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Knowledge and Awareness Determinants of Renewable Energy Technologies: A Cross Sectional Study of Rural Residents from Njoro Constituency, Nakuru County, Kenya

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Abstract
Background:*Awareness to renewable energy technologies (RET) can have multiple positive effects as it can be a precursor to greater RET adoption levels as well as promotion of the same. The aim of this study was to assess the level of awareness of rural residents of Njoro constituency to the different renewable energy technologiesas a precursor to their adoption.*
Materials and Methods: *The study was based on primary data collected through personal interviews with household heads in Njoro constituency, Nakuru County, Kenya. Two stage cluster random sampling was used to select the 200 households. The results showed that majority of the respondents exhibited a moderate level of knowledge and awareness to RETs.*
Results:*Results of the study indicated that gender and education level had a significant effect on knowledge and awareness. It was also found that age and social-economic status did not have significant effect on the knowledge and awareness.*
Conclusion:*The overall finding of the study underlined the high importance in strengthening communication to enhance knowledge and awareness of renewable energy technologies. The findings of this study will be significant to planners, policy makers, researchers and individuals to build the case for proactive promotion of RETS.*
Key Word:*Knowledge and awareness; renewable energy technologies; rural households*

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I. Introduction

Energy is central to sustainable development and poverty reduction efforts. It affects all aspects of development - social, economic, and environmental - including livelihoods, access to water, agricultural productivity, health, population levels, education, and gender-related issues [1]. The push for higher economic growth combined with an ever-increasing population has increased the global demand for energy. Where there is lack of electricity and affordable energy resources, economic and environmental constraints occur which manifest in the form of reduced investments, slow economic growth and massive deforestation [2].

In East Africa, Kenya has been on the forefront in investing in large-scale renewable energy projects, with several large and medium scale electricity generation projects having been commissioned in the past two decades. In 2016 Kenya opened the world's largest geothermal plant at the Olkaria Geothermal field and in 2017 the country completed building the Lake Turkana Wind Power Project, touted as Africa's biggest wind energy farm to generate a fifth of her power. This has been attributed to a change in a number of policies, key being the Energy Act 2006, which allows private individuals to sell off their excess supply of energy to Kenya Power Company (KPC) and the Feed-in Tariff policy (2008, revised 2010) that legitimized private renewable energy power generation.

All commendable progress, but on the flipside, Kenya is faced with many challenges that can be tied to access to energy. About 5,000 hectares of the Mau, a closed indigenous forest ecosystem, are lost each year due to the demand for fuel wood and charcoal leading to serious deforestation and land degradation [3]. This is paradoxical despite the fact that the tropics are blessed with strong winds, sunny skies, plant residues, heat from the earth and fast-moving water, each of which can provide a vast and constantly replenished energy resource supply. These diverse sources of renewable energy have the technical potential to provide alternative energy and electricity to cater for all peoples' needs especially rural communities. The utilization of renewable energy technologies (RETs) directly contributes to the economic, social and environmental pillars of sustainable development [4]. The Kenya government through the Ministry of Energy and Petroleum, Department of