

## Rural household fuel energy switching in Giwa Lga Kaduna State, Nigeria

Baiyegunhi Lloyd James<sup>1\*</sup> and Hassan Mohammad Bello<sup>1</sup>

<sup>1</sup> Discipline of Agricultural Economics, School of Agricultural, Earth and Environmental Sciences, University of KwaZulu-Natal, Scottsville 3201, Pietermaritzburg, South Africa.

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Access to clean, sustainable, modern, affordable and reliable energy services is an enormous challenge facing the African continent, particularly Nigeria. Energy plays a vital role in a nation's economic growth, progress and development. However, rural households in northern Nigeria in particular, are almost entirely dependent on fuelwood for their basic energy needs. This has adverse effects on their health, productivity and the environment. Also, there is a dearth of empirical research on the process of fuel switching in rural Nigeria to give a clear picture of the present conditions and well-grounded outlook for the future. This study used a cross-sectional dataset collected from a survey of 240 rural households in Giwa Local Government Area of Kaduna State, Nigeria to analyse the effect of households' socio-economic characteristics on choice of cooking fuel. A multinomial logit (MNL) model was used to estimate the determinants of fuel choice. The result generated from the data analysis suggests that majority of the households depend largely on fuelwood as its principal cooking fuel. Furthermore, the patterns of fuel usage are consistent with the 'energy stacking' theory as fuelwood are often used alongside modern fuels, and thus, modern fuels have failed to displace traditional fuelwood. Empirical results of MNL model revealed that household head's age, educational level, household size, income, type of dwelling unit, the duration of food cooked and fuelwood price are statistically significant factors influencing households' choice of cooking fuel. Given that fuelwood is a major source of air pollution and to poor health outcomes in rural households in Nigeria, further transition to modern clean fuels such as kerosene, natural gas and electricity is important. Implications for regional and national energy policies are discussed.

Keywords: Rural households, fuel energy, fuel switching, fuel stacking, MNL model, Nigeria.