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Competitiveness of Banana Production in the Mampong Municipality of Ashanti Region of Ghana

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Authors' contributions

This work was carried out in collaboration between all authors. Authors FN and SY designed the study, wrote the protocol, analyses and wrote the first draft of the manuscript. Author EKTA managed the literature searches and analyses of the study. All authors read and approved the final manuscript.

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ABSTRACT

Using household-level survey data, this study investigates the relative competitiveness of banana production in the Mampong municipality of Ashanti region of Ghana. Empirical results from discounting and non-discounting technique of project evaluation show that banana production is relatively profitable than other staple crops such as maize and cassava, despite the relatively higher investment required. Production of banana is also constrained by lack of funds and lack of labour in the study area. Policy efforts should be geared toward addressing the problems that discourage farmers from cultivating crops such as banana. Farmers should also be educated and encouraged to cultivate banana as an alternative crop that can maximize their long-term returns.

Keywords: Banana; competitiveness; profitability; rate of return; Mampong-Ghana.

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1. INTRODUCTION

Banana is cultivated in over 100 countries in the tropical and sub-tropical regions of the world where the crop constitutes a major staple food for millions of people as well as providing a valued source of income through local and international trade [1]. According to the [2], total world banana production is estimated at over 50 million metric tons of which export Cavendish varieties to the richer nations represent less than 11 million tons. The rest, over 85% of the production, is made up of a wide range of banana varieties grown by peasant farmers or small holders and their families. These are basically either for household consumption or traded locally, and in such informal economies, production figures can only be estimates.

Banana production in Ghana is about 50,000 tons, which is mainly engineered by Volta River Estate Limited, producing about 20,000 tons per year [3]. An average of 12,416 tons of fresh banana has been exported to the European Union market from Ghana between the years 1999 and 2008. Production levels of banana in Ghana, in the year 1999, 2000 and 2001 were about 2,526 tons, 2972 tons, and 3345 tons respectively, rising to 34,134 tons in 2007 and 45,951 tons in 2008, which provide credence to the fact that banana production is growing steadily in Ghana. The crop constitutes about 13% of the total horticultural exports and is among the cheapest staple foods produced [4]. Total domestic banana production was estimated to be about 100,000 metric tonnes with a per capita consumption of about 4.1kg/annum. Although banana has less importance as a basic food item, it has become an important export commodity. [4] however, reported that the banana export industry in Ghana was fragile and depended on one plantation – the Volta River Estate Limited (VREL), whereas according to [5] in Latin America and the West Indies, banana exports contribute immensely to the growth of their economy. [6] reported that in Ghana, 2006 earned about US $10.3 million in foreign exchange from 44,098 metric tonnes of banana exported.

Banana production in the Mampong Municipality, the study area, is about 1200 metric tons, according to the Municipality's Agricultural data. Production levels of banana in the municipality during 2005, 2006 and 2007 were about 2000 tons, 1800 tons and1600 tons respectively. An average production level of 1400 tons of banana was recorded for the 2008 and 2009 production seasons, declining to about 1200 tons in 2010. Banana is a key crop that sustains the livelihoods of farmers in Mampong Municipality [7].

Despite the profitability of banana production, farmers in the Mampong Municipality are gradually replacing the crop with other staple crops. The production of banana over the past six years has declined from 2000 to 1200 metric tonnes relative to maize and cassava where levels have increased over the past years. Previously, banana production was the main farming activity in the study area, but in recent years production has been declining every successive year relative to for example maize, where production has risen from 1500 to 2500 metric tonnes [8].

Farmers in the Municipality have provided reasons for the substitution of banana for other staple crops. It is rational to argue that banana as a perennial fruit crop which takes considerably a longer period of time to harvest compared to maize and cassava that requires only four months to one year to harvest may switch to the production of crops with considerably shorter maturity period. Satisfying household food requirement is a major priority of farmers in the study area; hence resources are allocated to the production of crops most suited to satisfying household needs [9].

Banana production is resource-demanding, in terms of time and labour, relative to maize and cassava production. Moreover, it is rational to argue that challenges such as decreasing soil fertility, lack of access to credit facilities, accessibility to land, strong winds, high cost of labour, increased average age of the farmers, lack of good quality planting materials and marketing-related issues could be very influential in determining the type of crop to produce in the Municipality. In addition, farmers are also worried about the destruction caused by insect pests, nematodes and the foliar disease, notably the black sigatoka, low level of technology adoption, unstable pricing and dependence on the traditional practices in banana production in the study area. Despite the constraints to banana production in the study area, it isa high income-generating crop as well as a higher export potential crop, it is essential to investigate the relative financial competiveness of banana production in the study areaso as to help make appropriate policy recommendations targeted at rural poverty alleviation and food security.

2. RESEARCH OBJECTIVES

The study sought to address the following questions: What is the annual return on banana production relative to maize and cassava on an acre basis? What are the factors influencing farmers to shift from banana production to other crops? What challenges do farmers face in banana production?

3. RESEARCH METHODOLOGY

The research design used in the study was 'survey'. Therefore, cross-sectional data was used. Purposive sampling technique which is a non-probability sampling was used to select four banana producing communities namely Mampong, Hwediem, Ninting and Benim in the Municipality, according to the proportion of farmers involved in banana production [9]. Using a household list from the District's Agriculture unit, the study employed a cross-sectional data collected from 80 banana farmers who were randomly selected from the four towns with 20 farmers from each town. The survey was done in the year 2010.

Descriptive statistical tools such as mean, frequency counts, percentages, distribution tables were used to organize and summarize the data. Net farm income analysis was used to estimate the competitiveness of banana production relative to maize and cassava in the Municipality. Rate of return on investment was used to assess the return per every cedi invested in production. Net present value was also used to estimate the present value of the cash flow streams of banana, maize and cassava production over a five-year period for clear comparison between the crops produced in the study area. Below are definitions and explanations of investment criteria that were employed in the study.

3.1 Income Statement

The income statement is a financial statement that presents revenue, expenses and the net income or loss for a specific period of time. The income statement therefore reveals the success or failure of a farm business over time. It is a summary of receipts and expenses during a specific period. The primary objective of income statement is to show the income produced and the expenses involved in the operation of a business for the period accounted for by the income statement. The income statement basically comprises three parts namely; receipts, expenses and net income [10].

3.2 Receipts

These are derived from sales of banana. Farm product used at home is also valued and added to the receipts. The objective is to show as accurately as possible the gross production of the farm for the production period in value terms. This facilitates analysis of the trend of income over a given period of time. The total receipt constituted the gross income and was calculated as:

Gross Income = Total yield per acre x market price of the product (GI=TY x MP)

3.3 Expenses

These include all the operating and fixed expenses incurred in the operation of banana production during the period covered by the income statement. Capital expenditure on fixed and working assets such as machinery is excluded for all crops under study because such items are used in the business for several years [11]. However, the annual depreciation on these items for the period covered by the income statement is an expense and was included.

3.4 Net Income

This is the difference between sales revenue from production and all expenses incurred in the production process.

Net Income = Sales Revenue – Expenses (NI=SR-E)

Sales revenue was computed by multiplying the quantities of the crop produced by the unit market price of the produce. Expenses are the summation of the costs incurred in producing the crop up to the marketing of the produce.

3.5 Operating Profit

The operating profit was calculated as gross revenue less total operating cost (variable cost + operating overheads). This is expressed as:

Operating Profit = Gross Income – Operating Cost (OP=GI-OC)

3.6 Net Profit

This is the amount of money earned after paying all expenses. Net profit is calculated as operating income less fixed cost associated with production. This is expressed mathematically as:

Net Profit = Operating Income – Fixed Cost(NP=OP-FC)

3.7 Depreciation

Depreciation is the loss of value of an asset as a result of wear, age or obsolescence. Depreciation involves spreading out the original cost of an asset over its useful life. The amount of depreciation charged should correspond to the loss in value of the asset. The loss in value of asset is determined by the years of remaining life used and obsolescence.

Depreciation can be estimated by several methods including annual revaluation, production based, the sum of year digits, and the straight line method. For this study, the straight line method was used to estimate the value of assets such as hoe, cutlass, sacks and baskets, for the sake of simplicity to farmers in the study area.

3.7.1 Straight line method of depreciation

It is a convenient and simple way to calculate annual depreciation by dividing the original cost of the asset less any salvage value by the expected years of life of the asset as shown below.

$$\text{Annual Depreciation} = \frac{\text{Initial Cost} - \text{Salvage Value}}{\text{Expected Years of Life}}$$

(AD=IC-SV/EYL)

3.8 Rate of Return

The rate of return is used to measure the profitability of an investment as an annual percentage of capital employed. It relates profit and total revenue from production to the total cost of production taking into account the opportunity cost of capital used in production [11].

3.9 Rate of Return on Capital Invested

The rate of return on capital invested relates the net profit to the total cost of production. Thus, it measures the efficiency of production in relating the total revenue less all expenses to the total cost of production [12]. It is calculated as shown below:

$$\text{Rate of return on capital invested (ROCI)} = \frac{\text{Net Profit}}{\text{Total cost of production}} * 100\% (\text{ROCI=TR/TCP} * 100\%)$$

It should be noted however that, there is a clear distinction between rate of return on investment and the rate of return on capital invested. As the rate of return on investment relates the total revenue from production to the total cost of production, the rate of return on capital invested relates the net profit from production to the total cost of production [12].

3.9.1 Discounting cash flows

A simple discount value is the one with maturity value the same as its present value. The interest amount is deducted in advance from the present value. Discounting enables cash flows that occur in different years to be compared with one another [12].

3.9.2 Net Present Value (NPV)

The straightest forward discounted cash flow measure of a project value is the net present value of the project. It is simply the sum of the present value of the cash flow stream. It may also be calculated by finding the difference between the present value of the benefit and the present value of the cost stream. Although the NPV may be computed by subtracting the total discounted benefit from the discounted cost, it is easier to compute it by discounting the cash flow or the net benefit stream [13]. The decision rule is to accept all projects with a positive NPV discounted at the opportunity cost of capital invested. To estimate the costs and benefits of banana, maize and cassava production in the study area for the future years and using production, costs and price trends in the study area, the following assumptions were made:

- The prices of the studied crops were assumed to be constant for the period of study. An interest rate of 25.15% per annum [14] was charged on the capital outlay to discount the stream of cash flows of the studied crops to their present values.
- Land rent was fixed at GH¢ 20.00 for the five year period study in the study area.
- The yields of banana increased by 10% after year 1 to the third year and decreased by 5% in the subsequent years.
- The yields of maize and cassava decreased by 5% after year 1 to the year 3 and decreased by 10% in the subsequent years because of decreasing soil fertility.

- Land preparation cost decreased by 10% every year after crop establishment (year 1).
- Seed cost for maize production increased by 5% every year over the five-year period of production.
- Planting cost increased by 10% every year for the five-year period.
- Weed control cost decreased by 5% every year for the five-year period.

It should be noted however that, the respective percentage increase or decrease in the yields of the studied crops in the study area affected the cost of labour for harvesting, threshing, transportation and baskets/sacks needed for production to the same extent.

4. RESULTS

4.1 Comparison of Crops over One Year Production Period

Table 1 shows the income statement for a seasonal production of banana, cassava and a two season production of maize per acre for the year 2010 in the study area. The gross income from banana, maize and cassava in the study area are GH¢374.64, GH¢476.20andGH¢286.50 respectively. This means that in the study area, maize has the highest gross income, followed by banana and cassava per acre of land produced. The operating income for the crops studied, banana, cassava and maize were found to be GH¢177.31**,** GH¢205.00 and GH¢130.50 respectively, implying that maize production in the study area has the highest operating income per acre of land produced, followed by banana and cassava. With proper financial support, the banana industry can increase production and generate more jobs in the areas of curtains, twine and other packaging material production much needed by the banana industry. Income levels can be increased from the present levels of US$1.8 million to about US$3.6 million if production for export is doubled [6].

The net profit per acre of production from banana, maize and cassava in the study area are GH¢146.31**,**GH¢169.52andGH¢99.50, respectively, having accounted for fixed costs including depreciation on fixed assets such as hoe, cutlass, baskets and sacks for bagging maize.

4.2 Net Profit

The net profit per acre of production from banana, maize and cassava in the study area were found to be GH¢ 146.31**,** GH¢ 169.52 andGH¢99.50 respectively (Table 1). This means that in the study area, maize has the highest net profit, followed by banana and cassava per acre of land produced.

Table 1. Income statement for banana, maize and cassava production (1acre/year) for the year 2010 in the Mampong Municipality

Receipts	Banana(GH¢)	Maize(GH¢)	Cassava(GH¢)
Sales	**374.64**	**476.20**	**286.50**
Variable Cost			
Land Preparation	40.00	80.00	40.00
Suckers/Seeds/Sticks	60.95	16.00	20.00
Labour			
Planting	16.00	16.00	16.00
Weed Control	52.13	40.00	40.00
Harvesting	20.00	20.00	20.00
Threshing	-	24.68	-
Fertilizer Application	-	54.00	-
Transportation	8.25	20.00	20.00
Total Variable Expenses	**197.33**	**270.68**	**156.00**
Operating Income/Profit	**177.31**	**205.00**	**130.50**
Fixed Expenses			
Land Rent	20.00	20.00	20.00
Depreciation			
Hoe	2.50	2.50	2.50
Cutlass	3.50	3.50	3.50
Baskets/ Sacks	5.00	10.00	5.00
Total Fixed Cost	**31.00**	**36.00**	**31.00**
Net Income/ Profit	**146.31**	**169.52**	**99.50**

Source: Field Survey, 2010

4.3 Depreciation of Capital Assets

It should be noted that the cost of land per acre per year which is also an overhead cost is constant irrespective of the crop been grown and it is GH¢ 20.00. It should also be noted that the production of the various crops is associated with different depreciation charges (Table 2). Thus for banana production, the depreciation charged on fixed assets per year were estimated at GH¢31.00and that of maize and cassava were GH¢36.00 and GH¢31.00 respectively.

The results showed that the main fixed expenses incurred in banana production, maize and cassava production were the depreciation of fixed assets such as hoe, cutlass, baskets and sacks for bagging maize. Land rent was also considered as part of the fixed cost associated with production in the Municipality. It should be noted that the cost of land per acre per year is constant irrespective of the crop been grown and it is GH¢ 20.00. It should also be noted that the production of the various crops is associated with different depreciation charges. Thus for banana production, the depreciation charged on fixed assets per year is GH¢31.00and that of maize and cassava are GH¢36.00 and GH¢31.00 respectively.

Therefore, with competitiveness of banana production using the same land for banana, maize and cassava cultivation in the Municipality, banana and cassava have the lowest fixed expenses followed by maize. This implies that, using the same land for production, a farmer is better off by GH¢5.00on fixed expenses associated with production if/he produces banana or cassava rather than maize [9].

4.3 Rate of Return

An interest rate of 25.15% per annum was charged on the capital outlay in order to determine the total cost of production taking account of the interest on loan for production. Table 3 shows that banana production has the highest cost of production, GH¢285.75, followed by cassava GH¢234.03 for a seasonal production and maize GH¢ 383.81 for two seasons production (GH¢191.91 per seasonal production) in the study area.

To calculate the rate of return on capital invested, the profitability of production should be valued at the opportunity cost of capital used in production [12]. Therefore, an interest rate of 25.15% per annum [7] was charged on the capital outlay in order to determine the total cost of production taking account of the interest on loan for production. Table 3 shows that banana production has the highest cost of production, GH¢285.75, followed by cassava GH¢234.03 for a seasonal production and maize GH¢ 383.81 for two seasons production (GH¢ 191.91 per seasonal production) in the study area. This attest to the fact that, the initial capital for banana production is very high as claimed by 31.25% of the respondents compared to maize and cassava production in the study area.

4.4 Rate of Return on Production for a Year Production in the Study Area

From Table 4, it can be observed that the rate of return on investment is the highest in banana (31.12%) production, followed by maize (24.07%) and cassava (22.42%) per cedi invested in production.

Table 2. Depreciation of capital assets

Asset	Unit cost	Quantity	Economic life	Annual depreciation	Total charged depreciation
Hoe	5.00	1	2	2.50	2.50
Cutlass	7.00	1	2	3.50	3.50
Sack/Basket	1.00	10	1	1.00	10.00
Total					16.00

Source: Field Survey, 2010

Table 3. Total cost of production at opportunity cost of capital invested

Crops	Capital outlay	25.15% of capital outlay	Total cost of production
Banana	228.33	57.42	285.75
Maize	306.68	77.131	383.81
Cassava	187.00	47.03	234.03

Source: Field survey, 2010

Table 4. Rate of return on production for a year production in the study area

	Banana	Maize	Cassava
Total Revenue	374.64	476.20	286.50
Total Cost of Production	285.75	383.81	234.03
Net Profit (before opportunity costs of capital)	146.31	169.52	99.50
ROCI (%)	31.12	21.07	22.42

Source: Field survey, 2010

This means that farmers in the study area would be better off by a margin of 7% to 9% if they deploy their scarce resources for banana production rather than shifting to crops such as maize and cassava.

In spite of the above attesting the profitability of banana production in the study area, farmers are gradually replacing banana with other crops such as maize and cassava. Based on their immediate needs and the current problems with banana cultivation, farmers in the study area are now more interested in the cultivation of staple crops like maize and cassava, but from a long-run perspective, it is vital to consider whether a shift from banana production to other crops is necessary or should be the ultimate solution to alleviating poverty and ensuring food security in the Municipality.

4.5 Comparison of Crops over a Five-Year Period

For a clear comparison between banana, maize and cassava in the study area, a five-year costs and benefits associated with banana, maize and cassava production in the study area are presented in Tables 5 at a discount rate of 25.15% per annum [8] to examine whether farmers in the Mampong Municipality are justified in shifting to maize and cassava. Table 5 shows that the net present value for a five-year production of banana, maize and cassava in the study area were found to be GH¢649.86, GH¢394.06, and GH¢271.84 respectively per acre of land cultivated. It can be observed that banana has the highest net present value (GH¢ 649.86), followed by maize (GH¢ 394.06), and cassava (GH¢ 271.84) per acre of land produced over a five-year period.

4.6 Rate of Return on Production for a Five-Year Production

The total discounted revenues generated from five years production of the studied crops in the study area was the highest in maize production (GH¢1169.00**)**, followed by banana (GH¢1030.04) and cassava (GH¢696.36). The total discounted costs of production for five years is the highest in maize (GH¢774.94), followed by cassava (GH¢424.52) and banana (GH¢380.18) for the studied crops. About 31% of the respondents claimed that since banana is a perennial crop, an average of GH¢380.18is needed before a farmer can start banana production as shown in Table 5, which is the highest initial capital to farmers compared to maize (GH¢306.68) and cassava (GH¢187.00) for a year production in the study area per acre of land.

Table 6 shows that the rate of return on investment for the five years production of the studied crops in the study area is the highest in banana (271%), followed by cassava (151%) and maize (164%) per acre of land produced. Again, it is evident from Table 6 that the rate of return on capital invested for the five years production of banana, maize and cassava is the highest in banana (171%), followed by cassava (64%) and maize (51%) per acre of land cultivated in the study area.

The initial capital for banana production (GH¢380.18) is the highest compared to maize (GH¢245.04) and cassava (GH¢149.41) per acre of land cultivated. About 31% of the respondents complained that, the initial capital for banana production is high and that resource such as capital is directed to the production of crops which require less initial capital, therefore both maize and cassava being perfect substitutes to banana in the study area (Table 6).

The total revenue generated from five years production of the studied crops in the study area was highest in maize production (GH¢ 1169.00**)**, followed by banana (GH¢1030.04) and cassava (GH¢ 696.36) (Table 6).

Table 5. Costs and benefits associated with a five-year banana, maize and cassava production in the study area

Crop	Year	Cost	Benefit	Discount factor (25.15%)	Discounted cost	Discounted benefit	Present value
Banana	1	228.33	374.64	0.799	182.44	229.33	46.89
	2	107.05	412.104	0.638	68.30	262.92	194.62
	3	108.19	453.314	0.510	55.18	231.19	176.01
	4	103.78	430.648	0.407	42.24	175.27	133.03
	5	99.76	409.115	0.321	32.02	131.33	99.31
	Total				**380.18**	**1030.04**	**649.86**
Maize	1	306.68	476.20	0.799	245.04	380.48	135.44
	2	292.05	452.39	0.638	186.33	288.62	102.29
	3	284.85	429.77	0.510	145.27	219.18	73.91
	4	275.64	386.79	0.407	112.19	157.42	45.23
	5	268.24	384.11	0.321	86.11	123.30	37.19
	Total				**774.94**	**1169.00**	**394.06**
Cassava	1	187.00	286.50	0.799	149.41	228.91	79.50
	2	154.35	272.175	0.638	98.48	173.64	75.16
	3	148.47	258.57	0.510	75.72	131.87	56.15
	4	141.32	232.713	0.407	57.52	94.71	37.19
	5	135.17	209.44	0.321	43.39	67.23	23.84
	Total				**424.52**	**696.36**	**271.84**

Source: Field survey, 2010

Table 6. Rate of return on production for a five-year production in the study area

	Banana	Maize	Cassava
Total Revenue	1030.04	1169.00	696.36
Net Profit	649.86	394.06	271.84
Total Cost of Production	380.18	774.94	424.52
ROI (%)	**271**	**151**	**164**
ROCI (%)	**171**	**51**	**64**

Source: Field survey, 2010

The total cost of production for five years is the highest in maize (GH¢774.94), followed by cassava (GH¢ 424.52) and banana (GH¢380.18) for the studied crops. About 31% of the respondents claimed that since banana is a perennial crop, an average of GH¢ 380.18is needed before a farmer can start banana production as shown in Table 5, which is the highest initial capital to farmers compared to maize (GH¢306.68) and cassava (GH¢ 187.00) for a year production in the study area per acre of land (Table 6).

Table 6 shows that the rate of return on investment for the five years production of the studied crops in the study area is the highest in banana (271%), followed by cassava (151%) and maize (164%) per acre of land produced. Again, it is evident from Table 6 that the rate of return on capital invested for the five years production of banana, maize and cassava is the highest in banana (171%), followed by cassava (64%) and maize (51%) per acre of land produced in the study area.

Although the farmers appreciated the fact that the rate of return on investment and the rate of return on capital invested is highest in banana production than maize and cassava per acre of land produced in the study area, as shown in Table 4 and Table 6, Table 7 explains why the shift is necessary to the farmers in the Mampong Municipality:

The initial capital for banana production (GH¢380.18) is the highest compared to maize (GH¢245.04) and cassava (GH¢ 149.41) per acre of land produced (Table 6). About 31% of the respondents complained that, the initial capital for banana production is high and that resource such as capital is directed to the production of crops which require less initial capital, therefore both maize and cassava being perfect substitutes to banana in the study area.

Banana is a perennial crop and more labour intensive relative to maize and cassava production per acre of land produced. Although farmers in the study area appreciated the fact that there will no need to buy suckers for planting in subsequent years in banana production compared to maize which requires buying of seeds for planting every year, about 25% of the farmers consider the laborious nature of banana production a key factor in shifting to crops which require less labour. It was observed also that, cultural practices such as staking and earthing up are essential for banana but not so in maize and cassava production thereby farmers shifting to the production of crops that will render them some degree of freedom from laborious activities in their farming operations.

For subsistence consumption and that resources such as land, labour and capital are allocated to the production of crops most suited to satisfying household food requirements, farmers in the study area prefer maize and cassava to banana production since satisfying the household food requirements is a major priority of the farmers in the study area. About 19% of the respondents identified this as necessitating the shift to other crops.

To serve as an assurance against periods of banana crop failure and thus farmers being rational, they are therefore always finding ways to reduce the risk of having less income from production. About 15% of the respondents prefer to diversify so as to make more income in case banana production fails in a particular season and that shifting to other crops which could guarantee this assurance is necessary.

Banana takes considerably a longer period of time to bear fruit compared to maize or cassava. About 8% of the respondents also identified time of maturity as a crucial factor influencing the shift from banana production. It was realized that farmers prefer to invest in crops which are early maturing such as maize which takes considerably three months to harvest compared to banana which takes a year or above to bear fruit.

The outputs from a DREAM project shows that the potential benefits of (bio) technology-induced productivity changes are much larger in central and western Uganda than in Eastern Uganda, while North Uganda gains little. In addition, the gains to richer households (the upper two income quintiles) are about 3 to 5 times of those to relatively poor households (the lower two income quintiles). This begs important questions about the efficiency of banana technology as a means of targeting poverty alleviation efforts, and such questions and targeting options can be examined in this framework [13].

4.7 Challenges of Banana Production

Table 7 presents the major problems associated with banana production in the study area. The study revealed that the major problems associated with banana production in the study area were lack of credit, inappropriate pricing of produce, high labour cost, bushfires and theft.

A study by [10] showed the following challenges; inadequate funds for farm expansion, high cost of agricultural inputs, prevalence of Sigatoka and Fusarium Wilt diseases, lack of market for harvested fruits, poor road network and lastly, the high premium placed on the cultivation of plantain. This is to buttress the points made that these make up the challenges for which farmers consider shifting to other crops necessary in the Mampong Municipality.

Table 7. Reasons why farmers consider shifting to other crops necessary in the Mampong Municipality

Variable	Frequency	Percentage (%)
Initial Capital	25	31.25
Labour Intensive	20	25.00
Household Consumption	15	18.75
Assurance	12	15.00
Time of Maturity	6	7.50
Others	2	2.50
Total	**80**	**100**

Source: Field survey, 2010

4.7.1 Lack of credit

This is the main challenge hindering banana production in the study area since 41.25% of the respondents identified it as a challenge. This can be attested to the fact that about 75% of the respondents do not save with financial institutions but rather save at home. This makes it difficult for credit institutions in the Municipality to give credit to the farmers when the need arise. The 25.50% of the respondents who save with financial institutions are at times worried by the cumbersome processes such as need for collateral and high interest rates associated with loans and therefore decide not to go for the loan at all.

4.7.2 Pricing of produce

Pricing of produce is the next most important challenge hindering fruitful banana production in the study area. About 31% of the respondents identified this as a problem. This is so because there is no established mechanism for pricing of banana in the Municipality since bunches of banana varies in size and this attracts different market price depending on the bargaining power of the seller and the buyer and this affects the annual income of the farmers. Conversely, the farmers attested to the fact that crops such as cassava is measured in number of baskets which goes with a specific price and so with maize which is also measured in bags and allotted a specific price at any point in time. This is not so for banana, thereby pricing of the produce a worry to farmers in the Municipality.

4.7.3 Labour cost

Labour is an integral part of production and without it, output is virtually zero. This implies that labour is a very important factor of production. Labour availability in the Municipality was not a problem to the farmers but rather the cost. About 14% of the respondents claimed labour is expensive in the Municipality. Farmers in the Municipality being rational producers will produce crops which require less labour thereby shifting from banana which is more labour intensive to crops which require less labour such as maize and cassava.

4.7.4 Bushfires

Bushfires are normally rampant during the dry season and this can cause an established farm burnt down. It was observed that 10% of the respondents claimed bushfires are their main worry during the dry season. It was evident that banana plantations in the Municipality were prone to bushfires than either maize or cassava because the leaves of banana easily dry up during the dry season.

4.7.4 Theft

This was the least challenge hindering banana production in the Municipality because only a small fraction of the respondents (3.75%) identified it as a problem. Theft was a worry to banana farmers because banana being an edible crop easily attracts people to steal the fruits than food crops such as maize or cassava which requires cooking before eating. Thus, for the farmers to be on a safer side, it was necessary to produce crops which are less prone to stealing and either cassava or maize serves this purpose.

5. CONCLUSION

The results of the study showed that the gross income from banana, maize and cassava in the study area were GH¢ 374.64**,** GH¢ 476.20 and GH¢ 286.50 respectively. This means that in the study area, maize has the highest gross income, followed by banana and cassava per acre of crop produced. The operating income for banana, maize and cassava were GH¢ 177.31, GH¢ 205.00, and GH¢ 130.50 respectively. Maize has the highest operating income, followed by banana and cassava. The net income per acre of cultivating from banana, maize and cassava in the study area were GH¢ 146.31, GH¢ 169.52, and GH¢ 99.50respectively, per acre of land produced. Maize has the highest net profit followed by banana and cassava.

The results of the study also revealed that for a year production of banana, maize and cassava in the study area, banana has the highest rate of return (130%), followed by maize (124%), and cassava (122%) per cedi invested in production. It was evident from the study that for a five-year production of banana, maize and cassava in the study area, banana has the highest rate of return (271%), followed by cassava (164%), and maize (151%) per cedi invested in production.

The study showed that for a year production of banana, maize and cassava in the study area, the rate of return per cedi on capital invested for banana, maize and cassava were 51%, 44%, and 43%respectively. This means that banana has the highest rate of return on per cedi capital

invested in production. However, on a five-year production period, the rate of return on capital invested for banana, cassava and maize in the study area were 171%, 64%, and 51% respectively. It was evident from the study that either a year or a five-year production of banana, maize and cassava in the study area, banana production has the highest rate of return on capital invested per acre of crop produced.

The study revealed that although the farmers appreciated the fact the rate of return from banana production is higher than either maize or cassava, the shift was necessary because:

- The initial capital for banana production is higher compared to maize and cassava.
- Banana is a perennial crop and more labour intensive relative to maize and cassava.
- Resources such as land, labour and capital should be allocated to the production of crops most suited to satisfying household food requirements. This will suit subsistence consumption.
- To serve as an assurance against periods of banana failure and thus increasing farmers income.
- Banana takes considerably a longer period of time to bear fruit compared to maize and cassava.

The results of the study also revealed that the major challenges facing banana production in the study area are lack of credit, inappropriate pricing of produce, high labour cost, bushfires and theft. The minor problems in the production of banana in the study area were found to be inconsistent rainfall pattern, land tenure, windstorms and decreasing soil fertility.

6. RECOMMENDATION

On the basis of the findings of the study, the following recommendations are made:

- Through the Ministry of Food and Agriculture, policies should aim at encouraging farmers through farmer education and making farmers aware of the crops with higher returns to know the crops to produce with their scarce resources.
- Through the Ministry of Food and Agriculture, policies should be directed at addressing the needs of farmers by making credit available to them with a more simplified procedure and reduction of interest rate on credit for agricultural purposes.
- Labour requirements and cost is high, hence farmers should make optimum use of family labour when available as this can have a positive effect on operating income.
- A pricing mechanism could be established by the farmers through forming of cooperative societies or associations so as to receive good prices for their produce.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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