

## **Relationship between Water Access, Exogenous Prices, and Poverty of Farm Households in a Surface-Gravity Irrigation System: The Case Study of the *Kirindi Oya* Irrigation and Settlement Project**

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Irrigation is vital as a common pool resource in increasing agricultural production. Farmers mostly use surface irrigation as their method of irrigation. *Kirindi Oya* Irrigation and Settlement Project (KOISP) is a major surface gravity irrigation system in the Hambantota District where priority is given to rice cultivation. Currently, its farmers leave paddy farming due to their low income. This study first analyses inequality in the water received by farmers and its relationship with household income and then the effect of exogenous prices and water access on farmers' poverty status. The theoretical basis is the model of profit-maximising farm households. Using published data on the KOISP, descriptive statistics, farm budget techniques, FGT indices and binary logistic regression were used for the analysis. Findings indicate substantial differences in water quantity received by the farmers across seasons and subareas of the system ( $P<0.05$ ). Around 60% of farmers show poor water access in Maha and Yala seasons in the New Irrigation Area (NIA). The average water quantity received in the Old Irrigated Area (OIA) was 17% higher than the NIA. The changes in household income were simulated by allocating additional water to fulfil the minimum requirement of the rice plant in its vegetative stage. Household income increases with every unit of additional water received ( $P<0.05$ ). The result of the binary logistic regression indicates that the water access ( $P<0.05$ ), exogenous prices; agrochemicals ( $P<0.05$ ); machinery ( $P<0.05$ ), seeds ( $P<0.05$ ) and rice ( $P<0.05$ ) significantly influence the probability that a household will be poor or non-poor. Additional water allocation caused an apparent reduction in the poverty status of farmers in NIA. Changes to exogenous prices caused a distinct reduction in poverty in both seasons of the current period (2020/21), which was more prominent in Maha. However, the number of poor households was higher in OIA than in NIA.

**Keywords:** Farm budgets, Farm household income, FGT indices, Rice farming, Water access inequality

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