ABSTRACT

Smallholder agriculture dominates Kenya's agricultural landscape, accounting for 75 % of total agricultural output and 70 % of the marketed agricultural produce. As a result, the Government of Kenya, with the support of development partners, has invested in production and dissemination of productivity-enhancing technologies such as high-yielding varieties and inorganic fertilizers targeting the smallholders. Adoption of these technologies has remarkably improved, especially in the maize sub-sector. However, productivity has been declining or, at best, stagnating. Productivity is attributable to not only technological improvements but also technical efficiency. Consequently, this study sought to determine the technical efficiency of the country's smallholder food crop farmers and establish how it correlates with environmental factors. The study used a two-stage nonparametric approach on household panel data to estimate the efficiency levels of the smallholders and establish the sources of its variation across households. Controlling for endogeneity and incorporating geographic information system-derived measures of environmental factors in the analysis, the study finds that technical efficiency differentials are influenced by environmental factors, production risks and farmer characteristics. The policy implication is that the country has room to improve agricultural productivity by addressing environmental and farm-level constraints. Viable options include switching from rain-fed to irrigated agriculture, entrenching land tenure security, improving transport network among farm communities and setting up smallholder credit schemes