ORGANISING INTEGRATED MANAGEMENT OF THE COASTLINE

HAZARD

COASTAL DYNAMICS

IMPLEMENTATION STEP

TERRITORY

AREA OF ACTION

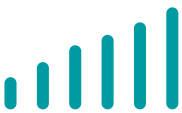
OUTDOORS

COST

€ € €

low medium **high**

LEVEL OF SKILL



high

Integrated coastline management aims to take into account human, economic, urban planning and environmental parameters in order to adapt to coastal dynamics. It involves using a variety of management methods, both soft and hard, while working in harmony with the natural environment. By strengthening the resilience of coastal areas, it is possible to reduce the effects of natural hazards (coastal flooding, coastline retreat, etc.).

The seashore is a dynamic geosystem with a naturally mobile coastline (the place of land-sea contact). In order to protect ourselves from maritime hazards, humans have mainly adopted a strategy of controlling nature by constructing defence works to keep the coastline from moving: dykes, riprap, breakwaters, etc. Conventional engineering can provide some protection against coastal flooding, but it remains limited. In addition, it alters the dynamics of the environment, exacerbates coastal erosion and seriously damages ecosystems. An environmental approach, on the other hand, relies on natural coastal environments to limit the effects of these phenomena and manages the causes of coastal erosion rather than its effects.

IMPACTS

Integrated coastline management is an approach that draws on all existing solutions with the aim of reconciling the many challenges facing the coastline.

Hard structures built on the coast disrupt the natural movement of sediment, encourage erosion, contribute to the artificialisation of the coastline and damage the natural environment. **So-called soft techniques,** like beach nourishment and wave attenuators (e.g. geotextile socks) are costly and not very sustainable. In order to favour sustainable approaches, **nature-based solutions should be a priority**.

Restoring natural environments such as marshes, dune strips and seagrass beds helps to limit the impact of **coastal flooding** and **erosion**. They dissipate wave energy, store sediment in the dunes, limit sediment transport and protect the hinterland from flooding. These ecosystems also provide various **ecosystem services** such as carbon sequestration and pollutant filtration.

However, increasing urbanisation is destroying a large proportion of these natural environments, contributing to climate change and its impacts. Preserving and restoring these ecosystems will help mitigate climate change and help the coastline adapt to environmental challenges. Land-use issues therefore arise when it comes to implementing such solutions and limiting urbanisation.

CLICK HERE TO CONSULT THE GUIDE TO ACTION FOR CLIMATE CHANGE ADAPTATION

Methods of combating coastal erosion on the coastline in the Camargue Regional Natural Park in the Provence-Alpes-Côte d'Azur region. © Jean-Pierre BOUCHARD

INSTALLATION GUIDE

A successful integrated coastal management project comprises several stages. Firstly, it's essential to control or even eliminate the pressures likely to degrade the habitat or species targeted in the project area.

An assessment is then carried out to identify the **services provided by the ecosystems** and evaluate the impact of their degradation. Next, a **feasibility study** (technical, economic, regulatory, management of uses, etc.) summarises regional knowledge and identifies vulnerable areas.

These studies are used to identify the operations that will be implemented, giving priority to **nature-based approaches**. Other options such as beach nourishment, flexible management and dune reconstitution may also be considered, provided that they don't result in a **spatial and temporal transfer of vulnerability**.

Lastly, a **monitoring phase** is necessary to assess the effectiveness of the operation and ensure that the chosen solution takes account of all the issues.

WEAK POINTS AND STRONG POINTS

- ⊖ Striking a balance between **cost**, **technical efficiency** and **environmental issues** can be complicated. Conflicts of use are frequent.
- ⊖ Once a conventional engineering project has been implemented, **reversing the action** is complicated. It may be impossible to return to a highly functional natural environment.
- ⊖ Nature-based solutions for adaptation take a **long time to develop,** which can be an obstacle in the case of urgent needs.
- ⊕ Run a **communication** campaign using educational fact sheets explaining the choice of nature-based solutions.

MALADAPTATION

Maladaptation can result from the following:

Habitats unsuited to the nearby environment

The restoration of natural environments will only be effective if a **detailed study of the habitats and their functions** (shelter, nursery, spawning ground: reproduction zone, corridor, etc.) is carried out. This makes it possible to restore or even recreate an habitat that is adapted to the surrounding environmental context. By corresponding to the environmental context, local ecosystems can be restored, with a lower **risk that an opportunistic species could disrupt the ecosystem**. If the seabed is rocky, for example, restoration operations must correspond in order to blend in with the environment.

Destruction of functional ecosystems

Protecting against maritime hazards using conventional engineering solutions contributes to the **destruction of functional ecosystems**. This can amplify the impacts of climate change because natural environments help to mitigate climate change and reduce local impacts.

Transfer of vulnerability to other systems

Most solutions, whether involving conventional engineering or softer approaches, result in a transfer of temporal and/or spatial vulnerability. During beach nourishment operations, for example, the removal of sediment can cause damage and emit greenhouse gases**.** Measuring the extent of vulnerability can help you choose the solution with the least negative impact, and therefore protect the environment as effectively as possible.

CLICK HERE TO CONSULT THE GUIDE TO ACTION FOR CLIMATE CHANGE ADAPTATION

MONITORING INDICATORS

ESSENTIAL RECOMMENDATIONS WORTH THINKING ABOUT

- ENSURE THAT THE COASTLINE MANAGEMENT OBJECTIVES OF THE SRADDETS (FRENCH REGIONAL PLANS FOR SPATIAL PLANNING) ARE TAKEN INTO ACCOUNT
- REFER TO THE COASTLINE MANAGEMENT POINTS FEATURING IN FRENCH LOCAL URBAN PLANNING DOCUMENTS (SCOT AND PLU)
- GIVE PRIORITY TO RESTORING NATURAL AREAS RATHER THAN DEFENSIVE SOLUTIONS (E.G. DYKES)
- MAKE PART OF THESE NATURAL AREAS ACCESSIBLE VIA FOOTBRIDGES IN ORDER TO RAISE AWARENESS AND IMPROVE THE WELL-BEING OF USERS

MONITOR MY ACTIONS FOR CLIMATE CHANGE ADAPTATION

+/− : Quantitative indicator ★ : Qualitative indicator

INDICATORS OF MEANS	INTERPRETATION
+/− Sealing rate of the area studied (m^2)	To be minimised
+/− Percentage of natural surface area (%)	To be maximised
+/− Percentage of dune surface in the area (%)	To be maximised
+/− Surface area of seagrass beds as a proportion of the surface area studied (%)	To be maximised
+/− Percentage of essential recommendations followed (%)	To be maximised

INDICATORS OF RESULTS	INTERPRETATION
+/− Annual number of coastal floods that reach urbanised areas after the operation	To be minimised
+/− Annual number of coastal floods that reach wetlands (natural estuarine areas, maritime marshes, etc.) without reaching urban areas.	Verification of the proper functioning of the ecosystems that enable sustainable management of the coastline

REGULATION

In 2012, France adopted the first **National Strategy for Integrated Coastline Management** (*SNGITC*), which was revised in 2017. Taking a proactive, environmentally friendly approach, this strategy focuses on preserving coastal ecosystems to minimise the negative impacts of human activities and maximise the social, economic and environmental benefits they offer.

FIND OUT MORE

French National strategy for integrated coastline management, 2017-2019 action programme

French Ministry of Ecology, Energy, Sustainable development and Sea (2012), *A l'interface entre terre et mer: la gestion du trait de côte*

France nature environnement (2017), *La gestion du trait de côte sur le littoral Méditerranéen sableux*

French network of coastline observatories, *Qu'est-ce que le trait de côte ?*

CLICK HERE TO CONSULT THE GUIDE TO ACTION FOR CLIMATE CHANGE ADAPTATION