Trophic webs from discharges: nature enhancement through the Waterharmonica concept

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Wastewater treatment has improved surface water quality enormously during the last decades reducing the impact of discharges on the different water bodies. But the impact of the treated wastewater on the aquatic ecosystems is still noticeable, especially in places where dilution flows are low, such as in Mediterranean streams but also in small streams and canals in northern Europe.

In order to overcome this problem and to help comply with the European Water Framework Directive (EWFD), the Waterharmonica (www.waterharmonica.nl) concept has been developed in Netherlands and it is currently expanding throughout practitioners from all over Europe. This concept consists on reducing the discharges into water bodies by turning the pollutants into resources and using them to create biomass. The original idea came after the observation that the use of constructed wetlands for effluent polishing produced trophic webs similar to those in natural wetlands, something that gave an additional value to these constructed wetlands themselves and also to the natural habitats of the surroundings, including the discharge point.

The Waterharmonica concept is a very useful instrument to close the gap between tap and source, enabling water reuse programmes in a more natural framework and enhancing levels of biodiversity with re-naturalizing what once were effluents. It has also proved very useful in bringing people from different disciplines (engineering, ecology) together, and to understand each others? goals and needs for better overall solutions.

A new use of the Waterharmonica concept has recently come from experiences in Costa Brava, Spain, where water reuse and nutrient recycling have protected local water sources and helped restore macroinvertebrate abundance in coastal temporary streams. Some full-scale experiences and some possibilities for future research, such as removal or pathogenic micro-organisms and micropollutants, or assessment of their ecological quality will be described. These experiences are also met in the new Aqualân in Grou, in Fryslân, The Netherlands