, rainwater, soil sealing, subsidy

Sectors:
Financial, Urban, Water management

Climate impacts:
Flooding, Water Scarcity

Governance level:
Local (e.g. city or municipal level)
Sub National Regions

Geographic characterization:
Europe

Macro-Transnational region:
North Sea

Biographical regions:
Atlantic

Countries:

Case study use

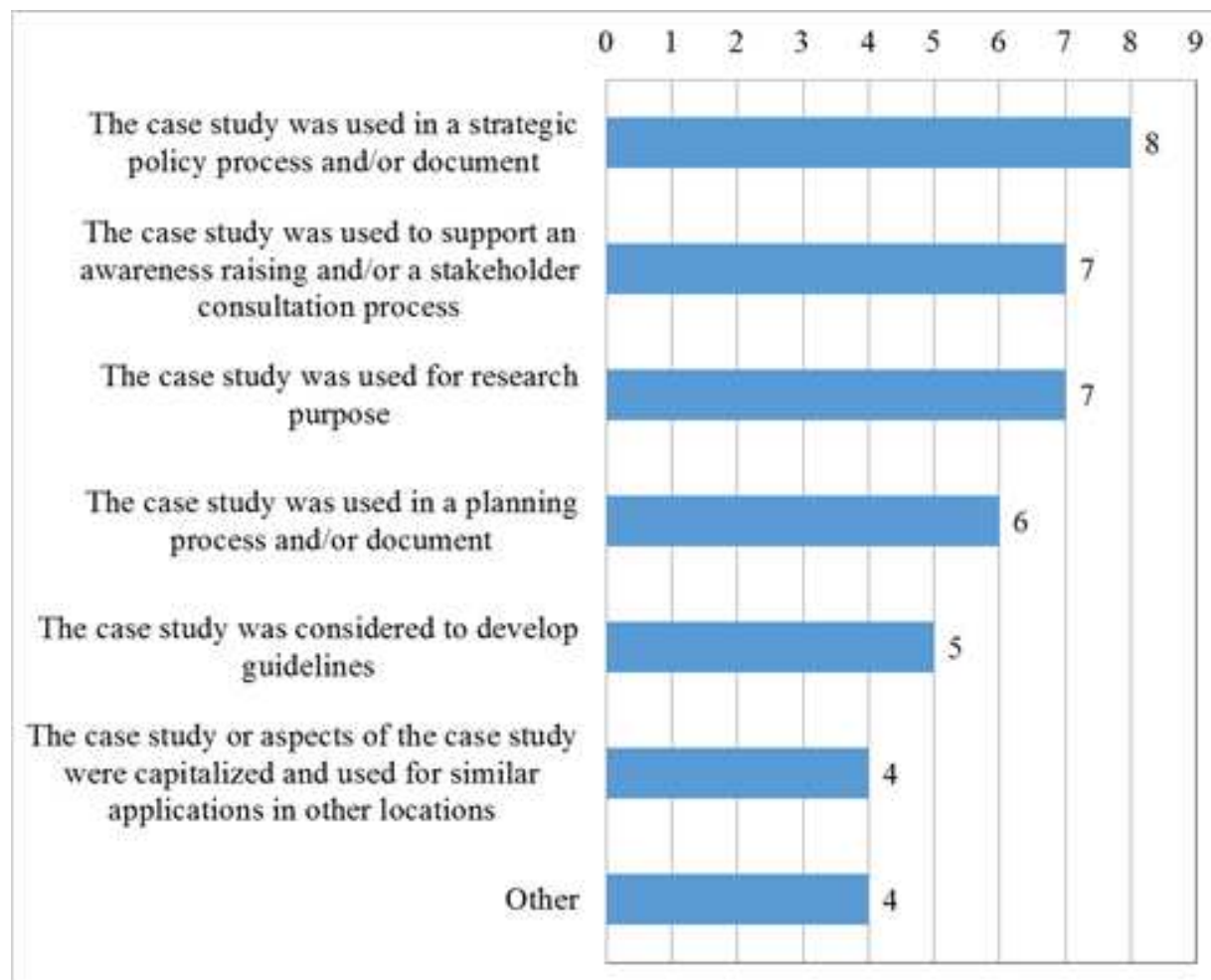
EEA Report | No 03/2018

Sharing adaptation information across Europe

ISSN 1977-8449



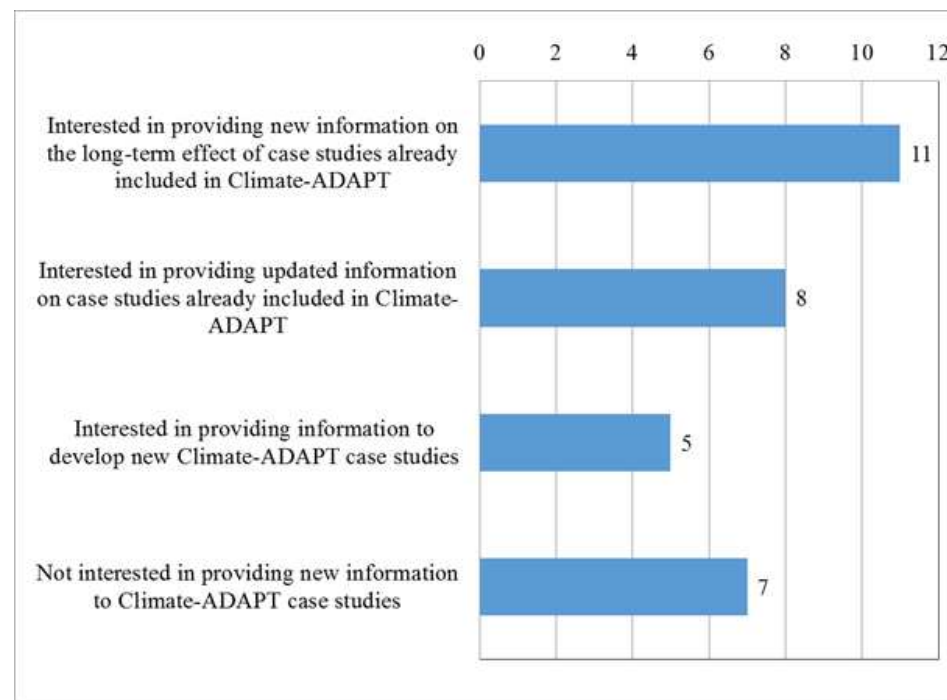
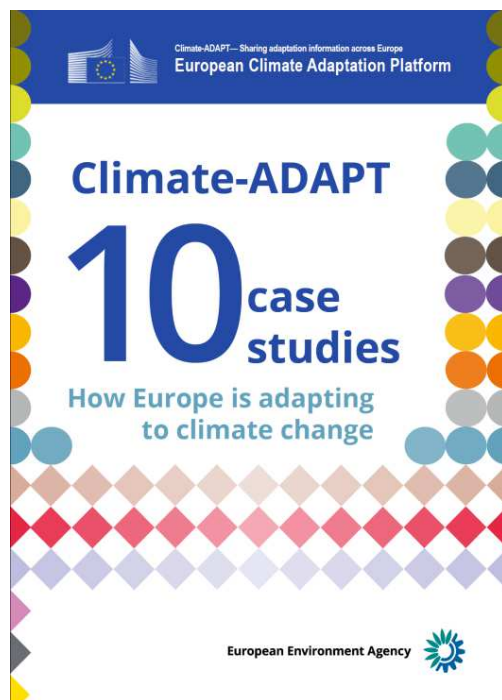
European Environment Agency



Why more detailed information on case studies has been requested to local contacts

Looking forward

- ✓ Improve case study dissemination
- ✓ Close remaining gaps
- ✓ Update older case studies (e.g. 2014-2015)
- ✓ Collect structured information on long-term effects of implemented measures
- ✓ Develop a closer cooperation with potential external submitters



Climate-ADAPT case studies



Sand Motor case study

Building with nature solution to improve coastal protection along Delfland coast (the Netherlands)



<https://www.dezandmotor.nl/en/home/>
<https://www.deltares.nl/en/projects/sand-engine/>

What is Sand Motor?

It is a 'Mega-nourishment', implemented as a pilot project to test an innovative solution alternative to traditional sand nourishment interventions.

It was carried out in 2011 by the Dutch Ministry of Infrastructure and Water Management Works (Rijkswaterstaat) mainly to:

- preserve the coastline and protect against flooding,
- and also creating space for leisure activities and for nature.

Sand Motor is an example of a Building with Nature (BwN) solution that uses natural processes to fulfil multi-functional purposes in coastal management.



Challenges

- 350 km long coastline in the Netherlands
- nine million residents living in the coastal areas of the Netherlands
- vast regions located below the mean sea level
- coastal erosion

Climate Impacts

- Sea level rise
- Flooding
- Storms

Regular sand nourishment interventions started since 90s to preserve the coastline at its reference position

Increasing volumes of sand needed considering past trend and regional future projections of sea level rise

The idea of Sand Motor

Ideas of a “mega-nourishment”, instead of traditional and regular nourishments, emerged since 2006 to investigate a more efficient way of maintaining the coast.

A plan survey started in 2009, focused on a deposit of a **huge volume of sand in a single operation, allowing that wind, waves and currents progressively spread the sand along the coast** over a longer period of time compared to traditional nourishment initiatives.

After the Environmental Impact Assessment procedure, the intervention was carried out between April and November 2011.

Objectives

- Preservation of a wide beach along the Delfland Coast between Hook of Holland and Scheveningen (Province of Holland)
- Nature conservation
- Appealing space for leisure activities
- Knowledge development and innovation



Solutions implemented

The intervention involved :

- Sand extraction about **10 kilometres** offshore
- **21.5 million** cubic metres of sand deposited along the coast
- New hook-shaped peninsula of about **128 ha**
- **2 foreshore nourishment** operations conducted on either side of the peninsula to complement the intervention
- In its original shape, protruded **1 km** into the sea and stretched along **2 km** of coast



Aerial image, 2011



Aerial image, August 2016

Continuous changes in the shape of the Sand Motor, with the strongest evolution in the first year after construction.

New morphological shapes and landscapes

An intense monitoring effort has been realised

Success and limiting factors

- + Long-term protection of the coast combined with nature expansion and new space for recreation, meeting multiple targets of different actors and creating national and international interest



Temporary **dangerous situations**, especially for bathing created by new currents.

- Special control needed by a combination of information to the public, extra attention of coastal guards provided with new tools

Cost and benefits

- The project was funded by the Province of South Holland and Rijkswaterstaat.
- The cost of the intervention was **70 million euros**
- The first complete assessment of the intervention effects (**2016**) indicates **success** in coastal protection, with new habitat for local flora and fauna and new opportunities for recreational activities.
- Acquired **knowledge** on the coastal system functioning
- About **20 years** is the projected **lifetime** of the Sand Motor, a clear advantage of the intervention compared to traditional sand nourishment
- A complete **economic evaluation** of the innovative intervention compared to conventional maintenance solutions is expected in the **upcoming years**



Feedback, questions and answers

- Are Climate-ADAPT case studies useful? For what purposes?
- What shall be the focus on next actions on Climate-ADAPT case studies: more cases, updating old ones, focused activities on existing gaps?
- Would you like to contribute to Climate-ADAPT case studies development?
- How could you contribute to case study dissemination?



Climate-ADAPT case studies



Thank you very much



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INFORMATION
ACROSS EUROPE