DEWESUSWAMA

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

Coordinator: Dr. Nikolaos Tzoupanos
Contact: nikolaos.tzoupanos@tu-berlin.de

Technische Universität Berlin, Campus El Gouna, Dep. Water Engineering (public)

Zagazig University, Soil and Water Science Dep., Faculty of Agriculture (public),
Desert Research Center, Ministry of Agriculture and Land Reclamation, Egypt (public)

University of Sousse, Institut Supérieur Agronomique de Chatt-Meriem (public),
Institut National de Recherche et d'Analyse Physico-chimique (public)

Mohammed V University, Faculté des sciences de Rabat-CERNE2D (public),
Agronomic and veterinary Institute Hassan II, Agronomy Department (public),
Institut Nationale de Recherche Agricole (public)

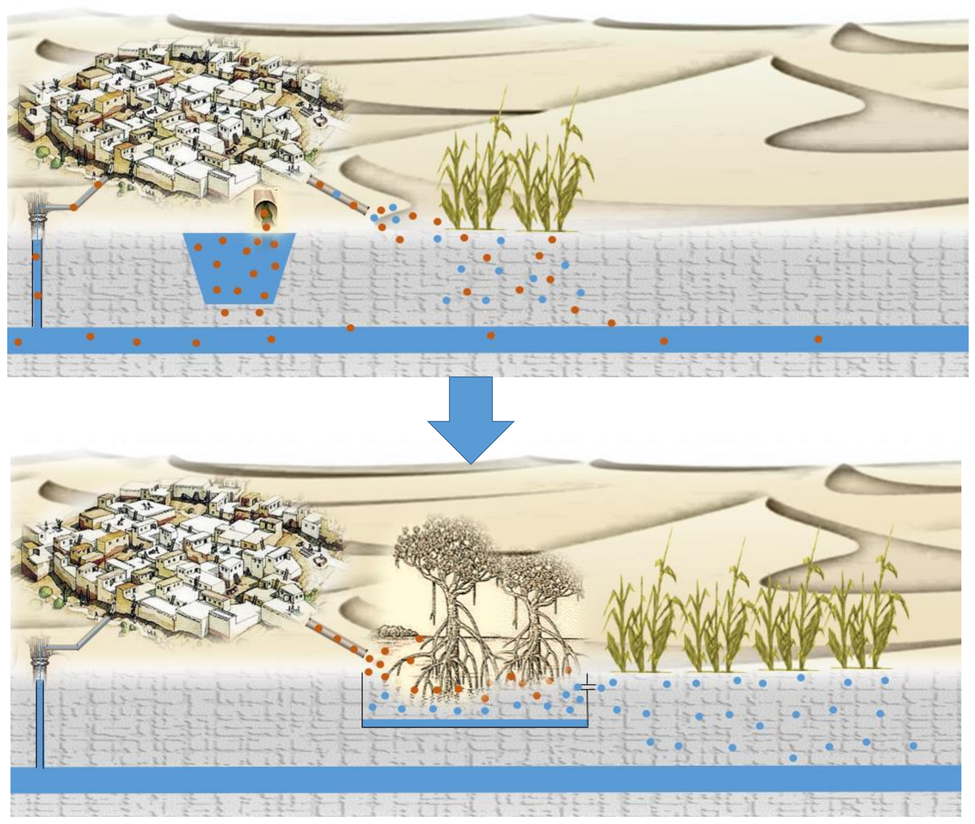
▶ OBJECTIVES / MOTIVATION

A common issue in rural and remote areas in the south Mediterranean countries is the inefficient or completely absent sanitation, resulting in the contamination of the already scarce water resources and in insecurity in water and food supply.

The main objective 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 utilizing decentralized natural-based treatment systems with domestic vegetation.

In the frame of the project, 8 institutions from 4 countries will cooperate. It is intended to increase the public awareness about treatment wetlands through intensive dissemination actions. The purpose is to apply the most successful concept in full scale in a later/following project.

The experiments will be conducted in Egypt, Tunisia and Morocco in laboratory scale and outdoors, to investigate the direct effect of climate. Efforts will be taken to use partially as bed material manmade aggregates and/or industrial by-products. Periodically inlet and outlet samples will be analyzed regarding major physic-chemical parameters and disinfection efficiency. Soil, plant tissue and root samples will be also analyzed to understand the removal mechanisms and to assess the C sequestration potential. The small scale experiments will allow flexibility in case of necessary modifications. Further exploitation of the vegetation will be investigated for additional socio-economic impact on the societies. Data evaluation and definition of the most efficient configuration for each region will be the final step of the project.



▶ Approach and Methodology

Relevant literature data for the specific regions and vegetation are relatively scarce. The specific design, operational conditions, samples to be treated and sampling and analysis protocols have to be initially defined. All materials for the construction will be purchased locally, to ensure sustainability.

The domestic vegetation was chosen based on: conservation of the regional ecosystems, resistance against extreme environmental conditions, remediation abilities and potential further socioeconomic exploitation.

▶ Expected Results and Outcome

- Securing enough safe water for irrigation for food production – improvement of agricultural practices.
- Protection of natural water resources from overexploitation (water reuse) and anthropogenic contamination.
- Improving life quality in remote areas and offering new jobs in the field of sanitation; supporting the local socio-economic growth; preventing urbanization.
- Additional economic benefits: production of agricultural and industrial raw materials for forage, personal care products, etc.
- Contribution to climate change mitigation through C sequestration and minimum energy demands.
- Turning arid areas into green areas - potential solution to desertification – improved productive and sustainable land management (SLM) practices.
- Improved soil properties.
- Increasing public, local/regional decision makers and other potential stakeholder awareness about natural treatment systems.
- Filling important gaps in the existing relevant literature.
- Extendable concept to various agricultural sectors, polluted streams (e.g. domestic wastewater, agricultural drain water, polluted surface waters) and similar regions.
- Base for future application in full scale.

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