



MACROPHYTES - New Floating Macrophyte Green Filters (FMF) For the Mediterranean Region

LIFE02 ENV/E/000182

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Project description:

Background

The quality of surface water in Spain is currently far from satisfactory. An analysis by 533 surface water testing stations of biochemical demand in oxygen indicated water pollution in 11% of the cases. In 42% of the cases there was heavy water pollution. In the Segura river basin, there is little treatment of residual waters. Of 207 residual water treatment stations listed, only 87 operate correctly, two have been abandoned, 59 are inoperable and the remaining 59 do not operate satisfactorily. The small municipal budgets for stations limit the quality of water treatment. Another limiting factor is the low population and settlement density, which prevents the establishment of residual water treatment networks. Additionally, there are a large number of pig farms in the municipality of Lorca. A satisfactory solution has not yet been found for treating solid and liquid manure. Given the fact that there is no experience of systems of extensive treatment of this kind, the project offers an innovative method to treat residual urban water in other rural areas of the EU.

Objectives

The project aimed to demonstrate the effectiveness of an innovative system for the treatment of residual waters using floating macrophyte plants (FMPs). Macrophytes, which in their natural state are usually rooted, are made to float. Their filtration power, tested in a preliminary phase, proved to be higher than that of green filters which use rooted or floating plants in their natural state. The project also aimed to promote the new system in those Mediterranean regions where plants are not dormant in the winter. This system is especially suited for tourist areas, which are sometimes far from urban centres and where the

population increases in the summer, a period when the filters are at the height of their activity. A further aim was to promote this new system of filtration in small communities and in various sectors such as livestock farming and industry as well as in urban areas. It is not subject to an economy of scale and costs little to implement and maintain.

Results

The construction of seven pilot prototypes demonstrated that the filtering systems are technically and economically viable under different waste conditions. The filters were successful when using waste water from towns with 150 to 1,000 inhabitants. Due to their size and location, such residential or business centres are unlikely to have access to conventional waste water treatment facilities at a similar cost. Water was sampled and analysed on a regular basis. In the case of urban waste waters, the system was able to eliminate approximately 90% of their organic biodegradable contamination (based on the reduction of BOD5). The system was less efficient at purifying total nitrogen and phosphorus content, and the reduction values were between 30% and 50%. In the case of purifying organic animal waste from pig farms, laboratory testing indicated that after raw waste pre-treatment by physical-chemical precipitation with lime and iron chloride, solids in suspension can be reduced by 70-80%, BOD by 50-60%, COD by 37-58%, and phosphorus by 67-73%. This project indicates that floating macrophyte filter systems are a viable alternative if there is prior treatment. This is especially so given the lack of low-cost and efficient purifying systems for organic animal waste and the fact organic animal waste is often tipped and causes serious aquifer pollution by nitrates. The system proposed by the project, which is easy to apply in areas that are not highly developed, enables wastewater to be purified with good results. The only requirement is to have enough area - the equivalent of 2m² per inhabitant. In contrast, the project will not generate a large number of jobs. One operator alone can manage several filters. Occasionally several operators may be necessary in order to repair or to change the material of the plant.

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Environmental issues addressed:

Themes

Water - Waste water treatment

Keywords

urban wastewater, waste water treatment, residual waste

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	AYUNTAMIENTO DE LORCA (MURCIA)
Type of organisation	Local authority
Description	The municipality of Lorca is situated in south-west of the Spanish region of Murcia. It has a population of 75,000 according to the 2001 census. The municipality also has a coastline in the south-east.
Partners	Fundación 2001 Global Nature Universidad Politécnica de Madrid-Departamento Producción Vegetal

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Administrative data:

Project reference	LIFE02 ENV/E/000182
Duration	01-OCT-2002 to 30-SEP -2005
Total budget	1,013,008.00 €
EU contribution	499,367.00 €
Project location	Murcia(España)

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Read more:

Project web site	Website of the project
Publication: Layman report	Title: Layman report Year: 2005 No of pages: 10
Video feature	Title: DVD "Filtros verdes con macrofitas en flotación"

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