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Analysis of Biogas Innovations in Smallholder Farms in Kenya

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Abstract

Wood fuel in Kenya constitutes 90 % of energy consumption in the rural areas with the demand growing at 3.6 % per annum. The use of such fuel has significantly contributed to deforestation through felling of trees. Forest cover in Kenya is now about 4 % of the total land area compared to the world requirement of 20 %. The energy poor in Africa spend about $17b a year on fuel for lighting like kerosene which can be considerably reduced by replacing such fuels with biogas. Biogas is the most effective way of converting on-farm biological waste into fuel. Its use translates to increased incomes through reduction in energy costs, environmental conservation, and reduced labour demand on women, who often spend many hours searching for firewood. Biogas technology has been in Kenya since 1950's but is restricted to the highly productive areas of Kiambu, Nakuru and Kisii.

Our objective therefore was to study the factors influencing adoption of biogas technology in Kisii and Nyamira districts where land subdivision due to increasing populations has diminished forest cover thus limiting biomass fuel sources availabe to the people. Using multi-stage and random sampling, a total of 100 farms were selected for analysis. The study employed the double-hurdle model to analyse choice, rate and intensity of adoption. The main factor influencing adoption of biogas technology was the level of income. High cost of biogas installation was an impediment to the adoption by the poor and less endowed farmers tended to use plastic bag digesters as opposed to fixed dome and floating drum digesters which are more expensive but efficient. The other factor was the level of social capital, since farmers belonging to certain social groups tended to own biogas plants. Availability of technical support as well as donor subsidies also influenced adoption. Over 150 biogas plants have been installed by smallholder farmers in Kisii and Nyamira with help from GTZ. It was concluded that biogas promotion, development of appropriate technologies for different socio-economic groups, and forms of incentives or subsidies would enhance adoption especially in densely populated regions experiencing severe fuel wood shortage.

Keywords: Adoption, biogas, biogas technologies, digesters, income

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