ECONOMIC ANALYSIS OF COCOYAM-BASED PRODUCTION IN IKOLE LOCAL GOVERNMENT AREA OF EKITI STATE

BY

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A PROJECT SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

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DEDICATION

This report is dedicated to Almighty God, who saw me through my undergraduate days. I also dedicate it to my lovely parents, siblings and lecturers who immensely served as intermediaries in imparting knowledge. I also dedicate this project to the needy and the less privileged in the society.

DECLARATION

This is to declare that this report is the product of my research findings.

DAODU, ODUNAYO TEMITOPE Date/signature .....

(Student)

The above declaration is affirmed by

PROFESSOR. R.A. OMOLEHIN Date/signature 17/01/16

(Project supervisor)

CERTIFICATION

This project, Productivity Analysis of Cocoyam-based Production in Ikole Local **Government** Area of Ekiti State meets the requirement for the award of Bachelor in **agriculture** in Agricultural Economics and Extension, Federal University Oye Ekiti.

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ABSTRACT

The productivity analysis of cocoyam-based production in Ikole local government area of Ekiti state was investigated using 80 respondents from 4 villages (Otunja, Isaba, Ilotin and Ijesha isu), farmers were interviewed from each area. Data was collected using structured questionnaires. Descriptive statistics, cost and returns analysis and regression analysis were employed as analytical tools. The result shows that most of the farmers were from 40-49 years of age, constituting 35% of the respondents, while 90% of the respondents were male, just 10% of the respondents were females. The result also shows that 68.8% of the respondents are married, while 26.3% are single. Most of the respondents had secondary education, accounting for 43.8%, while 31.3% had primary education. More so, 18.8% had tertiary education leaving 6.3% of the respondents with no education.

The result of the cost and return analysis revealed that the cocoyam/cassava enterprise had the highest net margin (N27,550), followed by cocoyam/cowpea enterprise (N26,100), cocoyam/maize (N25,290), and cocoyam/yam (N18,210).

Regression results revealed labor in man-days, land and other variable inputs as the significant factors influencing yam production in the area. These are targets for policy formulation. The major factors affecting the effective cultivation of the cocoyam in the study area includes; lack of information, irregular extension services, lack of government subsidies, lack of access to improved varieties, absence of

government support, low awareness level on the importance of the crop and poor research on the crop.

CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND OF THE STUDY

Cocoyam is a stem tuber that is widely cultivated in the tropical regions of the world and is a well-known food plant which has a long history of cultivation with Nigeria being the largest producer in the world and accounting for about 40% of the total world output (Ademiluyi, 2013).Cocoyam is an important carbohydrate staple food in the southern and middle belt areas of Nigeria (Asamugha and Mbanaso, 2002). It has been reported to be the third most important staple root / tuber crop after yam and cassava in Nigeria, (Knipscheer and Wilson, 2000 and Echebiri, 2004). It has relatively small-sized starch which are easily digestible and therefore acclaimed to be a very good source of carbohydrate for diabetic patients (Ademiluyi, 2013).

According to Ugbajah and Uzuegbuna (2012) small-scale farmers who operate within the subsistence economy grow most of the cocoyam in Nigeria. The surplus of the product is supplied to the market in the rapidly growing urban centers and the bulk of the production of cocoyam is in the Southern Nigeria. Ugbgah and Uzuegbuna (2012) also, observed that per capital production of the crop is on the decline and that its ecological restriction in the humid zones further compounds this. From a socio - cultural and economic point of view, the crop has a low rating and as a result, the

cultivation and consumption are of secondary importance. Ezenwa, (2010) observed that there has been a decline in the yields of cocoyam in the past few years. Although, present yields are still below expectation which could be attributed to many factors such as climate variation, drought, poor cultural practices among cocoyam growers, pest and disease infestations, there is the need to increase yield to meet the objective of national food security.

Table 1.0 World leading cocoyam producers 2007

	Area 1000ha	% World Area	Production 1000tonnes	% World Production	Yield kg/ha
World	983	100	5225	100	5314
Africa	783	74.3	3130	59.9	3996
Asia	150	15.2	1727	33.1	11538
Oceania	47	4.8	337	6.4	7142
Nigeria	250	25.4	1300	40.9	5200
China	86	8.7	1182	22.6	13808
Ghana	200	20.3	900	30	4500
Japan	28	28	380	7.3	13571
Cote d ivore	32	22.1	282	5.4	1300

Source: FAO production year book vol 44

Although Cocoyam is regarded as a major food crop in Nigeria especially in female-headed households, its consumption in recent times has increased (Asadu, et. al., 2011). Nwabuzor (2001) noted that, cocoyam are consumed in various forms when boiled, fried, pounded or roasted, and processed into chips (Achicha) which has a long shelf life and provides food all year round especially during lean planting season. More than ever, farmers will have to produce more efficiently: That is produce maximal output from a given mix of inputs or use the minimum levels of inputs for a given level of output. Various factors that explain farm efficiency could be examined so as to improve the crop production in the country.

1.1 STATEMENT OF THE PROBLEM

Despite cocoyam contribution to nutritional status of the diets of Nigeria and its contribution to industrial development and creating income for farmers, production of this crop has not received required attention.

Past researchers have limited themselves to the cultural practices like fertilizer application, spacing, weeding and so on. With little emphasis on the socio-economic aspects of the production, profitability and also the constraints faced by cocoyam-based farmers. The study will therefore seek to address the following research questions:

1. What are the socio-economic characteristics of cocoyam-based farmers in Ikole local government area of Ekiti state?
2. What is the return on investment of cocoyam-based production in the study area?
3. What is the output-input relationship of cocoyam-based production in the study area?
4. What are the problems faced by cocoyam-based farmers in the study area?

1.2 OBJECTIVES OF THE STUDY

The main objective of the study is to examine the profitability and constraints in cocoyam-based production in Ikole local Government area of Ekiti State, Nigeria. The specific objectives of the study are to:

i. examine the socio-economic characteristics of cocoyam-based production in study area;
ii. determine return on investment in cocoyam-based production in the study area;
iii. determine the output-input relationship of cocoyam based production in the study area; and
iv. identify the constraints faced by cocoyam-based farmers in the area of study.

1.3 JUSTIFICATION OF THE STUDY

A study of this nature has become necessary since cocoyamfarms in the form of the cocoyam intercropped with other crops called the cocoyam-based production systems has from time immemorial been the prevalent arable cropping system in the large guinea savanna vegetation agriculture in Nigeria. The predominance of the system has been occasioned by Nigeria's climate which is basically tropical and favourable for cocoyam production, farmer's level of technology and their socio-economic situations.

Though cocoyam when cultivated as a sole crop results in high outputs, the greatest disadvantage of sole cropping is that in instances of pest or disease outbreaks that attacks the soled crop, the farmer usually loses a significant part of his crops and sometimes even lose all. The cocoyam-based form of producing cocoyam is therefore preferred by farmers, as it insures them against total crop losses. However, producing cocoyam under different mixed cropping conditions will definitely impact on resource use in cocoyam production and consequently crops' yields. It is therefore necessary to examine the productivity of resource use in these cocoyam-based systems as this will help highlight those areas or variables that could be better managed to improve the productivity of cocoyam farms in Nigeria.

CHAPTER TWO

LITERATURE REVIEW

2.1 COCOYAM AS AN AGRICULTURAL PRODUCT

Cocoyam belongs to the monocotyledonous family Araceae known as the Aroids. The name cocoyam is generally applied to a variety of useful and edible species belonging to different genera including colocasia, Xanthosoma, Alocasia, Crytospema and Amorphophallus. Nigeria is the greatest producer of cocoyam in the world, she produces 40% of the world output followed by Ghana which produces 31% (Onwueme, 1978) By far, more important and more extensive cultivation in Nigeria are Colocasia and Xanthosoma (Ekpo, 2001; Nwauzor, 2001). Small-scale farmers who operate within the subsistence economy grow most of the cocoyam in Nigeria. The surplus of the product is supplied to the market in the rapidly growing urban centers. The bulk of the production of cocoyam is in Southern Nigeria (Enyinnia, 2001).

2.2 DIFFERENT FARMING SYSTEMS

Farming systems can be defined as the distribution of plants and animals in space and time and the combination of inputs believed to give maximum production in socioeconomic, political, and cultural contexts.

In conventional farming and monocropping systems, although high yield per unit area is been able to provide the nutritional needs of growing populations in some areas, but these systems requires direct and indirect to abundant costs and energy that arise from fossil fuels. In terms of ecology and environment, monocropping has been caused a series of serious problems. Human by excessive use of resources such as water, soil, forests, pastures and natural resources not only put them at the risk of extinction, but also with the creation of pollution caused by industrial activities, chemical fertilizers and pesticides, threatens the earth (Reganold, 1992). If farming activities can be conducted based on ecological principles, in addition to preventing the destruction of natural ecosystems, the result is a stable condition (Mazaheri, *et al* 2006). Also agricultural systems must provide the need of the people today and future generations; it therefor seems that it is essential to achieve a sustainable agriculture. One of the strategies in sustainable agriculture is restoring diversity to agricultural ecosystems, and also the effective management of the ecosystem.

Intercropping is a way to increase diversity in an agricultural ecosystem. Intercropping as an example of sustainable agricultural systems following objectives such as: ecological balance, more utilization of resources, increasing the quantity and quality and reduce yield damage to pests, diseases and weeds. Success of intercropping system of farming in comparison witha pure cropping can be determined by a series of agronomic operations and interactions between the species will be affected by them.

These operations are including ultimate density, planting date, resources availability and intercropping models (Mazaheri*et al.*, 2006; Gliessman, 1997)

Although there is no recorded history for intercropping and multiple cropping, however, considering the available evidence, planting crops as a combined has a long history. Intercropping is as a multiple cropping system, in which two or more crops species planted simultaneously in a field during a growing season or the simultaneous cultivation of different crops on the same piece of land. Intercropping has been used interchangeably with mixed cropping. Of course this doesnot mean that in the intercropping, plants can be planting at a time together, but is the purpose that two or more crops are together in one place, during their growing season or at least in a timeframe. Therefore it is possible that the plants are different in terms of planting time, and a plant is planted after the main crop has been planted on the same piece of land plant (Mazaheri*et al.*, 2006; Ofori and Stern, 1987).

2.2.1 Advantagesof intercropping

There are many reports concerning the positive effects and also superiority of intercrop than the pure cropping. Most important advantages of intercropping are the following:

1. Increasing production

One of the main reasons for the use of intercropping around the world is produced more than a pure cropping of same land amount (Caballero and Goicoechea, 1995. Theincrease in the use efficiency is important, especially for small-scale farmers and also in areas where growing season is short (Altieri, 1995). Production more in intercropping can be attributed to the higher growth rate, reduction of weeds, reducing the pests and diseases and more effective use of resources due to differences in resource consumption (Eskandari, 2012b; Eskandari et al., 2009b; Watiki et al., 1993; Willey, 1990; Willey, 1985). In addition, if there are "complementary effects" between the components of intercropping, production increases due to reducing the competition between them (Mahapatra, 2011; Zhang and Li, 2003; Willey, 1979).

2. Greater use of environmental resources

Advantages of intercropping in the crop production in comparison with pure cropping are due to the interaction between components in intercrops and the difference in competition for the use of environmental resources (Mahapatra, 2011; Valdez and Fransen, 1986). If the intercrops components have a difference together in use of environmental resources, so that are complementary in use of this resources, thus use of the resources is moreeffective than a pure cropping, and the result increased yield (Jensen, 1996). In terms of competitive this means that, intercrops components are not

competition for same nich (ecological nest) due to differences morphological and physiological, and competition between species is less than competition within species (Vandermeer, 1992).

3. Reduction of pests, diseases and weeds damage

One important advantage of intercropping is its ability to reduce pest and disease damage. In general strategies involved in reducing pest infestation and damage in intercropping can be divided into three groups: First: delimiter crop hypothesis: this way that second species, breaks down the ability of a pest in attack to its host, and is used more in proprietary pests. Second: trap crop hypothesis: means that second species, attracted towards their, pest or pathogen that normally does damage to the main species, and is used more in general pests and pathogenic agents.

Third natural enemies' hypothesis: this way that predators and parasites are more attracted in intercropping, than the monocropping, and thereby diminishes parasitized and prey (Danso *et al.*, 1987). Intercropping patterns are more effective than monocropping in suppression of weeds, but their effectiveness varies greatly (Girjesh and Patil, 1991).

4. Stability and uniformity Yield

For farmers who have limited sources, income and stability yield of agricultural systems is very important. When several crops can be grown together, fail to produce

a product, could be compensated by other crop, and thereby reduces the risk. Risk of agronomy failure in multi cropping systems is lower than pure cropping systems. It may be an appropriate growth condition for a species and inappropriate for other species (Eskandari et al., 2009a).

5. **Improve soil fertility and increase in nitrogen**

Conservation of soil fertility in intercropping is a form of rotation that each season is done on land. Rhizobium bacteria are able to have a symbiotic relationship with plants of leguminosae family, and thereby can fixation of atmospheric nitrogen into available nitrogen for plants uptake. And the result nitrogen (as an essential element for soil fertility and plant growth) is added to the soil. There are several reports indicating that increasing the nitrogen content in non-legume plants, due to the intercrops of these plants with plants of leguminosae family (Eskandari et al., 2009a; Anil et al., 1998; Fujita et al., 1992). (Mousavi and Eskandari, 2011).

2.3 COCOYAM PRODUCTION (WORLD VIEW)

The production of cocoyam can occur under upland or flooded condition, or the production of cocoyam can be confined almost exclusively to upland condition. Most of the upland cultivation of cocoyam is for subsistence, average holdings are typically small, and intercropping is common

The major cocoyam-based cropping system in Cameroon are;

a. In the very wet regions with short dry season, the cocoyam is grown as a biannual or perennial crop. It is planted with little or no tillage and it is intercropped with maize and vegetable. Multiple harvesting is practiced with mature cormels being removed from each cocoyam plant every three months or so, over a period of two to three years.
b. In drier areas, the crop is grown as an annual crop intercropped with vegetable and harvested at the onset of the first dry season.
c. In the plantations of young cocoa, oil palm and rubber, cocoyam is sometimes grown as an intercrop until plantation closes canopy.

In south-western Nigeria, cocoyam as historically been a shade crop for the young cocoa plants in the plantation. On the other hand, cocoyam are the favourite crops for compound gardens around the homestead in south-eastern Nigeria. Ash and refuse from the compound are used to provide nutrient for the cocoyam whether in compound farming or in more distance farms, intercropping with maize, yams, cassava, pulses, cucurbits or groundnuts is quite common. Intercropping cocoyam with plantain and young oil palms is also practiced. In japan, upland taro and flooded rice are sometimes grown in rotation on the same plot with a resultant improvement in yields of both crops.

2.4 PROBLEMS ASSOCIATED WITH COCOYAM PRODUCTION

Laborious; it is labor intensive. Planting and harvesting require the most labor. Unfortunately, most of the production is from small holdings where manual labor is used. The solution to this problem lies in greater mechanization. Efforts should be increased to devise machines that will plant and harvest cocoyam. It is hoped that seedling transplanters used for other crops can be modified for planting and harvesting for other crops can be used.

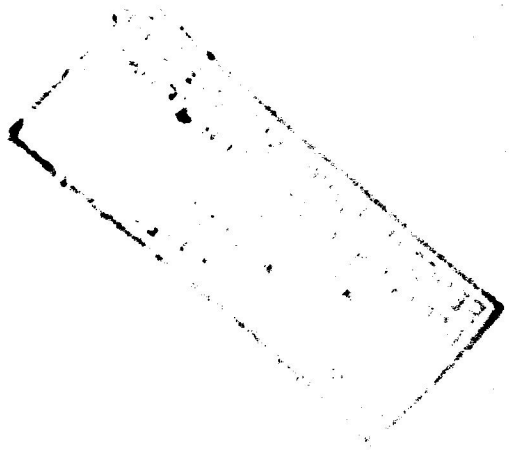
Limited ecology; large amount of water is toproduce is a big problem where water is scarce. It require a great amount of water per unit of dry matter produced. It require water continuously throughout the growing season.

Difficulty in breeding; the sexual processes in cocoyam are unreliable and controlled hybridization is extremely difficult. The use of gibberellic acid to induce flowering has alleviated the problem somewhat, but much more progress still needs to be made.

Planting materials; like yam, but unlike cassava and sweet potato, cocoyams have the disadvantage that part of the edible harvest must be reserved as planting material up to 10%

Storage; most types do not keep well for long periods. Farmers are tempted to leave them in the ground and harvest when needed. Solution will probably be found in ongoing research aimed at devising cheap but effective storage methods.

Diseases and pest; diseases and pest pose problem in production. Taro leaf blight is a disease that mostly affect the cocoyam leaf which can result in low production. Small rodents like bush rat can greatly affect the yield of cocoyam comels.



CHAPTER THREE

METHODOLOGY

3.1 THE STUDY AREA

This study was be carried out in Ikole Local Government Area of Ekiti State. Ikole is situated in the deciduous forest area of the State. The good drainage of the land makes it very suitable for agricultural pursuits. The two seasons – Dry Season (November – February) and Rainy Season (early March – mid November). Rainfall is about 70 inches per annum which is quite distinct and very important to the agricultural pursuits of the people.

Ikole Local Government is located between longitude 45o East of Greenwich and latitude 7° – 8° – 15° North of the Equator. It is bounded by Kwara State to the North, Kogi State to the North east, Ekiti East to the East, Gboyin Local Government to the South and Oye Local government to the West. The local government is mainly on the upland zone rising to about 250 meters above the sea level and occupies an area of about 374,940kms of land and according to the 2006 National Population Census figure, the total population of the local government was 168,436.

3.2 Method of data collection

Data was collected from both primary and secondary sources. Data from primary sources was collected through interview technique based on the use of questionnaires administered by enumerators.

Data from secondary sources were collected through the use of official reports from the local government officials and the review of literature.

3.3 Sampling technique

Four villages under Ikole local government area were purposively selected for the study. They include; Otunja, Isaba, Ilotin, and Ijeshaisu. Random sampling technique was used to select 20 respondents in Otunja, Isaba, Ilotin, and Ijeshaisu. This brings a total sample size of 80 respondents.

3.4 Data collection

Data collected includes production pattern of respondents and cost of production. On the pattern of production, information collected were based on the cropping system, farm size, crop yield/ha and the total amount of yield obtained from the area cultivated. For cost of production, input procurement cost, cost of hired and family labor, inputted cost of land were determined.

3.5 ANALYTICAL FRAMEWORK

3.5.1 Descriptive statistics

Descriptive statistics were used to achieve objective 1, and 4 so as to have a summary description of the data collected by the use of percentages, measure of central tendency to describe parameters like farmer's age, family size, educational level, income farming experience, main occupation and production constraints

3.5.2 Gross margin analysis

Gross margin analytical tools was used to achieve objective 2 to determine the cost and returns involved in the production of cocoyam-based farming and the Net farm income. This was carried out to ascertain profitability of cocoyam-based production of farmers. The formula is given as:

GM = GI – TVC

Where:

GM = Gross margin

GI = Gross farm income or total revenue

TVC = Total variable cost

The Net farm income is given as

NFI = GM – TFC

Where:

GM = Gross margin

TFC = Total fixed cost

3.5.3 Multiple regression analysis

Multiple regression analysis was used to achieve objective 3, to determine the input-output relationship.

Data obtained from the field were subjected to four functional forms, linear, semi-log, Double-log and exponential forms. The regression model used in its implicit form is specified as follows:

$Y = f(X1, X2, X3, U)$

Where Y = Quantity of cocoyam output in Kilogram

X1 = Farm size (land)

X2 = Labor input in man-days

X3 = Educational level

X4 = Fertilizer

ei = Error term.

3.6 LIMITATION OF THE STUDY

There was the problem of accurate data collection because most famers did not keep records of their farm transactions. They however rely on their memories to give information needed. Also some of the farmers were unwilling to answer some questions in the questionnaires. Their reasons are that questionnaires have been administered to them in the past but nothing has been done for t to assist them their cocoyam production in the study area.

CHAPTER FOUR

RESULTS AND DISCUSSION

The presentation of results and discussion is based on, the socio-economic characteristics of the farmers which consists of the farmer's age, sex, marital status, and level of education, and also the crop production, sales, and the constraints.

4.1 SOCIO-ECONOMIC CHARACTERISTICS OF FARMERS

Table 1 shows the distribution of respondents according to farmer's age, this determines the farmer's strength and extent of farming experience the farmers has especially in developing countries where most of the farm operations are done manually. A too young farmer lacks both experience and strength to farm while an old farmer though with experience but may not be able to perform well. The result shows that farmers below 30 years constituted 16%, farmers between the age of 30-39 constituted 15%, farmers between the age of 40-49 constituted 35%, farmers between the age of 50-59 constituted 15% and farmers above 60 years constituted 15%. These shows that younger farmers between the ages of 30-39 and older farmers above 60 years of age are not actively involved in cocoyam-based production, while farmers from 40-59 years were mostly involved in the production of cocoyam. And these constitute 50% of cocoyam producers in the study area.

Table 2: frequency distribution of respondents according to their age

age	frequency	percentage	mean age
< 30	13	16.3	45
30-39	12	15	
40-49	28	35	
50-59	15	18.8	
>60	12	15	
total	80	100	

Source: Field Survey

4.1.2 Sex of Respondents

The sex of respondents were also computed. Analysis has shown that 90% of the respondents were male while 20% were females. These shows that the men are mostly involved in cocoyam production than women in the study area.

Table 3: frequency distribution of respondents according to their sex

sex	frequency	percentage
male	72	90.00
female	8	10.00
total	80	100.00

Source: Field Survey

4.1.3 Marital status

Results show that 68.8% of the respondents were married, 26.6% were single and 5% are widowed (as shown in table 4). High percentage of those married can be attributed to the fact that women play important role and contribute a lot to farm work.

Table 4: frequency distribution of respondents according to their marital status

status	frequency	percentage
single	21	26.3
married	55	68.8
widowed	4	5
total	80	100

Source: Field Survey

4.1.4 Level of Education of Respondents

From the result in table 5, it was discovered that 6.3% of the respondents had no formal education, 31.3% attended primary school, 43.8% attended secondary school and 18.8% had tertiary education. This shows that majority of the farmers in the study area i.e. 93.9% had basic education to help them in farming. Educated farmers are known to be better informed, they have access to information on production technologies. Educated farmers are also known to easily adopt new and improved technologies.

Table 5: frequency distribution of respondents according to their level of education

education	frequency	percentage
no formal education	5	6.3
primary education	25	31.3
secondary education	35	43.8
tertiary education	15	18.8
total	80	100

Source: Field Survey

4.2 CROP PRODUCTION

The basic resource used in agriculture is land. Crop production depends on land availability which can determine the output of the farm.

4.2.1 Land ownership

Land is the basic means for agricultural production, its mode of acquisition either through inheritance, rent or leasing, purchased or from cooperative society in the area of study as shown in table 8. From the table, 48.8% of the respondent inherited the land they use, 35.o% got the land through leasing, 12.5% of the respondents purchased the land they use, 2.5% got the land they use through cooperative societies and 1.5% got the land through other means.

Table 6: frequency distribution of respondents according to their mode of land acquisition

method	frequency	percentage
inheritance	39	48.8
rent/lease	28	35
purchased	10	12.5
cooperative society	2	2.5
others	1	1.3
total	80	100

Source: Field Survey

4.2.2 Farm Size

Farm size is very important in agriculture because it determines the output of the farmer. From the result in table 7, those that cultivates less than 1 hectare constituted 57.5%, those that cultivated between 1-2 hectare constituted 27.5% and those that cultivated between 2-3 hectare constituted 15.0%. This shows that the majority of the farmers are small scale cocoyam growers and devoted less land to cocoyam-based production.

Table 7: frequency distribution of respondents according to their farm size

farm size	frequency	percentage	mean size
<1 hectare	46	57.5	2
1-2 hectare	22	27.5	
2-3 hectare	12	15	
total	80	100	

Source: Field Survey

4.2.3 Mode of Cultivation

Table 8 shows that 67.5% of the farmers did not grow cocoyam solely, and this is likely due to the fact that cocoyam is a shade crop and help to provide shade for smaller crops, and or lack of enough land, capital and other resources to go into cocoyam production solely, also 32.5% of the farmers grow cocoyam solely.

Table 8: frequency distribution on mode of cultivation

mode	frequency	percentage
yes	26	32.50
no	54	67.50
total	80	100.00

Source: Field Survey

4.2.4 Crop combination

When asked what crops the respondents grow along side with cocoyam in the form of combinations, 50% of the respondents have their combinations in this form cocoyam/maize/cassava, this can be due to the fact that farmers make more profit with this form of combination. More so 25% of the respondents have combine crops in form of cocoyam/yam/cassava and 15% have combination in form of cocoyam/maize/vegetable.

Table 9: frequency distribution on crop combinations

enterprise combination	frequency	percentage
cocoyam/cassava	35	45
cocoyam/yam	25	27
cocoyam/maize	16	20
cocoyam/cowpea	4	8
total	80	100

Source: Field Survey

4.2.5 Percentage area devoted to cocoyam

From the research conducted in the study area, 17.5% of the farmers in the study area devoted less than 20% of the total land area to cocoyam cultivation, 80% devoted between 20-50% of the land area to cocoyam cultivation, and just 2.5% of the farmers

devoted more than 50% of the land area to cocoyam cultivation, this can be due to the fact that the total land area is small to combine with other crops.

Table 10: frequency distribution on percentage area devoted to cocoyam

percentage area	frequency	percentage
< 20	14	17.5
20-50	64	80
> 50	2	2.5
total	80	100

Source: Field Survey

4.2.6 Reasons why farmers cultivate cocoyam with other crops

When respondents were asked why they grow crop in combinations, 85.0% said that it's because they get more money from the production, 11.3% said that it helps to insure their farm against certain uncertainties, while 3.8% gave no reason.

Table 11: frequency distribution of respondents on why they grow crop in combinations.

reasons	frequency	percentage
more profit	68	85
insurance	9	11.3
none	3	3.8
total	80	100

Source: Field Survey

4.3 SALES

4.3.1 Specific buyer

The result of the analysis conducted in the study area shows that 81.3% of the respondents has specific buyers of cocoyam and 18.8% of the respondents do not have specific buyers for cocoyam.

Table 12: distribution on whether the farmers have specific buyer or not

specify	frequency	percentage
yes	65	81.30
no	15	18.80
total	80	100.00

Source: Field Survey

4.3.2 Mode of transportation

Table 13 shows that 41.3% of farmers transport their produce using motor vehicle, 25% of the farmers transport their produce by hand trucks and 33.8% transport by head potterage. These result shows that 58.8% does not transport their produce by motor vehicle probably because of the high cost of transportation by that means.

Table 13: mode of transportation

transportation	frequency	percentage
motor vehicle	33	41.3
hand trunks	20	25
head potterage	27	33.8
total	80	100

Source: Field Survey

4.3.3 Price determination

When respondents were asked how they determine the price of the cocoyam produced, 13.8% said that they determine the price personally, 85.0% responded that it is from the cost of production and margin and 1.3% said that the government help them to determine the price of cocoyam.

Table 14: price determination

price determination	frequency	percentage
personal	11	13.8
cost of production	68	85
government	1	1.3
total	80	100

Source: Field Survey

4.4 RESULT OF THE GROSS MARGIN ANALYSIS AND NET FARM INCOME

The result of the gross margin analysis conducted to deduce the cost and return of cocoyam-based production in the villages selected in Ikole local government area of Ekiti state is shown in table 15.

Table 15: Result of cost and return analysis

Variable	Cocoyam/cassava	cocoyam/yam	cocoyam/maize	cocoyam/cowpea
seed	21,480	16,750	19,650	23,130
fertilizer	37,050	31,200	32,900	36,700
land preparation	30,900	17,200	20,050	28,600
ploughing	7,800	6,480	6,500	8,750
weeding	6,950	5,750	4,450	7,450
harvesting	8,100	6,300	8,000	8,450
empty sacks/baskets	5,350	5,850	5,050	5,900
transportation	42,570	16,260	17,540	26,770
pesticides	33,200	25,250	27,250	32,350
TVC total variable cost	193,400	131,040	141,390	178,100

Source: Field Survey

variable	cocoyam/cassava	cocoyam/yam	cocoyam/maize	cocoyam/cowpea
TVC total variable cost	193,400	131,040	141,390	178,100
AVC average variable cost	0.3	0.25	0.33	0.23
GI gross income	224,000	151,200	168,000	141,390
GM gross margin	30,600	20,160	26,610	29,100
TFC total fixed cost	3050	1950	1319.6	3000
NFI net farm income	27,550	18,210	25,290.40	26100

Source: Field Survey

Costs and returns analysis

It was determined that the total yield obtained by the sampled farmers in otunja was 40 sacs of cocoyam and the average selling price of one sac is N5600 naira during the survey period from this information, the gross margin for Otunja was calculated thus:

The cost and return statistic for cocoyam-based production farm enterprises in the study area are as presented in Table 15. The Net farm income revealed that the cocoyam/cassava enterprise had the highest net margin (N27,550), followed by cocoyam/cowpea enterprise (N26,100), cocoyam/maize (N25,290), and cocoyam/yam (N18,210).

4.5 REGRESSION RESULT

The Cobb-Douglas production function was chosen as the lead equation for cocoyam-based cropping systems in the area Table 16. All specified variables in the model were significant ($P<0.05$). The co-efficient of determination of the best fit showed that 85% of the variation in cocoyam production was explained by the fitted variables. The variables that significantly influenced cocoyam-based cropping systems in the study area were labour in mandays, land, and fertilizer. The regression result clearly shows that there is a relationship between the key inputs; land, labor, level of education and fertilizer, and the output. This simply implies that if there is an increase in these variables there will be a resultant increase in the output/hectare and vice-versa.

Table 16: Regression Results of cocoyam-based Production in Ekiti State

Cocoyam-based system	Constant	Land	Labor	Level of education	Fertilizer	Adjusted R	F-Value
cocoyam/cassava	19.214	89.924	2.589	**0.017**	0.179	0.642	649.04
	0.314*	0.098	5.644*	**0.916**	7.025*		
cocoyam/yam	2.007	0.133	0.041	**0.0042**	0.539	0.748	479.17
	3.775*	0.35	7.689*	**1.022**	4.231*		
cocoyam/maize	1.055	0.213	0.732	**0.035**	3004.3	0.846	314.87
	8.511**	7.027**	2.781**	**1.988**	2.126*		
cocoyam/cowpea	-8.768	9.02	4	**7.462**	2368	0.423	314.87
	3.819**	1.498	2.031*	**0.76**	3.935*		

* = significant at 0.05, ** = significant at 0.01

4.6 CONSTRAINTS

During the research , respondents were asked to indicate the various constraints to cocoyam production in the study area as indicated in table 16, 45% of the respondents said absence of government support is their major constraint, 20.4% said that lack of subsidies is their constraint. Moreover, 12.8% said that irregular extension service is their major constraint, while 10.9% said lack of access to improved varieties is their constraint, 5% said that low awareness level on the importance of the crop is their major constraint. Finally, 4.3% of the respondent said that poor research on the crop is their constraint, and while 1.6% said that lack of information also contribute to the constraint faced by farmers in the study area.

Table 17: frequency distribution of the constraints faced by farmers.

Constraints	frequency	percentage
Lack of information	2	1.6
Irregular extension services	13	12.8
No government subsidies	20	20.4
Lack of access to improved varieties	10	10.9
Absence of government support	28	45.0
Low awareness level on the crop	4	5.0
Poor research on the crop	3	4.3
Total	80	100

CHAPTER FIVE

SUMMARY, CONCLUSSION AND RECOMMENDATIONS

5.1 SUMMARY

The study was carried out to provide information on cocoyam-based production in the study area. The objectives are to examine the socio-economic characteristics of cocoyam-based production in study area, determine return on investment in cocoyam-based production in the study area, determine the output-input relationship of cocoyam based production in the study area, and identify the constraints faced by cocoyam-based farmers in the area of study.

The result shows that most of the farmers were from 40-49 years of age, constituting 35% of the respondents, while 90% of the respondents were male, just 10% of the respondents were females. The result also shows that 68.8% of the respondents are married, while 26.3% are single. Most of the respondents had secondary education, accounting for 43.8%, while 31.3% had primary education. More so, 18.8% had tertiary education leaving 6.3% of the respondents with no education.

The result of the cost and return analysis revealed that the cocoyam/cassava enterprise had the highest net margin (N27,550), followed by cocoyam/cowpea enterprise (N26,100), cocoyam/maize (N25,290), and cocoyam/yam (N18,210).

From the regression analysis, it shows that there is a relationship between the inputs used in the cocoyam-based production and the output/ha.

Lastly, the result also shows that 45% of the respondents said absence of government support is their major constraint, 20.4% said that lack of subsidies is their constraint. Moreover, 12.8% said that irregular extension service is their major constraint, while 10.9% said lack of access to improved varieties is their constraint, 5% said that low awareness level on the importance of the crop is their major constraint. Finally, 4.3% of the respondent said that poor research on the crop is their constraint, and while 1.6% said that lack of information also contribute to the constraint faced by farmers in the study area.

5.2 CONCLUSION

From the research carried out in Ikole local government area of Ekiti state, it shows that cocoyam-based production has a bright prospect despite numerous constraints faced by farmers in the study area. Increased in production could be achieved if both institutional and infrastructural facilities are provided in the study area. These problems affecting cocoyam production include; lack of information on modern methods of cultivating the crop, irregularity of extension services for the crop, shortage of planting materials, lack of access to improved varieties of the crop,

absence of government support for the crop, low awareness level on the importance of the crop

5.3 RECOMMENDATION

In view of the result of the study, the following measures if adopted could boost cocoyam-based production in the area.

1. Farm inputs like seeds, fertilizer, pesticides, etc.should be given to farmers at subsidized rate so as to aid their production.
2. Infrastructural facilities like good road network to aid the transportation of produce to reduce marketing cost should be provided by the government
3. Government should create more cocoyam marketing boards to encourage the farmers in production.
4. Government and NGOs should create awareness on the importance of the crop.
5. Private and public research institutes should research more on the crop to produce new and improved varieties.

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APPENDIX

QUESTIONNAIRE

FEDERAL UNIVERSITY OYE-EKITI, EKITI STATE, NIGERIA.

THE DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

TOPIC: PRODUCTIVITY ANALYSIS OF COCOYAM-BASED PRODUCTION IN IKOLE LOCAL GOVERNMENT AREA OF EKITI STATE.

FARMERS QUESTIONNAIRE

The bearer is an undergraduate student from the department of Agricultural Economics and Extension, Federal University Oye-Ekiti, Ekiti State and is carrying out a project on Productivity Analysis of Cocoyam-Based Production; A case study of Ikole Local Government Area of Ekiti state which is a for partial fulfillment for the award of B.Agric in FUOYE Ekiti.

NOTE: The questionnaire is designed to obtain information for academic research purpose. It will be appreciated if answered whole-heartedly as information will be treated with strict confidentiality.

SECTION A: SOCIO-ECONOMIC CHARACTERISTICS [personal data]

1. Age in years_____
2. Gender (a.) Male ( ) (b) Female ( )
3. Marital status (a) Single ( ) (b) Married ( ) (c) Divorced ( ) widowed ( )
4. Number of years spent in School_____-

5. Are you the Household head? Yes ( ) No( )

6. Total number of people living in your household_____

7. People living in your household above 18 years,**family relations** and age (start from the eldest)

S/N	Sex	Age	**Relationship with the household head**	Occupation

8. How many people do you have below 18years in your household?_____

9. Primary Occupation of the Household head? **a. Trading** ( ) b. Civil Service ( ) c. Artisan ( ) d. Farming ( )

10. If farming, how long have you been farming? _____

11. Which crop(s) do you plant? a. Maize ( )b. Cowpea ( )c. Vegetables ( ) d. Coco-Yam ( ) e. Yam ( ) _____Others specify

.....

12. What is your farm size (Ha)
13. How did you obtain your farm land? a. By inheritance ( ) b. By gift ( ) c. By Leasehold ( ) d. By Community e.Shared Tenancy ( )
14. Are you a member of any cooperative or farming organization? Yes ( ) No ( )
15. If yes please specify:_____
16. Secondary Occupation of the Household Head? .....
17. What is your estimated average montly income_____N
18. What is your average monthly savings _____N
19. What is your average monthly investment_____N

SECTION B: CROP PRODUCTION.

20. How many hectares of land do you cultivate?_____Ha
21. Do you grow cocoyam solely? YES [ ] NO [ ]
22. If no, what other crops do you grow alongside cocoyam? _____ Specify.
23. Which crop do you prefer to produce aside from cocoyam?

Crop	Tick as appropriate
Pepper	
Maize	
potatoes	

tomatoes	
Rice	
soybean	
beans	
Yam	
cassava	

24. Why do you produce cocoyam?

(a) I get more money [ ] (b) requires less labor [ ] (c) less disease attack [ ]

(d) used for food [ ] (e) Has medicinal value ( )others (specify)_____

25. Where do you obtain farm inputs like, seedlings, fertilizer, agrochemicals etc.

Inputs	source	Quantity	Amount
Seedlings			
Fertilizer			
agrochemicals			

Others specify

26. Which of the following means of transportation do you use for moving your cocoyam to the market? _____

27. How much does it cost to move your coco-yam produce in the last season (N)

SECTION C: SALES

28. do you have a specific buyer for your cocoyam? YES [ ] NO [ ]

29. if yes, specify from the following:

(a) farm gate [ ] (b) cooperative society [ ] (c) agro-industries [ ] (d) wholesaler [ ]

Others_____

30 Who determines the market price for your cocoyam (a) My family [ ] (b) union [ ] (c) cost of production and margin [} (d) government [ ] (e) international price [ ]

31. Do you think people consume more cocoyam in your area YES [ ] NO [ ]

If yes, do you think more farmers needs to go into the production of cocoyam? YES [ ] NO[ ]

SECTION D: CONSTRAINTS

32. Please tick as appropriate for each constraint to cocoyam production. Key: To A Very Great Extent (TVGE), 4: To A Great Extent (TGE), 3: To Some Extent (TSE), 2: To A Little Extent (TLE) 1: To No Extent (TNE)

S/N	Constraints	TVGE	TGE	TSE	TLE	TNE
1	Lack of information on modern methods of cultivating the crop					
2	Irregularity of extension services for the crop					

3	No subsidies on planting materials for the crop					
4	Lack of access to improved varieties of the crop					
5	Absence of government support for the crop					
6	Low awareness level on the importance of the crop					
7	Poor research on the crop					
8	Others (specify)					
9	Others (specify)					
10	Others (specify)					

33. What do you think can be done to solve the problems listed above.

1 ..... 2. .....

3. .....4.....

5. ..... 6. .....

E. Input and output during the last season: 34. Please complete the table below

1. Plot number	2. Total plot area (ha)	3. Land tenure	4. What Crop is grown	5. Quantity of Seed/planting materials	6.Cost of seed/planting materials	7.Quantity of herbicides	8. Cost of herbicides	9. Quantity of pesticides	10. Cost of pesticides	11. Quantity of Fertilizer applied	12. Cost of fertilizer applied	13. Quantity of other	14. Cost of Other chemicals/inputs used	15.Output of plot	16. Price /unit of Output

35. Please complete the table below on your labor input

	Land preparation			Weeding		fertilizer application		Herbicides application		Pesticides application		Harvesting		Labour input for all other activities	
1.Plot number	2. Land preparation method	3. Family labour (total labour days)	4. Hired labour (total labour days)	5.Family labour (total labour days)	6. Hired labour(total labour days)	7.Family labour (total labour days)	8.Hired labour (total labour days)	9. Family labour (total labour days)	10. Hired labour (total labour days)	11. Family labour(total labour days)	12. Hired labour (total labour days)	13. family labour (total labour days)	14. Hired labour (total labour days)	15. family labour(total labour days)	16. Hired labour(total labour days)
Total labour days (adult equivalent)															

36. What is the daily average wage during cropping season (Naira/day) _____?