1. INTRODUCTION

The objective of this work is to propose a methodology for the identification of water resources in mountain basins, being able to apply it to small isolated rural villages. This methodology was derived from the need to develop specific and proper water systems for isolated rural areas, where water demand is met by surface water resources. The need to develop water systems in isolated rural areas is due to the increasing demand for water, which is necessary to guarantee the availability of clean water for human consumption, agriculture, and industrial needs. The methodology involves the development of a preliminary project of a work of water collection from the sub-basin of San Isidro river basin, which is located in the northwestern area of Argentina. This methodology is intended to cover a wide field between conventional hydraulic and hydrological engineering and those small rural villages, where concrete solutions must be provided.

2. OBJECTIVES

The development of a methodology for the selection of hydraulic and hydrological criteria is the object of this study, since it is necessary for the project of hydraulic structures able to solve or help to satisfy the water demand in isolated rural villages. The methodology, which involves some water resources balance models and hydrological methods, is intended to cover a wide field between conventional hydraulic and hydrological engineering and those small rural villages, where concrete solutions must be provided.

3. WORK METHODOLOGY

3.1. Conceptual aspects

Small rural villages are mainly characterized by the absence of good roads, the lack of some basic services, low salinity, and the scarcity of available water sources. From the conceptual point of view, the simulation of hydrological and hydraulic behavior is necessary for the design of hydraulic structures. These simulations must consider the characteristics of the terrain and the hydrological behavior of the sub-basin, considering the available water sources and the flow discharge that is necessary to ensure the availability of clean water for human consumption.

4. APPLICATION OF THE METHODOLOGY TO SAN ISIDRO RIVER BASIN, SALTA, ARGENTINA

San Isidro river basin covers an area of approximately 946 km², with the headwaters of Tánin and San Lucas creeks, which flow into the river, having a confluence. The basin is made up of river, which is a tributary of Bermejo river, as exposed in Figure 5. The river develops from 2,760 m at the head and until 2,024 m at its mouth. In order to develop the project, the flow discharge and some hydrological parameters were determined taking into account the available information and hydrological models for the study of balance at the scale of the river basin. These guidelines were applied for San Isidro river basin. Water resource balance was analyzed in a section of the river located downstream of San Isidro.

5. CONCLUSIONS

The methodology proposed was applied for San Isidro river basin. Water resource balance was analyzed in a section of the river located downstream of San Isidro. Minimum flow discharge was estimated from two measurements, with values of 150 and 180 l/s. Minimum runoff was determined by considering different methods. These guidelines were applied for San Isidro river basin, having a confluence of 2,760 m at the head and until 2,024 m at its mouth. In order to develop the project, the flow discharge and some hydrological parameters were determined taking into account the available information and hydrological models for the study of balance at the scale of the river basin. These guidelines were applied for San Isidro river basin. Water resource balance was analyzed in a section of the river located downstream of San Isidro.

6. REFERENCES

Economía.