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## Effects of improved pond aquaculture techniques on household well-being: A case study from rural Bangladesh

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### Abstract

Homestead pond aquaculture is considered sustainable in terms of fish availability and choice. Fish, in particular indigenous small fish (ISF), are known to improve food security and provide a source of income, and the poor can purchase small quantities of fish to supplement their diets. However, it is not clear to what extent households benefit from polyculture systems including ISF. One way to promote ISF production is via Improved Pond Management Techniques (IPMTs). This paper sheds light on the adoption of IPMTs in homestead ponds, their costs and returns and their effects on household well-being. Household well-being refers to- 1. income calculated as the net return from homestead pond in USD per hectare; 2. consumption of fish measured in gram per capita per day; and 3. household poverty includes the percentage of households living below 1.90 USD per capita per day.. It uses data obtained from a two round panel survey of 234 households from three sub-districts in Barishal district, situated in Barishal division of Bangladesh in 2014 and 2022. Results reveal that cost and gross return increase in 2022 compared to 2014. The two-stage least-squares logit regressions with instrumental variables show that there is a significant and positive effect of IPMT adoption on household well-being. This is especially true for adopting IPMTs such as sunlight exposure, pre-stock liming, supplementary feeding and fertiliser application together as a package on per capita daily fish consumption and household poverty defined by household living under 1.90 USD per day. However, the net return from homestead pond production does not seem to be significantly correlated with IPMT adoption.

**Keywords:** Control function approach, homestead pond aquaculture, instrumental variable, two-stage least squares logit regressions, well-being