Technical Efficiency among Smallholder Irrigators: Trends from Zimbabwe

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Abstract

Smallholder irrigation productivity has been a topical issue among researchers and policy makers in developing countries. The level of productivity has raised questions on whether smallholder irrigation is the most suitable model for agricultural development. The study was conducted at HamaMavhaire and Ngondoma irrigation schemes in the Midlands Province of Zimbabwe. The aim of the study was to assess the level of technical efficiency and agricultural productivity in smallholder irrigated agriculture. The study used primary data collected from a randomly selected sample of 127 respondents. The sample comprised of 76 farmers from Ngondoma irrigation scheme and 51 farmers from HamaMavhaire irrigation scheme. The stochastic frontier production function was used to analyze the productivity and technical efficiency of the irrigation schemes. The study's findings show that the average technical efficiency for Ngondoma irrigation scheme was 69%. This implies that there is a potential of increasing agricultural productivity by 31% using the existing irrigation technology. The findings also show that for the efficiency model, the statistically significant variables are; manure ($P<0.01$), farm size and irrigation water ($P<0.05$). The results for HamaMavhaire irrigation scheme show an average technical efficiency of 65%. This implies that there is a potential to increase agricultural productivity by 35% using the existing technology. The use of pesticides was statistically significant ($P<0.01$). The inefficiency model suggested that the statistically significant variables influencing agricultural productivity are years of schooling ($P<0.01$) and agricultural extension ($P<0.05$). The study concluded that there were potential gains to be realized by the farmers if technical efficiency of the smallholder irrigation schemes were to be improved.