

Abstract

Rural electrification can, potentially, enhance the welfare of households if the scarcity of inefficient fuels and/or a rise in income facilitates inter-fuel substitution towards electricity use. This research aimed to analyse the rural energy use patterns and gauge the welfare impact of rural electrification on households. Descriptive techniques and non-parametric statistics were used to evaluate the inter-fuel substitution to more efficient fuels. Further, regression analysis was used to gain insights into the factors that influence the level of electricity consumption. The analysis shows that firewood is the main energy source in the study area. Further, inter-fuel substitution is hampered by unfavourable electricity tariffs and costly electric appliances for cooking. Although connected households enjoy social benefits attributed to electricity use, its consumption in the study area is low, and the range of electricity-dependent activities is narrow. The findings suggest that there is a need, in the short run, to sustain current efforts to increase wood fuel supply and its end-use efficiency as part of the solution to the rural energy crisis. For electricity to be the major source of energy, the Kenya Power Company should work out a tariff structure that encourages its adoption and consumption. In addition, the Kenyan government should initiate appropriate tax exemptions and subsidies towards wood-fuel-saving devices and relevant electric cooking appliances. Moreover, rural electrification should be treated as an infrastructural project, requiring modification of Rural Electrification Program expansion so that connections are made in those rural areas where the expected electricity demand level and growth appear promising. However, the government should heavily subsidize community standalone solar photovoltaic systems projects to ensure that economically vulnerable communities access electricity service.