Profitability analysis of small holder root and tuber crop production among root and tuber expansion programme farmers in Plateau state, Nigeria

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ABSTRACT

This study estimated the profitability of RTEP small holder root and tuber crop farmers in Plateau State, north central Nigeria. A multi-stage random sampling method was used to select 160 root and tuber crop farmers who were interviewed for the study using close and open ended questionnaire. Information on the inputs used and output realized in the root and tuber production were collected and subjected to various analyses using the net farm income equation. Root and tuber crops in Plateau state was profitable with a net farm income of RTEP and non-RTEP participants was N128,469.60/Ha and N91,462.30/Ha respectively while the return per Naira (N) invested for RTEP and non-RTEP participants was N1.62k and N95k respectively. Suitable increase in farm size was recommended in the study area to further widen the profit margin.

Key words: Profitability, Root and Tuber crops.
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INTRODUCTION

Root crops are plants that develop starchy roots, tubers, stems, bulbs or corms that act as food stores for the plant. The common root and tuber crops in the sub- Saharan Africa include Cassava, Yam, Sweet potato, Irish potato and Cocoyam [1].Root crops are among the most important staple foods in Tropical Africa. They play a vital role in the region's food security because they are tolerant of environment stresses and give reasonable yields under marginal soil condition [1]. Hahn further added that the importance of root crops is well reflected by the large area they occupy and the increase in land devoted to their cultivation year after year. Also, the role root and tuber play in the diet of Africans is in their contributions to calories. This claim was credited to [2] who emphasized the importance of root crops in terms of calorie supply even though smaller compared to the contribution of cereals: 5% against 48%. This makes root crops crucial for food security strategy pursued by most African Sub-Sahara region as indicated by [1];[3];[4]

In Africa, roughly 40% of all root and tuber crops are produced in Nigeria; followed by Congo DRC (10%), Ghana (8%); Tanzania (6%); Uganda (5%); Mozambique (3%); Angola (3%) [2].Many of the developing world's poorest producers and most undernourished households depend on Root and Tuber as a contributing, if not principal, source of food and nutrition (see, for example, Alexandratos1995, 100–102). In part, these farm households value R&T because R&T produce large quantities of dietary energy and have stable yields under conditions in which other crops may fail [5]. R&T produce remarkable quantities of energy per day, even in comparison to cereals. Potatoes lead the way in energy production, followed by yam. In addition, some Root and Tuber are an important source of vitamins, minerals, and essential amino acids such as lysine [6];[7];[8] In many parts of Sub-Saharan Africa (SSA), Root and Tuber are a major source of sustenance. They account for 20 percent of calories consumed in the region. In 31 African countries with annual cassava production of more than 10,000 MT each, annual per capita consumption averaged 140kilograms (kg) during the last four decades [9]. Consumption in production centers and among the rural poor in many parts of the region greatly exceeds this figure. Per capita consumption levels for cassava and the

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importance of Root and Tuber in the diet of many Africans, particularly less-well off consumers, have remained remarkably constant despite drought, famine, wars, political and economic instability, regional population growth rates that averaged nearly three percent per year during the last 30 years, and growing urbanization. In addition, cassava leaf is an important source of protein in many parts of West and Central Africa [7]

In the last two decades, yam and potato achieved the highest annual growth rates in production among Root & Tuber in developing countries: 8.0percent and 4.1 percent, respectively (Yam production grew from a small base and increased largely in one region (West Africa).

Cassava production grew at a more modest pace, 1.8 percent annually. Growth in sweet potato production was flat over the period, with an initial decline in production followed by a recovery to earlier levels. In developing countries, total production of Root & Tuber crops increased by 30 percent, from 344 million mt in 1983 to 449 million mt in 1996.Production increases varied substantially by commodity. The production increase was largest for yam in percentage terms. Output reached 32 million mt in 1996, a 170 percent increase over the 13-year period, albeit from low production levels. The crop contributed 19 percent to the total increase in Root & Tuber output. Sweet potato production, on the other hand, barely increased during the same period, rising by 1.8 percent to 134 million MT in 1996.Cassava and potato contributed 33 percent and 42 percent, respectively, to growth in Root & Tuber output. Production of cassava grew by 27 percent between1983 and 1996 to 164 million MT, and production of potato grew by 68 percent to 108 million MT.

 Production of individual Root & Tuber tends to be highly skewed toward particular countries and regions show the locations of R&T production in 1996. More than 60 percent of global potato production was harvested in developed countries, followed by China with a 17 percent share and India with 7 percent. Potato production has been shifting back toward developing countries; they have increased their share of global output from 11 percent in 1961–63 to 37 percent in 1995–97[10] slightly more than half the global production of cassava takes place in Sub-Saharan Africa, followed by Southeast Asia with 23percent and Latin America with 20 percent. Sweet potato production is concentrated in China, which has an 88 percent share of global production. Ninety-six percent of the world's yam is produced in Sub-Saharan Africa (mostly West Africa).

MATERIALS AND METHODS

The study area was Plateau state. This state lies between latitudes 8° N and 10° and latitudes 7° E and 11° E of the prime meridian. The Plateau highland stands at an average height of 1200 meters above mean sea level. The State has a land mass covering nearly 53,585 square kilometers with An estimated population of 3,473,336 people. A Multistage Sampling technique was adopted to select 160 respondents from 5 Local government Areas farmers from who the data used for this study were collected using the interview method with the aid of a well-structured questionnaire in the 2009 production year. The profitability analysis model adopted for this study is as stated below;

NET FARM INCOME;
▪ Net farm income measures the return to unpaid family labour, operator's land, labour, capital and management Olukosi et al (2008).It is notationally represented as NFI.

▪ NFI = TR – (TVC + TFC)

Where
NFI = Net Farm Income (N)
TR = Total Revenue (N)
TVC = Total Variable Cost (N)
TFC = Total Fixed Cost (N)
TR = PyY (Unit price of output multiplied by the total output)
Y = Quantity of output in Naira
Px = Unit price of input in Naira
X = the quantity of input

Measure of Production Performance by Efficiency:
As a measure of performance, efficiency ratio, profitability ratio and operational efficiency are specified as follows:
i. Efficiency ratio (ER) $= \frac{TR}{TC}$
ii. Profitability ratio (PR) $= \frac{\pi}{TC}$
If ER >1 and PR> 1 then the root and tuber crops evaluated are operationally efficient and vice-versa.

RESULTS AND DISCUSSION

Net Farm Income Analysis: The result of net farm income analysis as a measure of profitability among the RTEP and Non – RTEP root and tuber farmers revealed that RTEP farmers had an average total cost and total revenue of N97, 447.00/Ha and N225, 916.60 /Ha respectively, with an average Net farm Income of N128, 469.60. Also, the average total cost and total revenue for Non – RTEP farmers were N 100,710.00/Ha, and N 202,172.30/Ha respectively with an average net farm income of *N91, 462.30/Ha.* The size and the positive values of Net Farm Income obtained for both RTEP and Non-RTEP farmers confirmed to the fact that root and tuber farmers were able to cover their operating expenses with a significance level of Net Farm Income obtained from the study area. It is however important to state here that RTEP farmers' total revenue and net farm income was higher than that of Non-RTEP farmers in the study areas.

Measure of Production Performance (Profitability and Efficiencies)
Profitability Ratio: The computed production profitability ratio as presented in Table 1 for RTEP and Non-RTEP farmers were 1.30 and 0.91 respectively. This means that for every N1invested by RTEP and Non-RTEP farmers, each gained N 1.3, and N0. 91 respectively in the study area .Hence, Root and tuber crops were confirm to be profitable in conformity with the earlier findings under cost and return analysis.

Efficiency Ratio: The estimated efficiency ratios for RTEP and Non-RTEP farmers were are 2.30 and 2.00 respectively. Meaning that as the efficiency ratios of both RTEP and Non-RTEP farmers were greater than unity and is an indication that their operations were efficient. However, the efficiency of RTEP farmers was higher than that of Non-RTEP farmers, indicating that RTEP had a positive impact on the farmers in the study area

Table 1: Summary distribution of cost and NFI analysis of root and tuber crops in the study Area

Parameters	RTEP	NON-RTEP
Total cost (N)	97,447.00	100,710.00
Total Revenue(N)	225,916.60	202,172.30
NFI (N)	128,469.60	91,462.30
Profitability ratio(NFI/TC)	1.30	0.91
Efficiency ratio (TR/TC)	2.30	2.0

USD= N162

CONCLUSION

This paper used net farm income and measures of operational efficiency such as profitability ratio and efficiency ratio   to examine the performance of root and tuber crop farmers in the study areas. The results of the net farm income analysis revealed that root and tuber crops were profitable. Using the profitability ratio, it was further discovered that for every N1 incurred by RTEP and Non-RTEP root and tuber crop farmers   realized ₦ 1. 3 and N 0.91 respectively. Meaning that the operations of root and tuber crop production were efficient and profitable. The implication of this finding is that root and tuber crops has the potential of improving the standard of living of the RTEP farmers as well as those of the Non-RTEP farmers such that unemployment problem should be alleviated and income generation greatly enhanced considering the profitability level recorded in root and tuber crop production in Plateau state Nigeria.

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