

EUROPEAN COMMUNITY

COUNTRY:ITALY

ENVIRONMENT LIFE 2002 - TRELAGHI PROJECT

“EUTROPHIC REDUCTION THROUGH NATURAL TECHNICS OF THREE LITTLE ITALIAN LAKES’ WATERS”

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Mr. Chairman, ladies and gentlemen

Candia Lake Natural Park (Torino, Italy), Mountain community Val Cavallina (Bergamo, Italy) and Mountain community n. 2 “Su Sassu-Anglona-Gallura” (Sassari, Italy) have the common problem of water eutrophication in their three lakes (Candia lake, Endine lake and Coghinas lake). The three organizations have taken the opportunity of finding common planning solutions, from the experience exchange viewpoint.

The project has a cost of 2.616,250 euro and the European Union gives a contribution equal to 40 % of the total amount.

The project, intends to demonstrate the innovative natural technology in depuration techniques based on the synergic use of mycorrhizas (that are ground fungi growing on the plants roots, they help the plant to absorb nutrient substances and gain their nutrients from the plant without any damage), PGP bacteria (Plant Growth Promoting they are bacteria that can modify some organic substances in the soil to create some elements that can be used by the plants), zeolites (that are minerals classified as tectosilicates; with a structure, characterized by cavities occupied by big ions and water molecules, both endowed with great mobility) and BSF wastes (Blast Furnace Slag are sub-products of the iron and steel industry). So we can obtain a substantial reduction of the eutrophic substances (Nitrogen and Phosphorus) into the lakes waters and in all those wet areas compromised by great eutrophic problems.

The three lakes biological situation shows many common aspects: in fact the eutrophication that has taken place during these last decades in the three lakes waters and in the Candia marsh, due to an excessive amount of nutrients coming from the drainpipes and the agricultural techniques, have caused a progressive impoverishment of the present biotypes, leading to a loss or a reduction of some life forms of the lake ecosystem trophic chain.

The reduction of the fertilizing (Carbonium) and eutrophic (Nitrogen and Phosphorus) elements from the dumps coming from civil and agricultural settlements is performed with natural methods known as “Filter ecosystems”, composed by innovative multistage depuration plants with the rizospheric system, that provide the

addition of bacteria and mycorrhizas to the plant roots. The medium is composed by zeolitic rocks and siderurgic waste.

The targets of reduction of the eutrophic elements are reached through three different activities:

The first are specific activities: filter ecosystems that are interposed between the dumping pipes and the lakes or complete the existent depuration plants refining their effluents.

The filter ecosystems, thanks to physical and chemical properties of the chabasitic zeolites (that are a kind of zeolite able to exchange ions of ammonium in a not so selective way, so they don't cause problems with the normal root adsorption of nutrients. Especially if protected by bacteriums and mycorrhizas), are able to adsorb the polluting elements inside the water and release them to the plants that are over, that have the bacteria and the mycorrhizas in common with the zeolites of the rhizosphere.

The reduction of the Nitrogen and other eutrophic elements is compared to the amount of the same elements without the operation, that is in percentage: 70% for the Nitrogen; 50% for the Phosphorus

The second are spread areas activities: the aim of reducing the eutrophic elements is pursued through some low fertilization impact agricultural methods, with the strengthening of the roots apparatus instead of chemical fertilizations.

The third are areas activities: The aim of reducing the eutrophication of the Candia Lake waters is pursued through the marsh revitalization with the restoration of the natural processes of plants natural extraction power of the nutrient elements by the typical processes of the wet areas.

Furthermore in this project is expected the water analysis, for the coming flows, into the various parts of the filter ecosystems and lakes.

The aim of the action is to achieve, at the end of the project, the three lakes environmental certification according to the european EMAS and international ISO 14000 standards, and the creation of environmental formative and educational courses.

Thanks to the filter ecosystems it will be possible to fight the surface pollution by low environmental impact systems, characterized by an operational efficiency and low running and maintenance costs. Since there is no need for electricity, chemical elements or artificial oxygen, the running costs are halved if compared with traditional systems. The maintenance costs are limited to a normal care, performed by a non skilled worker.

The enrichment of the ground with mycorrhize and bacteria has lower costs than traditional fertilization done with synthetic products, so, thanks to this project, also the agricultural production costs will be lowered a lot; moreover, the agricultural products has a higher quality, as confirmed by some preliminary tests. With the end of chemical manuring the aspects of nitrate washing will be cancelled in advantage of the fight against the lakes eutrophication. This will allow the development of a new kind of agricultural cultivation with a low environmental impact.

The validity on an international scale is reinforced by the fact that the three Italian lakes involved in these new techniques are part of different general and climatic situations. The project is a perfect test bed for the reproducibility in all climatic conditions and thanks to its simple managing it can be exported in the Developing Countries.

Thank you for your attention