FARM PRODUCTIVITY AND PROFITABILITY OF TROPICAL MANIHOT SELECTION CASSAVA VARIETIES IN EBONYI STATE, NIGERIA

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ABSTRACT

This study evaluated farm productivity and profitability ofTropical Manihot Selection(TMS)cassava varieties in Ebonyi State, Nigeria. One hundred and twenty respondents were randomly selected from twelve villages using multi stage random sampling technique. Primary data for the study was collected using a well-structured questionnaire and interview scheduled. Percentages responses, allocative efficiency model and gross margin analysis were used to capture the specific objectives of the study. The results of the socioeconomic characteristics showed that majority of the respondents were females, youthful, married, educated, moderate household size, well educated, experienced and had access to credit. The limiting factors to production of TMS cassava production in the study area were land problem, high cost of labour, high cost of fertilizer, theft and poor access to extension services. The result of the Gross Margin analysis showed that the production of Tropical Manihot Selection cassava varieties was profitable in the study area with Gross margin of N994, 300, Farm Income; N988, 752 and Benefit Cost Ratio of 1: 3.7. There is need to make policies options in order to ensure farmers' access to credit facility, educational programmes, labour saving devices and extension services.

KEYWORDS: Cassava varieties, productivity, profitability, Tropical Manihot Selection

INTRODUCTION

Farm productivity and profitability are important components of food security**.** In agricultural sense, productivity measures how well farmers and agribusiness companies combine inputs to produce output. Growth in productivity reflects increases in the efficiency of the production processes which, in turn, occur as a result of improvements in technology or knowledge (Ogbeide, 2015). Agricultural productivity may also be measured by what is termed total factor productivity (TFP). This method of calculating agricultural productivity compares an index of agricultural inputs to an index of outputs. Changes in TFP are usually attributed to technological improvements (FAO, 2001). Farm productivity is measured as the ratio of agricultural outputs to inputs. This productivity can be compared to many different types of inputs such as labour or land. Productivity is driven by changes in either agricultural technique or improvements in technology. Some sources of changes in agricultural productivity have included mechanization and high yield varieties, which were the basis of the green revolution (Akenbor&Esheya,2022).

The productivity of a region's farms is important for many reasons. Aside from providing more food, increasing the productivity of farms affects the region's prospects for growth and competitiveness on the agricultural market, income distribution and savings, and labour migration. An increase in a region's agricultural productivity implies a more efficient distribution of scarce resources. As farmers adopt new techniques and differences, the more productive farmers benefit from an increase in their welfare while farmers who are not productive enough will exit the market to seek success elsewhere(Amusa&Esheya, 2022). Achieving farm productivity in cassava production relies on the efficiency of combining resources and the support systems available particularly those that motivate the human capital (Esheya, 2012).

Farm productivity and profit maximisation in any farm production enterprise can only be achieved through efficiency in the use of farm resources.The concept of efficiency has been given various interpretations. Efficiency itself is concerned with the relative performances of the processes used in transforming a set of inputs into output. The pioneering work of (Asumugba, Onwubiko, & Okoye; 2007) distinguished three types of efficiency, technical, allocation and economic efficiencies. Technical efficiency is synonymous with productivity and it is born out of technique used in production. It is the ability of firms to employ the best practice or technology in the production process so that the minimum possible resources are used to achieve the best or optimum output level. Allocative efficiency is the kind which takes unit prices of inputs into consideration. It is the choice of input level which is consistent with relative factor price. In other words, a firm is said to be efficient in allocation of resources if it is capable of equating the marginal value product (MVP) of the input of its unit price hence, it is also referred to as pricing efficiency. This means that the farm has the ability to maximize profit with respect to that input factor (Adamu and Esheya, 2021). Resource useefficiency measurement has received considerable attention from both theoretical and applied economists. From a theoretical point of view; there has been a spirited exchange about the relative importance of the various components of firm efficiency (Okoye and Onyenweaku, 2007). Measuring efficiency from applied perspective is significant because it provides the first step in a process that might lead to substantial resource savings, which has important implications for both policy formulation and firm management (Wossen,Tessema, Abdoulaye, Rabbi, Olanrewaju, et al; 2017).

Generally, farm profitability is the degree in which a company, or a single business, produces a profit (money earned above what it costs to produce and sell farm goods and services) (Esheya, 2021b).According to Edwards and Duffy (2014), farm profitability is the degree to which the value of a farm's production exceeds the cost of the resources used to produce it. An absolute measure of profitability is net farm income. If the opportunity costs for the farmer's own labor and capital are subtracted, the remainder is profit and return to management. A positive profit means that the farm has produced crops and livestock that have a greater value than the seed, fertilizer, fuel, labor, feed, and other inputs that were used up in their production(Ubokudom, Esheya&Udioko, 2021). Farm profitability can be measured using earnings before interest, taxes, and amortization (EBITA), net farm income, operating profit margin ratio, rate of return on farm assets, and rate of return on farm equity. EBITA, as the name implies, is used to cover interest, taxes, and amortization, which includes depreciation on machinery and buildings (Langemeier, 2017). It reflects the efficiency with which land, machinery, breeding livestoke, and other resources are turned into food, fuel, and fiber.

Many empirical studies abound on productivity, resource use efficiency and hence profitability of the farm firm.Ume, et al (2018) reported that variable inputs of fertilizer, labour and planting material were underutilized by cocoyam farmers in Ivo Local Government Area of Ebonyi State, Nigeria , while farm land and capital were over-utilized, as the ratio of marginal value product (MVP) and marginal fixed cost (MFC) was greater than 1. Kadiri, Eze,Orebiyi, andOnyeagocha, (2015) worked on resource-use and allocative efficiency of paddy rice production in Niger Delta Region of Nigeria, revealed that rice producers in the area did not attain optimal economic efficiency, seed input (0.94) had the highest allocative efficiency, while land input (0.05) showed the least allocative efficient input.Ogbeide (2015) studied increasing agricultural productivity using multi-dimensional approach and opined that the ultimate objective of productivity growth is to produce output optimally at the most efficient rate. According to him, productivity is important in distribution of income, the allocation of resources and the relationship between stocks and flows.Jirgi, et al; (2014) in a study on the profitability and resource use efficiency in maize production in Kontagora Local Government Area, Niger State, Nigeria, found that farm size, labour and fertilizer were over-utilized, while capital inputs were underutilized. Gani and Omonona (2009), studied the resource use efficiency among small-scale irrigated maize producers in Northern Taraba State of Nigeria. The empirical results showed that fertilizer, seeds, labour and land were underutilized, whereas water (the key variable) was over- utilized.In a similar study, Kehinde, et al; 2012) conducted a study on the resource use efficiency in quality protein maize (QPM) production in Kaduna State, Nigeria. In this study, the results showed that whereas fertilizer, family and hired labour were over-utilized, land and seeds were underutilized. The allocative efficiency analysis by Gani and Omonoma,(2009) a study on the resource use efficiency of maize (*Zea mays* L.) production in Sri Lanka showed that profitability can be increased by increasing land, seed and fertilizer as well as reducing use of agrochemicals and labour.

The findings of Zongoma (2015), in resource use efficiency in maize production among small-scalefarmers in Borno State in Nigeria, observed that maize production can be improved if resources like fertilizer, labour and farm size are adequately utilized. Iheke, (2006) in optimization of resource use efficiency in small scale production in Abia State, Nigeria, reported underutilization of inputs such as land, improved seed, fertilizer and capital items.Ibekwe, *et al;* (2012) investigated resource use efficiency and productivity in cassava production inOwerri West local Government Area of Imo state, Southeast Nigeria. Results of the analysis showed that most of the farmers are small scale farmers and who are young and well experienced by the number of years of farming. The results on productivity showed that such inputs as fertilizer, labour cost, capital and other inputs were over-utilized. Farmers should reduce the rate of input use for efficiency to be enhanced (Adamu and Esheya, 2021).

To calculate farm profit, you normally subtract the operating costs of seeds, fertilizers, pesticides, fuel, interst, hired labour, others from the years's income. Growing farm requires machinery and buildings, which add to the cost of the farm. These items serve for several years, you do not subtract the entire cost for use of the equipment and buildings the year they are purchased(Esheya, 2022). Instead, you depreciate their value; that is you prorate their costs over the useful life of the machinery and buildings; so you charge only part of the cost against each year's income. Thus, income – operating cost – depreciation = net farm profit (Dale, Billy and James, 1988).

Agriculture is the major occupation of the people of Ebonyi state in the South Eastern region of Nigeria and policy options geared towards growth of agriculture is perceived as a best-bet strategy for poverty alleviation. An increase in agricultural productivity, as asserted by Kolapo and Abimbola, (2020) has the capacity of lessening poverty by enhancing farmers' income and thus, resulting in boosts in consumption. Among popular crops grown in the region as powerful poverty fighter, cassava has gained wide preeminence among smallholder farmers (FAO 2018). Cassava has intrinsic features which enables it to play a vital role in the food security of the rural economy through its capability to produce a reasonable level of output under marginal soil conditions, tolerance to drought, low cash input, all year round availability, adaptability to several farming systems, tolerates adverse weather and tolerates pest and diseases (Ume,Ahaiwe, Anozie, &Okoronkwo; 2016)

Apart from human consumption and cash income purposes, cassava could be used as livestock feed and industrial needs (for plywood, textile and bakery industries, and cassava starch for pharmaceutical, industrial alcohol, processed foods and laundry industries) (Esheya, 2012). Among the varieties of cassava varieties that are gaining wide acceptance was Tropical Manihot Selection (TMS). These varieties weredeveloped by International Institute for Tropical Agriculture (IITA) and National Root Crop Research Institute(NRCRI) in collaboration with government of Federal Republic of Nigeria. The TMS varieties although exists under diverse cultivars (TMS 50395, 63397, 30555, 4(2)1425, TMS, 30211 and 30572) with remarkable features, including tolerant to Cassava mosaic disease (CMD) and Cassava Spider mite (CSM), low in cyanide content, drought resistant, early maturing, and high yielding (Ume, Onwujiariri&Nwaneri; 2020)

Nevertheless, despite the cassava production feat of Nigeria, yet the average yield per land area of the crop has remained relatively low, with average yield per hectare of about 7.7 metric tonnes compared with 23.4 metric tonnes and 22.2 metrics in Indonesia and Thailand, respectively. The low yield of the crop could be correlated to low productivity, hence aggravating poverty and food insecurity (FAO, 2019). A study by Okoye and Onyenweaku (2007) shows that low productivity in agriculture in general could be enhanced through efficiency in resource use. It is against this background that this study intends to evaluate farm productivity and profitability of TMS cassava varieties in Ebonyi state, Nigeria.

Specifically, the objectives are to:
describe the socioeconomic characteristics of the respondents;
identify the constraints to TMS cassava varieties production; and
estimate costs and return in TMS cassava varieties production in the study area.

MATERIALS AND METHODS

This study was conducted in Ebonyi State of Nigeria. Ebonyi State is one of the five Southeastern States of Nigeria. The state is made up of 13 local government areas with the capital at Abakaliki. It is located between latitudes $6^0$15'N and $6^0$25^{1}N and longitudes $8^0$05'E and $8^0$08^{1}E on the globe and it shares boundaries with Cross River, Abia, Enugu and Benue States in the east, south, west and north respectively. Its total land area is 5,533km^2. According to NPC (2006) the population of the area is 2,173,501 made up of 1,132,517 males and 1,040,984 females. The state has an annual temperature range of 23^{0}C and40^{0}C and annual mean relative humidity of 72.2% at 0900 GMT. Ebonyi State indigenes are agrarian, cultivating crops such rice, yam, cassava, cocoyam, and vegetables. Livestock such as sheep, goat, rabbit, cow, pig, and chickens are also reared. The off-incomes engaged by the farmers included, salon, mason, tailoring, automobile mechanics, driving, trading among others.

Purposive and Multi-stage sampling techniques were used to select 120 farmers that supplied the primary data needed in the study. In the first stage, two agricultural zones were purposively selected out of three. This could be because large scale adoption of TMS cassava farmers in the zones. The purposive selected zones were Ebonyi South and Ebonyi North. In the second stage, one LGA was purposively selected from each of the zones. The selected LGAs were Ohaukwu and Ivo. In stage three, in the fourth stage, 6 communities were selected from each of the LGA. This brought to a total of twelve communities. Finally, ten TMS cassava farmers were randomly selected from lists of TMS cassava varieties farmers from extension agents covering the areas or local leaders, these brought to a total of one hundred and twenty farmers for detailed study.

The information to be used for this study were derived from primary. The primary data were obtained through the use of structured questionnaires and informal or oral interview schedules with respondents. Objectives (i) and (ii) were addressed using descriptive statistics such as frequency distribution tables and percentage responses while objective (iii) was realized using costs and return analysis model.

Model Specification: ***Gross Margin Analysis Model***

The objective 3, estimation of cost and returns was determined using gross margin analysis, which is the difference between the total revenue (TR) and the total variable cost (TVC)

$$G.M. = TR - TVC \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$\text{i.e. } G.M = \sum_{1-1}^{n} P_1 Q_1 - \sum_{j-i}^{m} r_i x_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The net farm income can be calculated by gross margin less fixed input. The net farm income can be expressed as thus:

$$NFI = \sum_{1-1}^{n} P_1 Q_1 - \left[\left(\sum_{j-i}^{m} r_i x_i\right) + k\right] \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where:

GM = Gross margin of TMS cassava varieties production measured in Naira (₦)

NFI = Net farm income farm income of TMS cassava varieties production measured in Naira (₦)

P1 = Market (unit) price of output of TMS cassavavarieties measured in Naira (₦)

Q = Quantity of output of TMS cassava varieties measured in kilograms (kg)

ri = Unit price of the variable input of TMS cassava varieties measured in kilogram(kg)

xi = quantity of the variable input of TMS cassavavarieties measured in kilogram (kg)

K = Annual fixed cost (depreciation)of TMS cassava varieties measured in Naira (₦)

i = 1 2 3 …….. n

j = 1 2 3 …….. m

RESULT AND DISCUSSION

Socio-Economic Characteristics of the cassava Farmers

This section deals with the presentation of the result on the socio economic characteristics of the farmers. The socioeconomics characteristics discussed herein were gender, age, marital status, household size, educational status, rearing experience among others. The results are presented below.Table 1 reveals that 25% of the cassava farmers in the study area were males, while 75% were females. The gender composition is not against a*priori* expectation as in many societies of sub Saharan Africa, cassava is regarded as female crop. However, Ume; *et al;* (2020) found men and women competing in proportion as regards the cultivation of the crop.

The relatively high involvement of males may also be an indication of the transition of the crop from being a staple subsistence to a cash crop, he noted. Also, most sampled farmers (52.5%) were less than 40 years of age, while 47.5 % were 40 years and above. This showed that many of the farmers studied were within the economically active age. Ibekwe, Orebiyi, Henri-Ukoha, Okorji, Nwagbo, and Chidiebere-Mark (2012) asserted that farmers in their youthful age are often active, energetic, more productive and progressive, hence more willing to adapt new practices leading to higher efficiencies in cassava production.

As well, 75% of the respondents were married,21.67 % divorced, while 3.33 % were single. Married people often have large family size to cater for, hence could afford to adopt technologies in order to accomplish such aim. Furthermore, the Table shows that majority (54.17%) of the farmers had household size of 6 – 10 people, while the least (12.5%) had household size range of 11 – 15 persons. Large household size serve as source of cheap labour especially during peak of farming when hired labour is scarce and expensive to procure (Esheya, 2012). The finding of Wilcox, Ugwumba, Achike, Agbagwaa, and Uche, (2016) concurred to above assertion. They opined on the essential of family labour in enhancing the adoption of labour intensive agricultural technologies, for high productivity to be attained is well documented.

Moreover, majority (37.5%) of the farmers studied cultivated farm size ranged from 0.01 – 1.00, while the least (4.17%) cultivated above 5 hectares. This implied that TMS cassava production in the study area was in small scale and such class of farmers is known to be efficient in resource use (Wossen, *et al*; 2017). The finding of Okoye and Onyenyeaku, (2007) was in affirmation to the above declaration.They reported that these farms are small sized, fragmented and scattered and not contiguous land holding. These opposed great challenges to the much desired agricultural modernization/ mechanization and commercialization in Nigeria.In addition, majority (50%) of the respondents had farming experiences, of 11 – 15 years, while the least, 5% had 21 years and above. The more the years of farming experience the farmer has, the more efficient in resource use he or she has compare to less experienced farmers. This finding is in accordance with Shittu,Alimi,Wahab, Sanni, and Abass (2016)but contradicted those of Nnadozie, Ume, Isiocha, and Njoku (2015)who opined that experienced farmers incline to rely on their technical know-how and thereby, tend to ignore any innovative ideas being disseminated, perhaps by extension agents. Besides, 44.3 3% of the respondents had contacts with extension agents, while the greater majority (56.67%) had not. Poor extension outreach adversely affected innovation adoption, hence resulting in low productivity and exuberating of poverty. This is contrary to the submission of Gani and Omonoma, (2012), who reported that the limitations of the change agents in accomplishing their responsibilities could be a draw back in enhancing farmers output as their efficiencies in resource use are compromised. More so, 10 % of the respondents had no formal education, while 90% had formal education. Education helps to unlock the natural talents and inherent enterprising qualities of the farmer, hence increasing their technical efficiency (Kehinde, *et al; 2012)*. Several studies (Oparinde, Abdoulaye, Mignouna, &Bamire, 2017; Oyewole and Eforuku, 2019) are in synchronization to the important of education to agricultural development through producing individuals that more skilled and adaptable to the need of changing economy because *ceteris-peribus*, educated farmers are more amenable to risk taking and change than non-educated ones.

Table 1: Distribution of respondents according to socioeconomic characteristics (n=120)

Factors	Frequency	Percentages
Gender		
Male	30	25
Female	90	75
Marital Status		
Single	26	21.67
Married	90	75
Divorced	4	3.33
Divorced	4	3.33
Age of Farmer		
20 – 29	23	19.2
30 – 39	40	33.3
40 – 49	32	26.7
50 – 59	14	11.7
60 and 70	11	9.2
Household Size (No)		
1-5	40	33.33
6-10	65	54.17
11 -15	15	12.50
Farm Size (Ha)		
0.01-1.00	45	37.5
1.01 – 2.00	30	25
2.01 – 3.00	13	10.83
4.01 – 5.00	10	8.33
> 5.00	5	4.17
Years of Farming (Year)		
1 – 5	12	10
6 – 10	30	25
11 – 15	60	50
16 – 20	22	18.33
21 -25	5	4.17
Educational Level		

(years)		
No formal educational	12	10
Primary	55	45
Secondary	35	29.2
Tertiary	20	16.7
Extension Agent		
Access	52	44.33
No access	68	56.67

Source: Field Survey 2021.

Constraints to TMS Cassava Production

The constraints to cassava production in the study area is shown in Table 2.Table 2 indicated that 88.3 percent of total respondents reported land problem as a constraint to cassava production. The communal ownership of land in the study area in most cases restricts the areas of land an individual could be assigned to, the purpose for the land use and the duration of use, thereby affecting long term agricultural development plan (Wilcox; *et al:* 2016). This is followed by high cost of labour, which was encountered by 66.7 % of the total respondents. The high cost of labour as reported by Ume, *et al* (2018) could be related to non-existence of labour saving devices in the study area and in effect, hired labourers capitalize on this to charge high. Poor access to credit was reported by 57.5% of the respondents. Credit helps farmers for timely procurement of farm inputs to avoid price fluctuations that are commonly associated with late input purchase, thus affecting the farmers' production frontier (Ogunleye, Bamire&Awolola, 2019).

Furthermore, unavailability and high cost of fertilizer was reported by 57.3 % of the sampled farmers. The diversion of fertilizer to the neighbouring states and countries could be cited for the high cost of the important resource (Oyewole and Eforuku, 2019). The effect of unavailability of fertilizer have caused many farmers to waste their precious time in transporting themselves to distant markets in search of this essential commodity to the detriment of their farm work (Ibekwe, *et al*; 2012). In addition, although access to extension service enhances the farmers' likelihood of acquiring technical knowledge as well have access to improved production innovations, but unfortunately these services are not adequately provided to farmers as observed by 56.7% of the respondents. The poor extension outreach tomany farmers could be allied to poor motivation of the change agents, hence making them very ineffective in discharging their responsibilities. The findings of Kadiri*et al*; (2015) concurred to the above assertion. Besides, 66.7% of the respondents complained about attitude of cattle herders. The herders use their cattle to ravage cassava farms and many a times steal the farmers' crops in the study area (Adamu, Esheya&Tanko, 2021). The need to call these herders to order by government and law enforcement agencies, to avoid imminent food insecurity in the study area.

Table 2: Distribution of respondents according to constraints to cassava production

Constraint	Frequency	Percentage
Land problem	100	88.3
Cost of labour	80	66.7
High cost of fertilizer	69	57.5
Theft	80	66.7
Fulani herders	30	25
Pest attack	52	45
Pesticides	40	33.3
High cost of herbicides	50	41.7
Poor access to extension service	68	56.7
Access to credit	69	57.5

Sources: Field Survey, 2021

Table 3: Costs and Return of TMS Cassava Production

Item	**Unit**	**Quantity**	**Price/unit**	**Cost/value**
Revenue				
Roots	Kg	8000	150	1200000
Sales of TMS cassava stem cutting	Kg	200	800	160000
Total Revenue				**1,360,000**
Total Physical input				
stem cutting	Bundle	80	800	64,000
Fertilizer	Kg	8	8000	64000
Miscellaneous				30,000
Total				158,000
Clearing	Md	12	2000	18,000
Mounding / ridging	Md	30	3000	90000
Cutting of stem	Md	1	1000	1000
Planting	Md	8	1200	9600
Fertilizer application	Md	10	1200	12000
Weeding	Md	20	2500	50000
Harvesting	Md	15	1500	22, 500
Bagging/Transportation				4,600
Total labour costs				207,700

Total variable costs	**365,700**
Gross margin (TR - TVC)	994,300
Depreciation of fixed assets excluding land	5,548
Total cost (TVC+TFC)	371,248
Farm income (TR-TC)	988,752
Benefit cost ratio	3.7

Field Survey, 2021.

Costs and Return of TMS Cassava Production

The costs and return of TMS cassava production is shown in Table 3. The cost elements in cassava production are cassava stem cuttings fertilizer and tools. No attempt was made to value land of which minimal or no rent is paid. This could be because of among others most lands in the study area are communally owned with meagre pays charged to the users. The farm tools (cutlasses, spade, basket and hoes) used were depreciated. On cost of inputs, the average quantity of cassava stem cutting per hectare used was 80 bundles (50 sticks per bundles costing N800 per bundle), totally N 64,000. In addition, eight (8) bags of fertilizer (NPK) costing N 64,000 at N8, 000/bag was applied to a hectare of cassava. The total cost of physical inputs was N158, 000.

On labour cost, hours worked by men women and children were converted into a common frame following Ume, et al; (2020). A total number of 96 man-day was used to produce one hectare of cassava, with mounding and ridging constituting the highest man-days, (30.0), while the least was cutting of cassava cuttings(1.0). The high number of man- hours of mounding and ridging could be attributed to the fact that the operation is tedious and energy sapping especially in peasant farming where farming operations are nearly zero mechanized, thus requires many people to accomplish a given area compare to other labour types in farming in general (Iheke, 2006; Oparinde, *et al*; 2017).Wage rate varied with the nature of the farm operations For instance in the study area, averagely; clearing attracted N2000 per man day, mounding and ridging; N 3000, cutting of stems; N1200, fertilizer application; N1,200, weeding; N2500 and harvesting; N 1500. The total cost of labour was N207, 700, which constituted about 49 % of the total cost of production. The high cost of total cost of cassava production could be correlated to high cost of hired labour, especially during peak of farming season (Nnadozie, et al2015). A Net Farm Income (NFI) N 988,752. The high Net Farm Income result coincides with Kehinde, *et al*(2012) finding among NR 8082 and NR 8081 farmers in Anambra State of Nigeria. Furthermore, the Benefit Cost Ratio (BCR) was 1: 3.7 and Gross Margin was N 994, 300.

CONCLUSION

Farm productivity and profitability are intimately related terms. Farm productivity reflects improvements in the ability to transform inputs into outputs in the most efficient manner; while farm profitability is the degree to which the value of a farm's production exceeds the cost of the resources used to produce it.The results of the socioeconomic characteristics showed that majority of the respondents were females, youthful, married, educated, moderate household size, well educated, experienced and had access to credit. The limiting factors to cassava production were land problem, high cost of labour, high cost of fertilizer, theft and poor access to extension services. TMS cassava varietiesproduction was also profitable in the study area with Gross margin of N994, 300, Net farm income; N988, 752 and Benefit cost ratioof 1: 3.7. The role of science and technology as well as the availability of natural endowments are critical to increasing farm productivity and profitability. Thus, increasing farm productivity and profitability leads to agricultural growth which boosts economic development and can help to alleviate poverty in developing countries where agriculture often employs the greatest majority of the working population.

RECOMMENDATIONS

(I). Researchers should develop labour saving devices such as hand driven plough to curtail cost of production especially in peasant agriculture where farming activities are nearly zero mechanized.

(ii). Government needs to encourage financial institutions to make credit facilities more accessible to farmers and timely too.

(iii). Since farm productivity and profitability is driven by improvements in farm techniques and technology; government should invest in farm mechanization and high yielding crop varieties in the study area.

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