

# Decentralized treatment wetlands for sustainable water management in rural and remote areas of semi-arid regions.

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**Type  
de Projet**

Interational

Traitement des  
eaux usées

**Domaine  
de Recherche**

**Appel  
d'offre**

PRIMA (ERANETHMED)

Climate, Environment,  
Sustainability, Ecology,  
Nature Conservation,

**Mots  
Clés**

## Résumé

2020 >>> 2022

Availability of water of good quality and with relatively low cost is one of the most important factors affecting the development of a modern society. However, the wastewater [WW] produced may result to significant environmental issues, if not efficiently managed. A typical example are rural and remote areas in the south Mediterranean countries, where the inefficient or completely absent sanitation results in the contamination of the already scarce water resources and creates insecurity in water and food supply. The overexploitation of the remaining freshwater resources and in general the unsustainable water uses practices worsen further the situation. Lack of access to enough safe water, food and basic sanitation can be also regarded as additional reasons that enhance migration to large urban areas.

The main purpose of the project is to provide a sustainable solution for polluted streams management in rural and remote areas under arid and semi-arid climatic conditions by using decentralised constructed wetlands [CWs]. CWs are special systems designed to utilize natural processes within the ecosystem vegetation-soil microorganisms to achieve treatment. Minimum energy input, relatively low construction and operational costs, easiness of operation and maintenance and good performance are among the advantages of CWs.

Despite the advantages, the adaption of CWs in developing countries is unfortunately still slow, mainly due to lack of awareness and local expertise.

The target countries are Egypt, Tunisia and Morocco, where remote, rural areas face water scarcity and the issues of inadequate water and WW management. Very important aspect of the project is the choice of the vegetation which will be used in the CWs. Domestic species will be used in each region, as a more sustainable solution. Further exploitation of the plants will be investigated, for additional socio-economic impact on the societies.

In the project, 8 institutions from 4 countries will cooperate with their specific expertise, covering all different disciplines required for the project, i.e. water resources management, WW treatment [with focus on CWs], agricultural expertise, plant ecology, biology, environmental pollution, analytical and local expertise.

In the initial stage of the project, the experimental conditions and the analytical/sampling protocols will be determined. After the construction of the facilities and the initial test runs, the main experimental part will start. Different CWs conditions will be tested. The evaluation of the treatment performance will be mainly based on the removal efficiencies of selected pollutants, but also on other parameters, such as carbon sequestration potential. An economical and feasibility study will be conducted, adapted also in full-scale for investigation in a future project. During the whole project duration, workshops and continuous communication between the partners will ensure technology transfer, good cooperation, and smooth realization of the project.

Open to the public workshops will increase public awareness about CWs. It is the intention of the consortium to support spreading of those systems, also with the help of specific stakeholders, which are also potential beneficiaries of the project results. Participation in conferences and publications in scientific journals will enhance the results dissemination.

The project is expected to provide a complete sustainable solution for remote, rural areas in arid and semiarid regions, which could secure enough safe water for agriculture and protect the natural water resources from overexploitation and contamination. Life quality could generally be improved, also by creating new job opportunities and thus preventing urbanization. Further socio-economic benefits are expected. The purpose is to apply the most successful concept in full scale in a later/following project. Therefore, this project is essential for the further development of the idea of the consortium.

## Partenaires

University of Technology Berlin Campus El Gouna, Department Water Engineering [TUBCEGWE] [Germany], Zagazig University and Desert Research Center, DRC [Egypt], Institut Supérieur Agronomique de Chatt-Meriem, Université de Sousse et Institut National de Recherche et d'Analyse Physico-chimique, INRAP [Tunisia], Faculty of Science [LS3MN2E], Mohammed V University in Rabat, INRA et IAV [Morocco], Redal – VEOLIA.