

Handbook of Solutions



**Co-funded by
the European Union**

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.

Contents

Introduction	03
Overview	04
Map of Regions	05
Solution 1 - Raingarden catalogue	06
Solution 2 - Blue-green factor (BGF)	07
Solution 3 - Cost-benefit analysis of NbS	08
Solution 4 - XR Pathfinder	09
Solution 5 - BEST Adapt tool	10
Solution 6 - IoT loggers	11
Solution 7 - Argos tool	12
Solution 8 - Citizen participatory toolkit	13
Solution 9 - Integrated areas of landscape management	14
Solution 10 - Hydrological/Hydraulic Modeling & NBS Simulation	<u>15</u>

Introduction

RESIST brings knowledge, innovations and best practices to the regions in Europe in a time of growing uncertainty due to climate change. Climate adaptation solutions are at the core of the RESIST project - testing, refining, and creating solutions designed to meet the needs of climate-vulnerable regions. **Nearly 100 solutions** emerging from RESIST large scale demonstration and twinning regions **are being brought closer to the market**.

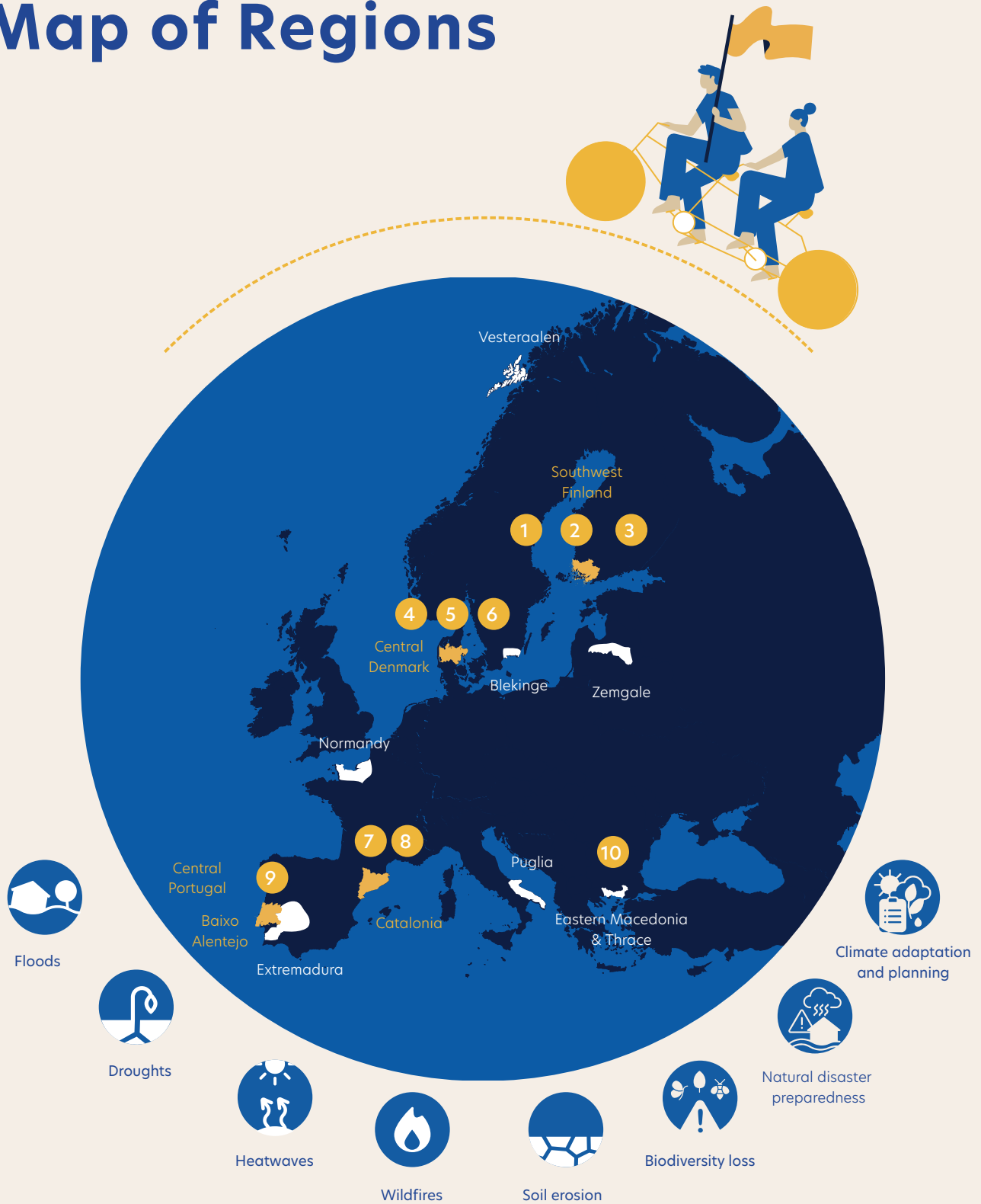
This Climate Adaptation Solutions Handbook is a curated, accessible guide to the most promising outcomes of the **RESIST project**. The handbook brings cutting edge climate adaptation strategies to life- transforming technical details into communicative, user-friendly formats encouraging uptake by policymakers, business leaders, concerned citizens, and media professionals.

This Handbook features ten climate adaptation solutions, and it will be updated and extended to include more CCA know-how and innovations such as digital twins, virtual replicas of real-world regions that model environmental scenarios and simulate the impact of proposed solutions. The Handbook is designed to complement the RESIST repository where information about the demonstrated CCA solutions is provided in a more interactive and detailed manner.

Overview

N.	Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
1	Raingarden catalogue	Nature-based, community engagement	Urban flooding	Southwest Finland	Normandy
2	Blue-green factor (BGF)	Policy & governance	Urban flooding and biodiversity loss	Southwest Finland	Normandy, Eastern Macedonia & Thrace
3	Cost-benefit analysis of NbS	Policy & governance	Urban planning	Southwest Finland	Normandy, Eastern Macedonia & Thrace
4	XR Pathfinder	Digital	Climate adaptation and planning	Central Denmark	Blekinge Vesterdaalen
5	BEST Adapt tool	Digital	Socio-economic decision-making for climate adaptation	Central Denmark	Vesterdaalen
6	IoT loggers	Digital, technology & engineering	Flooding	Central Denmark	Zemgale
7	Argos tool	Digital	Natural disaster preparedness	Catalonia	Baixo Alentejo Puglia
8	Citizen participatory toolkit	Community engagement	Climate adaptation planning	Catalonia	Baixo Alentejo Puglia
9	Integrated areas of landscape management	Community engagement	Forest fires, soil erosion, and biodiversity loss	Central Portugal	Extremadura Vesterdaalen
10	Hydrological/Hydraulic Modeling & NBS Simulation	Digital	Flooding	Eastern Macedonia & Thrace	Zemgale

Map of Regions



SOLUTION 1

Raingarden Catalogue

The raingarden catalogue is one of several innovative solutions being shared between leading and twinning regions as part of the RESIST project. It offers valuable insights into raingardens -shallow, landscaped areas designed to collect and absorb rainwater runoff from hard surfaces.

Raingardens help reduce flooding and prevent water pollution by filtering out pollutants before they reach rivers or groundwater. This solution promotes sustainable urban drainage systems by adapting to local hydrological conditions and providing a cost analysis with an implementation timeline.



SOLUTION



CHALLENGE

Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
Raingarden catalogue	Nature-based, community engagement	Urban flooding	Southwest Finland	Normandy

SOLUTION 2

Blue-Green Factor (BGF)

The Blue-Green Factor (BGF) is an assessment tool designed to evaluate urban developments based on their surface water management and vegetation qualities. By classifying blue (water-related) and green (vegetation-related) areas, along with additional ecological features, BGF calculates a score that reflects the resilience and sustainability of a property. This tool supports urban planners in enhancing climate resilience by promoting green infrastructure and integrating nature-based solutions tailored to local conditions.



Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
Blue-green factor (BGF)	Policy & governance	Urban flooding and biodiversity loss	Southwest Finland	Normandy, Eastern Macedonia & Thrace

SOLUTION 3

Cost-Benefit Analysis of NbS

Cost-Benefit Analysis (CBA) for Nature-Based Solutions (NbS) is a tailored evaluation framework that helps regions assess the economic, social, and environmental impacts of implementing nature-based climate adaptation measures. By quantifying both direct and indirect benefits—such as flood prevention, enhanced biodiversity, and improved well-being—against implementation and maintenance costs, CBA supports informed decision-making. This approach is adapted to local contexts, ensuring that unique regional challenges and non-monetary ecosystem services are fully considered when prioritizing resilient, sustainable solutions.



SOLUTION



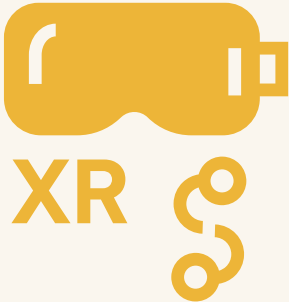
CHALLENGE

Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
Cost-benefit analysis of NbS	Policy & governance	Urban planning	Southwest Finland	Normandy, Eastern Macedonia & Thrace

SOLUTION 4

XR Pathfinder

The XR Pathfinder is a web-based guidance tool developed to support strategic decision-making and planning for climate adaptation. it suggests resources to users to evaluate adaptation options, integrating socio-economic and environmental factors. The tool is customised for regional needs, offering milestones for development and deployment, and is designed to overcome local barriers while enhancing resilience through informed planning and scenario analysis.



SOLUTION



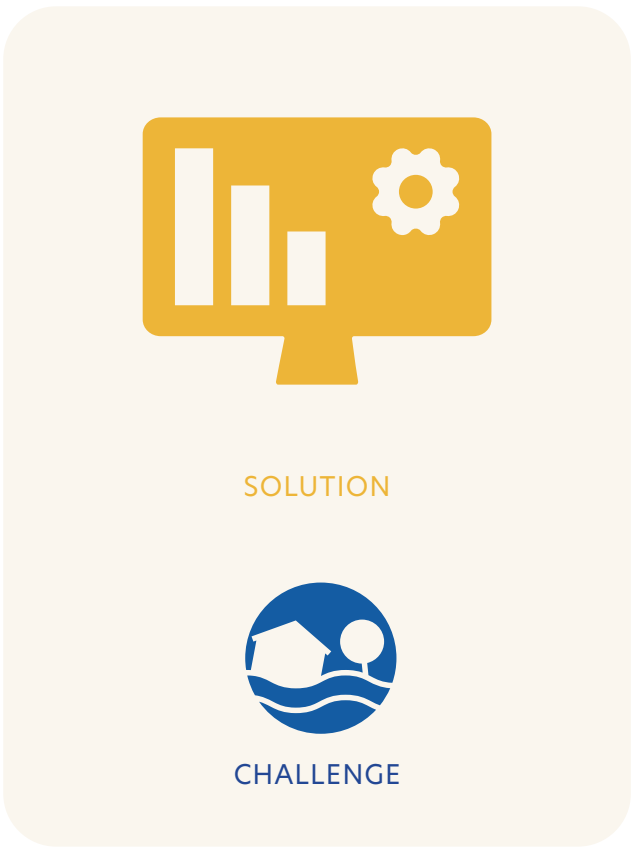
CHALLENGE

Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
XR Pathfinder	Digital	Climate adaptation and planning	Central Denmark	Blekinge Vesteraalen

SOLUTION 5

BEST Adapt tool

The Best Adapt tool is a socio-economic decision support system that helps regions evaluate the costs and benefits of various climate adaptation measures. It is tailored to local economic frameworks and assists policymakers in integrating economic analysis into adaptation strategies. By providing clear comparisons of adaptation options, Best Adapt supports informed decision-making for sustainable and resilient regional development.



Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
BEST Adapt tool	Digital	Socio-economic decision-making for climate adaptation	Central Denmark	Vesteraalen

SOLUTION 6

IoT loggers

IoT Loggers are sensor-based devices deployed for real-time data collection on groundwater systems. They enable continuous monitoring of hydrological conditions, supporting improved flood risk management and water resource monitoring. These loggers are customised for local needs and are integrated with collaborative efforts among local institutions, enhancing the region's ability to respond to climate-related water challenges.



SOLUTION



CHALLENGE

Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
IoT loggers	Digital, technology & engineering	Flooding	Central Denmark	Zemgale

SOLUTION 7

Argos tool

The Argos Early Warning Systems Tool is designed to enhance disaster preparedness by providing real-time alerts for natural risks such as floods and fires. Adapted to regional risks and needs, Argos integrates technical solutions with stakeholder engagement to ensure timely and effective warnings. It supports civil protection efforts and helps communities respond proactively to climate hazards.



SOLUTION



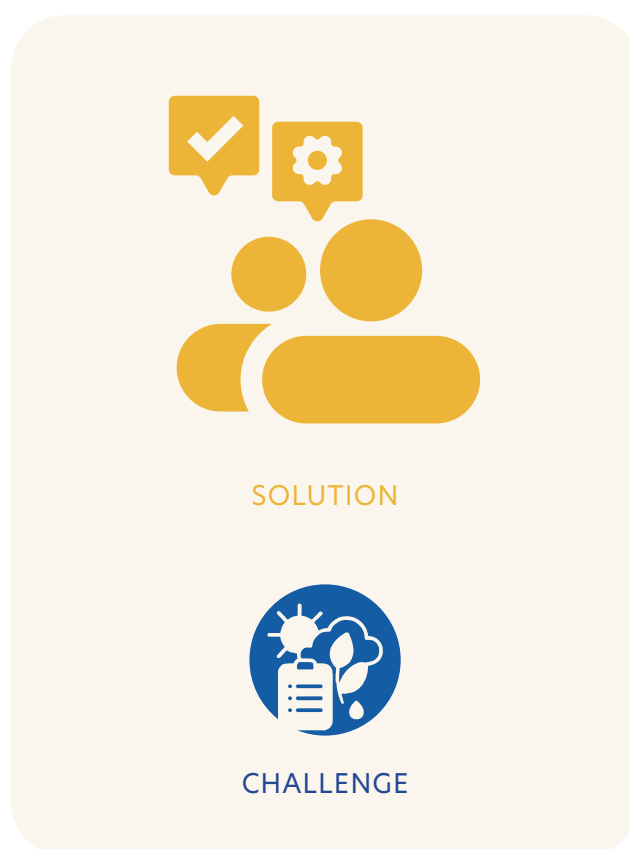
CHALLENGE

Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
Argos tool	Digital	Natural disaster preparedness	Catalonia	Baixo Alentejo Puglia

SOLUTION 8

Citizen Participatory Toolkit

The Citizen Participatory Toolkit empowers communities to actively engage in climate adaptation planning. It provides resources and methods for involving citizens in decision-making processes, fostering local ownership and knowledge-sharing. Adapted to regional contexts, the toolkit includes training and implementation support, aiming to strengthen community resilience and participatory governance in climate adaptation.



Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
Citizen participatory toolkit	Community engagement	Climate adaptation planning	Catalonia	Baixo Alentejo Puglia

SOLUTION 9

Integrated Areas of Landscape Management

Integrated Areas of Landscape Management (AIGP) is a strategy focused on promoting sustainable land use and fuel management to create fire-resilient territories. It addresses region-specific environmental and socio-economic challenges by fostering stakeholder collaboration, technical integration, and adaptive land management practices. The approach aims to enhance biodiversity, prevent forest fires, and support long-term landscape resilience.



SOLUTION



CHALLENGE

Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
Integrated areas of landscape management	Community engagement	Forest fires, soil erosion, and biodiversity loss	Central Portugal	Extremadura Vesterdaalen

SOLUTION 10

Hydrological/Hydraulic Modeling & NbS Simulation

Hydrological/Hydraulic Modeling & Nature-Based Solutions (NbS) Simulation involves using advanced modelling techniques to assess and design flood prevention and water management strategies.

These simulations are tailored to local geographical conditions and support the implementation of nature-based solutions, such as wetland restoration or green infrastructure, providing a scientific basis for effective climate adaptation and risk reduction.



SOLUTION



CHALLENGE

Solution	Solution Type	Challenge	Leading Demonstration Region (LDR)	Twinning Region
Hydrological/Hydraulic Modeling & NBS Simulation	Digital	Flooding	Eastern Macedonia & Thrace	Zemgale



Regions for climate change resilience
through Innovation, Science and Technology



Discover the innovations that
our regions are implementing to
mitigate climate change impacts

www.resist-project.eu

RESIST Coordinator

Vilija Balionyte-Merle

Project Coordinator | SINTEF

vilija.balionyte-merle@sintef.no

RESIST Operational Coordinator

Catarina Azevedo | INOVA+

catarina.azevedo@inova.business

RESIST Communication Contact

Cristina Biddlecome

Project Manager | REVOLVE

cristina@revolve.media