

## Abstract

Biomass energy provides 68% of Kenya's national energy requirements and it is expected to remain the main source of energy for the foreseeable future (Mugo, F. and Gathui, T. (2010). The traditional stoves which happen to be very popular with most households wastes a lot of fuel due to its low energy efficiency and this leads to negative environmental impacts such as deforestation and pollution. This study focused on understanding the sustainable utilization of woodfuel in two (2) Sub-locations of Mwala Sub-county namely: Mwala and Kibauni. The primary objective of this study was to determine if woodfuel utilization by the households in the study areas is sustainable. The specific objective of the study was to establish the level of adoption of the energy saving techniques in the selected sub-locations. This study used survey methodology and observation to collect data. The total household sample size was 160. Data collection instrument was questionnaires. Data was analyzed using descriptive statistics and inferential statistics and the software was Statistical Package for Social Sciences (SPSS) version 23.0. The study revealed low adoption of rationing of wood with majority of the respondents 84% in Kibauni and 65% in Mwala not practicing it. There was significant relationship between rationing of woodfuel and the number of days taken to consume a bundle of wood ( $df=1$  and  $158$ ,  $F=462.898$ ,  $p=0.00$  ). The study also revealed low adoption of splitting of wood with 70% of respondents in Mwala and 88% in Kibauni not doing the splitting. There was significant relationship between splitting of wood and pollution challenges (  $df=1$  and  $158$ ,  $F=28.456$ ,  $p=0.00$  ). Low adoption of the practice of putting off fire after use was also revealed with 66% of respondents in Mwala and 80% in Kibauni not practicing it. The study revealed a significant relationship between putting off fire after use and the number of days taken to consume one bundle of wood ( $df=3$  and  $156$ ,  $F=57.292$ ,  $p=0.00$ ). It was also found out that there was no significant relationship between the type of stove and pollution challenges ( $df=1$  and  $158$ ,  $F=0.072$ ,  $p=0.789$ ). The study recommended that aggressive campaign in dissemination of improved stoves and related technology in order to reduce pressure on forests, the Government to have a structured management in production of charcoal and fuel wood by small scale farmers so as to have a source of income, promote capacity of field extension staff in the energy sector and establish an Energy Centres in the Sub-county to help disseminate knowledge and materials related to energy conservation.