



Albert Sorolla Edo

“ ... SOIL BIOENGINEERING TECHNIQUES ARE THE BEST MANAGEMENT PRACTICES OF CHOICE TO IMPROVE ENVIRONMENTAL QUALITY AND MAINTAIN HYDRAULIC PROTECTION. ”

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CONTINENTAL CLEAN WATER

Spanish canal project illustrates Europe's growing utilization of soil bioengineering techniques

In October 2000, the European Union Water Framework Directive (EUWFD) was adopted, expanding the scope of water protection to all continental water bodies. It set a clear objective that “good status” must be achieved in all European waters by 2015 to ensure sustainable water across the continent.

The Mediterranean climate features a dry summer, temperate winter and largely variable rainfall. Rainfall intensity and distribution throughout the year provide very specific characteristics to the region's rivers. Though one may find some large and plentiful rivers, most are simply “ramblas,” or avenues that contain water only a few days per year.

The low land near Mediterranean rivers used to coincide with intensely populated areas. This situation created some conflicts; for instance, hundreds of people have been killed during flooding. To mitigate negative effects, today's rivers utilize canalization, damming and nonnative plants such as *Arundo donax*, *Ailanthus altissima* and *Senecio inaequidens* to minimize natural width reduction.

In the last 10 years, and especially today with the reinforcement of the EUWFD, soil bioengineering techniques are the best management practices of choice to improve environmental quality and maintain hydraulic protection. These techniques have become typical solutions for concerns such as the following:

- Protecting river-situated infrastructure from water impact during floods;
- Soft canalization of rivers in urban areas where it is not possible to re-establish the original width;
- Increasing the natural capability of wetlands to improve water quality;
- Increasing habitat biodiversity by modeling the flux of water; and
- Controlling water flow in relation to sediment transport.

All of these techniques are being used in a demonstrative project in Sant Boi de Llobregat, Spain, where a landscape improvement of the Right Canal has been achieved. The sphere of activity involved about 420 m of canal. The vegetation growing within the canal was of poor quality, and the erosion of slopes had created significant problems.

The work, designed in 2001 and executed in 2003, is particularly interesting for its use of various bioengineering techniques (i.e., permanent reinforcement blankets, coir rolls, rock rolls and fascines). The project illustrates the potential for bioengineering techniques in Mediterranean climates and the use of native plants such as *Vitex agnus-castus* and *Iris pseudacorus* for erosion control. **[SWS]**

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