

Linares Trunk Canal Project, 1988

Summary:

This study formulated and assessed – at the overview level – the irrigation project entitled “Canal Tronco Linares” (CTL). The operation of the Colbún and Machicura hydro plants, which generate and distribute electricity to the Central Interconnected Grid (SIC), at times limited the amount of water available to the CTL. The interdependence of the CTL project and the hydropower sector was evident in the fact that water for irrigation was required in summer, the period during which the hydro plants with reservoirs tended to store water for power generation in winter, when the price for power was higher.

The project incorporated technical limitations on energy generation, such that the quantity of water flowing into the canal and its distribution in irrigated zones were determined by an assessment that sought to maximize the net benefit of water available for power generation and irrigation. The most significant contribution was the inclusion of a risk analysis that took into account hydrology as a random variable.

Thus, for each year of the time horizon, one of the 34 hydrologies available was chosen at random, and each of these was associated with an “updated agricultural surplus.” In this way, the study obtained a probability distribution and the corresponding “expected value” of the net benefits for that surplus. In the study, 1,000 hydrological sequences were simulated for a 30-year time horizon.

The results of the study led to the conclusion that the implementation of the irrigation project would be privately and socially profitable, even after compensating Colbún S.A.

for the loss of income due to the “de-optimization” of its power plants to meet irrigation demands. The CTL would allow the redirection of part of the flow of the Melado Canal, which is today used by growers in the project’s zone of influence, to be used for generation in the Pehuenche, Colbún, and Machicura hydro plants and then redirected to its current users via the CTL. In this case, the power companies would obtain additional benefits, which would be a matter of negotiation between the Melado water users, the power companies, and the owners of the CTL.