Data Envelopment Analysis of Allocative Efficiency among Small-Scale Tuber Crop Farmers in North-Central, Nigeria

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Abstract : The empirical study examined the allocative efficiency of small holder tuber crop farmers in North central, Nigeria. Data used for the study were obtained from primary source using a multi-stage sampling technique with structured questionnaires administered to 300 randomly selected tuber crop farmers from the study area. Descriptive statistics, data envelopment analysis and Tobit regression model were used to analyze the data. The DEA result on the classification of the farmers into efficient and inefficient farmers showed that 17.67% of the sampled tuber crop farmers in the study area were operating at frontier and optimum level of production with mean allocative efficiency of 1.00. This shows that 82.33% of the farmers in the study area can still improve on their level of efficiency through better utilization of available resources, given the current state of technology. The results of the Tobit model for factors influencing allocative inefficiency in the study area showed that as the year of farming experience, level of education, cooperative society membership, extension contacts, credit access and farm size increased in the study area, the allocative inefficiency of the farmers decreased. The results on effects of the significant determinants of allocative inefficiency at various distribution levels revealed that allocative efficiency increased from 22% to 34% as the farmer acquired more farming experience. The allocative efficiency index of farmers that belonged to cooperative society was 0.23 while their counterparts without cooperative society had index value of 0.21. The result also showed that allocative efficiency increased from 0.43 as farmer acquired high formal education and decreased to 0.16 with farmers with non-formal education. The efficiency level in the allocation of resources increased with more contact with extension services as the allocative efficeincy index increased from 0.16 to 0.31 with frequency of extension contact increasing from zero contact to maximum of twenty contacts per annum. These results confirm that increase in year of farming experience, level of education, cooperative society membership, extension contacts, credit access and farm size leads to increases efficiency. The results further show that the age of the farmers had 32% input to the efficiency but reduces to an average of 15%, as the farmer grows old. It is therefore recommended that enhanced research, extension delivery and farm advisory services should be put in place for farmers who did not attain optimum frontier level to learn how to attain the remaining 74.39% level of allocative efficiency through a better production practices from the robustly efficient farms. This will go a long way to increase the efficiency level of the farmers in the study area.
Keywords : allocative efficiency, DEA, Tobit regression, tuber crop
Conference Title : ICAES 2016 : International Conference on Agriculture and Environmental Systems
Conference Location : Miami, United States
Conference Dates : March 24-25, 2016