



Development of LPG and Household Woodfuel Consumption: Case Study of two Rural Areas in Gezira State, Sudan

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Introduction

Sudan depends mainly on the forestry sector to supply its energy need. However, Woodfuel (WF) is one of the main causes of deforestation. The new petroleum discoveries in the end of this century and Liquefied Petroleum Gas (LPG) availability allowed following new policy to alleviate the pressure on forest. Trying to understand the effect of this new energy development, this study was designed to investigate the level and patterns of WF consumption, WF share in energy budget and household WF dependency as well as main determinant of household energy demand (i.e family size, household head education level, household income, and alternative fuels (firewood and LPG) expenditure).

Methods

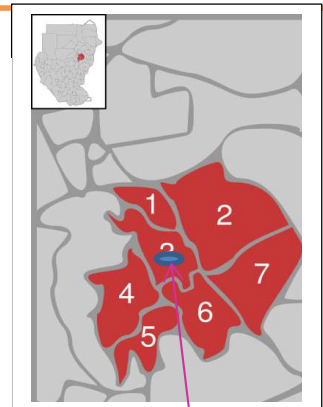
The socioeconomic data were collected using structured questionnaire (in 2007) in which the level of household WF consumption before and after these energy developments was investigated (73 and 121 household samples were selected from Fadasi and Alshikayrat, respectively). Random sampling technique was used because of the homogeneity of the households' socioeconomic characteristics within each study area. The data from field survey were classified, coded and entered into a computer using "SPSS". Descriptive statistics, t-test for mean comparison and regression analysis as well as elasticity's of demand analysis were applied.

Conclusion and policy recommendation

The study support the presumption that LPG price reduction policy and charcoal price policy, have succeeded in reducing WF consumption but in the long run other policy option might be necessary specifically under the expected increase in price of LPG in future. However, due to its positive effect on deforestation, the LPG price reduction policy in association with policies that increase the cost of obtaining WF were recommended especially in areas with easy access to forest resource.

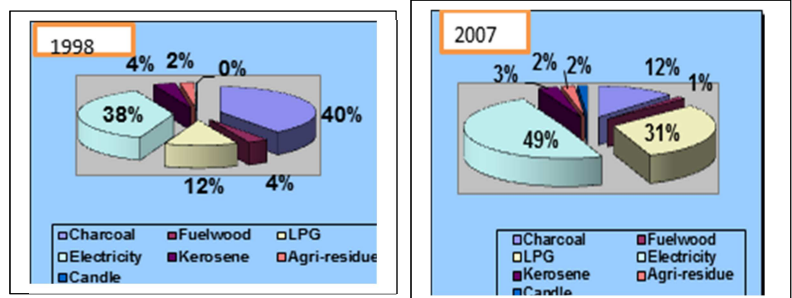
Study Area

The study was carried out in Fadasi Alhalimab (semi-urban area) and Alshikayrat rural area in Gezira State, Central Sudan. The areas were selected to represent different settings and typical semi-urban and rural areas with different access to woodfueland LPG resource. Additionally, Gezira State, reported to be one of the most highly woodfuel consumption region in Northern Sudan (FAO, 1994).



Location of the

Study Results



Share of different fuels in household financial energy Expenditure 1998-2007

The study results revealed significant reduction in share of WF in household energy expenditure within the two periods associated with increase in LPG expenditure. In addition, the level of household WF consumption significantly decreased (Charcoal from 374.50 kg in 1998 to 133.65 kg per household in 2007 or 64.3% and fuelwood consumption is decreased from 133.65 kg to 38.70 kg per Hh or reduction of 71%). Moreover, WF dependency decreased in the two areas (in 1998 about 78.9 % of Hh in the study area actually depend on WF as a main cooking fuel and only 5.2% in 2007) compared with the national reported level for rural areas (93.6%). The analysis of demand elasticity indicated that WF is (inelastic for its own price and) while high cross-and demand elasticity LPG indicated thatLPG is (substitute to WF and very sensitive to change in price) which indicate that any increase in price of LPG will lead to shifting effect to WF especially to areas with near access to forest. The result of the regression analysis of factors affecting Hh WF suggested that among the variables tested only family size and expenditure in LPG have respectively positive and negative significant influence in charcoal consumption.