EFFECTS OF CHANGES IN COCOA PRODUCTION ON FARMERS LIVELIHOOD IN EMURE LOCAL GOVERNMENT AREA, EKITI STATE NIGERIA

BY

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A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SCIENCE DEGREE IN RURAL DEVELOPMENT

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APRIL, 2017

DECLARATION

I declare that the work in this Dissertation entitled "**Effects of Changes in Cocoa Production on Farmers Livelihood in Emure Local Government Area, Ekiti State Nigeria"** has been carried out by me in the department of Geography. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this work has been presented in any previous application for another degree or diploma at any institution.

…….. …… ……

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MSC/01829/2010-2011

CERTIFICATION

This dissertation entitled **"EFFECTS OF CHANGES IN COCOA PRODUCTION ON FARMERS LIVELIHOOD IN EMURE LOCAL GOVERNMENT AREA, EKITI STATE NIGERIA"** by Emoyefe Ono EMUEMUKORO meets the regulations governing the award of the Degree of Master of Science in Rural Development of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

I dedicate this work to Almighty God who saw me through the course of this study and my lovely wife Edith Emuemukoro.

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ABSTRACT

There is a growing demand for the resuscitation of the cocoa industry in Nigeria largely due to the dwindling of the foreign exchange earnings from the oil sector. It is believed in principle that the economy can be diversified in favour of cocoa production in other to boost socio-economic standards in our rural communities. This study therefore focused the effect of changes in cocoa production on farmers' livelihood in Emure Local Government Area of Ekiti State, Nigeria. Two hundred and forty eight 248 samples were proportionally selected according to population size among the four wards namely, Odo-Emure I, Odo-emure II, Oke-Emure III and Oke-Emure IV. Multi-stage sampling procedure was adopted using purposive and random sampling techniques in selecting cocoa farmers in the study area. Structured questionnaire was used as a major research instrument. Data were analyzed using descriptive statistics to summarize the data into frequency counts, percentages and charts. Also, multiple regression and t-test statistics were employed to test whether there is no significant relationship between socio-economic characteristics of farmers and productivity. Malmquist productivity index was used to analyze the total factor productivity (TFP) of cocoa producers from 2005- 2014. The results show that nearly all the cocoa farmers are males (97.6%) and are married (92%). Moreover, about 53.0% are aged, while less than half (48.0%) are have had more than 20 years farming experience. At literacy level, 60.8% were educated. Majority (91.3%) of the farmers producing between 1-10 tons of cocoa are in 2005-2010, and they produced a total of 6.0 metric tons of cocoa compared to an increase number of farmers in 2011-2014, numbering a total of 96.8% farmers producing 6.5 metric tons of cocoa. Majority of the respondent 46% earned maximum of ₦250, 000 yearly. Considering the Malmquist productivity index, the result of the analysis shows a progress in the total factor productivity growth of cocoa farmers. The positive growth was due to both technical efficiency change and technical change. The result of the analysis indicates that change in production had a significant impact on the farmers' livelihood. Challenges facing cocoa production ranged from finance to non-availability of chemicals. Cocoa diseases accounted for 81.9%. The coping strategies include planting of hybrid seedlings 90.3% to replace the moribund ones. The factors that were found related to the productivity of cocoa include, age, marital status and years of the farmers' experience in cocoa production were found to be significant at 1% percent level of probability. On the basis of the findings, the study recommends that as cocoa farmers are ageing the youths should be encouraged by making farming attractive and lucrative. Also, government should give priority to cocoa production not only to solidify country's economic base but also raise living standards of the cocoa producers.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Nigeria is one of the countries in Africa that has highly diversified agro-ecological conditions, which makes the production of a wide range of agricultural products possible. Agriculture is a potentially viable sector of the country's economy, particularly in terms of its employment generation as well as its contribution to Nation's Gross Domestic Product (GDP) through export. The contribution of agriculture to the overall economic growth has declined from 70 per cent at independence to about 25 per cent in the mid-1970s (the oil boom period). In spite of this sharp decline, agricultural sector accounts for about 80 per cent of the active labour force (Central Bank of Nigeria, 2007). Abayomi (2006) noted that agriculture is capable of increasing not only per capita income; reduce spatial inequalities between rural and urban areas, but also to reduce the unprecedented mobility of rural-urban migration.

Cocoa (*Theobroma cacao*) is a major economic tree crop in Nigeria because it provides jobs and income to the farmers, raw materials for the industry and foreign exchange for the country. Between 1950 and 1960, cocoa was the highest source of foreign exchange in the country (Oyedele, 2007). The discovery of oil in 1970, coupled with other socio-economic factors such as Household size, Farm size, management system and input cost, led to the relegation of cocoa to the second position in terms of foreign exchange earnings for the country. Since then, oil sector is the pivot of Nigerian economy with attendant poverty, unemployment and weak industrial base particularly in the agriculture sector. Economic diversification is a panacea to the socio-economic problems

in Nigeria. In order to diversify the Nigerian economy, the Federal Government of Nigeria (FGN) decided to rejuvenate cocoa industry with emphasis on increased production among other things. As a result, some interventions were introduced into cocoa industry with the aim of meeting the needs of the expanding industrial sector, increasing foreign exchange, enhancing job creation and farmers' income (FGN, 2006).

Nigeria is an important player in the cocoa sector and as such, the Nigeria output has effects on the international aggregate output and price level. Cocoa production in Nigeria is done in the South West of the country especially in Ondo state and some are seen in the South -South zone especially in Akwa-Ibom state.

In the early part before and after the independence in Nigeria, Nigeria was solely dependent on agricultural output such as cocoa as means of foreign exchange and income for the government and citizenry. The bulk of the country was run with revenues got from agricultural produce. The Southwestern part of the country was reliant on the production and sales of Cocoa. So also was the Northern part of the country that gets its output from monkey nut (also known as groundnut) and cotton. The southern parts were not left out because they had vast amount of land at the time providing them with palm kernel. This is an indication of the commercial viability and economic importance of cocoa in the community of other cash crop. (Alamu, 2013).

World cocoa output was estimated to have increased by 50% in the early period of independence of the country's output (between 1958 and 1966) with practically the whole increase coming from West Africa (Ivory coast, Ghana & Nigeria mainly). Cocoa has several uses and benefits to an economy which includes export, support to the manufacturing sector, supplies of raw materials to industries and gainful employment to

the teeming population. Africa is the largest producer of cocoa to the international market, which are normally in Europe and America. Ivory Coast, Ghana and Nigeria share the largest contribution to the world market and with Ivory Coast by far the highest producer producing up to 39% of world output (United nation on Trade and Development, 2004). While the contribution of Nigeria and Ghana is 19% and 6% respectively (UNCTAD, 2004).

The agro-forestry sub-sector is of great significance to the Nigerian agricultural sector, which is the integration of trees, food crops and/or animals in an interactive manner (Okadi 2007). It is one of the most popular agricultural practices in southwest Nigeria under which cocoa is produced. Cocoa-based agro-forestry therefore refers to the practice in which cocoa trees for the production of cocoa beans are the dominant component of the agro-forest and usually inter-planted with other food crops. Cocoa is a high-value cash crop among farmers in the major producing areas in Nigeria. It originated from the Upper Amazon in Latin America, from where it spread to all parts of the world. Its cultivation started in Nigeria about 1879, when a local chief established a plantation at Bonny district and cultivation spread. However, cultivation in western Nigeria began afterwards. By 1962, Nigeria had become the world's leading producer with about 20% of the world's total production (Amos 2007). In the 1960s, agriculture accounted for 65-70% of total exports; it fell to about 40% in the 1970s, and dropped to less than 2% in the late 1990s. Decline in the agricultural sector was largely due to rise in crude oil revenue in the early 1970s (Enoma, 2010)

Agricultural sector plays significant role in developing economies. According to Eicher and Witt, 1994 and Adefila, 2008, they remarked that it served as source of basic

raw materials for our light industries generates employment and contributes to the gross domestic product (GDP). Nigeria was ranked among the highest cocoa producers in the world as observed by International Cocoa Organization (ICCO) (2003) that in 1970s cocoa output peaked at 308,000 tones but this figure dropped sharply in 1980s to 155,000 tones and continually down to 110,000 tonnes by 1990 farming season. The problem persists to present.

There is urgent need to increase agricultural production especially cash crops and more importantly cocoa production as a prerequisite to expanding Nigeria's participation in international trade and enhance the country's export trade diversification. The bulk of foreign exchange the country earned from non-oil export was accounted for by cocoa. This crop has remained the second largest foreign exchange earner after the crude oil CBN (1998).

Nwachukwu *et al*. (2010) identify low yields in consistent production patterns, disease incidence, pest attack and little agricultural mechanization as key factors leading to decreasing cocoa production in Nigeria. Additionally, the ageing of cocoa producing trees also plays a role in the decrease productivity. Particularly, 60 percent of cocoa farms are over 40 years old, thus hampering productivity. (Nwachukwu *et al*.2010).

Another important factor is that many actors in the cocoa industry were more interested in marketing than production. Other reasons include the abolition of the Nigeria Cocoa Board which created a vacuum in the area of input and supply, produce quality control and farmers' subsidy support. This vacuum led to poor management of cocoa farms which enhance pest and disease growth; thereby leading to high cost of management, crop loss and eventually abandonment of the farms. The second wave of

decline occurred after the implementation of the Structural Adjustment Program because of the impact it had on the value chain. World cocoa trend is influenced by a number of domestic policies, which in turn impact on permanent production shares of producing countries. Overtime, this trend will affect these countries foreign earning capacities.

The decline in cocoa production in Nigeria could also be attributed to acquisition of land for cocoa farming. Often, small scale farmers acquire land renting, pledging cocoa farm or giving it to another farmer in exchange for loan which the farmer returns to the owner once the loan is paid, most and very significant too, is the main mode of land acquisition through family inheritance. Over the years, change in production does not only affect the country overall yield alone but also the socio-economic development of farmers as a whole.

According to Adams, Brian, Stephanie and Neil. (1998), changes in agricultural supply result from a combination of changes in yields and changes in crop acreage. Changes in crop yields are the result of climate changes and any human mitigating responses (such as increasing fertilizer or water use or adoption of new crop varieties), while changes in acreage are affected by producers' expectations concerning changes in relative crop prices and per acre returns. Crops that decline in supply will rise in price. Higher prices reduce consumption levels and adversely affect consumer welfare. In some cases, the negative effects on consumers may be partially or totally offset by producer gains from higher prices, but in general, total welfare tends to decline when supply is reduced. In the long term, higher prices stimulate producers to seek ways to increase supply, resulting in new equilibrium levels of prices and quantities. So, the long term effect of a drop in cocoa yield per hectare negatively affects the welfare of the cocoa

farmers. The age of cocoa trees have really affected production thereby affecting the socio economic development of the farmers. The farmer's inability to procure essential farming materials which include chemicals has affected production as well.

1.2 Statement of the Research Problem

Cocoa used to be the highest source of foreign exchange earning in Nigeria before the oil boom of the 70s. Since then, crude oil has remained the highest source of foreign exchange earnings while cocoa, a versatile, renewable and sustainable source of revenue is yet to reclaim its lost glory.

The country is losing the foreign exchange that could be derived from exported cocoa going by the present US$2, 581.6 per tonne of the commodity. This shows that foreign exchange earning potential of cocoa has not been optimally actualized in Nigeria. Also, cocoa production in Nigeria is retarded by declining productivity of the existing old cocoa trees. For example, Fashina *et al* (2001) and Cocoa Research Institute of Nigeria [CRIN], (2003) showed that most of the cocoa trees in the country have almost attained 30 years of age with diminishing production trend. These old trees coupled with their susceptibility to pest attack are responsible for decline in the quality and quantity of cocoa production in the country. Cocoa production in Nigeria is undertaken mostly by poor, small scale and low technically capable farmers. These farmers therefore face difficulties in setting up of new cocoa farms and rehabilitation of old ones.

Most producers have small farms, often with less than five hectares of land. They also face significant problems with the crops, including Black Pod disease which globally is killing one in 10 cocoa trees and causing a drop in yield of 20-30%. The general age of many cocoa trees is also an issue and means small-scale farmers are producing less cocoa

year-on-year. The average age of a cocoa farmer is now over 50 because the younger generation cannot be attracted to cocoa farming because of the poor returns.

Many West African cocoa farmers earn less than the globally defined poverty level of $2 a day. In Côte d'Ivoire farmers would need to earn four times their current income to reach that level. Families of six in Ghana, Nigeria and Côte d'Ivoire with two hectares of land subsist on 34 and 45 percents per person per day respectively. This forces many farmers into debt as they have to borrow money to buy farm inputs and pre-sell their crop to finance its harvest and transport.

In real terms – adjusted for inflation – the market price of cocoa fell almost every year between the late 1970s and 2000. Falling cocoa farmer incomes in real terms have restrained economic development and exacerbated poverty in vulnerable communities. Despite the current upward trend in international cocoa prices, farmers still do not receive an adequate, sustainable income that allows them to provide a decent standard of living for their families.

Some scholars have carried out studies in different parts of Nigeria on cocoa production. Abang and Ndifod (2002) worked on the permanent production shares and analyzed the world's cocoa production growth trends. The motive for determination of the trend in production share was based on the postulate that permanent production shares can only be influenced by domestic policy changes of producing countries. This therefore implies that countries with favorable agricultural policies will witness improved or expanded cocoa production shares and vice-versa. From the study of Abang and Ndifod, it was established that world cocoa production trend has gradually been on the increase.

Some major producers of cocoa have however witnessed differential contributions to this trend while in some cases their contribution has declined.

On the other hand, Oluyole *et al.* (2007) examined the effect of technological changes on the demand for labour among cocoa farmers in Ogun state of Nigeria. Based on the findings, the study concluded that the introduction of improved technology such as mechanization and herbicides unequivocally reduced labour use as such reducing the cost of employing farm labour thus reducing overall cost of farm operations.

Oyekale and Oladele (2012) investigated the effect of climatic variables on cocoa seedling raising, production and processing and also assess the degree of vulnerability and coping strategies adopted by the farmers. The major objective of this study was to determine the impact of climate change on cocoa production in Ondo East Local Government Area (LGA) of Ondo State in Nigeria. Tobit analysis model was used to estimate the responsiveness of yield of cocoa crops under the study to changes in climatic variables. The cocoa production losses resulting from climatic changes were taken as the dependent variable and were expressed as a function of the socio economic characteristics of cocoa farm households and climate changes as are the coefficients of the socio economic characteristics and climatic factors in the Tobit equation. An aspect of the socio-economic characteristics of cocoa farmer shows that the, respondent are male. The study also indicated that majority of the farmers' produced cocoa at subsistence level. In all, rainfall, temperature and sunshine were observed to have been the most important climatic factors that affect cocoa production.

Onumah, Al-Hassan and Ebo (2013) examined the productivity, technical efficiency and its determinants among cocoa producers in the Eastern region of Ghana. A

multi-stage random sampling technique is used to obtain a cross sectional data on 190 respondents. The results reveal that productivity level of cocoa responds positively to land size, the level of agrochemical, labour and intermediate input used. However, productivity responds negatively to the increasing age of the cocoa trees. The mean technical efficiency among the cocoa producers is estimated to be 85%, indicating that the possibility of enhancing production given the present state of technology and input level can be achieved in the short run by increasing technical efficiency by 15% through adoption of practices of the best cocoa farm. Exogenous factors such as access to extension services, technical support and credit are found to reduce the level of technical inefficiency among the producers. Also older farmers and male farmers are efficient than younger and female farmers. Farmers with more experience in cocoa production also produce with technical efficiency. A recent study by Adefila (2013), examined the spatial effect of cocoa production on the rural economy of Idanre-Ifedore area of Ondo state. The study shows that there is a significant decrease in annual cocoa output in the study area.

While the studies of Abang and Ndifod (2002), Oluyole *et al* (2011), Onumah *et al* (2013), Oyekale and Oladele (2011) and Adefila (2013); cited in the foregoing paragraphs have been conducted to assess different factors affecting cocoa production, effect on rural economy, none has really looked at how the changes have affected socio-economic development of an individual farmer. Farmers must contend with severe crop loss due to disease, aging tress, outdated farming techniques, and limited organizational support. Many farmers have virtually abandoned their cocoa trees, only investing the bare minimum of time and money to maintain the crop.

A decline in production is a problem for the farmers who are interested in high yield to raise their standard of living and the consumers who are interested in consuming cocoa product. It is not a gainsaying that changes in cocoa yield is critical to the socio-economic development of the farmer's household.

The manner in which changes in cocoa production have affected the livelihood of the farmers, the causal factors and how they are coping with the changes in production constitute the gap in knowledge that this present study has attempted to fill.-The research answers the following questions:-

(i) What is the relationship between socio-economic characteristics of cocoa farmers and cocoa productivity?

(ii) How has the growth and performance of cocoa production change over time in Emure Local Government area of Ekiti State?

(iii) How has changes in production influence the livelihood of cocoa farmers in the study area?

(iv) What are the challenges facing cocoa Farmers?

(v) What strategies are adopted by farmers to cope with the changes in production?

1.3 Aim and Objectives of the Study

The broad aim of the study is to examine the effects of changes in cocoa production on farmer's livelihood in Emure Local Government Area (LGA) of Ekiti State. However, the specific objectives are to:-

i. examine the relationship between socio-economic characteristics of farmers and cocoa productivity

ii. examine the changes in growth and performance of cocoa farmers productivity

iii. examine how changes in production affects cocoa farmers livelihood in the study area.

iv. examine the challenges facing cocoa farmers in the study area.

v. assess the strategies adopted by the farmers to cope with the changes in cocoa production as it affect livelihood.

1.4 Hypotheses

i. $H_0$1: There is no significant relationship between socio-economic characteristics of farmers and productivity.

ii. $H_0$2: There is no significant influence of changes in cocoa production on the livelihood of farmers in the study area.

1.5 Significance of the Study

Providing employment for a large section of the population, agriculture remains a major source of economic activity in Nigeria. Nigeria produced 242,000 tonnes of cocoa in 2008. The National Cocoa Development Committee (NCDC), made up of the 14 cocoa producing states in the country, has distributed new high yield cocoa seedlings to cocoa farmers, and continues to allow the purchase of chemicals and inputs at 50% subsidy. Cocoa, currently one of the market's best performing commodities, hit a 23-year high in December 2008. The price of cocoa hit $2,581.6 per tonne in January 2009.South West Nigeria is regarded as the cocoa belt of the country, accounting for 70 per cent of Nigeria's

annual production of 242,000 metric tonnes in 2008.Agriculture is the largest and oldest industry in the world. It is a vital sector of the Nigerian economy, supplying food for the population and providing raw materials for the industry (*www.mbendi.com*). Cocoa as a major part of Agriculture plays its role in the provision of foreign exchange cannot be overstated as it remained for a long time, the main machine for the earnings. In terms of sustainable employment, agriculture is by far the most important sector of Nigeria's economy, engaging about 60% of the labor force (Central Bank of Nigeria [CBN], 2003).

The effect of change in cocoa production on socio-economic development of the farmers in Emure Local Government cannot be understood without carrying out a study of this nature. The study helps to determine the factors affecting cocoa production and how it has rubbed on their socio-economic development of farmers. How the effect of change has affected the farmers standard of living. This is done with the aim of suggesting ways to improve production which will in effect affect their socio-economic development. The study is aimed at investigating the possible constraints to cocoa production, in order to identify the problems encountered by the farmers and proffer solution on how to boost productivity, reduce inefficiency and improve level of living.

Information gathered from this work will guide policy makers on how to direct government toward improving cocoa production in the study area and the country as a whole, since they will be better equipped in areas of constraints to cocoa production. The study is designed to investigate the constraints of cocoa farmers. The result of the study will serve as a guide to extension agencies to form a data base for continuous research aimed at improving the efficiency of small scale cocoa producers. This research work will also be a base line for statistical inference to other works and research analysis, also as an

inferential guide for manipulation of the variable(s) which hinder improved /increase cocoa production. The findings of this research will serve as a framework for further research on small scale cocoa production in the area.

CHAPTER TWO

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Theoretical Framework

The theoretical framework can be used to answer descriptive research questions that only require literature (or desk) research. For example, theory alone is sufficient to answer the research question: ‘What is the relationship between production and livelihood?

The theoretical framework (and the literature review that serves as its backbone) can also be used to further analyze existing findings and hypotheses. It may also be used to formulate and evaluate hypotheses of your own, which you can later test during the qualitative or quantitative research of the study.

The study examines theory of change which explains the process of change by outlining causal linkages in an initiative, i.e., its shorter-term, intermediate, and longer-term outcomes. The identified changes are mapped –as the "outcomes pathway" – showing each outcome in logical relationship to all the others, as well as chronological flow. The links between outcomes are explained by "rationales" or statements of why one outcome is thought to be a prerequisite for another

A 'theory of change' explains how activities are understood to produce a series of results that contribute to achieving the final intended impacts. It can be developed for any level of intervention – an event, a project, a programme, a policy, a strategy or an organization. A theory of change can be developed for an intervention: where objectives and activities can be identified and tightly planned beforehand, or that changes and adapts in response to emerging issues and to decisions made by partners and other stakeholders. Sometimes the term is used generally to refer to any version of this process, including a results chain, which shows a series of boxes from inputs to outputs, outcomes and impacts.

2.1.1 Social Change Theory

Both Rogers (1995) and Ekong (1988) defined social change as the process by which alteration occurs in the structure and function of a social system. Based on this definition therefore, any change that occurs in the norms, values, culture, ideas, roles and social habit of a people can be referred to as social change. Social change can be planned

and unplanned. Planned change involves human intervention in controlling the direction of change toward a definite set goal, but unplanned change is a result of unforeseen occurrences (Salawu, 2007). Change comes from two sources. One source is random or unique factors such as climate, weather, or the presence of specific groups of people. Another source is systematic factors. For example, successful development has the same general requirements, such as a stable and flexible government, enough free and available resources, and a diverse social organization of society. On the whole, social change is usually a combination of systematic factors along with some random or unique factors. The effect of change on socio-economic development of farmers for instance, is an unplanned change or random factors that are a result of varying factors such as climate, weather, government policy and other uncontrolled events, which affect the socio-economic development of farmers.

Long (1977) opined that an account of sociological and anthropological perspectives on development would not be complete without some discussion of planned change, for an understanding of the patterns of development. Change necessarily involves understanding something about the types of approach used by government and their agencies for initiating economic development and social change. It is especially the case with third world countries where governments often play a dominant part in attempting to re-structure society in conforming to particular politico-economic goals. Such approach by government could bring about an unplanned change. This is evident in the down word trend of cocoa production which has affected the socio-economic development of the cocoa farmers. The social change theory as used in this study will help to explain how

certain factors have brought about change in production as such affecting socio-economic development.

2.1.2 Impact Theory.

The term impact is used in many different ways by different people. Impact refers to the broad, long-term economic, social and environmental effects resulting from research while evaluating/assessment in judging, apprising or determining the worth, value or quality of research, in terms of its relevance, effectiveness, efficiency and impact. Impact theory also refers to the broad, long-term socio-economic and environmental effects of the programme on the beneficiaries and the general eco-system, (Impact Assessment and Evaluation Group [IAEG], 1999).

2.1.3 Application of Impact Theory.

Impact of a programme can be manifested in relation to whether the service actually resulted positively on the people who receive them. Impact studies are of paramount importance in agricultural programs as it shows the benefits derived by the participants as a result of their involvement in the programme as well as show their preference to the programme. Similarly, Sanginga *et al*. (1999) stated that impact analysis deals with the investigation of the changes that occurred or likely to occur on the peoples life's as a result of a programme. It is a special form of elevation that deals with the effect of investigation programme output on the targeted beneficiaries. Hence, impact of a programme can be seen in relation to what services actually do to people who receive them.

In conducting impact assessment, researchers often use "with or without" impact method while others use "before and after" method. Manyong *et al.* (2001) opined that

impact assessment of agricultural projects is a continuous process and therefore being a process, it is better conceptualized to use the before and after impact assessment approach.

According to Alene *et al*. (2006) impact assessment of agricultural research is viewed as an important activity to ensure accountability, maintain and improve internal decision making process and the capability to learn from the past experience. Impact study is seen as a critical component of agricultural research that helps define priorities of research and facilitate resource allocation among programs, guide researchers and those involved in technology transfer to have a better understanding of the way new technologies are assimilated and diffused into farming communities, and show evidence that clients benefit from the research products (Manyong *et al* 2001).

2.2 Literature Review

Cocoa serves as an important crop around the world: a cash crop for growing countries and a key import for processing and consuming countries. Cocoa travels along a global supply chain crossing countries and continents. The complex production process involves numerous parties including, farmers, buyers, shipping organizations, processors, chocolatiers, and distributers. Cultivation of cocoa at the farm level is a delicate process as crops are susceptible to various conditions including weather patterns, diseases, and insects. Unlike larger, industrialized agribusinesses, the vast majority of cocoa still comes from small, family-run farms, who often confront outdated farming practices and limited organizational leverage. A steady demand from worldwide consumers draws numerous global efforts and funds committed to support and improve cocoa farm sustainability.

2.2.1 Historical Perspective of Cocoa Production in Nigeria

Cocoa which belongs to the family *Steruliacaea* and genus *Theobroma*was discovered in18th century at the Amazon basin and later spread to other tropical areas of South and Central America, and West Africa (Opeke 1986). Since the end of the First World War, West Africa has been the highest producer of cocoa. The crop was eventually introduced into Nigeria about 1879 (Ayorinde 1996). Cocoa (*Theobroma cacao*) was introduced to West Africa sub region from Brazil and into Nigeria from Fernando Po in the year 1874 (Adegeye, 1996). It was first cultivated into the western region of Nigeria in 1890.

Its cultivation gained prominence rapidly in Nigeria such that by 1965, Nigeria became the second largest producer in the world (Adegeye, 1996). Nigeria as a developing country was rated the second largest world producer of cocoa in the 1960s (Adegbola and Abe 1983) and, for a long time, the crop has been generating substantial foreign exchange earnings for the country. Cocoa is produced mainly in the rainforest area of the country, known as the cocoa belt. The main producing states are Ondo, Ekiti, Oyo, Osun, Ogun, Delta, Edo, Cross Rivers and Akwa Ibom. According to Adegeye (1996), over 50% of the total quantity of cocoa produced for export or utilized locally per annum comes from Ondo state.

The Nigerian cocoa economy has a rich history which is well documented in literature. The contributions of cocoa to the nation's economic development are vast and have been reported by many authors (Olayide, 1969). In Nigeria, cocoa is a very important part of the cash crop family in the agricultural sector. So, the downturn trend of the aggregate agricultural output is as a result of downward movement in the whole composing variables in the sector. And of course, the composing variable includes all

other agricultural products contributing to aggregate agricultural output. The resultant output is a result of the declining level/pace of growth in the composing output. Countries that have a higher or increasing rate of growth in each composing products tends to have an overall increase in the aggregate agricultural output.

2.2.2 Significance of Cocoa

Apart from its contribution to the nation's economy, Cocoa is a plant-based food that contains carbohydrates, fats, proteins, natural minerals and some vitamins and like several other plant foods such as tea, red wine, fruits, vegetables and nuts cocoa contains a group of compounds which exhibit health benefits (Taubert *et al*, 2007). Research conducted at Harvard Medical School (2007) showed that heavy consumers of cocoa had significantly lower rates of heart disease and cancer compared to those who consume less. Cocoa has a unique natural taste and colour and possesses a delicious aroma used in many food products for extra flavor and colour (ICCO. 2005). It further states that "Increasing evidence points to heavy intake of certain types of cocoa as an easy, inexpensive way to increase blood to the brain and, thus, to play a role in reducing the risk of those devastating diseases."

Different sorts of products can be derived from cocoa. According to ICCO (2003), the husks of cocoa pods and the pulp, or sweating, surrounding the beans and the cocoa bean shells can be used. Literature also confirms that animals feed from cocoa husk. It is used for production of soft drinks and alcohol. The fresh juice is boiled, cooled and fermented with yeast. After 4 days of fermentation the alcohol is distilled. Potash from cocoa pod husk - is used mainly for soft soap manufacture. It may also be used as fertilizer

for cocoa farms, vegetables, and food crops. Cocoa butter is used in the manufacture of chocolate. It is also widely used in cosmetic products such as moisturizing creams and soaps. Cocoa powder can be used as an ingredient in almost any foodstuff. For example, it is used in chocolate flavored drinks, chocolate flavored desserts such as ice cream and mousse. Chocolate is used as a product on its own or combined with other ingredients to form confectionery products

The importance inherent in cocoa in any economy is rather vast because it serves as food and raw material (beverages, butter) in local use, and export. Cocoa production can be the main source of a country's foreign exchange earnings as well as a significant part of the GDP. At least post independent (1960- early 1970s) Nigeria belonged to this category/cadre. At the said time, cocoa was sufficient to produce a bulk of the national need of foreign exchange while other agricultural produce complemented the efforts therein.

Cocoa plays a very important economic role for small farmers. As a cash crop it can provide necessary income for the purchasing of food (Bentley *et al*, 2004) and is especially important in areas where food security has been a problem. For example, cocoa appears to provide a main source of income in southern Cameroon. In a sample of 21 villages in southern Cameroon, farming makes up two-thirds of the total income in each village (Sonwa *et al.*2002) and Gockowski and Ndoumbe´ (2004) report that in households where cocoa is an important source of income, it contributes roughly one-third of revenue within them.

Cocoa is an important generator of income for most rural farmers in Nigeria especially in the South West and serves as a backbone for their livelihood. However, in

recent times, Nigeria has slipped from being the world's second largest producer to the fifth position, behind Cote D'Ivoire, Ghana, Indonesia and Cameroon with a production figure of 160 thousand tonnes representing 4.6% of the world production in 2006-2007 seasons (Adeniyi and Ogunsola, 2014). Reasons elicited for the reduction in production included; less emphasis on agriculture, inadequate government program on agricultural input subsidy such as chemicals and planting materials, small farm sizes, inadequate capital, inadequate labour availability and most importantly, change in global climate (Oduwole, 2004). The dominance of smallholders in the cocoa production sector and the lack of farm labor due to increased rate of urbanization held back production. Nigeria has the potential to produce over 300,000 tons of cocoa beans per year, but production only amounted to 145,000 tons in 1999 (Nigeria Agriculture Stats, 2014).

2.2.3 Concept of Productivity and Measurement

According to Reference for Business, productivity is an overall measure of the ability to produce a good or service. More specifically, productivity is the measure of how specified resources are managed to accomplish timely objectives as stated in terms of quantity and quality. Productivity may also be defined as an index that measures output (goods and services) relative to the input (labor, materials, energy, etc., used to produce the output

Productivity is an objective concept. As an objective concept it can be measured, ideally against a universal standard. As such, organizations can monitor productivity for strategic reasons such as corporate planning, organization improvement, or comparison to competitors. It can also be used for tactical reasons such as project control or controlling performance to budget.

Productivity is also a scientific concept, and hence can be logically defined and empirically observed. It can also be measured in quantitative terms, which qualifies it as a variable. Therefore, it can be defined and measured in absolute or relative terms. However, an absolute definition of productivity is not very useful; it is much more useful as a concept dealing with relative productivity or as a productivity factor.

Productivity is useful as a relative measure of actual output of production compared to the actual input of resources, measured across time or against common entities. As output increases for a level of input, or as the amount of input decreases for a constant level of output, an increase in productivity occurs. Therefore, a "productivity measure" describes how well the resources of an organization are being used to produce input.

2.2.4 Agricultural Productivity

Agricultural products are usually measured by weight or volume. An immediate question arises as to how to best combine different agricultural products since summing over weights or volumes is not very meaningful. One approach when dealing with crops is to convert them to a common physical unit, such as wheat units (Hayami and Ruttan, 1985; Block 1994). More commonly, *aggregate* output in agriculture is measured in monetary units as the sum of the value of all production in the agricultural sector minus the value of intermediate inputs originating within the agricultural sector. Both cash and non-cash (barter, trade and self-consumption) transactions of final products should be included. This is referred to as "final output" and differs from agricultural GDP by not subtracting out the value of non-agricultural inputs (Rao, 1993). In other words, final

output is the amount of agricultural output available for the rest of the economy, while agricultural GDP measures the net contribution of agriculture to the GDP of a country.

Productivity measures are subdivided into partial or total measures. Partial measures are the amount of output per unit of a particular input. Commonly used partial measures are yield (output per unit of land), labour productivity (output per economically active person (EAP) or per agricultural person-hour). Yield is commonly used to assess the success of new production practices or technology. Labour productivity is often used as a means of comparing the productivity of sectors within or across economies. It is also used as an indicator of rural welfare or living standards since it reflects the ability to acquire income through sale of agricultural goods or agricultural production (Block, 1995).

2.2.5 Changes in Cocoa Production in West Africa

Ofori-Boateng and Insah (2011) stated that while there has been an increasing trend of cocoa output among the major producers (Cote d'Ivore, Ghana, Nigeria and Cameroon), while the minor producers (Togo, Sierra leone, Liberia) have had fairly constant production over time. There has being dwindling occurrences along the production path of the three major producers, namely, Ghana, Cote D'Ivoire and Nigeria. In specific terms, the production trajectory of Cote D'Ivoire has witnessed increasing trend throughout the research period from about 1.2 tons – 1.3tons. Ghana, which was the leading producer among the countries in West Africa started envisaging low production from the early seventies till 1984 when it started rising to date. Nigeria's output was higher than that of Cote D'Ivoire in the early stages of the 60's but after 1970 output

started declining till the late 1980's when it started increasing again till date. Ghana and Nigeria have followed similar patterns of output growth over the years except for quantity.

In the recent time, the issue of climatic change and its resultant effect on mankind has become a global phenomenon. According to a study by Oluyole *et al* (2013), the study found it quite imperative to examine the trend at which the changes take place and the implication of the changes on cocoa output. Data on climatic elements such as rainfall, temperature, humidity as well as cocoa output were collected. The data were analyzed with descriptive statistics, regression analysis and correlation analysis. The heaviest rainfall was recorded between 1990-1994 while the highest temperature was recorded between 1995-1999. There was a sharp decrease in rainfall and sharp increase in temperature between 1995-1999. Between the period 1980-1994, rainfall kept on increasing while temperature kept on decreasing during the same period. There was a sharp decrease in humidity between 1980-1989. The result of regression analysis shows that rainfall and humidity significantly affected cocoa output while temperature did not. There was a significant correlation between cocoa output and rainfall as well as cocoa output and humidity.

According to the international cocoa organization, Quarterly Bulletin of Cocoa Statistics 2008/09, the world production of cocoa beans has experienced irregular pattern due to heavy dependence on weather in production, low farm-gate prices, pests and diseases. For example, in 2003/04 season, the global production of cocoa beans continued to rise for the fourth successive year, with output exceeding the recorded production levels of 2002/03 by almost 10 percent to reach 3.5 million tons (ICCO, 2003). ICCO spelt out in their 2003/04 report that, Cote D'Ivoire defied fears of decline and instead recorded a

substantial increase to reach 1.4 million tons, despite two years of political and social unrest. During the same season, good weather, higher farm gate prices, combined with effective government-backed of mass spraying of crops contributed to a substantial increase in yields, propelling Ghana's output to a record of 736,000 tons. However, during 2006/07 season, world production dropped by almost 9 percent from the previous season to 3.4 million tons, mainly as a 27 consequence of unfavorable weather conditions in many cocoa producing areas (ICCO Annual Report, 2006/07).

2.2.6 Livelihood

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. (Chambers & Conway, 1991) The term is well recognized as humans inherently develop and implement strategies to ensure their survival.

In order to better understand how people develop and maintain livelihoods, the UK Department for International Development (DFID), building on the work of practitioners and academics, developed the Sustainable Livelihoods Framework (SLF). This framework is an analysis tool, useful for understanding the many factors that affect a person's livelihood and how those factors interact with each other. The SLF views livelihoods as systems and provides a way to understand: the assets people draw upon , the strategies they develop to make a living , the context within which a livelihood is developed , and those factors that make a livelihood more or less vulnerable to shocks and stresses

Livelihoods are formed within social, economic and political contexts. Institutions, processes and policies, such as markets, social norms, and land ownership policies affect our ability to access and use assets for a favorable outcome.

In summary, livelihood is a means of making a living. It encompasses people's capabilities, assets, income and activities required to secure the necessities of life. A livelihood is sustainable when it enables people to cope with and recover from shocks and stresses (such as natural disasters and economic or social upheavals) and enhance their well-being and that of future generations without undermining the natural environment or resource base.

2.2.7 Constraints to Cocoa Production

In the case of cocoa, critical constraints associated with cocoa production at the upstream level were identified to include the use of low yielding varieties by most cocoa farmers, high cost of cocoa field maintenance or management, limited land for expansion and soil infertility due to erosion and leaching as well as high cost of plantation establishment. Other problems were lack of access to market information, price fluctuation and low quality of cocoa beans which forced prices down (Ugwu 2009).

According to Mars (2015), demand for cocoa is growing. Assuming 2% annual growth, the world will require at least one million more metric tons to meet various industrial uses by 2020. Production in Côte d'Ivoire, the world's largest cocoa bean producer, should grow by 2.3 percent a year from 1.2 million tonnes of the base period to 1.6 million tonnes in 2010, and account for 44 percent of global cocoa production due mainly to the increased foreign direct investment followed by the market liberalization.

Underinvestment has contributed to this pressure. As a crop mostly grown by individual farmers, cocoa historically hasn't benefited from the government or industry support and investment needed to put research programs in place. As a result, it lags behind other major crops in modern farming practices and knowledge. Fragmentation of cocoa farmers is another constraint. There are more than five million cocoa farmers worldwide, many working in remote parts of West Africa, Asia and the Americas. Their sheer number makes it very difficult to make industry-wide changes. By drawing on collective expertise and resources across the world to deliver a holistic program from farm to factory, it will help safeguard the future of cocoa industry.

Barry Callebaut (2015) stated that cocoa is typically produced by smallholder farmers in remote equatorial areas. Most of the world's cocoa volume comes from West Africa, the area that faces the industry's most vital sustainability challenges. Cocoa farmers' lives are hard. On average, they earn £325 a year, and despite growing much of their own food, they need cash to pay for many essentials such as inputs for their farms, school fees, medicine, doctor's fees, transport and clothes.

Pauline Tiffen (2000) cocoa farmers face a lot of problem. This range from the price of cocoa on the world market continues to fluctuate up and down, meaning cocoa farmers have no long-term security, and in some situations, cannot even cover their farming costs. Sometimes, Farmers often only receive a fraction of the price their beans sell for on the world market because there are several people in the trading chain. In the early 1990s, cocoa farmers were getting less than half of what international buyers were paying. The cost of buying, such things as tools, fertilizers and pesticides, medicine, food and clothes, are expensive. The problem of underpayment of farmers by local cocoa

buyers using ‘fixed’ scales, set to show a lower reading than the actual weight of their cocoa beans.

2.2.8 Concept of Wellbeing

Wellbeing has been conceptualized broadly and linked very closely to a person's location and functioning in society, with considerable attention being paid to their transactional, social and recreational relationships with kin and non-kin.

The concept of wellbeing is very broad and is applied to many situations for a variety of purposes (Paim, 1995). Applications of the concept range from specific domains of wellbeing, such as economic, material, social, and psychological, to all the domains impacting upon people. The diversity results from the different reasons there are for using the concept and different approaches to measuring it. The particular measure or measures that are used – or developed for use – in any particular context reflect the purpose of the measurement and the disciplinary and theoretical perspectives that inform the measurement. Veenhoven (2004) suggests that, very broadly, the term ‘wellbeing’ “denotes that something is in a good state.” Beyond that, the term does not, in itself, specify what is in a good state, nor the criteria for being in a good state (Veenhoven, 2004). As with other ‘catchall’ terms, such as ‘progress’ and ‘welfare’ Veenhoven (2004) suggests that the term ‘wellbeing’ needs to be clarified by specifying what the term applies to and what constitutes it (a state of wellbeing)

Economics approaches to wellbeing From a narrow economic perspective, objective definitions of wellbeing can be divided into two types: resource related and consumption related (Paim, 1995). Resource related definitions typically focus upon

indicators such as income (Paim, 1995), earning capacity (Garfinkel and Haveman, 1977), income combined with net worth (Weisbrod and Hansen, 1977) and in terms of a debt-asset ratio (Marlowe and Goodwin, 1988). National level measures such as GNP are sometimes used as crude wellbeing indicators for a nation; but they are not equipped to identify inequality associated with differential distributions of income, and are of limited usefulness in studying individual wellbeing.

2.2.9 Coping Strategies

Coping strategy can be defined as any short-term temporary response to immediate exigencies (Davies, 1996). It is what victims of a phenomenon engage in to ameliorate its negative effects. The Coping Strategies Index (CSI) is a relatively new concept. It was developed by East and Central Africa Regional Management Unit of the World Food Programme (CARE/WFP) in 2003 as an indicator of household food security that is relatively simple and quick to use, straightforward to understand, and correlates well with more complex measures of food security. Umar *et al.*

However, the fact that rural communities have survived till today with fast population growth rates indicates that they have developed certain strategies that reduce their vulnerability and enhance their resilience to adverse environmental phenomena such as climate change (Musa and Omokore, 2011; Nelson et al. 2009)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area

3.1.1 Location

The study area is located between Latitudes 7º 21′ - 7º 32′ North of the Equator and Longitudes 5º 26′ - 5º 37′ East of the Green Wich Meridia. Emure is boarded in the East by Ise/Orun in the east and Gbonyin in the North, Emure is in the Southern part of Ekiti which share boundary with Ondo State (Figure 3.1). Emure is one of the 16 local

governments areas (LGA)of Ekiti State. The Local Government occupies a land area of about 374,940 Km of land. (National Population commission [NPC] 1991)

3.1.2 Relief and Drainage

The Emure Local Government is mainly upland zone, rising over 250 meters above sea level. It lies on an area underlain by metamorphic rock. It is generally undulating country with a characteristic landscape that consists of old plains broken by step-sided out-crops that may occur singularly or in groups or ridges (Wikipedia the free encyclopedia).

Generally, where the farms are located are level ground as such water is less likely to run-off quickly. The topography of the farms makes it easy to transport farm produce from the farm. Emure is dotted with rugged hills just like other part of the state, notable ones being Ikere-Ekiti Hills in the south.

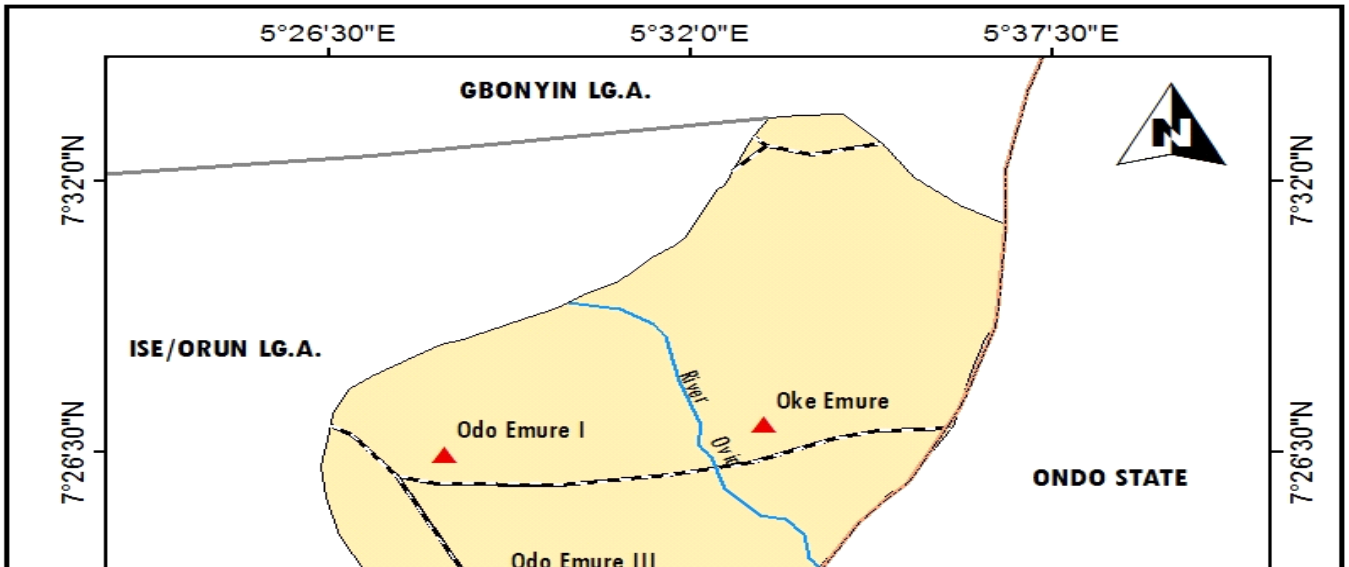


Fig 3.1: Ekiti State showing Emure Local Government Area.
Source: Modified from the Administrative Map of Ekiti State 2014.

3.1.3 Weather and Climate

The LGA enjoys a tropical climate with two distinct seasons. These are the rainy season beetween (April-October) and the dry season between (November-March). Temperature ranges between 21 ºC and 28 ºC throughout the year, with high humidity.

The state is mainly agrarian. The state produces Kolanut, and cocoa. Emure also produce crops like cassava, yam, cocoyam, maize, cowpea, plantain and fruits like cashew, mango and orange. The states also produce high quality woods. The state has a very conducive climatic condition which makes it enjoy luxuriant vegetation. The main cash crops are cocoa, kolanut (Wikipedia the free encyclopedia). Adegeye (2006) stated that-when cocoa trees attain a height of 37.5 centimeters to 62 centimeter. It requires annual rainfall ranging from 1,125 millimeter to 1,500 millimeter and must spread over eight to nine months and follow a dry period of three to four months to enable the cocoa pods ripe. Ekiti. (Wikipedia the free encyclopedia)

According to Oyekale (2009), weather and climate influence most of the processes involved in cocoa production for example: solar radiation produces energy for warming the soil, plants, air and metabolic processes; rainfall and it characteristics in terms of amount, intensity, reliability and distribution influence crop growth and soil erosion. Atmospheric evaporability determines the performance and survival of crops. Planting date of cocoa seeds is determined by start of the rains. Irrigation adds economic value to the products. Sun drying reduces the water content of cocoa seed and makes its processing easier.

3.1.4 Occupation

Emure is mainly an agrarian community. Most households are involved in cocoa production as well as other agricultural produce such as yam and cassava. Agriculture

accounts for over 70% of all business in the state. Both men and women are involved in trading especially farm produce (Wikipedia the free encyclopedia).

3.1.5 Soil

The state is mainly agrarian. This is mainly due to the rich soil which enables it produces Kolanut, and cocoa. The soil particles in Emure are course; it is more of silt and sand. Cocoa needs a soil containing coarse particles and with a reasonable quantity of nutrients, to allow the development of a good root system. The soil type also allows excess water to be drained off. The cocoa tree is sensitive to a lack of water, so the soil must have both water retention properties and good drainage. These are conditions that Emure enjoys. Emure also produce crops like cassava, yam, cocoyam, maize, cowpea, plantain and fruits like cashew, mango and orange. The soil is well packed making soil erosion less likely to occur as such the nutrients will not be lost increasing production.

3.1.6 Vegetation

The local Government also produces high quality woods. Emure has a very conducive climatic condition which makes it enjoy luxuriant vegetation. Emure is located in the rainforest, which makes its vegetation cover dense. According to (onlinenigeria 2003) Ekiti State is an important timber producing state in Nigeria. Among the hardwood species commonly found in the state are iroko, mahogany, obeche and sapelewood. The tree species found in the study area also include *Milicia exelsa, Irvingia gabonensis, terminalia ivorensis Ceiba petandra and Terminalia* superb among others. The rich forest zone enriches the soil, the vegetation cover help young cocoa plant during the dry season

when temperature is very high. Tropical forest exists in the south. The main cash crops are cocoa and kolanut.

3.1.7 People and Socio Economic Activities

Ekiti as a State in Yoruba land, had her progeny in Oduduwa, the father and progenitor of Yoruba race. Just like every major sub-ethnic division in Yoruba land, Ekiti has her origin from Ile-Ife (the cradle of Yoruba race). Typical Ekiti man cannot do without Iyan (pounded yam) in a day, with melon soup, crowned with bush meat. The people are mostly Muslims and Christians while some are still traditional religionists.

According to the 2006 population census by the National population commission put the population of Emure at 93,884 people. With an average growth rate of 3.02%, it is estimated that the population of Emure will grow to 104,211.68 by 2025.

A good number of them have other hand work ranging from carpentry, craft work and some as civil servants. One striking observation is that, there is no village community that does not have schools (especially primary schools). The people value and pursue education assiduously; little wonder the State is popularly called the "Fountain of Knowledge" (http://www.ekiti.com).

3.2 METHODOLOGY

3.2.1 Reconnaissance Survey

A reconnaissance survey was conducted to familiarize the researcher with the study area. Spot assessment was carried out in the study area to observe the different household and farm size. Four wards were selected from the local Government which are: Odo-Emure I, Odo-Emure, Oke-Emure III, and Eporo IV. From the number of wards, the

farming population was observed. Preliminary interview was also conducted with some members of the local community, mostly farmers (this was randomly done). It was discovered that most farmers are aged and male children have moved to the cities. The farmers faced challenges in cocoa production resulting in decline in production, most of the farmers suggested strategies to cope with the challenges in production. Preliminary interview was also conducted with some members of the local community.

3.2.2 Types of Data Utilized

Data used for the study include the following:-

i. The changes in cocoa production over time.

ii. How the change in cocoa production has affected standard of living of cocoa farmers.

iii. How socio-economic characteristic of the farmers affect productivity.

iv. The strategies adopted by farmers to cope with the challenges.

v. The challenges facing cocoa production in the study area.

3.2.3 Sources of Data

3.2.3.1 Primary sources

Primary data were mostly used in the study. The primary data was collected through questionnaire and observation techniques. Some of the things observed include infrastructures like; school, church, mosque, market place, burial ground and sources of water. The main instrument for primary data collection was semi-structured questionnaire administered to sampled cocoa farmer in Emure Local Government Area. Data collected were centered on respondent's demographics and socio-economic characteristics such as

age, marital status, educational status, household size, sex, income, asset of farmers and impact of cocoa production on livelihood. Also data on farm size, yield over a period of time, farm gate prize of cocoa and how it is being market. Information on constraints faced by cocoa farmers was also collected.

3.2.3.2 Secondary source

Data collected from the local government council were mostly from journal. Others Secondary data obtained from online materials; the internet was used extensively to sort information on the study area. All relevant journals, textbooks, online newspapers article, research abstract, official gazette from non-governmental organization were consulted, to help establish works done on cocoa and collect data relevant to the study. Thesis and dissertations relevant to the study were consulted.

3.2.4 Sample Size and Sampling Techniques

The sampling procedure involved multi-stage sampling. The first stage involved a purposive sampling of Emure local Government area among 16 LGAs that make up Ekiti State. Emure was chosen because most of the farmers produce cocoa. The second stage involved selection of the wards. There are ten (10) wards out of which four wards were purposively selected for the study. The selection was based on their homogenous nature in cocoa production and socio economic characteristics. The third stage has to do with selection of the villages from each ward. Three villages are randomly selected. The sample frame was determined by adopting Krejcie and Morgan's (1970) table for determining

sample frame, for a given population of 500, a sample size of 217 would be needed to represent a cross-section of the population. Therefore, the sample size of 248 famers is considered appropriate for a population 697 farmers which is approximate 700 famers. Since the cocoa farming populations are within this range, 248 respondents were selected from the total number of farmers from ADP list of farmers as shown in Table 3.1. The farmers were sample from the total number of farmers in each ward. Approximately 35% of the farmers in each ward were sampled. The questionnaire were administer on farm and off farm based on where they could be found at the time of administering the questionnaire The breakdown is presented in Table 3.1.

Table 3.1: Sample size by Villages

Wards	Villages	population of farmers	Sample size (35%) of populn
Odo-Emure I	Emure	86	30
	Aba Isua	47	17
	Owode	84	29
Odo-Emure II	Ose Onija	48	17
	Ibeji Reserve	53	19
	Adu Camp	74	26
Oke-Emure III	Aba Adeyemo	54	19
	Akiti Camp	42	15
	Oloyi Camp	52	18
Eporo IV	Eporo	66	23
	Reservoir	43	15
	Oge	58	20

TOTAL	**697**	**248**

3.2.5 Methods of Data Analysis

The data collected were analyzed using various statistical tools.

Objective (i) examine the relationship between socio-economic characteristics of farmers and cocoa productivity. Descriptive statistic such as tables, pie chart and bar chart were used to present the findings.

Objectives (ii) examine the changes in growth and performance of cocoa farmer's productivity. Secondary data was used. It makes use of table to show the trend in production.

Objective (iii) examines how changes in production affects cocoa farmers livelihood in the study area. Objective (iv): examine the challenges facing cocoa production. Descriptive statistics were used as an analytical tool.

Objective (v): assess the strategies adopted by the farmers to cope with the changes in cocoa production. Descriptive statistics were used as an analytical tool.

3.2.6 Hypotheses Testing

3.2.6.1 Hypothesis I

To test the relationship between socio-economic characteristics of farmers and productivity of cocoa, multiple regressions technique; where the dependent variable (Y) is

cocoa output and socio-economic characteristics of the cocoa farmers were the independent variables. The regression analysis is useful in estimating the contributions of each variable to the dependent variable to determine the best variable predictive of cocoa production and effects. Linear functional form was used to identify the factors that determine the production of cocoa.

The model is specified as follows:-

The implicit Linear functional form is expressed thus: $Y = a + bx$---------- (i)

Where Y= output of cocoa

X= variable inputs (socio-economic characteristic)

The implicit form is expressed thus:

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7$ …… (ii)

Where:

Y = Cocoa output (measured in kg).

X_1 = Farmers' age (years)

X_2 = Marital status (single = 1, married = 0)

X_3 = Level of education (Number of years in formal schooling)

X_4 = Household size (number in household)

X_5 = Farm size (hectares)

X_6 = Farming experience (years in cocoa production)

X_7 = income (amount earned per year)

3.2.6.2 **Hypothesis II**

The t-statistic was used to achieve hypothesis ii of the study

The specific expression used to determine the t-statistic is as follows:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{S_1}{n_1} + \frac{S_2}{n_2}}}$$

Where:

t= calculated t value

$\overline{X}_1$ = mean value of changes in cocoa production

$\overline{X}_2$ = mean value of livelihood indicator (asset)

S_1 = standard deviation of changes in cocoa production

S_2 = standard deviation of livelihood indicator (asset)

n_1 = sample size of changes in cocoa production

n_2 = sample size of livelihood indicator (asset)

The Malmquist Productivity Index Model

The Malmquist Productivity Index was used to achieve objective ii. The data envelopment analysis (DEA) based Productivity index was used to measure productivity change over time (2005-2014).Total Factor Productivity (TFP) growth measures how much cocoa is harvested relative to economic inputs used. This model calculates output oriented Malmquist indices of TFP, technical change and technical efficiency. The TFP is

said to have increased if the Malmquist Productivity Index is greater than 1 and declines if the Malmquist Productivity index is less than 1.To calculate the index we must calculate the four component distant functions, which will involve four linear programming programs for each of the farmer in each pair of adjacent time period. For example the constant- return to scale, output-oriented. The Model is specified below

$$M_{oc}\left(x^{t}, y^{t} x^{t+1}, y^{t+1}\right)=\left[\frac{(D_{oc}^{t+1}(x^{t+1}, y^{t+1})}{D_{oc}^{t}(x^{t}, y^{t})}\right] X \left\{\left[\frac{(D_{oc}^{t}(x^{t+1}, y^{t+1})}{D_{oc}^{t+1}(x^{t+1}, y^{t+1})} X \frac{D_{oc}^{t}(x^{t}, y^{t})}{D_{oc}^{t+1}(x^{t}, y^{t})}\right]\right\} 1/2$$

$$= TE\Delta_{c}(x^{t}, y^{t} x^{t+1}, y^{t+1}) X \ T\Delta_{c}(x^{t}, y^{t} x^{t+1}, y^{t+1}), \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(iv)}$$

TFP growth = technical efficiency change x technical change

Where:

$TE\Delta c\ (x^{t}, y^{t}, x^{t+1}, y^{t+1})$ measures technical efficiency change between time period t and time period t+1

$T\Delta\ (x^{t}, y^{t}, x^{t+1}, y^{t+1})$ measures the geometric mean of the magnitudes of technical change

x= Vector of Inputs

y= Output of cocoa in Kg/ha

t= time trend (2005-2014)

3.2.7 Definition and Measurement of Variables

3.2.7.1 Independent variables

i. **Age:** This refers to the number of years an individual attained from birth. It is a continuous variable. In this study, age was measured by the actual number of years the respondent has lived as at the time of the study.

ii. **Marital Status:** this is the state of being married or unmarried. It was measured with binary choice model (married=1, unmarried=0, Divorce=2, Separated=3, widow and widower=4)

iii. **Household size:** This is the total number of persons in the family sharing the same catering arrangement. Household size in this study was measured by actual number of wives, children, husband and other dependents of the respondents (interval of 1-5 persons).

iv. **Educational Status:** This refers to the acquisition of knowledge through formal schooling. This was measured by the total number of years a respondent have spent in formal education.

v. **Farming Experience:** This variable was used to measure the farmers experience based on the particular involvement in production/marketing organization. It was measured in years (10 years interval).

vi. **Farm size:** It was included in the model to determine the extent to which variability in output is affected by farm size. It was measured in hectares (1.0-2.0 hecters)

3.2.7.2 **Dependent Variables**

Output: This was the quantity of cocoa produced in 2005-2010 and 2010-2014 cropping seasons and was measured in kilograms.

Income from cocoa farming: This is the profit realized from sale of cocoa. This is measured in naira. The respondent's total money realized from sales of cocoa produce which is measured in naira (₦).

Livelihood: the level of living is generally used to describe the level of material comfort that an individual enjoys. The comfort is in form of the quantity and quality of goods and services that is consumed by an individual and his family members. This was measured by the number of items owned and procured from proceeds of cocoa farming.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-Economic Characteristics of Respondents

The study examined socio-economic characteristics of the respondents. The results is presented in Table 4.1 below.

The study as showed in Table 4.1 shows that about 11% of the cocoa farmers are within the age bracket of 19-29 years, about 15% were found to be within the age brackets 29-39 years. Only 14% of the farmers are within the age bracket of 39-49 years and majority of the respondents, 32% are within the 49-59 years. While 21% of the respondents are within the age of 59-69 years while 7% are within the age bracket 70 and

above with mean age of 41.3 years, minimum of 26 years and maximum of 79 years as showed in Table 4.1. 21% of the respondent are no longer be grouped among active age of cocoa farmers. They do not have anyone to take over from them as such are still engaged in farming. The findings of Maurice (2004) and Yusuf (2005) shows that age can influence the adoption of improved agricultural practice and production rate. Nwanko *et al*. (2009) and Institute of Agricultural Research (2001), reported that the most active farmers age group engaged in agricultural production is within 31-50 years which is close to the findings of this study. Age can contribute to high yield and innovations in agricultural practice

Table 4.1: Socio-economic Characteristics of Respondents in Emure Local Government Area

Characteristics	**Frequency**	**percentage**
Age (Years)		
19-29	29	11
29-39	36	15
39-49	37	14
49-59	81	32
59-69	54	21
>70	11	7
Mean: 41.3(years) Max: 79 (Years), Min:26 (years).		
Sex		
Male	242	97.6
Female	6	2.4
Marital Status		
Married	229	92.3
Single	10	4.0
Widowed	9	3.6
Household size		
1-5	66	26

6-10	122	49
11-15	41	17
16-20	16	7
21-25	2	0.8
26-30	1	0.4
Years of Schooling		
No Formal education	97	38.7
Primary	38	15.3
Secondary	102	41.1
Tertiary	11	4.4
Income		
100-250	102	46
251-350	90	26
351-450	27	14.6
451-550	23	11
>551	6	2
Years of Farming		
1-2	135	54
2-3	70	28
3-4	42	17
4-5	1	0.8
Years of Cocoa Farming		
1-10	19	8
11-20	59	24
21-30	49	19.7
31-40	55	22
41-50	55	22.1
>50	11	4
Total	**248**	**100**

Source: Authors field work (2015)
NB: Multiple responses existed hence column tallies may exceed 248 and 100% respectively

Regarding respondents household size, some 26% had household size that ranged from 1-5 persons in their family. Majority of the farmers, 49% have household size that range from 6-10 persons in their family. The farmers that had the family size of 11-15 and 16-20 persons constitute 17% and 7% respectively, while the family size of 21-25 and 26-30 constitute only 0.8 and 0.4 respectively. The maximum family size observed was 30 persons and a minimum of 1 person and an average of 8 persons (Table 5).

This implies that the farmers in the study area have advantage of family labour available only if many members participate in farms. The study shows that most of the

respondent makes use of laborers. According to Okoruwa and Ogundele (2006) large family size does not necessarily translate to higher use of family labour because some of the young able bodied family member may prefer to work other jobs than farming. The finding of Solomon (2008) and Bameke (2003), indicate that large household size can assist more on farm and other household activities to increase the family income.

As shown in Table 4.1 about 38.7% of cocoa farmers had no formal education, 15.3% of the respondent had only primary education, while 41.1% had secondary education and about 4.4% had tertiary education. However, altogether about 61.1 percent of the farmers are literate. This contributes to their perceived request for extension workers to the farmers in the local government. This indicates that the farmer's educational level is high. The finding is in line with Amaza (2000); education has a positive and significant impact on farmer's efficiency in production. Thus, literacy level will greatly influence the decision making and adoption of innovation by farmers, which may bring about increase in productivity.

The experience of farmers surveyed revealed that only 8% of the cocoa farmers had 1-10 years; while majority 24% had 11-20 years experience. The farmers that had the farming experience of 21-30 and 31-40 constituted 19.7% and 22% respectively. 22.1% of the farmers had 41-50 years experience while the farmers that had experience greater than 50 years constituted only 4%. The maximum farming experience observed was 48 years with a minimum of 5 year. This finding is in line with Ajani (2000) in food farming in Northern area of Oyo state, which revealed that that year of farming experience increase agricultural productivities among farming household in Nigeria.

The result in Table 4.1 indicates that majority 97.6% of the respondents involve in cocoa farming are males as shown in the pie chart below as well, while 1.6% are females. The dominance of cocoa farming by males in the study area is a pointer to the belief that farming is a man's job.

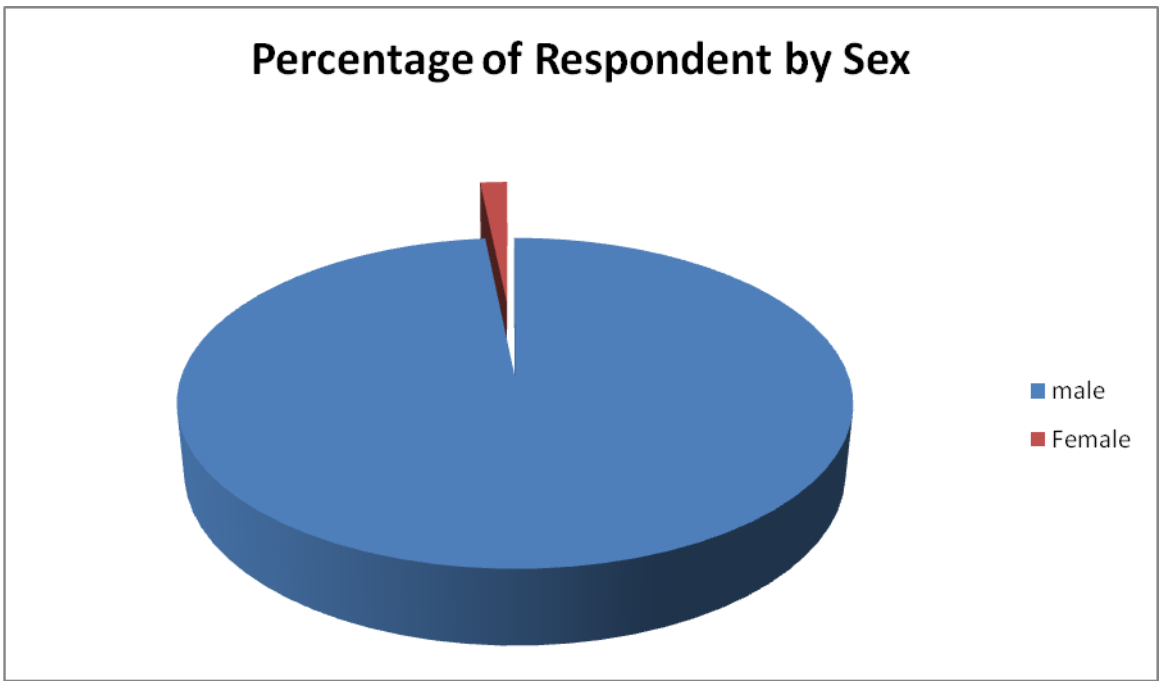


Figure 4.1**:** Distribution of respondent by sex.
Source: Authors fieldwork (2016)

This is because the farming requires a lot of energy and is labour intensive. The finding agrees with Asogwa (2012) who opined that farming activities is dominated by men because of the tedious nature of the farming operations.

The study investigated the marital status of the cocoa farmers in the study area. It shows that majority of 92.3% of the respondents were married, while 4.0% of the respondents were single. This implies that 95% of the cocoa farmers interviewed in the

study area have family responsibilities, which shows that majority are married and have children. The maroon color indicates the percentages of married, single and widowed. The 100 mark suggest the percentages. The finding is also in line with Solomon (2008) and Bameke (2003), which indicate that large household size assists more on farm and other household activities.

From Table 4.1 majority of the farmers, about 54% have farm land ranging from 1.0-2.0 hectares, closely followed by 28% of the cocoa farmers with farm size ranging from 2.1-3.0 hectares. This is typically an agrarian community; normally they are mainly dominated by small scale farmers.

The result above indicate that most of the farmers have small farm size and will not be able to enjoy economy of scale in production; similarly, small farm size is an impediment to agricultural mechanization because using farm mechanization like tractor will be difficult. Small farm size might be a result of the fact that most of the farmers got their farm land through inheritance.

About 30,000 farmers grow cocoa in the country and in general cocoa production in Nigeria is left to smallholders. The shortage in rural labour is a major constraint to production expansion as well as the relatively old workforce (Ogunleye *et* al., 2007) The size of cultivated area vary across states but an average cocoa farmer in Nigeria has a farm size of 2.5ha (Oguntade 2007). On the whole, the average deliver per farmer is less than 5 bags per season (roughly 300Kg per hectare of cocoa) (Nwachukwu et al., 2010).

4.2 Types of Asset Possessed by Respondents from Sale of Cocoa

The study examined the different assets possessed by the cocoa farmers through the sale of cocoa and the result is presented in Table 4.3. As showed in the table, 87.9% have at list one building/house. From cocoa proceed, majority 92.7% of the farmers have trained their wards at different level educationally.

Table 4.2: Distribution of Farmers by Asset Possessed from Cocoa Production

Asset	Frequency	Percentage
One and above building	218	87.9
Train Children in school	230	92.7
Have a Motorcycle	192	77.4
Have a Car	36	14

Source: Authors Fieldwork (2016)
NB: Multiple responses existed hence column tallies may exceed 248 and 100% respectively

Cocoa farmers which are about 77.4% have motorcycle. The motorcycle owned by the farmers enable them to move their cocoa from the farm. The roads to the farms are not really motorable so the bikes help to easy movement. A minority of 14% have cars. Majority of the farmers that have cars are civil servant. The multiple responses are in the four area mention above, meaning one respondent having two to three assets. The result obtain revealed that cocoa production has had impact on the farmers livelihood, because they were able to aquire all the assets over the years as a cocoa farmer as their main source of income. According to Vincent *et al*, (2010) Farmers did not become better-off in terms of asset acquisition. Whilst their nominal income increased drastically, their purchasing power rather deteriorated due to high inflationary effect.

4.3 Cocoa Farmers productivity growth and performance

Total factor productivity (TFP) measures how much cocoa is produced by the farmers relative to the amount of economic inputs used. When there is more yield relative to the quantity of economic input employed in cocoa production, then TFP has grown or increased. Therefore, TFP growth measures how much productivity grows or declines overtime. The change in productivity reflects how well a farmer has adopted technical change and adapted to the cocoa production environment. The DEAP Malmquist Productivity Index was used to analyze the TFP of cocoa producers 2005- 2014. The rule is MPI <1 implies an increase and MPI>1 implies a decline.

From the information gotten from secondary data, Table 4.4 shows that from 2005 on average efficiency change was 1.000 and technological change was 0.957. This indicated that efficiency change had positively impacted on total factor productivity growth during the period, while technological change had shown a technical regress of 0.975 , which contributed to the decrease in total factor productivity growth by 2.8% during the period. Scale efficiency and pure technical efficiency advance positively. Pajouhesh and Sazandegi, (2009) in Iran observed TFPG of maize decreased in Fars and Khozestan during 1998-2002. The result also tallied with the finding of (Rafiee and Zangenehand, 2012) on average he found corn TFP growth negative (4.5%) in Iran.

During 2006 on average, the result revealed that, the country had witnessed a cocoa productivity decrease by 16.7%. This was shown by the contributions from efficiency change of 1.000 and technological change of 0.801 at the time. The source of decrease to total factor productivity growth was due to technological regress from the technological change. From 2007 as indicated by Table 4.3 on average total factor productivity decrease in growth by 1.35%. During this period efficiency change had

positive impact on total factor productivity growth. What caused the decline was the technical regress during the period. Pajouhesh and Sazandegi, (2009) observed a technical regress from 1978-2001. It can be deduced from Table 4.3, that from 2008 the country had on average experienced a tremendous increase in cocoa productivity growth of 3.35%. It was found that the technical efficiency change components, scale efficiency and pure technical efficiency advanced.

It can also be observed from Table 4.3 that from 2009-2012 efficiency change on average 1.000 and technological change was 0.853.This reveals that the efficiency change has positively contributed to the total factor productivity growth while technological change has negatively contributed to the total factor productivity growth. During this period (2009-2012) the country witnessed productivity decrease as a result of technological regress. The result revealed that this is one of the periods the country had witnessed a huge decrease in cocoa productivity growth. This could be because during this period not much emphasis on programs that could derive increases in cocoa productivity growth in the country.

Efficiency change and technological change scores were 1.990 and 0.843, respectively. This has shown the commitment of government towards agricultural sector with a view to increasing cocoa productivity in the country through agricultural transformation agenda (ATA). This program (ATA) which was introduced in Nigeria in 2012 had led to increases in food , and increase in rural incomes and a dramatic reduction in rural poverty with the incidence decreasing from 52 percent in 2008 to 17 percent in 2009 (World Bank, 2002).

Table 4.3 Cocoa Farmers productivity growth and performance

Year	Technical efficiency change	Technical change	Scale efficiency change	Total factor productivity change
2005	1.454	0.957	1.454	-2.845
2006	1.000	0.801	1.000	1.677
2007	1.019	1.030	1.019	1.355
2008	1.031	1.547	1.081	52.48
2009	1.000	1.735	1.454	1.718
2010	1.000	1.076	1.276	1.373
2011	1.000	1.380	1.218	1.437
2012	1.113	0.890	1.113	1.647
2013	1.990	0.843	1.990	45.27
2014	1.000	0.914	1.000	1.414
Mean	1.113	1.326	1.113	1.477

4.4 Perceive Factors Affecting Cocoa Farmers Resulting In Change In Cocoa Production.

The various factors affecting cocoa production was examined in the study area and the results are presented in Table 4.4. It revealed that 91.5% of the farmers perceived that Finance is a major factor affecting production. Closely following is 86.3% of farmers stating Pest/diseases affect production. Similarly 68.9% of farmers perceived availability of chemical as a problem. 72.7% saw marketing as a factor and labour (60.9%). Next is 33.1% and 33.5% of the farmers, opined that storage facility and role of farmers respectively affect production. Adebiyi and Okunlola (2013) observed that the tendency for better implementation of cocoa rehabilitation techniques comes about when the farmers implement the techniques themselves and assisted by hired labour. They also

observed that the most important source of finance to cocoa farmers is from their personal. Majority depended on their personal savings as their source of finance while only 2.0 percent obtained bank loan. This could be as a result of inability of the respondents to meet up with the collateral security required by the banks. Few farmers have access to loan from non-governmental organizations and other credit agencies. Inadequate capital hinders adoption of some cocoa rehabilitation techniques as some of them reject technologies beyond their financial capability.

Table 4:4 Perceived Factors Affecting Changes in Cocoa Production by the Farmers

Factors	Frequency	Percentage
Finance	227	91.5
Pest control	214	86.3
Chemicals	171	68.9
Labour	151	60.9
Equipment	98	39.5
Market	101	40.7
Storage Facility	82	33.1
Role of Middle Men	83	33.5
Scarcity of fertile land	74	29.8
Security of land	32	12.9
Temperature	11	4.4

Source: Field Survey (2016)
NB: Multiple responses existed hence column tallies may exceed 248 and 100% respectively

According to Leonard *et al* (2011) the input factors such as usage of fertilizer, pesticides, modern equipment, the farm size, number of labour employed on a given piece of land and the years of tree of cocoa have either a positive or negative relationship with the total output of the farmer. But, priority should be given to those factors that have

significant effect to output such as fertilizer and pesticides as well as the usage of modern equipment. Joseph (2013) also identifies a number of socioeconomic variables such as labour, capital, price, political influence and gender, it implies that a unit increase or decrease in any of these variables will lead to a significant increase or decrease in output.

Output Distribution of Cocoa

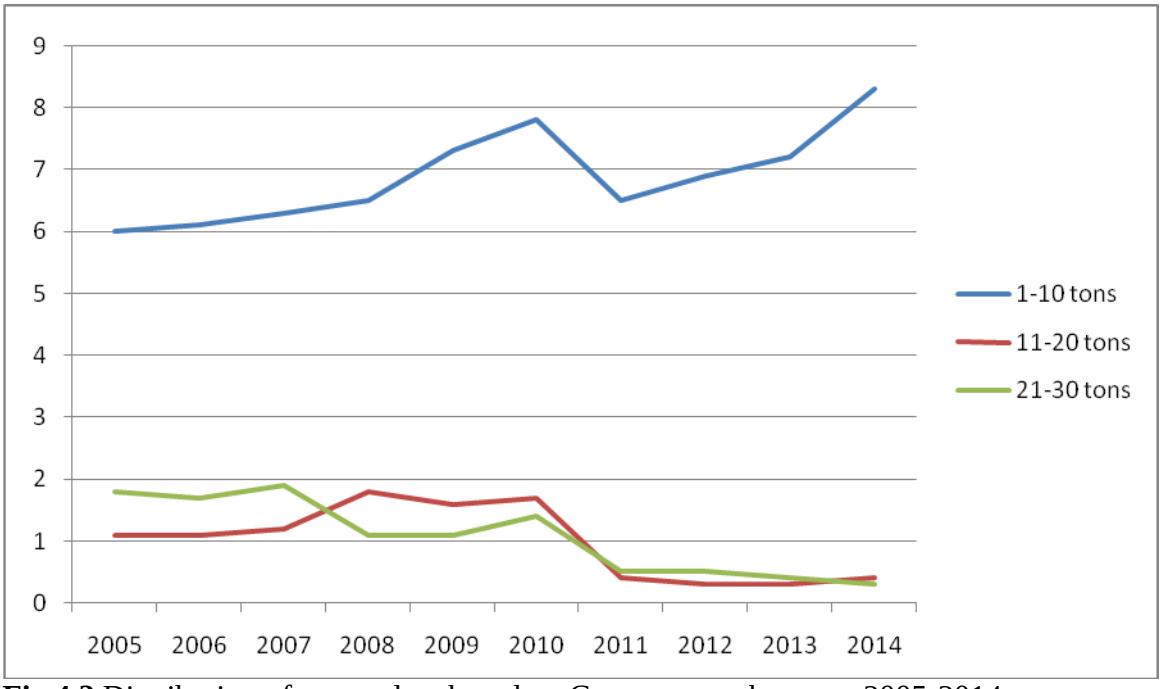


Fig.4.2 Distribution of respondent based on Cocoa output between 2005-2014

4.5 Distribution of Cocoa Farmers Livelihood indicator (asset)

Table 4.5 reveals that cocoa farmers have made concerted effort at providing productive goods among the farmers. The difference in the value of productive goods was large and significant over the years. A positive mean value in livelihood of cocoa farmers (₦2, 553, 282) indicating large increases in the value of productive goods. This result demonstrates that the cocoa production has helped the farmers to acquire more productive goods to facilitate their economic activities. It is expected that these goods contribute immensely to increase in productivity and consequently increase in income which would

lead to change in their livelihood. We operationalize level of living through all things contributing to the quality of life of the respondents hence boasting their social status. Thus, livelihood was measured in terms of value of durable goods such as motor cycle, car and farm equipment of an individual farmer which was converted to naira (₦) value.

The result presented in Table 4.5 Shows that about (65%) of the respondents had an asset ranging between ₦1 – ₦3,000,000 with minimum and maximum amount of ₦53000 and ₦12,429, 000, respectively. This means that farmers in these communities relied absolutely on farm business and must have acquired a lot of farming experience over time. According to FAO (1999), employment in non-farm activities is essential for diversification of the sources of farm household's livelihood. It enables households to modernize their production by giving them an opportunity to apply the necessary inputs.

Table 4.5 Distribution of livelihood (assets) of Cocoa Farmers.

Value	Frequency	Percentage
1-1000000	28	11.29
1000001-2000000	41	16.53
2000001-3000000	96	38.71
3000001-4000000	64	25.81
4000001-5000000	10	4.03
5000001-6000000	1	0.40
>6000000	8	3.22
Total	248	100
Minimum	53000	
Maximum	12,429, 000	
Mean	2,553, 282	

4.6 Annual Sale of Cocoa by the Farmers as it affect livelihood

The result from Table 4.6 revealed that 46% of the cocoa farmers make between ₦100-250,000 yearly. While 26% of the cocoa farmers make between ₦251-350,000. About 14.6% and 11% of the farmers earn between ₦351-450,000 and ₦451-550,000 respectively. Only about 2% of the cocoa farmers make above ₦600, 000 yearly.

Oluyole., *et al*. (2009) studied the Input use efficiency of cocoa farmers in Ondo State, the proportion of the total cost of production to the gross income was 16.70%, hence the average net farm income was ₦602, 152.00 showing that cocoa production are profitable in the study area. This implies that a profit of ₦100 and above is profitable based on the various farm size. Therefore considering what majority of the cocoa farmers make in Emure LGA, we could conclude that production is good.

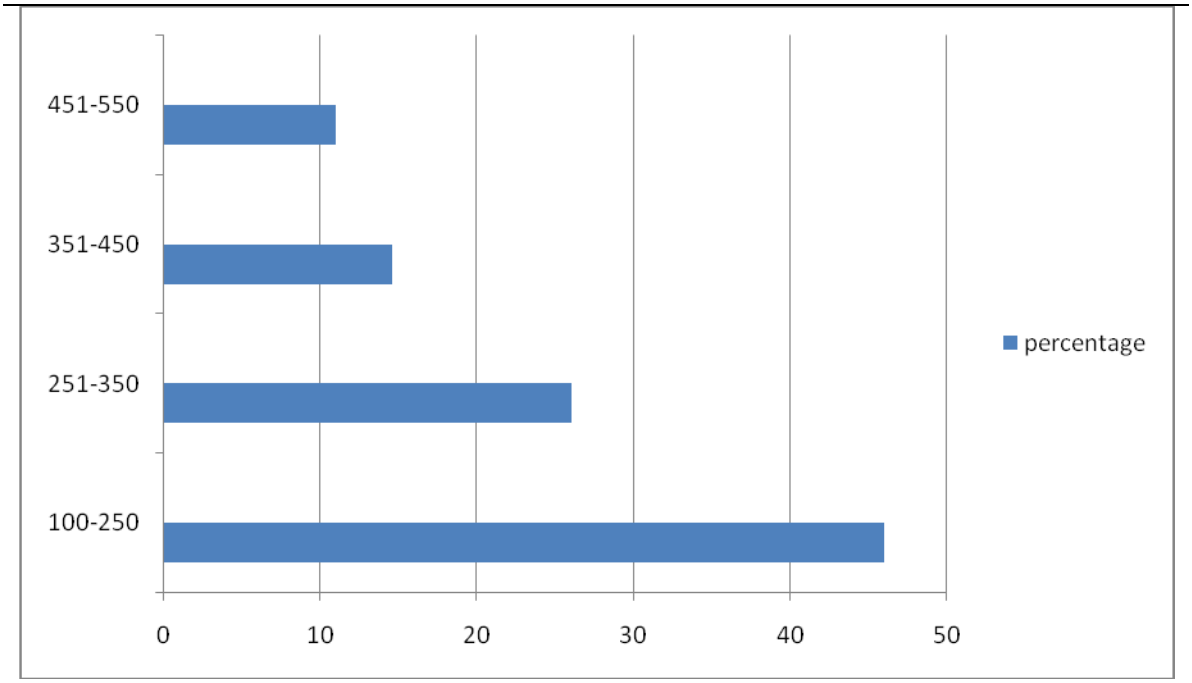


Fig.4.3 Distribution of Farmers by Annual Income from Cocoa Production
Source: Authors Field work (2016)

4.7 Challenges Faced By Respondents in Cocoa Production

The result in Table 4.7 revealed that only 13.7% of the farmers perceived that high cost of processing is a challenge in cocoa production. As high as 81.9% of farmers opined that lack of storage facilities is a major challenge.

Table 4.7 Distribution of Farmers based on perceived challenges faced in cocoa production

Challenges	Frequency	Percentage
High cost of processing	34	13.7
Lack of Storage	203	81.9
Low prize of cocoa seed	246	99.2
Diseases	152	61.3
Lack of Government intervention	186	75
Finance	164	66.1

Transport	174	70.1
Labour	174	70.1

Source: Authors fieldwork (2015)
NB: Multiple responses existed hence column tallies may exceed 248 and 100% respectively**.**

Another 99.2% of farmers feel it is the low prize of cocoa seed that is the most perceived problem. A group of 61.3% and 66.1% perceived that diseases and finance respectively was a challenge to cocoa production. Lack of Government interventions was perceived by 75% of the farmers. Transportation and labour had 70.1% perceived problem. According to PM news, (August 27th 2012), constraint mentioned by a group of cocoa farmers is that they hardly benefit from the so-called government intervention in form of funds/loans and improve varieties. They revealed that even some of the seeds, especially the high yielding seeds, meant for farmers courtesy of the government, are often hijacked by ghost farmers while genuine farmers are left out. Most of the farmers are also still applying old methods and tools due to illiteracy. While in countries like Ghana, most of the farmers are using high yielding and improved varieties, the old and regular seeds are in vogue among Nigerian farmers.

4.8 Farmers Suggested Solutions to the Challenges Facing Cocoa Farmers

The results in Table 4.8 reflect various responses on how to minimize the challenges faced by the farmers. Amongst the farmers, 19% of the farmers suggested replacing aged tree so as to improve production, while 11% of the respondent suggested that agro chemicals need to be used to reduce pest/ diseases from destroying the cocoa pods.

Table 4.8 Farmers Suggestions towards Minimizing the Challenges

Suggestion	Frequency	Percentage
Replace old trees	58	19
Use of Agro-chemicals	27	11
Availability of agro-chemicals	12	5
Market controlled by farmers	2	0.8
Farmers education by extension workers	9	4
Government support	103	45
Modern technology	29	12
Land fallow system	8	3

Source: Authors filed work (2015)

Closely related to these responds are 5% of the famers who advocated that agro chemicals are not affordable, therefore suggesting that they be subsidies for farmers. Only about 0.8% of the farmers suggested that cocoa market be left in the control of cocoa farmers. Majority of the farmers, about 45% strongly called for government intervention/support. Most believe that with government support, most of the constraint would be tackle. 12% of the farmers and 3%, suggested that the use of modern technology and land use respectively would help to reduce the problem faced by cocoa producers

4.9 Adopted Strategies by Famers in coping with Changes in Cocoa Production

Results in Table 4.9 revealed that a percentage of 76.2% of cocoa farmer agree to replacing the old trees with young new varieties. Majority, 90.3% use hybrid cocoa to replace the old ones. Another group of 52.8% use mixed cropping to cope with changes in production. In this case they are able to grow other food. From the research, farmers prefer the provision of hybrids to boost production of cocoa as compared to land fallow system and increased land size. Also noted is the replacing of old trees with new ones to increase

production. There are therefore two major copping strategies: use of hybrid and replace old trees with new and younger ones. This is shown in the table below.

Table 4.9 Distribution of Farmers based on Strategies adopted by farmers

Strategies	Frequency	Percentage
Replace old trees	189	76.2
Using old verities	87	35.1
Use of hybrid	224	90.3
Increase size of land	91	36.7
Mixed cropping	131	52.8
Land fallow system	48	19.3

NB: Multiple responses existed hence column tallies may exceed 248 and 100% respectively
Source: Authors filed work (2015**)**

4.10 Reason for Adopting Coping Strategies

As shown in Table 4.10, majority 46% of the farmers observed that the strategy they adopted will help develop resistance to diseases, while 26% said it is to help them control diseases especially when they replace the aged trees. Another 4.6% are of the option that it will bring about good growth for the trees while 11% said all copping strategies is to improve yield from previous production. From the table 2% and 4.8% of the farmers said it is to help in plantation regeneration and improve income respectively. All that the farmers try to do is to reduce loss each year.

Table 4.10 Distribution of Farmers based on reason for choosing coping strategies

Reason	Frequency	Percentage
Help develop resistance to diseases	102	46
Help in Disease control	90	26
Ensure good growth	27	4.6
Improve yield	23	11
Plantation regeneration	6	2
Improve income	13	4.8
Total	**248**	**100**

Source: Authors Filed work (2015)

4.11 Hypotheses Testing

4.11.1 Hypothesis I:

The first hypothesis states that there is no significant relationship between socio-economic characteristics of farmers and productivity. The study carried out the statistical testing of the null hypothesis that there is no significant relationship between the socio-economic characteristics of the farmers and the cocoa productivity in the study area. The result of the regression analysis was presented in Table 4.11. It showed that the estimated

R-square value was 0.58 this indicates 58 percent of the variation that occur in the production of cocoa could be explained by the independent variables included in the regression model. The F-value of 3.07 was significant at 0.01percent level of probability implied that independent variable jointly influenced the productivity of cocoa in the study area. The factors that were found related to the productivity of cocoa include age, marital status, education and years of experience in cocoa production.

The estimated coefficient was significant at 1 percent level of probability and negatively influential to the productivity of cocoa. This implies that as the age of farmer increases productivity of cocoa decreases. This could be attributed to the fact that the older the farmer, the less the willingness to take risk and try innovation that may increase cocoa output. More so, older farmers are less receptive to innovation unlike younger farmers.

The parameter estimated for education showed a positive relationship with productivity of cocoa at 1 percent level of probability. The negative coefficient of education reveals that a high level of education results to increase in productivity of cocoa farmers. Educated farmers are able to gather, understand and use information from research and extension more easily than illiterate farmers.

Table 4.11: Result of the Regression Analysis for the relationship between socio-economic characteristic and productivity

Variables	Coefficient	Std. Error	t-value
Constant	1657.92	1855.53	0.89
Age	-83.489	40.951	-2.04**
Marital status	799.688	392.43	2.04**
Education	753.062	332.43	2.27**

Household size	104.984	76.65	1.37
Farm size	228.744	341.939	0.67
Experience	93.162	39.406	2.36**
Income	0.002	0.002	0.67

** = significant at 1% level of probability
R-square = 0.58 F-value = 3.07**

Moreover, educated farmers are likely to be less risk-averse and therefore more willing to try out modern technologies. Tank and Opara (2009) opined that education raises the technical competence of an entrepreneur and enables the entrepreneur to cope with the complexities associated with adoption of improved technologies. Education is a central ingredient in a strategy to improve agricultural productivity especially where the use of modern inputs are emphasized (Lockhead *et al*., 1980). Gbigbi (2011) found that better performance by more educated farmers may be attributed to educational access, which gives the farmers the ability to perceive, interpret and respond to new information and improved technologies such as fertilizers, pesticides and planting materials much faster than their less educated counterparts.

The coefficient obtained for farmers' years of experience in cocoa production was positive and significant at 1 percent level of probability. This shows that increase in experience in cocoa production would increase the productivity of cocoa in the study area. Farming experience is an important factor determining both the productivity and the production level in farming activities. Generally, it would appear that up to a certain number of years, farming experience would have a positive effect on the productivity of the farmers this is because experience could be associated with skill accumulation which could enhance productivity and resource allocations.

Marital status was positive and significantly related to productivity of cocoa. This implied that married household obtained more output than unmarried household. This could be linked to access to family labour. It is expected that family labour would be more available where the household heads are married (Amaza *et al*., 2009). Marital status may influence the size of households as married farmers may have larger household sizes which may increase family labour input that is available for farm operations in cocoa production thereby enhance the productivity.

4.11.2 Hypothesis II:

It was hypothesized that: there is no significant influence of changes in cocoa production on the livelihood of the farmers in the study area. However, after estimation the results shows that changes in cocoa production had significant influence on farmers' livelihood in the study area. From the result in the Table 4.12, an average of 111300 and average livelihood (asset) was 2553 282. The calculated t-value was 2.22 and exceeds the critical value (t-critical two tail) of 1.97, therefore H_o is rejected at 5% level of significance. The result of the analysis indicates that change in production had a significant impact on the farmers' livelihood (asset). Therefore the null hypothesis stating that, there is no significant influence of changes in cocoa production on the livelihood of the farmers was rejected.

Table 4.12: The result of t-test showing significant influence of changes in cocoa production on the livelihood of the farmers

	Change in Output	***Change in Level of Living***
Mean	111300	2553282
Variance	28734.11	31637.91

Observations	248	248
Hypothesized Mean Difference	0	
Df	181	
t Stat	-2.22	
P(T<=t) one-tail	0.11	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.22	
t Critical two-tail	1.97	

**** p<0.05**

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of Findings

The result of the analysis shows that 97.6% of the respondents are male with 92.3% of them married. This indicates that cocoa production is primarily a man affair. Among the respondents, 32% of them fall within the age bracket of 49-59 years, which fall within the active age of production. This has affected the quality of work or supervision they can do on the farm. Only 14% fall within the age bracket of 39-49 year.

The household size ranged from 1-10 people. Majority of the farmers 60.8% are have one form of education or the other, while 24% of them have farming experience ranging from 11-20 years. Majority 27.3% in Odo Emure and Oke Emure are involve in craftwork, while 35.3% are civil servants and 28% are traders. This might explain why majority of them sale proceed to retailers.

Regarding areas of asset acquired by respondents, 87.9% of the farmers have built their own houses. Another 54% of the farmers have farm size ranging from 1-2 hectares. An average of ₦100-250,000 is earned by about 46% of the respondents. Response gotten from 56% of the respondents shows that the farm gate prize of cocoa is between ₦351-400 as at the time of the study.

The results obtained from the analysis indicate an average of 4.8tons of cocoa produced by 88% of the respondent yearly between 2005-2009 while there was an increase between 2010-2014 to 7.2tons produced by 98% of the respondent. The finding of the research also shows that 46% of the cocoa farmers makes between ₦100, 000 to 250,000, while another 26% makes between ₦251, 000 to 350,000 from sale of cocoa yearly. Considering their farm size and challenges faced by these farmers, one could conclude that cocoa farming is profitable in the study area. As at the time of the research,

responses gotten from 56% of the farmers put farm gate prize of cocoa at between ₦351-400 per kilogram. This still depends on the point of sale.

On the constraints identified by cocoa farmers, majority of the respondents 99.2% attested to the fact that low prize of cocoa seed, 77% of the respondent complained of transport, while 66.1% of the respondent identified lack of finance as a constraint. Another 61.3% complain of diseases. These are the major challenges faced by the cocoa farmers in the study area. To cope with these challenges, 90.3% of the farmers result to hybrid seedling to improve production. 76.2% of the same farmers are replacing the aged trees with new ones as a copping strategy. These rank among the major coping strategies.

The respondent's suggestions on minimizing the challenges, 45% of them call for government interventions to minimize the problems faced by farmers. Another 19% suggested the replacing of old trees with new improved seedling that can with stand diseases. The regression result indicates that the variable such as age, marital status, education and experience shows positive influence to production of cocoa in the study area all at 1% level of probability.

5.2 Conclusion

Based on the findings of this study, it could be concluded that change in cocoa production has affected the total income of an average farmer, these invariably has affected the level of living of the cocoa farmers. There is a decline in production, especially for those with a smaller farm size while those with larger farm size seem to experience a little increase.. However, some of the major constrain identified were: low prize of cocoa seed, finance, diseases, transportation and lack of storage facility. These are

major areas where cocoa farming needs improvement. Especially in area of disease control. Because of economic hardship most farmers cannot afford to apply insecticide as at when due which automatically affect production. Marital status was positive and significant to production. The hypothesis shows that married household obtained more output than unmarried household. The study has shown that the size of land does not result to more yield. It is still a function of the financial capability of individual farmers. Though experience of the farmers has a positive influence on production, if it is taped properly it will go a long way to improve productivity. We can also conclude that if all the socio-economic variables can be properly utilize there will be a positive output in cocoa production, thereby enhancing the livelihood of the individual farmers and encouraging the younger generation to key into cocoa production.

5.3 Contribution to Knowledge

The work has contributed the following to existing body of knowledge in productivity and its effect on socio economic characteristic:

i. It revealed that socio-economic characteristics contributes 87% to the productivity of cocoa all at 1% level of probability.

ii. The study established that experience of the cocoa farmers play a major role in productivity.

iii. The study also revealed that replacing of aged trees with younger ones will help in coping the changes in production.

iv. From the study, 92% of the farmers attested to low prize of cocoa as one of the constraints affecting production.

5.4 Recommendations

From the following findings of the study, the following recommendations among others are put forward:

i. It is recommended that the government should give cocoa production top most priority, so that Nigeria can regain its past glory in cocoa production. Cocoa industry has the capacity to boost the foreign earnings thus increasing the economic growth of Nigeria if its given serious attention

ii. Age, education, experience in cocoa farming were found to influence production of cocoa differently.. It is therefore recommended that attention should be given to cocoa farming to encourage younger ones to get involve in cocoa farming.

iii. Most of the farming populations in the study area are advance in years. Although experience matters, the level of agility also matter in agricultural practices. Government should organize programs that can encourage the younger generation to imbibe agriculture as a way of life.

iv. The study identified some constraint such as low prize of cocoa seed, in which Government can encourage Rural People's Organizations such as cooperatives which have been known to effectively harness member's resources for bargaining purposes and for developing markets for member's produce. They can increase farmer's voice, ensure that farmers receive fair prices for cocoa bean. Finance is yet another constraint. Government or NGO's can give out loans with little or no

interest attached. This will boost cocoa production, returning Nigeria to its past status as a major cocoa producing country. No amount of loans can be given if there are no measures to control diseases.

Insecticides and fungicides are on the high side as famers will always complain. If only majority of them are produced in Nigeria and subsidized for farmers. Transport cost is high because of accessibility to the farms. If other means of transport are made available to move goods from farm at a lower cost to farmers, it will prevent them from sailing off produce from farm site.

There should be silos that are rented to farmers at low cost to help preserve cocoa beans. Lack of storage facilities is a problem to farmers. Attention should therefore be paid to how to cope and reduce some of the constraints. The Government should subsidize considerably the cost of cocoa seeds.

Concerted effort should be made to increase Nigeria's share in the world cocoa market. This will help bring the agricultural sector to lam light. It will really go a long way to reduce poverty and expand rural development.

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Appendix I:

QUESTIONNAIRE SURVEY

QUESTIONNAIRE ON THE EFFECTS OF CHANGES IN COCOA PRODUCTION AND HOW IT AFFECTS SOCIO-ECONOMIC DEVELOPMENT OF EMURE LOCAL GOVERNMENT AREA. EKITI STATE

Dear respondents,

This questionnaire is for research purpose only. All information given will be considered confidential. You are requested to sincerely answer the following questions. Kindly tick ( ) or fill in the blank space(s) as appropriate.

SECTION A: BACKGROUND INFORMATION

i. Name of village ……Ward ……
ii. Date ……..

SECTION B: SOCIO-ECONOMIC CHARACTERISTICS OF FARMERS.

1. Age of respondents ……years

2. Gender: (i) Male ( ) (ii) Female ( )

3. Marital status: (i) Married ( ), (ii) Single ( ), (iii) Divorced ( ), (iv) Widow ( ), (v) Widower ( )

4. Educational qualification: (i) No formal education ( ), (ii) Primary ( ), (iii) Secondary ( ), (iv) Tertiary ( ), (v) Others specify ……..

5. What is the size of your household? ……..

6. Major occupation of the respondents: (a) farming ( ), (b) Craftwork ( ), (c) Trading ( )
(d) Civil servant ( ) (e) Others specify ……

7. How long have you been farming Cocoa? …… years.

8. Has cocoa production improved your standard of living? Yes ( ) No ( )

9. If Yes, How? i. Built your House ( ), ii. Train your Children in School ( ), iii. Buy a motorcycle ( ), iv. Buy a Car ( ), All of the Above ( ).

SECTION C: CHANGES IN PRODUCTION.

10. How had cocoa production affected you? i. schools ( ) ii. Recreational center ( ) iii. Good road ( )
iv. Electricity ( ) v. good drinking water ( ) vi. All of the above ( ) vii.non of the above ( )

11. In your own view grade the following factor that affect change in cocoa production in order of magnitude. Lowest score is 1 and highest score is 10. Note that you can grade more than one item the same grade.

S/n	FACTORS	RATE
1	Seed quality	
2	Equipment	
3	Finance	
4	Labour	

5	Storage facility	
6	Pest control	
7	Chemicals	
8	Market	
9	Scarcity of land	
10	Temperature	
11	Role of middle men	
12	Scarcity of fertile land	

12. What is your farm size? …….

13. How many kilograms' of cocoa did you harvest from your farm between?
(i) 2005-2010 …….kg
(ii) 2010-2014 …….kg

14. How much do you make from sales of cocoa yearly? …….

15. What was the farm gate price of cocoa per kg……..……?

16. How do you market your produce?
a. open village market ( )b. farm gate ( )c. retailers ( )d. wholesalers ( )e. all of the above ( )
f. others (specify). …….....

17. Indicate the total number and current value of assets possessed as a result of cocoa production?

	Assets	Number	Total value
A	**Building**		
B	**Farm equipment:** Sprayer Pumping machine Others (specify)		
C	**Vehicles/automobiles** Car Lorry Motorcycle Others (specify)		
D	**Electrical durables:** Refrigerator Radio Television Others (specify)		

SECTION D: PRODUCTION AND COMMUNITY DEVELOPMENT

18. How has production affected community development? i. Good portable water ( ) ii. Churches ( )
iii. Burial ground ( ), iv. Mosque ( ) v. All of the above ( ) vi. Non of the above.

SECTION D: CHALLENGES FACING COCOA PRODUCTION.

19. What are the major challenges you have observed in cocoa production?
i. High cost of processing ( ), ii. Lack of storage facilities ( ), iii. Low price of cocoa seed( ) iv. Diseases ( ), Transport ( ), Labour ( ).

20. Give your opinion on the following items:

Challenges	SA	A	UD	D	SD
A. there is high cost of farm inputs. E.g i. fertilizers ii. seeds iii. agro-chemical. iv. Seed dressing chemical					
B. poor infrastructural facilities, e.g. i. road ii. water					
C. low price for farm produce					
D. inadequate capital in the form of land					
E. inadequate capital in form of cash					
F. delay in distribution of subsidized inputs					
G. low western literacy level.					
F. Age of the trees					

SA: strongly agree, A: agree, UD, undecided, SD: strongly disagree.

21. What strategies have you adopted to cope with the challenges facing production?Give your opinion on the following items:

Strategies	SA	A	UD	D	SD
A. Diversification					
B. Delay Planting					
C. Change Varieties					
D. others Specify					

SA: strongly agree, A: agree, UD, undecided, SD: strongly disagree.

22. Why did you choose the strategies above?……

……..

23. What result have you observed from the use of these strategies?…….

……
……

24. Suggest ways in which the constraints and challenges can be minimized?……..……

……

……