

This study used cross sectional data from a 1998 survey of 227 small-scale farm households in Upper and Lower Highland agricultural zones in Divisions of Nakuru District to estimate the effects inadequate rural road infrastructure and high market access costs on the smallholder farm production patterns, costs, demand and intensity of use of agricultural production factors. The study sites included Upper and Lower Highland (UH and LH) Agro-ecological Zones (AEZ) in Njoro, Molo, Elburgon and Keringet Divisions. Save for heterogeneity in road (ranging from almost impassable to passable throughout the year by motorable transport) the productions conditions should theoretically be homogeneous.

An access cost variable was constructed by combining transport cost and the value of travel time to market outlet. This variable was used as a proxy for existing and extant road and transport infrastructure. Bivariate correlation analyses were used to profile crop production patterns in the area as a prelude to econometric analyses. A translog cost function was specified to determine the production costs, demand for and intensity of use of factors of production.

The study showed that high value crops were produced in areas with low market access costs with relatively higher level of chemical fertilizer use. From the analyses, it was established that although fertilizer and labour were complimentary in crop production, labour substituted for land implying that intensified fertilizer use would lead to not only an improvement in land productivity, but also to increased labour use in agriculture. Reduced market accessibility, as indicated by high market access costs, lead to increased manure use intensity. Farmers stood to benefit from reduced market access costs through production cost savings - a reduction of access costs by 10 percent translated to an average cost savings of between Ksh. 2,000 in pure maize stand and Ksh 4,000 in wheat.

The average total production costs were Ksh 68,000 and the production cost elasticity with respect to market access cost variable was 0.2. This meant that a reduction by 10 percent of market access costs, would translate to a cost saving of Ksh. 1,360 per acre. This is significant considering the current poverty status of farm households in the rural areas. A simultaneous estimation of cost and input share equation reveals rational responses to high market costs. In particular, although fertilizer and labour are complimentary in crop production, labour was a substitute for land. High access costs for fertilizer led to intensification of manure use. This suggests that once the effects of cropping patterns, farm-to-market transport costs, and labour availability are taken into account smallholder resource use is economically rational. Therefore the policy challenge is to identify and introduce institutional innovations that reduce transaction costs, increase financial liquidity, increase social capital, and reduce risk.