Upgrading surface waters at river basin scale - IT

1. Policy Objective & Theme

- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards

2. Key Approaches

- Participation
- Knowledge-based
- Technical

3. Experiences that can be exchanged

The case can be of use to those authorities with the responsibility to manage river basins, sewer systems or treatment plants in other areas of Italy and the Mediterranean region as a whole.

4. Overview of the case

Surface waters in Italy are often very polluted due to unrestrained waste discharge from urban and industrial water and agriculture. This situation is worsened by inordinate water usage. Coastal waters are ecologically damaged as a result. This case shows the development of a modelling system which can help decision-makers and planners to determine the activities needed to upgrade the quality of surface water bodies.

5. Context and Objectives

a) Context

Economic growth over the last few decades in Italy has led to over-exploitation and pollution of water resources. Despite the increasing movement towards sustainability, there is still much water currently wasted due to distribution network leakage that often exceeds 50% of the water supplied. Intensive agriculture can also have devastating effects in terms of groundwater over-abstraction and diffuse pollution of aquifers and surface waters. Water quality in rivers is degraded due to pollution loads in the form of uncontrolled combined sewer overflows, industrial spills and poorly treated sewage effluent. The application of inadequate low water tariffs does not give consumers incentives to save water. The 'polluter pays' principle is still not applied on a wide scale.

Three pilot river basins in central southern Italy, viz. the river Foglia (Marche region, central Italy), the river Salso Imera in Sicily and the river Rio Mannu in northwest Sardinia were chosen for the work. All three of these rivers have problems related to loss of water volume. This can be due to: lack of rainfall; uneven seasonal water-flow due to damming; a lack of groundwater; and/or abstraction for drinking water and irrigation.

b) Objectives

The initiative aimed to demonstrate a methodology to implement water management at river basin level involving relevant stakeholders in three Italian pilot river catchments. This would provide the economic and technical viability of the methodology in support of WFD. A further objective was widening the application of the innovative, integrated, numerical modelling methodology of Integrated Catchment Simulator to conditions in Central and Southern Italy as well as other European Mediterranean regions. It was also aimed to improve water stakeholder capacities by transferring innovative modelling and

monitoring technologies.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

S.P.S. srl, Società Progettazione e Servizi, is a company specialised in the development of technical, administrative, financial and research counselling services in the hydraulic and ecological engineering sector.

b) ICZM tools

Several different models were used for a number of issues like sewerage, waste water treatment and river systems. These were then connected into one GIS-based, integrated modelling environment called an Integrated Catch Simulator (ICS). Various simulations were made using data from such monitoring activities as rainfall using pluviometers, discharges using level and velocity ultrasonic sensors, and quality with water quality automatic sensors which analysed parameters of organic pollution such as chemical oxygen demand and total nitrogen. This new methodology allowed an appraisal of the interactive processes between rivers and pollution sources in order to assess discharge impacts on the water bodies in the three pilot areas which would allow a proposition for works which would upgrade the quality of these water bodies.

The initiative implemented and tested an integrated methodology involving field investigation, monitoring, advanced hydraulic modelling as well as end user training. The demonstration focused on a specific case study, the assessment of technical-economic feasibility and environmental value for money of an engineering solution - storage tanks - to reduce heavily polluted ‘first flush’ discharges into rivers. The results achieved appear promising and the methodology’s potential should be wide enough to be adapted to a variety of environmental scenarios.

The results included: - stakeholder agreement on joint action to improve water quality in pilot river basins in compliance with the WFD; - quantification of urban pollution loads into the pilot rivers and definition of measures to lower impacts on the water quality and quantity; - adaptation and validation of the ICS in the pilot basins and promotion of ICS use by new end-users and other river basins in Italy and Europe; - establishing monitoring and modelling systems at pilot sites; - provision of guidelines to enhance water management at pilot river districts taking into account specific socio-economic and environmental conditions.

7. Cost and resources

The total budget was €1,200,569 of which there was a Life contribution of €530,145.

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

The methodology allowed an analysis of the various problems of the river basins and, most importantly, proposals of upgrading actions which would increase, with the best cost-effective options, the environmental improvement of the receiving water bodies.

9. Success and Fail factors

The software packages used are standard i.e. for sewer, waste water treatment and river systems and the ones used had already been developed by the Danish Hydraulic Institute. Similarly, monitoring techniques were already well-established and implemented. The pilots brought together the various stakeholders involved in environmental management and protection i.e. the water services and control authorities and allowed them to harmonise and agree any interventions needed.

10. Unforeseen outcomes

The methodology can be used to forecast other water events like overflows in receiving waters, city floods, poor water quality discharges; to anticipate their impacts and thus allow implementation of appropriate measures to prevent social and

environmental damage.

11. Prepared by

A H Pickaver, Coastal & Marine Union (EUCC)

12. Verified by

It has not been possible to verify this case.

13. Sources

- Water Management At River Basin Scale (2006) Layman’s report. Società Progettazione e Servizi

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