



Project REWETLAND

Widespread introduction of constructed wetlands for a wastewater treatment of Agro Pontino



waste water

nitrogen

eutrophication

fertilizers

phitodepuration

water pollution

PROJECT DESCRIPTION

The problem of **eutrophication of surface waters** due to the excess of diffuse source nutrients is one of the major impediments to achieving the quality objectives established by the **Water Framework Directive (2000/60/EC)** at European level. In the **Pontine Plain (Agro Pontino, Lazio)** the problem was reported as a priority by the Lazio Water Protection Plan as early as 2007. In this context the **REWETLAND** project aimed to improve the quality of surface waters of the Pontine Plain through a series of biological treatments. The water quality of most of the channels and watercourses that cross it is considered "poor" or "bad" on the basis of the parameters established by the Water Framework Directive (WFD). The pollution is mainly due to the **intensive farming practices** in the area. The project operated on an area of about 700 km², intervening not on a single watercourse, but on the entire network of drainage channels (220 km) and approaching the question through a participatory management of the water system. The choices shared by all the actors involved in the governance of the territory (organisations, institutions, farmers and citizens) and the interinstitutional **collaboration** between the bodies responsible for programming, planning and carrying out the activities were essential for achieving the sustainability objectives of the intervention.



OBJECTIVES

The project led to the drafting of the **Integrated Environmental Restoration Program of the Pontine Plain (ERP)** and to the implementation of **four pilot projects** aimed at demonstrating the effectiveness of phytodepuration (a natural absorption process of nutrients in large quantity, typical of some aquatic species present in lakes and wetlands) in reducing the load of pollutants finishing in surface waters from urban and agricultural wastewater. The pilot interventions were based on the recovery of biodiversity of the interested areas through the use of ecotones, filter ecosystems and artificial wetlands.

PROJECT PHASES

Project actions have been developed in the short and medium-long term. Through the former, efforts have been made to demonstrate how phytodepuration techniques can contribute to improving water quality in the channels and to consolidating biological diversity for those species whose habitats are precarious. The medium-long term actions refer, instead, to the diffusion of the use of phytodepuration techniques with a view also to the quality objectives established by the WFD and the regional legislation in relation to the Pontine Plain's water management, as well as to an increase in biodiversity.

Three main phases of actions can be distinguished:

- in the **preparatory phase** the studies necessary to define the basic knowledge framework of the area, such as the report on the status of the environment and on the feasibility of the pilot projects were performed;



- in the **operational phase** a detailed environmental analyzes was carried out and a geographic database as well as the Environmental Rehabilitation Program of the Pontine Plain were developed, this latter including also participatory activities and the Strategic Environmental Assessment (SEA). **4 pilot projects** were implemented in typical environmental contexts of the Plain: a protected natural area, an urban area, the drainage channels and a winery farm;
- **monitoring phase** related to the maintenance of the facilities and the monitoring of the produced environmental results;

Furthermore, an effective dissemination and awareness raising activity was carried out through the use of web tools, participation in local, national and international events, educational and information campaigns, workshops and the establishment of an infopoint for farms. The involved subjects were students, institutions, farmers, experts of the sector and citizens.

PROJECT RESULTS

The project promoted a participatory planning process that took shape in the **Integrated Environmental Restoration Program of the Pontine Plain**, accompanied by awareness raising and dissemination activities. The achieved environmental benefits are due to the implementation of the 4 pilot projects. On the basis of the performed simulations and monitoring activities it is expected that the facilities will lead to a significant improvement in the quality of the treated water, increasing the presence of refuge areas for local fauna and biodiversity. Although a definitive calculation is not yet possible, it is noted that **in 29% of the monitored stations the water quality has significantly improved** and that there has been an **increase in birdlife, 15% in terms of population and 26% in terms of species**. As specified in the final report of the project, although it is linked to the regional and local management logics, the REWETLAND initiative can be replicated in those Italian and European territories in which the achievement of water quality objectives is complicated due to the presence of widespread discharges related to agricultural activities and/or human settlements.

Among the project results the following ones are to be mentioned:

- [Report on the environmental status of the Pontine Plain](#) reporting environmental information and planned actions in the territory of the Pontine Plain in order to define the objectives and methods for the implementation of the pilot projects and the Environmental Rehabilitation Program.
- 3 studies implemented to verify the feasibility of the treatment facilities envisaged in the areas identified by tracing the environmental reference frame, the objectives to be pursued, the technical aspects, the necessary economic resources and the possible critical issues in the implementation phase: [Pilot Project N°1 feasibility study: Province of Latina, Circeo National Park](#);
[Pilot Project N°2 feasibility study: Municipality of Latina](#);
[Pilot Project N°3 feasibility study: Pontine Plain Reclamation Consortium](#).
- the [Environmental Restoration Program of the Pontine Plain \(ERP\)](#) **approved by the Provincial Council unanimously and subject to Strategic Environmental Assessment**. The ERP represents a broad and shared programming tool for the promotion of phytoremediation systems on the territory interested by the local planning. The Program consists of several elements, among which the **Action Plan** which includes the operating strategies, the thematic Guidelines ([Guidelines for interventions on the drainage channels](#); [Guidelines for interventions in coastal protected areas](#); [Guidelines for interventions in the urban area](#)) and the **Project Fiches**, which illustrate operationally the various types of interventions;
- setting-up of the [Pontine Plains Reclamation Consortium's Geodatabase](#) for comparing and sharing data and geographical information of different entities, through the use of an open-source GIS (Geographic Information System) software;
- **extension, through environmental analysis and studies, of the knowledge base** on the Pontine Plain's territorial system with reference to the landscape, environmental and socio-economic aspects. In particular, the natural environment of the Fogliano lake and the network of drainage channels were analyzed;
- **implementation** of 4 pilot projects. The first, **Filter-Ecosystem**, resulted in the construction of two phytodepuration facilities in the Circeo National Park. The purpose of these interventions, in addition to the experimentation of the purifying capacity of particular plant mixes, was to enhance the local biodiversity with the creation of wetlands that reproduce marsh ecosystems. In addition, an educational walkway was created to encourage visits to the naturalized sites and the observation of the rich avifauna, of both migratory and non-migratory birds. The **Linear Park of Marina di Latina** consists, instead, in a facility designed to integrate the phytodepuration function with the recreational aspect, adopting systems, techniques and materials aimed at minimizing the environmental impact. The result is a peri-urban park with pedestrian and cycle paths in dirt road and green areas with native trees and shrubs. Another pilot intervention concerned the realization and study of the effectiveness of **buffer strips along the drainage channels**. These are linear plant formations designed to absorb the pollutants contained in the surface runoff of the farms, especially where the use of fertilizers and plant protection products is strong. The facility also served to promote, among the farmers, the improvement of rural landscape and biodiversity through the creation of belts of trees and ecological corridors. The fourth pilot project, **Best**



practices in the “Casale del Giglio” farm was aimed at promoting the virtuous experiences of water management in a farm by enhancing the "environmental multifunctionality" typical of this sector;

- **interactive tools** for an active participation of citizens and various stakeholders. This includes a [Webgis](#) which makes geo-spatial data, such as municipal boundaries, land registry, hydrographic basin, hydrographic network, lakes, *land cover* (land use) maps and *land use* (protected areas, SCI, SPAs, landscape heritage assets, general regulatory plans), available on a 1: 10.000 cartographic basis. Another instrument is the [Geoblog](#), an interactive communication tool that allows site visitors to post comments, photos, georeferenced videos to areas of their interest highlighting environmental criticalities, unsustainable uses of resources, strengths, potential of the territories, accompanied by proposals for requalification and environmental development; and a [Virtual Photo-video Tour](#) that illustrates through a suggestive air route the not easily accessible places of the Circeo National Park. Finally, a [Forum](#) was created for debates on the implemented actions.
- **final publication "REWETLAND – A vast area program to redevelop the Pontine Plain's surface water with phytodepuration techniques"**. The text offers a broad description of the state of the environment in the Pontine Plain and illustrates the objectives and results achieved within the project.
- several **environmental education initiatives** were carried out involving 84 classes and **1689 students** in 41 lectures, and 29 classes and **529 students** in 10 guided tours. The activities made it possible to raise children's and young people's awareness on environmental issues with particular reference to the sustainable management of water resources.
- **infopoint for farms** at the Pontine Plain's Reclamation Consortium with the aim of providing an information service for farmers and employees of the sector. At the end of the project the office will continue its work within the AFTER LIFE activities, receiving once a week.
- creation of a network of representatives of institutions involved in similar projects, with the aim to exchange experiences and good practices.



The project has been awarded the title **Best of the Best LIFE Environment**.



Acronym



REWETLAND

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LIFE08 ENV/IT/000406

Reference Programme
[LIFE](#)

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1.450.566,00

Call Year
2008

Start Year
2010

End Year
2014

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Region
Lazio

Description

Province of Latina