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Water access and its implications on farm production: Evidence from Hakwatuna irrigation system in Kurunegala District, Sri Lanka

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Water scarcity has become a global challenge due to adverse changes in the climatic conditions along with the anthropogenic impacts on traditional irrigation systems. As a result, the farmers' livelihoods are highly affected as they are mainly dependent upon traditional irrigation systems for their cultivation. The case of Hakwatuna Oya irrigation system in Kurunegala District, Sri Lanka is not an exception from this scenario. As one of the major traditional irrigation networks Hakwatuna Oya irrigation system serves more than 2500 farm families in the Northwestern region of Sri Lanka, and the expected demand for water from this irrigation system is enormously high, especially during the dry season. However, this system has been facing a huge challenge to satisfy the water needs of the local farmers due to erratic rainfall patterns, increasing encroachments in the tank command, poor maintenance of irrigation networks, and ineffective water management decisions. This study explores the relationship between water access from the tank and farm productivity using the primary data collected from 155 farmers who are the direct users of irrigation water supplied from Hakwatuna irrigation tank. Distance from Hakwatuna tank to the farmer's field was used as the proxy for water access. Farm productivity measures included paddy yield, sales revenue, farm income, net income, and water conflicts among the farmers in the tank command area. Multiple linear regression and logistic regression models were employed to examine the relationship between water access and farm outcomes. The results show that the distance from the water source has a significant negative association with farm outcomes such as paddy yield *($p<0.01$)*, sales revenue *($p<0.1$)*, and income *($p<0.1$)*. However, there is a positive relationship between the distance from the water source and water conflicts *($p<0.01$)*. The results clearly indicate that there is a significant negative relationship exists between the distance from the tank and farm productivity, and a significant positive relationship exists between the distance from the tank and water conflicts, suggesting the need of increasing water access to support the livelihoods of the local farmers.

Keywords: Distance from water source; Farm productivity; Hakwatuna Oya irrigation system; Kurunegala District; Multiple linear regression; Water access

Underlined is the presenting author.