# Use Case Scenario for Community-Led Actions:

# SEAGRASS MEADOWS – IRELAND – CLIMAREST DEMO 2

**EMPOWERING COMMUNITY- LED ACTION IN THE ATLANTIC & ARCTIC**

This project has received funding from the European Union's Horizon Europe Research and Innovation programme under Grant Agreement number 101215504

BLUEACTIONAA

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AIR CENTRE

Foras na Mara Marine Institute

ESF Your Partner in Science

SINTEF

PLOCAN Plataforma Oceánica de Canarias

NIVA Norwegian Institute for Water Research

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SDU University of Southern Denmark

## Use case Overview

### Use case title

Seagrass Meadows- Ireland

### Short Description

This use case focuses on seagrass meadows in Ireland, one of the most valuable coastal ecosystems. Seagrass meadows function as ecosystem engineers, providing habitat for numerous species and contributing to global climate regulation through carbon sequestration. They also buffer biogeochemical cycles, reduce the impact of coastal erosion, and help maintain ecological functioning in coastal waters. However, seagrass meadows have experienced accelerating loss during the 20th century due to eutrophication from agricultural intensification, habitat destruction and waste effluent from urbanization. In Ireland, nutrient over-enrichment poses a significant challenge for seagrass restoration. Previous projects funded by the Irish Environmental Protection Agency have identified seagrass restoration as a critical tool to recover ecosystem functioning in estuaries and reduce the occurrence of opportunistic macroalgal blooms. This use case highlights the relevance of seagrass restoration as a nature-based solution and illustrates restoration needs and context within Irish coastal environments.

### Country and Region

Ireland/ Atlantic coastal regions (Tralee bay, Killala Bay, Rusheen Bay and Conneara) and Dublin Bay.

### Domain/Sector

Marine Science; Environmental Protection; Coastal Management

### Current status

Pilot; Replicated/Transferred to Greece (replication site)

### Geographical scope

Coastal/EEZ

### Organization's categorization

Regional and local (public) authority; NGOs, foundations (public and private), professional association, community-based organizations including civil


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society and citizen associations; SMEs and Large Entreprises; Cultural and Educational organizations; Research organizations and academia.

### Promoter's information

- Organization's name: University of Galway
- Place: Ireland
- EU Mission Restore Our Oceans and Seas related project: CLIMAREST

### Use case duration

- From Year 2023 to Year 2025
- Number of Months: 34

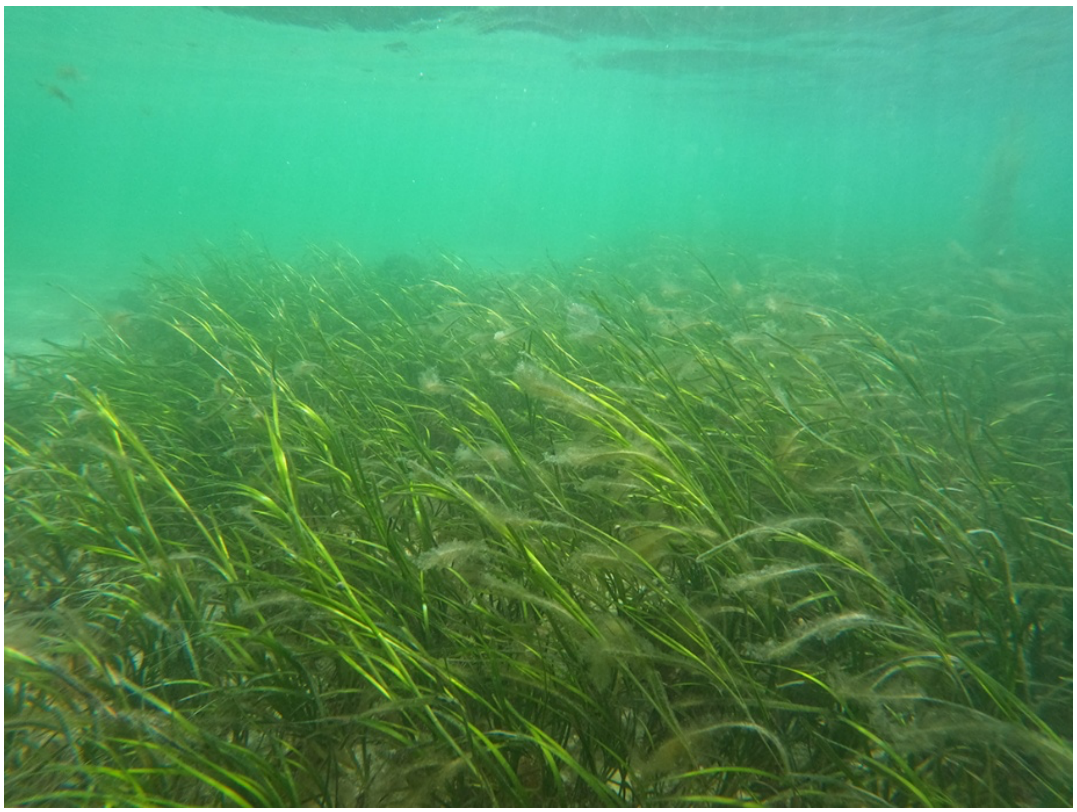
### Keywords

Seagrass meadows/Ecosystem services/Restoration

### Website link

https://climarest.eu/demo-2/

### Use case picture



## Design

### Alignment and contribution to the objectives of the EU Mission Restore Our Oceans and Waters 2030.

Objective 1 – Restore marine ecosystems and biodiversity:
Seagrass meadows are recognised ecosystem engineers that host numerous species and are key to biodiversity conservation and ecosystem functioning.

Objective 2 – Prevent and eliminate pollution of our oceans:
Seagrass meadows buffer biogeochemical cycles, enhance nutrient sequestration (nitrogen and phosphorus) and help mitigate eutrophication linked to agricultural intensification.

Objective 3 – Advancing a carbon neutral blue and circular economy:
Seagrasses play a significant role in global climate regulation through carbon sequestration.

### Challenge's definition and Primary Objective

Seagrass meadows have undergone accelerating loss due to eutrophication, habitat destruction, and urban effluent. In Ireland, nutrient over-enrichment associated with agricultural intensification poses a major challenge for restoration efforts.

Project objectives:

1. To develop and verify restoration methods for seagrasses in Ireland, focusing on planting methods aimed at large scale restoration.

2. Determine the suitability of selected locations in Ireland as potential restoration sites for marine angiosperms.

3. Monitor the transplanted population and obtain data on parameters regarding the health status of the population.

### End users

Local communities and volunteers; Local and regional authorities;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### Gender equality and diversity

The use case promotes inclusive participation by encouraging involvement across genders, ages and socio-economic backgrounds.

## Implementation

### Implementers

Regional or local (public) authority; NGOs, foundations (public and private), professional association, community-based organizations including civil society and citizen associations; SMEs and Large Entreprises; Cultural and Educational organizations; Research organizations and academia.

### Concrete Solutions and Actions taken

Relevant stakeholders in Galway Bay, Tralee Bay, Killala Bay and Dublin Bay were contacted primarily by email, and meetings were held with nearly all. Outreach was carried out together with Galway Atlantaquaria and with the city councils of Galway, Mayo and Dublin. Workshops were organised with university partners and local associations to raise awareness about seagrass meadows and CLIMAREST activities. For governance stakeholders, the meetings focused on obtaining permission for restoration activities, while other groups were engaged for possible involvement in planting, monitoring, and dissemination.

Restoration activities include transplantation sites already active in Tralee Bay and Galway Bay (Connemara and Rusheen Bay), with additional transplantation sites planned in Killala Bay and Dublin Bay. Collaborations with local volunteers, aquariums, restoration teams and community groups across the four bays were established and engagement has also expanded to partners such as Blue Ocean Watch and Ulysses in relation to documentation and restoration techniques.

### Community Engagement Needs

Local and regional communities needed information about seagrass meadows, their importance, and the CLIMAREST activities planned in Galway Bay, Tralee Bay, Killala Bay and Dublin Bay. They also needed ways to engage directly or indirectly with the project, either through restoration, monitoring or dissemination. These needs were addressed by contacting stakeholders across all bays, holding meetings and workshops, and providing outreach through Galway Atlantaquaria and the city councils of Galway, Dublin and



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Mayo. Engagement with groups such as Friends of Barna Woods, local divers and volunteer networks created additional channels for information and involvement. Through these activities, local communities were informed about planned restoration actions and were given opportunities to participate, contributing to awareness-raising and building local support.

### Community Engagement Measures

Concrete measures taken included contacting stakeholders primarily by email and holding meetings with nearly all relevant groups across Galway Bay, Tralee Bay, Killala Bay and Dublin Bay. Engagement was supported through outreach activities conducted together with Galway Atlantaquaria and with the city councils of Galway, Dublin and Mayo. Workshops were organized with university partners and various Galway associations to raise awareness about seagrass restoration.

### Community Engagement benefits

The community benefits include increased awareness of the importance of seagrass meadows and of the CLIMAREST activities taking place in the region. Engagement with Galway City Council resulted in seagrass being included in the Galway Biodiversity Action Plan 2025–2030. Partnerships with aquariums, councils, volunteers, and local groups enable broader dissemination of information and create opportunities for direct or indirect involvement in restoration, monitoring and outreach activities.

## Monitoring and Evaluation

### Technical Risks

Low transplant survival (specially with seeds); unsuitable sediment/light conditions; seasonal variability in water quality and temperature; storm damage and heat stress; handling and transport damage; uncertainty in site suitability; limited scalability from pilot to larger areas; potential impacts on donor meadows.

### Operational constraints

Fieldwork constrained by weather, sea state, visibility, currents, and sediment instability; limited seasonal windows for planting and monitoring; logistics of transporting plant material; occasional personnel/equipment limitations; long-term monitoring demands across multiple years.

### Legal/Regulatory Constraints

Need for permits for collection, transport, transplantation, and monitoring; compliance with protected area regulations and habitat conservation rules; restrictions on donor material collection; marine safety and diving regulations; administrative delays due to multiple authorities; need to avoid negative impacts on surrounding habitats and species.

### Ethical and Social Considerations

Need to minimize disturbance to donor meadows and associated biodiversity; responsible handling of sensitive ecological data; transparent communication of restoration uncertainty and results; stakeholder engagement with local communities and marine users; protection of staff safety during fieldwork; consideration of equitable public benefits from restoration.

## Results & Impacts

### Outputs

Restoration protocols for seagrass; Digital tools and monitoring systems; Nature-based solutions for coastal resilience

### Outcomes

- Environmental impacts: Improved awareness of seagrass ecosystem condition and support for future restoration activities;
- Economic impacts: The Irish demonstration shows that although seagrass restoration is costly at pilot scale, the long-term ecosystem service value is substantial, with significant economic benefits linked to nutrient cycling, tourism, and nursery habitat functions. Cost-benefit analysis indicates that these benefits accumulate slowly but steadily, and that restoration can become economically positive over long time horizons under high ecological recovery;
- Social impacts: Increased community involvement, enhanced collaboration with local councils, volunteers and environmental groups and greater visibility of seagrass in local biodiversity planning and public outreach activities.

### Operational benefits

Broader access to volunteer networks, strengthened cooperation with city councils and aquariums and improved opportunities for collaboration with

national and international partners involved in seagrass restoration.

### Lessons learned and take aways for the future

The results obtained showed high variability, highlighting the need for method stabilization, including site selection. Also important with long-term monitoring and community involvement.

### Scalability

Regional -> Global

### Replicability

Replicated in Greece as a part of the project.

### Transferability

Insights transferable to other habitat restoration types (saltmarsh, kelp, oyster reefs).

### Post project sustainability

Restoration protocols, monitoring tools and digital twins are open source and available through SER for 5 years.

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