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Summary

The Eastern area of Tucuman province was faced with significant problems of contaminated water. Extensive research was done, involving universities, and a project was carried out, applying the aspects of IWRM within the areas of technical solutions, institutional arrangements of future water supply operation. This case study highlights the importance of conducting research prior to a project to attain sufficient information.

Background

Tucumán province is the federal state with the smallest area (22.524 km^2) and the highest demographic density of Argentina. It is located in the Northern part of Argentina and has an extreme annual precipitation pattern, vegetation and topographic irregularities caused by the unequal spatial water resource distribution. The entire province has a seasonal rainfall regime of four rainy months (December, January, February and March) in which almost the 80 % of the annual precipitation is produced. The Eastern area of the province has scarce surface water resources. The groundwater resources are relatively important, but they present limitations for their use due to their high salts content, arsenic included. This area, from the social and economic point of view, presents lower indicators than the province average, being the region’s departments (Administrative divisions) the most deserted and with a population with unsatisfied basic needs.

Specifically, small rural communities and areas of scattered population rely on self-supply drinking water systems with shallow individual wells. Some communities have collective drinking water supply infrastructure in place. The main detected problems are the water uptake through shallow, vulnerable and polluted profiles (up to 30 m) and the existence of variable flows with the presence of incompatible elements, both organic and inorganic (arsenic), for drinking water and without the adequate treatment for its use.

Actions taken

The provincial government invited the National University of Tucumán to develop a feasibility study and technical projects for a community of 25,000 inhabitants. The Provincial Executing Committee (Unidad Ejecutora Provincial) was established to oversee the project.The University involved lecturers, researchers and students to develop this complex project. In these teams, students, researchers and professors of different levels worked together allowing not only the extension tasks made by the professionals, but also the practice, the knowledge acquisition and their application to real life problems by the advanced students of the different careers. The consultancy had to perform a study on water supply and demand in the settlement areas of the affected population. A feasibility study also included construction details, technical specifications, budget, financial resources and implementation schedules for the selected alternatives.

It was essential that IWRM aspects were employed: the interdisciplinary approach given to the study, analysing the water resource available, its demand and the evaluation of the best economic and technical alternatives.

The project team conducted a complex study including technical solutions, institutional arrangements of future water supply operation. Both ground and surface water resources were assessed to be used for drinking water purposes. The technical and financial justification favoured the ground water sources.This commission worked together with the University team presenting policies guidelines, offering pre-existing information, flattening the communication with the local authorities and making the tasks execution possible to achieve the appointed goal.

Outcomes

The outcomes of the project contain also non-structural proposals targeting to endow sustainability to the solutions (creation of Cooperatives to manage the services) involving the services users in their management. In this case, two aspects which are normally not faced together but contrary are prioritised.

On one hand, the necessary studies to achieve the basic water resources knowledge in order to have reliable, systematic and normalised information within the hydrological water cycle as well as the water quality and quantity corresponding time-space distributions, for their utilisation as a baseline for future studies.

On the other hand, the execution of specific projects to give solution to the health problems together with the future sustainability of water services through the Civil Organised Society participation.

Lessons Learned

In this case different essential IWRM aspects were employed, from the interdisciplinary approach, analysing the water resource available, its demand and the evaluation of the best economic and technical alternatives to give solution to an eminently social problems linked to the quality life

The study concluded with concrete structural proposals (civil work schedules) in a suitable format to receive funding. It also contains non-structural proposals targeting to endow sustainability to the solutions

In the final work, sanitation actions to avoid negative environmental impacts due to the installation of

drinking water systems without contemplation of the treatment and disposal of its effluents are proposed.

A weakness of this study is the lack of exhaustive consideration of other water uses in the area (especially irrigation), but its analysis was beyond the objectives and economic availability to perform the works.
