

Simulation of a Sustainable Irrigation System Development: The Case of Sitio Kantaling Village Farm Lands, Danao City, Cebu, Philippines

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Abstract : Sitio Kantaling is one of the 34 villages in Danao City, Cebu, in the central Philippines. As of 2015, the eight households in the mountainous village extending over 40 hectares of land area, including 12 hectares of arable land, are the source of over a fifth of the agricultural products that go into the city. Over the years, however, the local government had been concerned with the decline in agricultural productivity because increasing number of residents are migrating into the urban areas of the region to look for better employment opportunities. One of the major reasons for the agricultural productivity decline is underdeveloped irrigation infrastructure. The local government had partnered with the University of San Carlos to conduct research on developing an irrigation system that could sustainably meet both agricultural and household consumption needs. From a macro-perspective, a dynamic simulation model was developed to understand the long-term behavior of the status quo and proposed the system. Data on population, water supply and demand, household income, and urban migration were incorporated in the 20-year horizon model. The study also developed a smart irrigation system design. Instead of using electricity to pump water, a network of aqueducts with three main nodes had been designed and strategically located to take advantage of gravity to transport water from a spring. Simulation results showed that implementing a sustainable irrigation system would be able to significantly contribute to the socio-economic progress of the local community.

Keywords : agriculture, aqueduct, simulation, sustainable irrigation system

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