EXAMINING THE ECONOMIC POTENTIAL OF TREE PLANTING FOR SUSTAINABLE WOOD ENERGY PRODUCTION AND CONSUMPTION IN DEVELOPING COUNTRIES: THE CASE OF TANZANIA

Yusuph John Kulindwa

PhD (Economics) , University of Dar es Salaam (2017)

Abstract

Despite the fact that Indigenous forests are deacresing and demand for wood energy is increasing in developing countries, tree-planting activities are not expanding significantly, particularly in Tanzania. In this paper, we analyze the factors that influence households' tree planting behaviors and the number of trees planted. It should be noted, however, that while forests provide a primary source of energy for 94% (9,276,997) of Tanzanian households, forest cover is declining at an annual rate of 1.16% (403,000 ha), with a recovery rate of only 0.32% (109,000 ha). The Tanzanian government has introduced a tree-planting campaign focused on energy production to help alleviate pressure on natural forests. To explore this issue, we examine households' perceptions of tree planting for wood energy and identify the key factors that shape these perceptions. Morogoro and Coast regions in the east of Tanzania are selected as case studies and data are gathered from 202 households in 11 villages in these regions, where tree planting programmes have been or are still active. With increasingly improved cookstoves(ICS) technology that targets to reduce wood-energy consumption of forest dependent households, the need for more evidence of households' driving forces to adopt ICS increase as-well. A discrete choice experiment (DCE was used in offering ICS for sale to households in the study areas. Our aim of this section is to explore drivers of ICS' adoption other than income and socio-economic attributes on households' adoption of ICS. A Heckman model is undertaken to analyse the factors that drive tree planting behaviour. Results indicate that the households get wood-energy from forest reserves (57%) and own planted trees (9.1%). Empirical findings suggest that households' land sizes, households' awareness of tree planting programmes, tree planting for wood-energy, and the age of a household's head have and positive significant effect on households' tree planting behaviour and its extent. The analysis builds on the analytical framework that integrates the household's perception attributes into an economic policy instrument model. Results of the multinomial logit model (MNL) and Heckman models revealed that the rights/freedom to harvest trees from farms,

household awareness of tree-planting programmes and households' perceptions of tree planting for energy and trade are the factors that matters most for promotion of tree planting for energy. Lastly, using data from a representative sample (N=271) in DCE, we estimate a mixed logit model to take into account limitations of the standard multinomial logit model and relaxed the restrictive assumption of the conditional logit model. . We also find interesting results that households distributed with just one type of ICS design were liquidity constrained and adopted less ICS (30%). On the other hand, households supplied with more than one type of ICS options, largely adopted ICS (48%). In addition, ICS design that uses both charcoal and firewood was highly purchased (80%) by households which raised the total uptake of ICS up to 48 %.

Keywords: tree planting for wood energy, households' perceptions of tree planting, wood-energy, consumption, forest dependent households.