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Linkage Between Drinking Water Supply and Irrigation under Multi-Use Water System in Rural Ethiopia

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Abstract

In rural Ethiopia, irrigated agriculture has complex interaction with drinking water supply and sanitation services. Separate sources for drinking water and agriculture uses do not exist in several areas. Due to limited availability of safe drinking water, majority of rural population relies on unimproved water sources, including rivers, irrigation water from canals and dams, ponds, streams, and unprotected springs which are easily polluted by human and animal feces. Irrigation water might serve as an option to increase the availability of water for domestic uses and saving water collection time and energy. Drinking water quality and quantity can easily become affected through agricultural practices and poor quality of irrigation water for domestic purposes may be harmful for health due to the present of disease-causing pathogens. Hence this linkage is often overlooked and understudied. Considering the limited studies on the linkage between domestic water and agriculture, this study shed some light on the agriculture-water nexus using state-of-the-art econometric methods. For this study, a household survey has been conducted in rural area of Fogera and Mecha districts of Ethiopia from February to June 2014. More than 454 agricultural households were randomly selected using a stratified multi-stage cluster sampling technique. Drinking water sample quality testing has been conducted and anthropometric measurements such as height and weight were also collected for children under-five years of age.

Child and nutritional and health status is measured by z-scores and the prevalence of diarrhea in the preceding two weeks before the survey, respectively. The self-reported prevalence of diarrhea for children of under five years is 16 %. The prevalence of underweight and stunting based on the anthropometric measurement results for under five children is 27 and 40 % respectively. Although there is no systematic variation in the prevalence of diarrhea between irrigating and non-irrigating households, malaria incidence is much higher in households living in irrigating villages as compared to households living in non-irrigating village. Controlling for socio-economic variables, the estimation results show that household water quality, per capita water consumption, basic latrine, hygiene score and distance to irrigation water sources are highly associated with child diarrhea and nutrition outcome.

Keywords: Agriculture, health and nutrition, rural Ethiopia, water quality