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## Impacts of Fuel Efficient Improved Cooking Stove on Biomass Collection and Consumption in Rural Ethiopia

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### Abstract

Access to modern energy is critical for achieving almost all the Millennium Development Goals. Lack of proper access to modern cooking energy sources leaves the use of improved cook stoves (ICS) indispensable option particularly in rural areas of Africa South of the Sahara (SSA). This is because it can substantially improve cooking efficiency and plays positive role in improving the socioeconomic conditions of rural households. However, research to estimate the empirical impact of ICS on biomass consumption, labour use for collection and health is scanty. This paper attempts to uncover the rate and determinants of rural households' adoption of fuel efficient cooking stove and its impact on wood biomass collection and consumption based on two rounds of data collected in four districts of Ethiopia. We used a diff-in-diff approach to estimate the empirical impact of ICS. The findings showed that wood constituted the major source of fuel for cooking with disproportionate burden on women for its collection. Within the two surveys the uptake of ICS increased by more than two folds. The adoption of ICS has reduced the amount of biomass consumption for fuel and the time required for collecting fire woods. Such benefit is believed to contribute to climate change mitigation and livelihood improvement endeavours of the country. But the impact on household level health remained insignificant. We find different set of determinants for early (households adopted in 2012) and late (households adopted in 2104) adopters. Early adoption was influenced by better education of the spouse, higher household income, lower adult size, and higher family size. But late adoption was influenced by female headship, better spouse education, and spouse primarily engaged on domestic care. The study also showed many households who adopted the ICS have perceived positive attributes of ICSs that indicate the potential for sustained use of the stoves. Based on these findings we draw important policy implication on strategies to scale-up and capitalize the impact of improved stove.

**Keywords:** Adoption determinant, household energy, impact evaluation, propensity score matching