

## Rational Allocation of Resources in Water Infrastructure Development Projects

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**Abstract :** Within any European and world model of management of the integrated water service (in Italy only since 2012 is regulated by a national Authority, that is ARERA), a significant part is covered by the development of assets in terms of hydraulic networks and wastewater collection networks, including all their relative building works. The process of selecting the investments to be made starts from the preventive analysis of critical issues (water losses, unserved areas, low service standards, etc.) who occur in the managed territory of the Operator. Through the Program of Interventions (Provision by ARERA n. 580/2019/R/ldr), the Operator provides to program the projects that can meet the emerged needs to determine the improvement of the water service levels. This phase (analyzed and solved by the author with a work published in 2019) involves the use of evaluation techniques (cost-benefit analysis, multi-criteria, and multi-objective techniques, neural networks, etc.) useful in selecting the most appropriate design answers to the different criticalities. However, at this point, the problem of establishing the time priorities between the various works deemed necessary remains open. That is, it is necessary to hierarchize the investments. In this decision-making moment, the interests of the private Operator are often opposed, which favors investments capable of generating high profitability, compared to those of the public controller (ARERA), which favors investments in greater social impact. In support of the concertation between these two actors, the protocol set out in the research has been developed, based on the AHP and capable of borrowing from the programmatic documents an orientation path for the settlement of the conflict. The protocol is applied to a case study of the Campania Region in Italy and has been professionally applied in the shared decision process between the manager and the local Authority.

**Keywords :** analytic hierarchy process, decision making, economic evaluation of projects, integrated water service

**Conference Title :** ICSPSIWM 2020 : International Conference on Strategic Planning of Sustainable Urban Water Management

**Conference Location :** Athens, Greece

**Conference Dates :** October 22-23, 2020