Partnership

Applicant

Water and Sewage Municipal Enterprise of Kavala, Greece

ENPI Partner 1

Democritus University of Thrace, Greece

ENPI Partner 2

American University of Armenia, Armenia

ENPI Partner 3

Ilia State University, Georgia

ENPI Partner 4

Eco-TIRAS International Association of River Keepers, Moldova

ENPI Partner 5

Danube Delta National Institute for Research and Development, Romania

ENPI Partner 6

Odessa Regional State Administration, Ukraine

IPA FLB

Kocaeli Water and Sewerage Administration, Turkey

IPA Partner 1

Yalova University, Turkey

WASTEnet

www.waste-net.info

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Common borders. Common solutions.

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Black Sea CROSS BORDER COOPERATION

A Black Sea network promoting integrated natural WAStewater Treatment systEms – WASTEnet

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CROSS BORDER COOPERATION

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WASTEnet is a network joint action, which aims at motivating the widest possible audience of local and regional authorities of the participating Black Sea countries (Romania, Georgia, Moldova, Armenia, Ukraine, Turkey and Greece) to develop and apply Natural Treatment Systems (NTS), and in particular Constructed Wetlands (CWs), for the wastewater treatment of their remote rural communities.

THE PROBLEM

Wastewater treatment is becoming a more and more relevant problem due to the population rise and the stricter legislation regarding the environment. In large cities, technological progress allowed the realization of advanced wastewater treatment (WWT) systems, which respond reliably to the very strict legislation imposed by the EU (e.g., the Council Directive 91/271/EEC and the Water Framework Directive 2000/60). However, small, isolated or peri-urban communities cannot afford the ***construction***, ***operation*** and ***maintenance costs*** of conventional WWT plants.

THE SOLUTION

The development of very simple and cost-effective NTS, especially in small communities, (e.g., rural and mountainous communities, airports, hospitals, schools and universities) provides an ***effective*** and ***reliable***, but also ***simple*** and ***inexpensive solution***. The main advantages of NTS and CWs are the following:

- use of renewable energy sources in operation,
- absence of mechanical parts,
- reduced costs in construction, operation and maintenance,
- aesthetic improvement of the landscape,
- development of wildlife habitat,
- recreational and educational opportunities, and
- reuse of effluent for irrigation.

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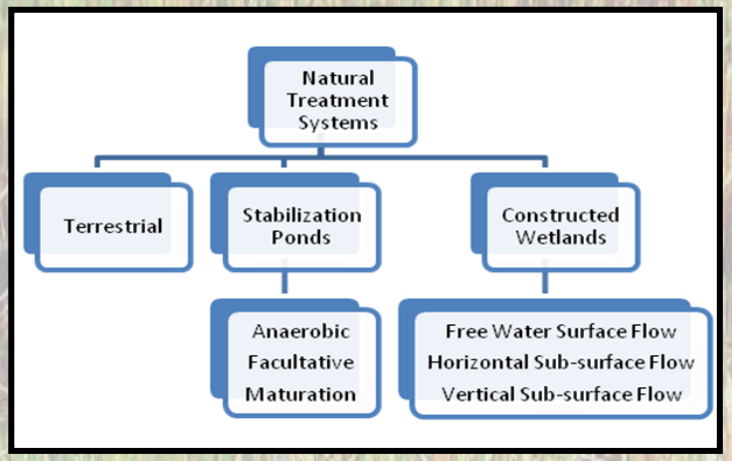
NTS CLASSIFICATION



CONSTRUCTED WETLANDS

CWs are man-made systems designed to simulate the function of natural wetlands in pollutant removal. To achieve wastewater treatment, a series of physical, chemical and biological processes take place in CWs, based on water, soil, atmosphere and micro-organism interactions. Wetland plants play a vital role in the removal and retention of organic matter, nutrients, heavy metals and various toxic substances. The Common Reed (*Phragmites australis*) and the Cattail (*Typha latifolia, T. angustifolia*) are good examples of marsh species that can effectively uptake pollutants, which are effectively used in CWs.

USES

CWs can be used for the treatment of:

- Municipal wastewater,
- Industrial wastewater,
- Urban runoff,
- Livestock wastes,
- Agricultural runoff,
- Acid mine leachates,
- Wastewater from septic tanks,
- Sludge.

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