ASSESSMENT OF THE EFFECTS OF FARMER FIELD SCHOOL ACTIVITIES ON LIVELIHOOD OF SMALL-HOLDER COCOA FARMERS IN KWARA STATE, NIGERIA

BY

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A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF SICENCE DEGREE IN AGRICULTURAL EDUCATION

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DECLARATION

I hereby declare that the work contained in this dissertation titled 'Assessment of the Effects of Farmer Field School Activities on Livelihood of Small-holder Cocoa Farmers in Kwara State, Nigeria' was carried out by me in the Department of Vocational and Technical Education. 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 for the award of degree in another university or higher institution.

……. ……..

Kamorudeen FATAI **Date**

CERTIFICATION

This dissertation titled 'ASSESSMENT OF THE EFFECTS OF FARMER FIELD SCHOOL ACTIVITIES ON LIVELIHOOD OF SMALL-HOLDER COCOA FARMERS IN KWARA STATE, NIGERIA'by Kamorudeen Fatai meets the requirements governing the award of Master of science degree in Agricultural Education of the Department of Vocational and Technical Education of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

……... …….

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DEDICATION

This work is dedicated to my parents, Mr. and Mrs. Fatai

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LIST OF ABBREVIATIONS

CRP	Cocoa Re-birth Programme
FFS	Farmer Field School
FAO	Food and Agricultural Organization
Ha	Hectare
ICCO	International Cocoa Organization
Kg	Kilogramme
SAP	Structural Adjustment Programme
MT	Metric tonnes
NCR	National Cocoa Rehabilitation

OPERATIONAL DEFINITION OF TERMS

Farmer Field School: This is an educational platform without walls consisting of 20-30 small-holder cocoa farmers in Kwara State who learn cocoa crop production activities.

Income: The amount of money in Naira received by small-holder cocoa farmers through the sale of cocoa produce as a result of their participation in FFS in Kwara State, Nigeria.

Livelihood: Refers to the state of wealth and material goods of small-holder cocoa farmers that participated in FFS in Kwara State, Nigeria.

Living Standard: Refers to the level of comfort available to small-holder cocoa farmers that participated in the FFS activities in Kwara State, Nigeria.

Small-holder: Cocoa farmers cultivating cocoa on <5 hectares of farmland in Kwara State, Nigeria.

Yield: Quantity of cocoa harvested by the small-holder cocoa farmers in kilogramme per hectare in Kwara State, Nigeria.

ABSTRACT

The study assessed the effects of farmer field school activities on livelihood of small-holder cocoa farmers in Kwara State, Nigeria. Descriptive survey design was adopted for the study. Five research question were raised with two testable null hypotheses. Purposive sampling procedure was used to select all the 160 respondents in Kwara State. A researcher designed interview schedule was used as instrument for collecting data. The reliability result of the instrument yielded a Guttman Split-half coefficient 0.73. Data collected was analyzed using descriptive statistics to achieve objectives while chi-square and linear regression analysis were used to test the null hypotheses at 0.05 level of significant. The result shows that skills provided by farmer field school had significant relationship with training needs of small-holder cocoa farmers ($p=0.001<0.05$). It was concluded that FFS activities showed positive relationship between the skills provided and the training needs of small-holder cocoa farmers. The study recommends that FFS should continue to serve as a training base that involve more farmers into the programme and encourage extension service delivery to encourage capacity building and increase productivity.

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Agriculture is the mainstay of many developing countries including Nigeria, which contributes significantly to economic growth, poverty reduction, direct employment, food security, livelihoods, export earnings, raw materials, and rural development of most nations. Agriculture has become a key source of income for most people in the developing worlds. In Nigeria, agriculture has continued to be the largest sector of the economy.Nigeria has an ecological diversity that makes it possible for the country to produce a wide variety of cropsamong which is cocoa that has been useful in several ways.

Cocoa contributes greatly to the economy of Nigeria, and it was one of the leading agricultural exports and a top foreign exchange earner in the 1950s and 60s before the discovery of oil. Cocoa is grown in Ondo, Ogun, Osun, Oyo,Ekiti, Cross River, AkwaIbom, Delta, Rivers and Kwara State in Nigeria. The estimated land area cultivated for cocoa in Kwara State is 5140 hectares and the estimated yield is 1430MT (Afolayan,2020 cited NBS,2013)

Statistical data reviewed by FAO (2016) on production and exportation of cocoa in Nigeria showed periods of decline and growth in both production and exportation. For instance, the period between 2010 – 2015 showed a decrease in production from 399,200 tonnes to 195,000 tonnes. Also, the number of cocoa beans exported was 226,634 tonnes in 2010 and declined to 76,197 tonnes in 2015 (FAO, 2016). Olusuyi (2016) identified that the decline in production was due to lack of infrastructure,incidence of pest and diseases, and lack of funds from the government to young cocoa farmers. This has prevented the Nigeria from meeting the target set of 500,000MT by the International Cocoa Organisation (ICCO) and hasaffected the productivity, livelihood and consequently resulted in a huge loss of revenue amounting to $1 billion (Eze, 2018).

Various strategies and reform programmes such as the Structural Adjustment Programme (SAP) in 1986,the National Cocoa Rehabilitation (NCR) in 1999and the Cocoa Re-birth Programme (CRP) in 2005 were introduced by the federal government to promote the production of cocoa to meet the demand of the export market. The programmes were also aimed at enhancing the livelihood of farmers and reducing poverty. To complement the effort of the federal government, the Kwara State government through the ministry of agricultureintroduced the Farmer Field School(FFS) to train and retrainsmall-holder cocoa farmers who have primitive skills in land preparation, climate requirement, planting and spacing, selection of planting material, fertilizers application, irrigation, pest and diseases control.

The FFS is a non-formal educationprogramme and is meant for adult farmers. It is designed to empower farmers, increase productivity and improve livelihoods. It involves a group of farmers jointly managing trial plots and doing thorough observations of innovative agricultural practices. The farmers group themselves based on the learning process and carry out experiential learning activities that help them understand the ecology of their crop (Food and Agriculture Organization, (FAO, 2019). The FFS activities are agro ecosystem analysis,group dynamic exercise and special topics. The FFS is a development programme that helps farmers to show their stable and full participation at all levels of innovation and act like experts on their farms. Generally, FFS programmes intend to include participants' own knowledge, experiences, and needs, rather than a top-down knowledge transfer (Price and Palis, 2016).According to Godrick, James and Erin, (2014), the common objectives of FFS intervention include improving productivity for food security and reducing rural poverty, enhancing individual and collective agency and action for livelihood and building resilience among communities faced with recurrent hazards such as drought, floods, plant and animal pests and diseases.

The specific objectives of FFS are as follows: empower farmers with knowledge and skills to make them experts in their own contexts; provide platforms where farmer groupings and extension and research workers can jointly test and adapt options with their specific local conditions; facilitate farming communities' learning new ways to solve problems and adapt to change; sharpen the ability of farmers to make critical and informational decisions that strengthen their coping mechanisms; help farmers learn how to organize themselves and their communities; and enable farmers' livelihoods to become more resilient and less vulnerable to disasters.

The approach of FFS requires a group of 20–30 farmers to meet regularly on a given farm where they make field observations, relate their observations to the ecosystem, and apply their previous experience with any new information to make a crop management decision with the guidance of a facilitator.It is expected that FFSactivities will increase the farmers' skills, knowledge, yield and income. It is for these reasons that this study deemednecessary to examine the effects of FFS activities on the livelihoods of small-holder cocoa farmers in Kwara State, Nigeria.

1.2 Statement of the problem

Cocoa *(Theobroma cacao)* is an important cash crop which small-holder farmers are involved in its cultivation and whose livelihood depends on its farming. In spite of the importance of cocoa to the livelihoods of farmers and the economy at large, its production is characterized by traditional methods of production and low levels of technological use. The decline in cocoa production is also attributed to a high level of yield loss due to the incidence of pest, diseases and poor management practices, which were considered as major threats to the livelihood of small-holder cocoa farmers in Kwara State (Agbongiarhuoyi,Abdulkarim, Oloyede, Famuyiwa and Oduwole, (2013).The Nigeria cocoa production index shows that farmers generally are producing below production capacity. For instance, Nigeria produced

270,000 metric tons in year 2019 and 250,000 metric tons in year 2020 (Vincent,Eyoand Bola, 2021).This shows a decline in production instead of an expected increase. The Nigerian government through several number of programmessuch as SAP, NCR and CRP intended an improved cocoa production and its export capacity. Despite these efforts, cocoa production in Kwara State has been affected by climate change, agronomic and social problems (Agbongiarhuoyi*etal.,* 2013). These may be attributed to the gap between developed cocoa technologies and the actual practice by farmers. The FFS was introducedto bridge the gap between the newly developed technologies that improve the yield of cocoa and the indigenous practices of the farmers in Kwara State that hitherto hinder high level of production and income of farmers. The FFS was hence introduced to facilitate farmerslearn new ways to solve problems, improve their livelihood and reduce insect pests and diseases that alter cocoa yields. However,the effects of FFS activities on livelihood of small-holder cocoa farmers in Kwara State, Nigeria is not known. The above gap is what this study seeks to address.

1.3 Objectives of the Study

The major objective of this study is to assess the effects of farmer field schools on livelihood of small-holder cocoa farmers inKwara State, Nigeria.

Specifically, this study intends to:

i. describe the socio-economic characteristics of small-holder cocoa farmers in Kwara State, Nigeria;
ii. identify the skills provided by FFS to small-holder cocoa farmers;
iii. determine the relationship between skills provided by FFS and training needs ofsmall-holder cocoa farmers;
iv. determine thedifference between yield and living standard of small-holder cocoa farmers before and after participation in FFS.
v. identifythe constraintsfaced by cocoa farmers participating in farmer field school activities in Kwara State, Nigeria.

1.4 Research Questions

In line with the objectives of the study, the following questions were raised:

i. What are the socio-economic characteristics of small-holder cocoa farmers in Kwara State, Nigeria?
ii. What are theskillsprovided by FFS to small-holder cocoa farmers?
iii. What is the relationship between the skills provided by FFS and thetraining needs of small-holder cocoa farmers?
iv. What is the difference between yield, income and expenditure of small-holder cocoa farmers of small-holder cocoa farmers before and after participation in FFS?
v. What are the constraints faced by cocoa farmers participating in farmer field school activities in Kwara State, Nigeria?

1.5 Research Hypotheses

In line with the research questions, the following hypotheses were formulated and tested at 0.05 level of significance.

i. There is no significant relationship between the skills provided by FFS and training needsof small-holder cocoa farmers in Kwara State, Nigeria
ii. Farmer Field Schools activities have no significant effects on yield and living standard of small-holder cocoa farmers in Kwara State, Nigeria

1.6 Significance of the study

The findings of this studywould be of immense benefit to cocoa farmers, agriculturalinstitutions, research agencies,governmentandnon-governmental organizationsthat are interested in cocoa production.

The findings of this study wouldbe of beneficial to farmers as the result is expected to determine the effects of FFS activities on their livelihood of small-holder cocoa farmers. This will allow farmers to see the extent to which FFS activities can contribute to their livelihood and also enable them to adopt the modern ways of carrying out cocoa production that are more productive.

This study will be of benefit to agricultural institutions,since it is expected to show the effects of farmer field school activities on cocoa production. This will draw the attention of Cocoa Research Institute of Nigeriato provide the needed assistance to cocoa farmers in terms of input and technology in order to boost their productivity.

The study will be of benefit to agricultural research agencies by providing them with useful information that will guide them to meet the farmer's needs. The result of the study will be useful to future researchers who are interested in the same or similar topics in different locations.

The study would be of help to non-governmental organizations that involves in assisting small-holder cocoa farmers. It will help them to know how best to train and allocate resources to cocoa farmersto increase production and also it will help them in planningprogrammesfor farmers.

The study will also be of particular importance to the government, since one of the major aims of the government is to improve the living standard of its people.This will prompt the government to consider providing the farmer with the needed support in order to increase their productivity and improve their standard of living.

1.7 Basic assumptions of the study

This study was carried out on the assumption that:

i. Farmer field schools' activities improves the cocoa production skillsof small-holder cocoa farmers in Kwara State, Nigeria;
ii. Skills provided by FFS relate to the training needs of small-holder cocoa farmers in Kwara State, Nigeria;
iii. Farmer field schools' activitiesimprove the yield, incomeand living standard of small-

1.8 Delimitation of the study

This study wasdelimited to effects of FFS activities on livelihood of small-holdercocoa farmers in Kwara State, Nigeria. The study was delimited toKwara South Agricultural Zone because cocoa is produced only in this agricultural zone(Kwara State Ministry of Agriculture,2021). The livelihood of small-holder cocoa farmers was delimited toincome, household expenditure and asset possession.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

ThisChapter reviewed the related literature under the following sub-headings:

2.1 Theoretical Framework

2.1.1 Participation Theory

2.1.2 Social change Theory

2.2 Conceptual Framework

2.3 Livelihood perspectives

2.4 Cocoa Farming in Nigeria

2.4.1 Cocoa Farming in Kwara State

2.4.2 Challenges of Cocoa Farming Sector

2.5 Historical Background of Farmer Field Schools

2.5.1 Concepts andObjectives of Farmer Field Schools

2.5.2 Farmer Field Schools Activities

2.5.3 Effects of Farmer Field Schools on Small-holder Farmer's Livelihoods

2.5.4 Constraints Faced by Small-holderCocoa Farmers in Farmer Field Schools

2.6 Socio-economic Characteristics ofSmall-holder Cocoa Farmers

2.7 Review of Empirical Studies

2.8 Summary of Literature Reviewed

2.1 Theoretical Framework

The theoretical framework is the 'blueprint' or guidesfor research (Grant &Osanloo, 2014). It is a framework based on an existing theory in the field of inquiry that is related and /orreflects the hypothesis of a study. It is often borrowed by researchers to build research inquiries. It serves as the foundation upon which research is constructed. Fulton and Krainovich-Miller (2010) compare the role of the theoretical framework to that of a map or

travel plan. The theoretical framework guides the researcher not deviate from the confines of the accepted theories to make a contribution. The theoretical framework consists of theoretical principles, constructs, concepts and tenant of a theory (Grant &Osanloo, 2014). The current study was premised on participatory and social change theories.

2.1.1 Participatory Theory

A participatory theory of knowledge which holds that meaning is enacted through the participation of the human mind with the world. Originally proposed by Johann Wolfgang von Goethe (August 1749 – 22 March 1832). Participation as a tool for reaching farmers, encourages bottom-up initiatives and shifts the focus to beneficiaries aimed to improve their quality of life (Ommen, Blut, Backhaus,Woisetschläger, 2016). Participation in FFS involves group of farmers who are interested in a particular intervention to respond to their felt needs and to give farmers the possibility to express their views on what they observed on the field. Participation is crucial toprogrammes' success that can transform development, empowers those that are involved in the programme(Coutts, White, Blackett, Rijswijk, Bewsell, Park, Turner, 2017, and Botha, Turner, Fielke, Klerkx,2017). In participatory approaches innovation is co-produced through interactions among farmers and the facilitators who create,learn, adapt, and diffuse knowledge based on what has been observed on the field in a collaborative way.The participatory approach attempts to consider farmers'objectives and constraints in the progranmme. This study intends to apply participatory theory because FFS activities are based on participatory approach moving away from top-down to bottom-up approach to empower farmers with skills and knowledgewheresmall-holder cocoa farmers are directly involved to identify ways of doing things by themselves.

2.1.2 Social change Theory

The theory of social change was propounded by Herbert Spencer (1820-1903). This theory stated that the only thing that is constant in life is change. Everything changes,

including the physical universe, biological universe, social universe, and the bewildering variety of phenomena that comprise the universe (Igbokwe, 2013). When such alteration takes place, it is termed "social change" (Jibowo,2017). Rogers (2017) and Chitamber (2013) define social change as the process by which change occurs in the structure and function of the social system. In this context, “social change” refers to a planned change in people's ideas, norms, values, roles, and social habits, or in the composition of society.Changes in culture can change technology; changes in technology can transform culture; and changes in both can alter other aspects of society. Technology is an important force for change. in some ways, technological development has made our lives much easier.The modern factory, means of transportation, farm machinery,agro chemical,medicine, surgery, mass media, computers technology and intervention of programmes have all had an effecton people’sattitudes, values and behaviour across societies.Social change in a society may be a result of the expediency needed in providing solutions to specific social problems faced in a society.The FFS intervention programmewas aimed at improving the livelihood of small-holder cocoa farmers by changing their way of production. This theory, therefore, provides the framework for understanding the social changes that would have taken place in the lives of smallholder cocoa farmers who participated in the FFS activities.

2.2 Conceptual Framework

Conceptual framework is a structure that shows the relationship that exists between variables, and these relationships are usually described in schematic, graphical and mathematical ways(Miles, Huberman&Saldana, 2014).In this study, it is expected that access to FFS activities will result in changes in smallholder cocoa farmer’s livelihood in terms of increased income, increased cocoa yield and improved living standards. As a result, it is assumed that farmers' socio-economic characteristics, such as age,household size, educational

attainment, farm size, and farmers' experience, serve asindependent variables along with the FFS activities that predict the dependent variable. The model aims to explain the relationship between independent variables and the livelihood status of farmers caused by FFS activities (Agro ecosystem analysis, Group dynamics Exercise and Special topic).

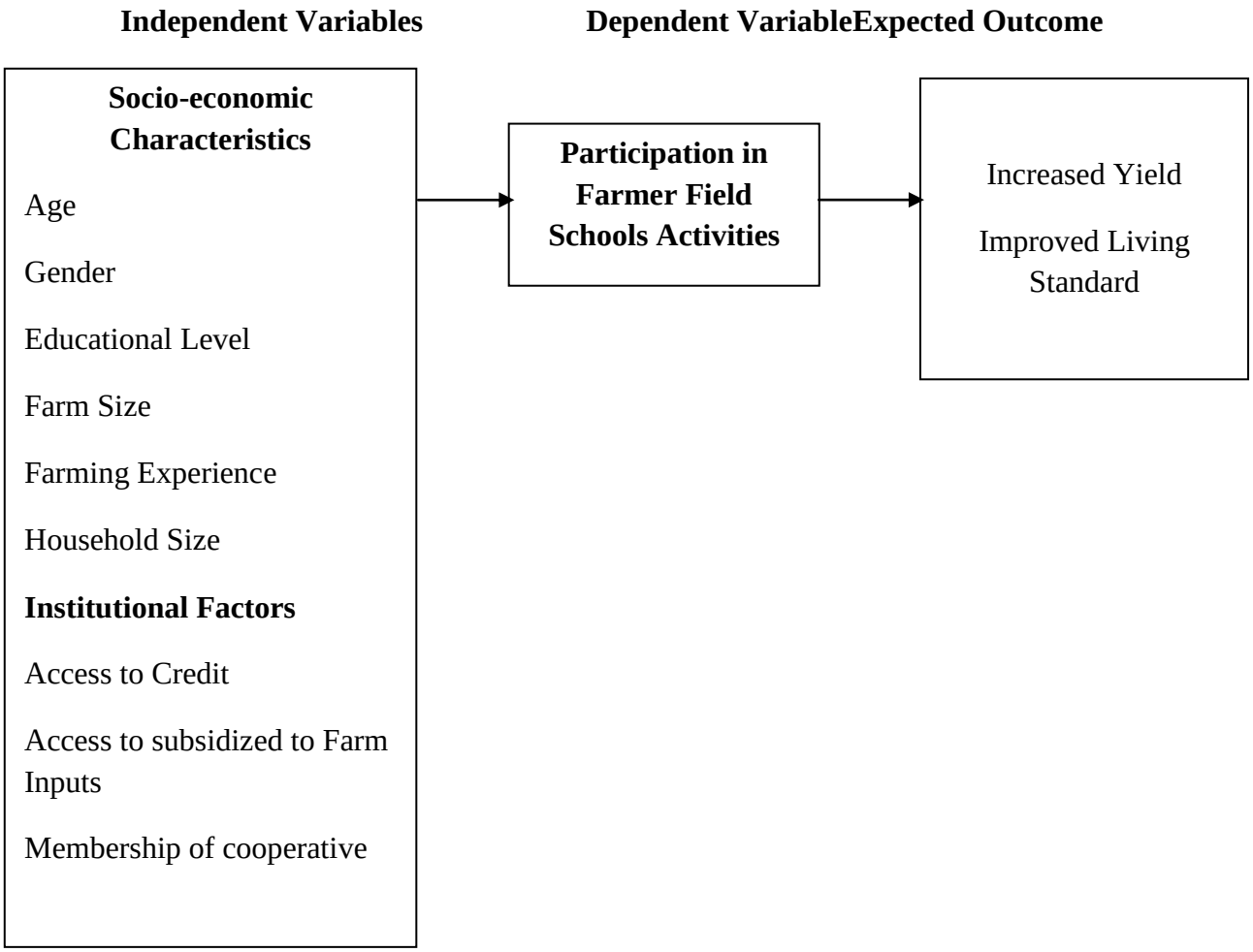


Figure 1: Conceptual Framework showingthe effects of FFS activities on Livelihood of Small-holderCocoa Farmers in Kwara State, Nigeria

2.3 Livelihood perspective

The concept of "livelihood" is widely used in contemporary writings on poverty and rural development, but its meaning can often appear elusive, either due to vagueness or to different definitions being encountered in different sources. Securing adequate livelihoods for rural farmers has remained a huge challenge for most developing nations across the globe, particularly Nigeria (Michael, Tashikalma, Kolawole &Akintunde,2021). Livelihoods encompass how people use their capabilities and means of livingto secure food, income, and assets (McLean, 2015).

A livelihood according to the International Centre for Development-Oriented Research in Agriculture (ICRA, 2012), is primarily concerned with generating incomefor use in such aspects for food security (the ability to feed oneself and one's family), providing a home, health, security (reduced vulnerability to climatic, economicor political shocks), sustainability (the ability to continue to make a satisfactory living), andpower (the ability to control one's own destiny). It emphasizes that it is important not to lose sight of long-term goals when analyzing the issue of livelihood. Livelihoods involve more than just maximizing the production of crops or livestock it is also about utilizing natural resources, plants and animals.

The World Bank's 2008 World Development Report on agriculture focused on the importance of livelihoods, characterized by different strategies based on farming (market-oriented and subsistence), labour, migration and diversification, and three different types of economies: agriculture based, transforming, and urbanized (World Bank, 2007). A strong narrative line suggests that progress (development) is about moving through a series of assumed evolutionary stages, with transitions that can be facilitated through a range of interventions in technologies, markets, support institutions and policies, as illustrated by the success stories of Brazil, China, India and Indonesia (World Bank,2007)

Unituslabs (2012)stated that a livelihood is one's "means of support or subsistence" or the activities that financially support a person and his/her family. In light of this discussion, the author proposes the following definition to describe the meaning of the term “livelihood”: A person’s livelihood comprises the assets (natural, physical, human, financial, and social capital), the activities, and the access to these assets (mediated by institutions and social relations) that together determine the quantity of life gained by an individual or a household.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 (Karki, 2021).

Sustainable Livelihoods (SL) can be used to examine the well-being of people and communities through measuring of capitals (e.g., financial, social, human, natural, and physical) and explore how their capitals relate to sustainable practices of living (Flora and Flora 2013). Rural families acquire resources from their natural, physical, social, financial, and human capital to survive and develop under natural and social adversity (Colombo, Romeo,Mattarolo, Barbieri&Morazzo, 2018).

Natural Capital: Natural capital, which includes improved access to land, land areas cultivated for agriculture, fertile soils, water availability and accessibility, pollution elements, livestock and crops, are the main drivers of agriculture. The availability and access to these elements of natural capital depend on the capability of the farmers to access and utilize the resources (MumuniandOladele, 2016).

Social Capital: The horizontal and vertical social resources (networks, membership of groups, relationships of trust, access to wider institutions of society) on which people rely in order to earn a living. The Natural Resources Institute (NRI, 2000) defines social capital as that part of human resources determined by the relationships people have with others. These

relationships may be between family members, friends, workers, communities and organizations, and can be defined by their purpose and qualities such as trust, closeness, strength and flexibility. Social capital is important for its intrinsic value, and also because it increases well-being. It facilitates the generation of other capital and services to generate the framework of society in general, with its cultural, religious, political and other norms of behaviour. Social capital has often been called the "glue" that binds people in a society together (Frankenberger&Nelson, 2013).

Human Capital: Describes the availability of farmers, marketers, agro-inputs dealers, labour and agricultural technical officers who have the skills, knowledge and ability to utilize their capabilities to undertake cocoa production as their livelihood option. The type of knowledge and experience applied to the pre- and post-production scale of cocoa directly relates to the outcomes. Experience, skill and knowledge again help to minimize the adverse effects of the vulnerabilities that the production processes are exposed to. Farmers' ability to select good seeds, prepare and keep good records of their income and expenditures, employ appropriate agronomic practices for the life cycle of the rice plant and the right techniques to reduce post-harvest losses will lead to a good yield and income.

Physical Capital: The basic infrastructure (transport, shelter, water, energy, and communications) and production equipment are the means by which enable people can pursue their livelihoods. Physical capital is derived from the resources created by people, such as buildings, roads, transport, drinking water, electricity, communication systems, among others, as well as equipment and machinery for producing further capital (Peacock, Brody, Seitz, Merrell, Zahran, Harriss& Stickney, 2010).

Financial Capital: Financial capital is seen within the sustainable livelihood framework as the financial resources people use to achieve their livelihood objectives. This capital in

agriculture is generated and converted from farmers' products into cash for household expenses and also to be used for savings towards challenging times and in bad seasons. Farmers can use both formal and non-formal financial resources and institutions, depending on their training and support from extension officers. This type of livelihood strategy and activity can guarantee the level of financial capital they can access or that is available to them. According to the Ministry of Food and Agriculture (2013) in their reports, they argue that farmers who are member of stronger farmer-based organizations (FBOs), which have a social capital element, could access financial support more easily from local banks and microfinance companies as well as from their own contributions than those who are not.

2.4 Cocoa Farming in Nigeria

The cocoa bean is one of the major cash crops in Africa, produced mostly for export purposes and the region accounts for more than 75% of the global cocoa (production and exports), which makes the region a global phenomenon (International Cocoa Oragnisation, 2017)**.** One of the cash crops grown in Nigeria is cocoa (*Theobroma cacao*). Cocoa is a perennial tree crop whose output is dependent on soil quality and minerals (Samuel, 2017). However, more than 90% of the world's cocoa is grown by farmers who own between one and ten hectares of land (Poelmans&Swinnen, 2016). In fact, the natural habitat for growing cocoa trees is concentrated among the countries comprised in a belt between 10°N and 10°S of the Equator because of its need for appropriate climate factors, particularly warm temperatures, adequate rainfall, high moisture and specialist pollinators (ICCO, 2013)

Cocoa is one the world most export crops with a global production of 4,794 million tones for the year 2018/2019 (ICCO, 2021). On a global scale, Africa remains the largest cocoa producing region, accounting for 75.9% of the world cocoa production in 2017/2018, followed by America (17%), and Asia and Oceania (7.1%) (Tenkap and Balogun, 2020). According to Afoakwa (2014), cocoa is grown mostly in humid tropic areas such as Central

and South America, Asia and Africa. The introduction of cocoa to West Africa after its discovery in the Amazon basin has resulted in its commercial cultivation and production in Nigeria. Cocoa has therefore contributed to the generation of cash income and revenue for the nation, and created employment for the citizens (Olowolaju, 2014).

The Nigeria's top ten cocoa export destinations between 1995 and 2018 are as follows: Netherlands (36.74%), Germany (13.34%), France (6.66%), United Kingdom (6.15%), Belgium (5.89%), Spain(5.64%), USA (4.35%), Canada (4.15%), Malaysia (2.48%), and Italy (1.58%) (Nazir, Saleh, Sokvibol, Aminu, Qianggiang&Xuexi, 2021). The European Union (Netherlands, Germany, France, United Kingdom, and Belgium) is the most significant market for Nigeria's cocoa exports.The export flows from Nigeria to these five countries between 1995 and 2018 reached the amount of $ 329 million annually, which accounted for about 69% of total Nigeria's cocoa market share (Nazir *et al.*, 2021). West Africa is a major producer, accounting for approximately 70% of global production, which fluctuates annually with climatic variations (Abayomi, 2017).

Currently, according to the International Cocoa Organization (2021), the main producers of cocoa in Africa are Cote d'Ivoire (2,154,000MT), Ghana (812,000MT), Cameroon (280,000MT) and Nigeria (270,000MT). In 2015, cocoa accounted for 21% of Nigeria's agricultural exports and generated US$ 711 million (CBN, 2015) and in 2018, Nigeria exported 321.99 thousand tons of cocoa worth US$ 657.61 million to the global market (FAOSTAT, 2020). Cocoa is still the first agricultural export crop in Nigeria and the second most important export commodity, behind petroleum (WTO, 2018). Ninety-three percent (93%) of Nigerian cocoa exports are in the form of raw beans, because of the limited processing activity within the country (Cadoni, 2013; FAOSTAT, 2018). Before the emergence of black gold (crude oil) in Nigeria, cocoa was the major leading cash and export

crop especially in the southern part of Nigeria.According to Adebayo, (2019) cocoa is grown mainly in fourteen states out of the thirty-six States in Nigeria. The cocoa producing States in Nigeria are Kwara, Ondo, Ogun, Osun, Oyo, Ekiti, Cross River, Edo, Abia, Kogi, Adamawa, and AkwaIbom,Taraba, and Delta State.

2.4.1 Cocoa farming in Kwara State

Kwara State is located in Nigeria on Latitudes 7°45′ N to 9°30′ N and Longitudes 2°30′ E to 6°25′ E and shares boundaries with Niger State in the North, Osun State in the South, Kogi State in the East and Benin Republic in the West and the mean annual rainfall ranges between 1000mm and 1500mm (Adewumi ,2017). The rainy season in the State falls between March and Octoberwith a short break in August while the dry season is between November and February. The average temperature ranges between 30°C and 35°C (Adewumi, 2017).

Kwara State is comprised of sixteen Local Government Areas out of which eight Local Government Areas are into cocoa production. The cash crops produced are cotton, cashew nuts, tobacco, coffee, kola nut, cocoa. Cocoa farming in Kwara State is predominantly carried out by small-holder farmers. Small-holder farmers account for 84% of all farms worldwide and produce around 30% of the world's food (Lowder, Sánchez &Bertini, 2019), yet small-holder farms are the most vulnerable to extreme climatic events and often suffer significant yield gaps (Tittonell&Giller, 2013).Small-holder farmers in developing countries are often trapped in a vicious cycle of low-intensity, subsistence-oriented farming, low yields, and insufficient profits to make beneficial investments. These factors contribute to high levels of poverty in many rural areas (FAO,2018; IFPRI, 2019). According to (Sabo, Isah, Chamo& Rabiu, 2017) the small-holder farming system plays a paramount role in the country’s production of food which is mostly operated on a small-scale level which consists of different aspects such as cocoa, yam, maize, cassava, millet.

However, the multifarious challenges facing small-holder cocoa farmers should be carried along in engaging the government towards a new direction for the maximization of farm products.

2.4.2 Challenges of Cocoa Farming Sector

The agricultural sector in Nigeria is encountering problems, including climate change, small farm holdings, technological modernization, access to finance, and pest and diseases (Uwagboe *et al*., 2017). In the 1960s, Nigeria was the world's second-largest cocoa grower and exporter, accounting for more than 15% of global cocoa production (Verter, 2016). Financial challenge, price instability, high transportation costs, irregular supply, inadequate storage facilities, pest and diseases, absence of a strong marketing board, poor infrastructure, high cost of preservation, low patronage, high cost of cocoa, unfavorable weather, and poor grade of cocoa beans are the major challenges confronting markets (Oladejo, 2019). Those factors make it difficult for small-holdercocoa farmers to generate a profit and invest in their farm (Laven, 2010; Basso, Schouten, Renner &Pfann, 2012). Some risks associated with crop production include: biological (insects, pests and diseases), climatic (droughts, floods), price (volatility of input and output prices), and financial (credit unavailability and fluctuations in interest rate) (Shoaib, Adnan, Amar, Razz, Muhammad, Muhammad&Muhammad, 2019) which are also apparent in the cocoa sector. Furthermore, Samuel (2017) identified pests and diseases and as well as marketing as some of the issues impending cocoa production in Nigeria.

Credit is viewed as an aid to agricultural transformation and economic development (Yusuf, Ishaiah, Yusuf, Yusuf & Shuaibu, 2015). Agricultural credit is needed in order to hasten the transformation of traditional farm practice to modern commercial farming (Ahmad, 2011). According toOlatinwo, Muhammad-Lawal and Ayojide, (2012), farmers face difficulty in accessing loans from formal institutions due to lack of collateral security and

interest rates in Kwara State, Nigeria.The cocoa yields in Nigeria are relatively low, because of the prevalence of pests and diseases, soil degradation, and generally old age of farmers, their farms and the trees (Laven, 2010;Adeniyi &Ogunsola, 2014).

Cocoa production in Nigeria is undertaken mostly by poor, small-holder and unskilled farmers (NBS, 2012).All these factors have hindered the cocoa sub-sector from receiving much attention in order to maintain its leading role as non-oil export. Despite several policy intervention programs and initiatives employed by the Nigerian government to solve the problems faced by cocoa farmers, cocoa bean production has continued to experience a downward trend.

2.5 Historical Background of Farmer Field Schools

The FFS is an educational strategy that enables farmers to make decisions based on their understanding of agro-ecological systems and processes appropriate for current field conditions (Pontius, Dilts,&Bartlett, 2002; FAO, 2016). The term "farmer's field school" is derived from the Indonesian term "*sekolahlapangan*," which means "field school." According to Mvena,Mattee Wambura, Mwaseba, Lazaro, Karana, and Kilave (2013), FFS has three educational goals embedded in it: learning takes place in the field; the majority of the curriculum is based on field settings; and from planting to harvesting, genuine problems are seen and analyzed. In the FFS Programme, the field is viewed as a class, farmers as students, and a qualified extension officer/lead farmer as a facilitator.

The FFS was designed to foster group learning by using field exercises, critical analysis, and group discussions at regular intervals during the production cycle (FAO 2016). The Food and Agriculture Organization (FAO) of the United Nations (UN) created the FFS in

Southeast Asia, specifically in Indonesia, in 1989.It began as a mechanism for small-scale rice farmers to research and develops the skills needed to Implement Integrated Pest Management (IPM) strategies in their own rice paddy fields. The FAO has actively promoted the FFS as part of measures aimed at improving food security, farmers' income, climate change adaptation, and agricultural sustainability. The FFS concept has been adopted by a number of farmer organizations, local and national governments, non-governmental organizations, and bilateral and international agencies in their rural development programs (FAO, 2016).

The FFS approach has spread to several countries in Africa and Latin America, and it has shifted from a focus of a single crop constraint (IPM for rice-based systems) to a focus on multiple aspects of crop production and management, cropping systems, non-crop/forest (livestock production), and natural resource management (soil fertility, water conservation), as well as on socio-cultural aspects of community life (food security, nutrition, savings, health, training andlivelihoods). Kenya, Uganda, Tanzania, Zimbabwe, Zambia, Malawi, Ethiopia, Ghana, Nigeria, Gambia, Egypt, Lesotho, Swaziland, and Mozambique are among the African countries that have adopted the strategy.

In 2008, it was anticipated that 10–20 million farmers had graduated from the FFS globally, while in 2012, an independent study projected that 10–12 million farmers had graduated from the FFS globally, with the FFS being implemented in 90 countries (Waddington,Snilstveit, Hombrados, Vojtkova, Anderson&White, 2014). Moreover, with respect to the sustainability of the FFS, it is encouraging that a gradual transfer of leadership of FFS programmes has taken place. In the early days of the FFS, leadership was mostly by FAO, but currently, government agencies are the most common leaders of FFS programmes and, even though the majority of FFS programmes still rely on external sources of funding, some programmes are funded through government budget allocation or are self-funded. There

is also evidence of FFS groups that continue to learn and develop for many years after graduation (FAO 2020;Van den Berg, Phillips&Fredrix, 2020).

An attempt has been made in Nigeriato change participatory extension approaches/systems (Ajayi & Okafor, 2006) which is mainly due to the criticism of past systems. One of the participatory approaches that have been tried in Nigeria is farmer field schools (FFS). Farmer field Schools were introduced to Nigeria in 2003 and were later adopted by the Sustainable Cocoa Development Committee (SCDC) in 2005 as an improved methodology for training cocoa farmers in Nigeria (Ajani &Onwubuy, 2010). In Nigeria FFS has been described as an entry point for the provision of an array of development services to affect the communities, acting as a useful platform for other partners, including the government to sensitize communities on issues such as health and education. FAO aims to establish a minimum of 100 active and fully engaged FFS across northeastern Nigeria by the end of 2018 (FAO, 2018).

2.5.1 Concept and Objectives of Farmer Field Schools

The FAO (2020) opined that FFSis a platform or a school without walls, where farmers learn in groups by testing out new ideas in their own fields through the use of indigenous technical knowledge, strengthening the decision-making capacity of farming communities and fostering local innovation for sustainable agriculture. Farmers serve as trainers, debating observations, using prior experience, and presenting fresh information from outside the community in this forum (Mwada, Fatsuma&Shettima, 2015). The FFS approach is a popular extension and educational programme that is still relatively new to small-holder farmers around the world.The FFS is a bottom-up participatory extension strategy for technology validation and distribution with the goal of empowering farmers to enhance their agricultural outcomes (Waddington *et al.*,2014). Farmers learn to manage their crops more

naturally, through integrated pest management techniques. The extensionist functions as a catalyst and facilitator, assisting communities in achieving their stated and perceived objectives (Mwada*et al.*,2015).

Braun and Duveskog (2008)posited that FFS is a platform for farmers to promote integrated decision making and innovation for sustainable agriculture. It is participatory, discovery-based learning and technical knowledge based on non-formal adult education concepts that guide groups of individuals with a shared interest who gather on a regular basis to study the "how" and "why" of a particular topic. They went on to say that it is a participative way of developing and disseminating learning technology based on adult learning principles such as experiential learning. Farmers meet on a regular basis in a crop-growing field to improve their abilities, examine and solve their individual and shared challenges, and make production-method decisions using a discovery-based methodology. The FFS initiatives were designed by the FAO to empower farmers by increasing their analytical and decision-making abilities. It is thus a platform that teaches fundamental agro-ecology and management skills and is used to communicate complicated notions like integrated crop management, empowering farmers by enhancing their skills and problem-solving abilities.

The broad objective of FFS is to bring farmers together to carry out collective and collaborative inquiry with the purpose of initiating community action in solving community problems. The specific objectives of FFS, according to Godrick, James and Erin (2014), are to equip farmers with knowledge and skills to make them experts in their fields, sharpen farmers' ability to make critical and informed decisions that make farming profitable and sustainable, sensitize farmers to new ways of thinking and problem solving, and assist farmers in learning how to organize themselves.

2.5.2 Farmer Field Schools Activities

The FFS activities are field-based, include experimentation to solve problems. In a typical FFS, a group of farmers meets regularly over the production cycle in a local field setting, under the guidance of a trained facilitator, and this process creates space for interacting among group members, sharing ideas, learning from each other, and identifying other topics of interest. For crop-based FFS, activities may cover "seed to seed", while in livestock-based FFS it may cover "egg to egg" or "calf to calf". This initial basic learning cycle aims to strengthen farmers' skills and knowledge for critical analysis, to test and validate new practices, and to assist in making informed decisions on field management. These FFS activities are agro ecosystem analysis, group dynamics exercises, and special topics.

i. Agro Ecosystem Analysis

Agro Ecosystem Analysis (AEA), is a field-based analysis of interactions observed between crop and other biotic and abiotic factors co-existing in the crop/livestock field (e.g., between plant/animal growth and pests, diseases, weeds, water, soil, and weather conditions), is the cornerstone of the FFS methodology. The goal of the AEA is for FFS participants to appreciate the value of frequent field observations, analyze ecosystem developments, problems, and opportunities encountered in the field, and improve farm management decision-making skills by building on critical group discussion to achieve a better shared understanding of different components and their interactions in agro ecosystems.Farmers work in four- to five-person sub-groups, conducting comprehensive field observations, debating outcomes, and analyzing the field conditions by creating a summary visual chart on a poster. Each sub-group makes a presentation to the plenary for further in-depth debate in order to obtain a group consensus on field management for the coming week. This exercise usually takes two to three hours and is repeated weekly throughout the season or learning cycle so that the problems and decisions being studied overlap with similar issues in the

participants' own fields, increasing motivation to learn and providing an opportunity to put the theory into practice (FAO, 2016).

ii Group Dynamics Exercise

Group dynamics is among theFFS activities that help to strengthen group cohesion and enhance cooperation which will help to create a good atmosphere, develop a close relationship and trust between farmers and facilitators.The group dynamics exercise is a short activity that prompts discussion on teamwork, problem-solving, leadership skills, and other group development processes during a regular session in an FFS (FAO, 2016). A number of activities could be formulated that help the group to become enthusiastic and motivated. Theactivities include role playing, short dramas and stories in group dynamics.

iii Special Topic

The FFS session defines a special topic of interest for the group at the particular crop growing stage, in addition to AEA and group dynamics. Small experiments are frequently used in special areas to highlight specific technical challenges (e.g., an insect zoo where studies are set-up to understand predation through direct observation). Depending on the needs of the FFS group and the wider community, topics of socio-economic concern might also be incorporated into a session in this way (FAO, 2016). For example, if during the field observation the farmer saw that a certain pest was causing a lot of problems, then the special topic could learn more about the specific pest. It is always a good idea to let the farmers decide on what special topic they need to build on theirexisting knowledge, promote interaction betweenfarmersand extension officer and enable them toshare information.

In West Africa, the FSS approach is relatively new, since 2003, the Sustainable Tree Crop Programme (STCP) has pioneered FFS on cocoa integrated crop and pest management in Cote d'Ivoire, Ghana, Cameroun, and Nigeria, and the SCDC adopted FFS in 2005 as an improved methodology for training cocoa farmers in Nigeria (Ajani &Onwubuya, 2010). Feedback from farmers and operators of the Farmer Field School (FFS) in Nigeria, according to Agro Care (2009), has shown that this agricultural extension approach is capable of greatly improving farm yields, particularly in the cocoa sub-sector, where it is currently being used and where many more farmers and states are adopting it.

The school, which is co-funded by the federal government, cocoa-producing states, and the STCP of the International Institute for Tropical Agriculture (IITA), is held fortnightly in the field in cocoa-producing communities where FFS is located. This approach can be tried and used to challenge other areas of agriculture, such as yam, rice, and cassava producing areas, as in the case of these cocoa producing areas. The overall objective of the project was to strengthen the capacity of the extension services of participating states to use the FFS extension approach to develop, implement and manage cocoa production.

2.5.3 Effects of Farmer Field Schools on Small-holder Farmers' Livelihoods

The FFS has been demonstratedto have an effect on farmers' livelihoods as well as knowledge, adoption, and productivity in various parts of the world. To a great extent, this may be due to its valuable principle, which allows farmers to integrate their indigenous knowledge through experiential learning/learning by doing with new scientific concepts and, as a result, make collective and well-informed decisions (Nyamonge, 2016). This technique instills confidence in the agricultural community, as well as improves their skills and knowledge, which leads to farmer empowerment (Khatam, Muhammed, Chaudhry & Khan, 2014). Farmers gained knowledge as a result of the participatory nature of FFS, which encourages participants to solve problems and share their knowledge (Anaeto, Asiabaka, Ani,

Umunakwe& Ejiogu-Okere, 2017). The inclusion of topics in FFS that are relevant to farmers' situations could be attributed to the knowledge gained from FFS activities. This will stimulate their interest in the activities, thus enhancing their knowledge. It could also be associated with the acquisition of formal education. According to studies (Bunyatta, Mureithi, Onyango&Ngesa, 2005), FFS enables farmers to gather information, learn more knowledge, retain that knowledge, share that knowledge, and boost their productivity. According to Ebewore (2013),the FFSactivities had helped in the understanding of cocoa farming practices among cocoa farmers. Participating in FFS allows farmers to gain knowledge. Farmers may be more likely to apply their newly learned knowledge to their various farms, resulting in higher output.

Successful crop production depends on the number of skills and knowledge possessed by the farmers in term of crop husbandry. The operations include: the choice of crops and varieties of seeds to grow, which is a critical ingredient for successful crop production; this is because different crops are suited to different agro-ecological zones; weed control since there is direct competition between crops and weeds against soil nutrients; crop spacing to ensure the optimal plant populations per unit area of land; and crop post-harvest handling to reduce losses due losses after harvesting, especially due to pest attacks.According to Akuno, Onyango and Obara (2014) FFS participants had higher (69.6%) knowledge and skills in the use of fertilizers and manures as compared to participants of theconventional extension approach (50.5%) and also FFS participants had higher (58.7%); Knowledge and skills than conventional extension (42.6%). They also indicated that FFS participantshad higher (56.5%) knowledge and skills in carrying out experiments than conventional extension (9.4%).

In Tanzania, FFSs have also been found to be useful in educating farmers about crop production practices (SUSTANET, 2010). Similarly, according to Nathaniels (2005), FFS assisted farmers in developing innovations in cowpea production in Benin. The effectiveness

of FFS activities could encourage farmers' participation, thus promoting the dissemination/sharing of agricultural information, adoption of agricultural innovations and agricultural productivity generally. FFS participants have been able to reduce pesticide use to zero or near zero. Reduced pesticide uses and better fertilizer management increased rice yields drastically, resulting in a higher profit margin for farmers (Kabir, 2006). Pesticide use was less of a problem in Africa, and as a result, various advancements have occurred since FFSs were introduced from Asia. The first is the inclusion of more health and nutrition "special topics" due to farmers' lack of understanding of the dynamics of diseases like HIV/AIDS and malaria, which are affecting many rural communities. Basic nutrition, water boiling, intestinal parasites, and women's reproductive health are included in FFS. Another innovation is the creation of commercial plots by women's groups, which are group production plots adjacent to FFS learning plots (Anaeto, Asiabaka,Ani, Umunakwe, & Ejiogu-Okereke, 2017). These commercial plots enable the group to raise revenue and become self-sufficient in their endeavors (Braun and Duveskog, 2008). According to Siddeswari, Sailaja, Gopal, and Prasad (2017), more than half of the participating farmers (57.33 percent) had a medium degree of profitability, followed by high (38.67 percent) and low (4.00 percent) levels. In the case of non-participant farmers, 41.33 percent reported a medium degree of profitability, followed by low (30.67%) and high (28.00%) levels. From the given finding,it is possible to deduce that the profits earned by rice FFS participants were significantly higher than those obtained by non-participant farmers.

Mbétid-Bessane, 2014; Owenya*et al*., 2016; Davis *et al*.,2012; Waddington *et al*.,2014, and Luther *et al.*, (2018) show that FFSpractices lead to an increase in agricultural productivity of participants.In Cameroon, Cyrille (2018) conducted research on the effect of farmer field schools on cocoa production. According to the findings the FFShave a real effect on cocoa yields. This is a statistically significant positive effect. In order to improve their

understanding of the origins and effects of agronomic problems, the FFS introduced participants to new methods of discovery, such as observation and simple experimentation. They utilized a variety of tools in a discovery and learning process to demonstrate the relevance of farm management methods like pruning, shade management, and adequate control, which resulted in significant changes in FFS participants' cocoa yields when compared to non-participants (Cyrille,2018).

2.5.4 Constraints Faced by Small-holderCocoa Farmers in Farmer Field Schools

Dimelu and Okoro (2011)stated that the major constraints to FFS include funding, poor cooperation and interest of farmer members, poor logistic support and poor staff mobility. Other constraints identified by the respondents includedan insufficient number of meetings, civil servants' attitudes toward extension workers, and meeting times that were inconvenient. According to Dimelu and Okoro (2011) lack of storage facilities was a serious constraint and inadequate subject matter specialists were constraints faced in FFS activities in Enugu.Aderibigbe, Taiwoand Akinbile (2014), posit that changes in weather, large numbers of members in a group, inadequate support and untimely release of input are the constraints faced by FFS activities in Osun State.According toNwaobiala and Odemelam (2013) identifiedthatinadequate, Incentives such as defraying transportation costs to training venue, fertilizers and agrochemicals and the location of school were the constraint to FFS participants.

As far as the constraints of the FFS implementation process is concerned,the duration of training given to facilitators was very short (3-4 days) (Babur, 2009). Since coca is a perennial crop, a season should be given to the facilitators in order toequipthe farmers with all the management practices of cocoa. During the data collection period, Babur (2009) observed thatthere was a lack of graduation of participants in FFS due to limitations of

budget and donor driven approach. This issue confirmed that sometimes donor preferences prevailed over the participants' needs. This finding is similar to Davis (2006), which stated FFS should be implemented because itsuits local conditions and needs of the farmer, not because it is donor driven. According to Roy, Farouque and Rahman(2014), FFS practitioners do not provide sufficient training materials to FFS practitioners. As a result, they are forced to form groups during training, but they prefer to practice separately in the field. The FFS farmers claimed that there were insufficient trials or that adequate trials were impossible due to unfavorable field conditions. Problems can also develop if a training of trainer's session does not provide participants enough opportunities to learn the FFS procedure. In other cases, the training sessions for trainers may not follow the experiential learning approach (Pontius *et al*., 2002).

2.6 Socio-economic Characteristics of Small-holder Cocoa Farmers

Socio-economic characteristics are important determinants of livelihoods since they are directly linked to people's assets and position in society (Abbay, Rutten, Azadi, &Witlox, 2019). Many past studies have demonstrated that personal characteristics of farmers, such as farm size, farmer experience, age, income, household size and level of education affect their decision to participate in agricultural developmental programmes.Age has been shown in different research conducted on various social problems. The age of a farmer determines the quality and quantity of work he or she can do on his or her farm which measures the farm productivity.According to Agbongiarhuoyi (2013), the Majority (59.9%) of the cocoa farmers were between 55-64 years old with a mean age of 49 years, which implies that semi aged and aged people are engaged in cocoa production. Iremiren, (2011) and CTA Agritrade (2012) reported that those into cocoa production in Nigeria are mainly old farmers over 60 years of age.

Khatun and Roy (2012) reported that experienced farmers on livelihood options and the desire to diversify increase with age. Age has an important role in the production process, particularly Since it requires modern knowledge of management, production while old farmers have less knowledge of different technologies as compared to young farmers. As regards years of experience, the mean year of experience was 23.7 years. This means that (29.9%) of the respondents had between 20- and-30years' experience (Aderibigbe *et al*., 2014).

Bawa and Ani, (2014) reported that farm size had a bearing on the capacity of farmers to utilize agricultural innovation and new farm practices. The study indicated that there was positive and significant relationship between farm size and agricultural innovation utilization. In a study carried out by Aderibigbe *et al*. (2014), stated that the mean of family size of the respondents was 6.7 people, which shows that the majority of the farmershad between 6 and 10 children.

Education is considered to play a vital role in human resource development. It influences the pace of development by providing skills, knowledge and problem-solving techniques. Komolafe *et al.,* (2014) also found that farmers with a high level of education adopt new technologies easily and use them effectively, while farmers with more years of farming experiencewill be more efficient in farm production.A farmer's level of acquired knowledge through education determines the ability of such a farmer to make profitable decisions on investment and adopt an approach to risk management that best reduces the incidences of production failure, although experiences of farmers with risk management strategies is of more relevance(Ogunmefun&Achike, 2015).Kehinde and Ushedo (2014) stated that the level of education attained by the farmers showed that more (42%) of the respondents had a secondary education.Formaleducation increases the knowledge that one needs to become competent to choose activities that generate more income and keep up to

date with all the modern technologies that make entrepreneurship much easier (Asfaw, McCarthy, Paolantonio, Cavatassi, Amare, &Lipper,2015).

2.7 Review of Empirical Studies

Adegboyega, (2013) conducted a study on the effects of FFS on the technical efficiency (TE) of cocoa farmers in Cross River and Ondo States, Nigeria. The study areas for this study were the two major cocoa-producing states in Nigeria, Cross River and Ondo States. A total of 120 cocoa farmers were interviewed. This sample size was divided equally between both states. Thus, the primary data set used in this study was collected by administering a structured questionnaire to sampled cocoa farmers. The data analysis techniques used in the study were descriptive statistics and the Data Envelopment Analysis (DEA) model. Cocoa farmers' socio-economic and farm-specific characteristics, such as age, income from cocoa, income from non-cocoa production, number of cocoa trees, number of shade trees, etc., were examined using descriptive statistics. The DEA model was employed to ascertain the productivity as well as the technical efficiency levels of the cocoa farmers. Respondents were selected randomly from the FFS communities in each state. Among the 60 respondents in each state, 30 were FFS participants, while the other 30 were Non-FarmerField School (NFFS) participants. The study revealed that the FFS participants had an efficiency score of 0.84, while the NFFS participants' technical efficiency score was 0.77. Thestudy therefore concluded that the FFS participants were more efficient in the use of factors of production than their NFFS counterparts.

The study was found relevant to the ongoing study because it helped the current researchers with the methodology. This study is similar to the past study, by using a structured questionnaire to collect data. This study differs from the past study because it seeks to measure the livelihood of small-holder cocoa farmers in Kwara State, Nigeria, while

the past study assessed the technical efficiency of cocoa farmers in Cross River and Ondo States, Nigeria.

Aderibigbe, Taiwo and Akinbile, (2014) conducted a study on the effect of FFS activities on farmers' production in Osun State, Nigeria. The main objective of the study was to examine the effects of FFS activities on farmers' production in Osun state, Nigeria. The study had four research questions and three hypotheses. The study employed a descriptive statistical design.Fifty percent of the total members of the farmers' field schools formed the population of the study. A multistage sampling technique was used to select 154 respondents for the study. A well-structured validated interview schedule was used to collect primary data for the study. Data collected was analyzed using descriptive statistical tools such as frequency counts, percentage, mean, standard deviation and inferential statistics (correlation and chi-square). There were positive and significant relationships between accessibility to NPFS loan loans (x^2=11.950, $P < 0.05$); education/communication activities ($r = 0.250$; $P \leq 0.05$); constraint (r=-0.547; $P \leq 0.05$), benefits derived by graduates of FFS (r=0.218; $P \leq 0.05$) and their level of production. FFS should be recommended for other farm enterprises to achieve the goal of the Agricultural Transformation Agenda (ATA), which is to improve agricultural productivity and the value chain, because there was an improvement in the farmer's level of production before and after attending a farmer's field school.

The study was found relevant to the ongoing study as both examined the effects of FFS activities and were also similar in using frequency counts, percentage, mean, standard deviation and inferential statistics using chi-square. This study used a structured questionnaire as was used in the previous study. This study, however, differs from previous studies in that it aims to assess the effects of farmers' field school activities on the livelihoods of small-holder cocoa farmers While the previous study looked at the effect of FFS activities on farmers' production.

Nyamonge, (2016) conducted a study on the role of FFS on adoption and adaptation of recommended rice production practices in Mvomero district in Tanzania. To achieve the objectives of the study, a cross-sectional research design was adopted where 188 FFS farmers were selected through a multi-stage sampling technique. Household surveys, interviews, focus group discussions, and observation were used to collect both qualitative and quantitative data.Data analysis was done using SPPS Version 22. The study findings indicated that there were total of 15 recommended rice production practices.The results further showed that the majority of the recommended rice production practices (80%) promoted were adopted by more than 65% of the FFS members. However, the results of the study showedthat only 20% of the recommended rice production practices were adapted by FFS members due to financial constraints. It was therefore concluded that FFS promoted a good number of recommended rice production practices and that the level of adoption of the recommended rice production practices was high while the level of adaptation was low.

The two studies are similar, because both assessed the FFS, butdiffer in the instrument for collecting data.The past researcher used Household surveys, interviews, focus group discussions, whereas the current researcherused a structured questionnaire for data collection. The previous researcher used multistage sampling technique while the current researcher used purposive sampling techniques.

David, Bernard, Ann, Nabwire, Abb, Babu, and Kato, (2017) carried out research assessing the FFS diffusion of knowledge and adaptation to climate change by small-holder farmers in Kiboga Districtof Uganda. A cross-sectional research design was adopted where a total of 120 FFS-members and 60 non-FFS-members were randomly selected and interviewed using a validated household survey questionnaire. Data was analysed through descriptive statistics and a Chi-squarefor the relationship between the FFS and the members' adaptation to climate change. The result showed that FFS majorly diffused adaptation

knowledge and skills through the establishment of comparative studies (28%); establishment of commercial enterprises (21%) and training of the members (18%); distribution of inputs to the FFS (10), examination of performance of distributed inputs (8%), FFS exchange-visits (6%), graduation of FFS, members (4%), field days (3%) and integration of village savings into FFS (2%) throughout the seasonal calendar. The FFS significantly contributed to the adaptation of climate change with an index of drought and shifts in seasons by small-holder farmers ($p < 0.05$) throughout the season in the study area. Based on the findings, FFS enabled farmers to validate and adopt new technologies in their fields that were a success. The FFS-members increased their innovations and use of local resources in adaptation to climate change. The FFS's promotion of climate change adaptation options benefits farmers' seasonal food security.

This study is similar to previous studies in data analysis techniques by using descriptive statistics, but it differs from previous studies. This study seeks to assess the effects of FFS activities on the livelihood of small-holder cocoa farmers in Kwara State, Nigeria; whereas the previous study assessed FFS knowledge diffusion and adaptation to climate change.

Gbawoquiya, (2017) assessed the effectiveness of FFS in improving agricultural productivity in Tanzania: a case study of small-holder rice farmers in MvomeroDistrict, Morogoro Region. A cross-sectional research survey method was used and involved interviewing 120 respondents (FFS and NFFS graduates) selected through a multi-stage sampling technique. A sample of 60 FFS and 60 NFFS graduates was proportionately selected for the study. Structured questionnairewas used to collect primary data; and secondary data was collected from relevant reports and documents. Frequencies were run using the Statistical Package for Social Sciences (SPSS) version 20 to determine the socioeconomic characteristics of small-holder farmers. In addition, an independent t-test was

used to compare crop yields between the two groups (FFS graduates and NFFS farmers).The significance level of $\alpha = 0.05$ was employed in deciding whether there was a significant difference between the variables. The findings of the study showed that for all the rice technologies, knowledge and or practices, FFS graduates did significantly well in terms of the utilization of all the technologies. The results further showed that the differences between the two groups (FFS and NFFS graduates) were statistically significant ($p < 0.000$) in rice yield for the three years, 2014-2016. The findings suggest that FFS as an extension approach is effective in improving agricultural productivity among small-holder rice farmers.

The studies are similar because they both assessed the effects of FFS. The past researcher only looked at the effect of FFS on farmers' productivity, while the current study to looked at the effects of FFS activities on the livelihoods of small-holder cocoa farmers.

Wijamunige and Arunakumara (2020) conducted a study on the effectiveness of FFSprogramme of minor irrigation systems in Hambantota districtin Southern Sri Lanka. The sample consisted of a total of 374 farmers (124 farmers from Hambantota and Beliatta 126 from the Tangalle divisional secretariat area) and Simple random sampling techniques were used to select 177 farmers from the study area who had not participated in the FFSs, and they were also chosen at random and interviewed.The data collection procedure comprises three major elements: (1) Focused questions (2) Events observation (3) Questionnaire survey. Data analysis was done based on the type of data using Excel, SPSS 20.0 and the Chi-square test was used in estimating the variance. Exploration of data was done with descriptive statistics.

The study was found useful to the on-going study because both assess the effects of FFSprogramme. However, the research instruments used in both studies are similar.The previousresearchers only examined the effectiveness of the FFSprogramme of minor

irrigation systems, whereas current researcher evaluated the effects of FFS activities on the livelihood of small-holder cocoa farmers.

Karimi and Niknami (2020) conducted research on the effects of FFS on the economic, social, production, and knowledge status of greenhouse owners in Tehran Province and surrounding Iran. The research instrument was a questionnaire. The research method was a comparative causal study. The statistical population composed of 80 greenhouse owners who had participated in the FFS programme as a treatment group and 716 owners who had not participated in this program, as the control group. The sample size for the non-participant group was determined to be 152 people using the Cochran formula. They were chosen by a simple random sampling method. The results of comparative tests indicate that the two groups significantly differed in crop marketability, job creation, production risk, cooperation, participation in social organizations and entities, use of macro and micro fertilizers, application of organic fertilizers, application of pesticides, and technical knowledge of safe crop production. However, there were no significant difference in annual income, marketing, and crop yield. The structural analysis also indicates that the FFS program had some positive effects on participants in economic, social, production, and knowledge aspects.

The current study is similar to previous ones in data collection techniques, but differs from the previous study because the researchers considered the economic, social, production, and knowledge status of greenhouse owners, whereas the current researcher considered the livelihood of small-holder cocoa farmers.

Ayi (2022) conducted a study on Farmer field school extension approach: A knowledge booster in Calabar Agricultural Zone, Cross River State, Nigeria. Specifically, the research aimed to describe the socio-economic characteristics of respondents; assess the effectiveness of FFS on training farmers, improving their knowledge and utilization of new

technologies; The study adopted multi-stage and purposive sampling techniques to select 318 respondents. Descriptive statistics such as means and percentages were employed to analyze the data. From the findings, it was revealed that FFS was effective in training participants, such as in helping them to learn new ways of doing things in their farm. it was concluded that FFS is an effective agricultural knowledge booster and based on the findings,it was recommended that FFS should be utilized to design and implement trainings, especially when introducing any innovation to farmers.

The studies are similar because both assessed FFS, but they differ in sampling techniques and procedures for data analysis. The past researcher used multi-stage and purposive sampling techniques and also used descriptive statistics, whereas the current researcher used purposive sampling techniques, descriptive statistics, Chi-square and regression.

2.8 Summary of Literature Reviewed

The theoretical framework for this study was built on the participatory theory andsocial change theory. The social change theory attempts to explain the social changes that could occur in the lives of cocoa farmers who attended farmers' field school training. Performance theory also seeks to provide an opportunity to measure how people act and what they achieve while carrying out a task on their own after being trained. The conceptual framework of the study was designedto show the relationship that exists between variables, and these relationships were described schematically.

Related literatures were also reviewed on livelihood perspective. The term "livelihood" refers tothe state of wealth, comfortand material goods of small-holder cocoa farmers. Literature on the history and concept of farmers' field schools, the goal of FFS, and the activities of FFS were also reviewed. The FFSis a platform or "school without walls" where farmers learn in groups by testing new ideas in their own fields using indigenous technical knowledge. It strengthens farming communities' decision-making capacity and fosters local innovation for sustainable agriculture.

The FFS activities such as agro-ecosystem analysis, group dynamics exercises and special topics play a significant role in enhancing the livelihood of small-holder cocoa farmers. Literature was reviewed on the history of cocoa production in Nigeria.It revealed that Nigeria is the fourth largest producer in the world and it is an important source of raw materials as well as a source of revenue for the governments of cocoa producing states in Nigeria, while the socio-economic characteristics of cocoa farmers were also reviewed. Similar literatures on farmers' field schools were reviewed, but none of it looked at the livelihood of small-holder cocoa farmers in Kwara State. This current study intendsto fill this gap.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter presents the research methodology under the following heading and sub-headings

3.1 Research Design

3.2 Population of the study

3.3 Sample size and Sampling procedure

3.4 Instrument for Data Collection

3.4.1 Validation of the Instrument

3.4.2 Pilot Study

3.4.3 Reliability of the Instrument

3.5 Procedure for Data Collection

3.6 Procedure for Data Analysis

3.1 Research Design

Descriptive survey design was adopted for this study. The reason for adopting a descriptive research design is that it involves the collection of the opinions of the respondents, and this is in line with the view of Adamu, Jibril and Bashir (2014) who stated that a descriptive research design involves the collection of the opinions of the respondents regarding a given situation or relationship. According to Emaikwu (2015) opined descriptive design is the most appropriate for studies that involve assessing the present state of affairs with regard to some variables that change over time. With the above statements in view the researcher found the design appropriate for the study.

3.2 Population of the Study

The populationfor the study comprised of all 180 cocoa farmers participating in FFS activities in KwaraState, Nigeria. The population was derived from farmer enrolment in each FFS.Each FFS has 30 enrolees as contained in the Kwara State Ministry of Agriculture 2021 document. The distribution of the population is given in Table 1.

Table1:Population of cocoa farmers participating in farmer field schoolsinKwara State,Nigeria

LocalGovernment Areas	School Location (FFS)	Population of participating Farmers
Isin	Igbesi	30
Oyun	Ilemona	30
Offa	Offa	30
Ifelodun	Idera	30
Irepodun	Olowolonjere	30
Irepodun	Olomi-Oja	30
Total		**180**

Source: Kwara State Ministry of Agriculture (2021)

3.3 Sample Size and SamplingProcedure

Purposive sampling procedurewas used to select the FFS cocoa farmers in Kwara South agricultural zone being the area where cocoa iscultivated and where farmer field schools are located.The total sample size of 160 cocoa farmers participating in FFS activities was used across the State. 30 farmers were selected from each school while 10 farmers were selected in Olomi-Oja, because 20 farmers had been used for pilot test.

Table 2: Sample distribution of the respondents

School Location	Population of participating Farmers	Sampling Size
Igbesi	30	30
Ilemona	30	30
Offa	30	30
Idera	30	30
Olowonjere	30	30
Olomi-Oja	30	10
	Total	**160**

3.4 Instrument for Data Collection

The researcher structured interview schedule was used to collect data from the respondents. The interview schedule was divided into 5 sections; Section "A" to Section "E." Section A was designed to collect data on the socio-economic characteristics of the respondents in terms of (sex, age, level of education, farm size, and household size of the respondents). Section B seeks information on the types of skills provided by FFS to small-holder cocoa farmers. Section C was designed to determine the relationship between the skills provided by FFS and the training needs of small-holder cocoa farmers. Section D was designed to seek information on the effects of FFS activities on the yield and living standard of small-holder cocoa farmers. Yet, Section E was designed to identify the constraints faced by farmers participating in FFS activities. The information on the instrument in Section C was rated on a 2-point rating scale (1 and 2), while Section D was on a 3-point rating scale. Open-ended questions were developed to capture aspects of the research questions in order to achieve the stated objectives of the study. The questions were written in English language and translated into the local language of the area where necessary by the two research assistants during the survey.

3.4.1 Validation of the Instrument

The instrument designed for this study was validated by two research experts of the rank of Senior Lecturer from the National Agricultural Extension Research and Liaison Services (NAERLS), Ahmadu Bello University using face and content validity for proper perusal and scrutiny to meet up with content validity.Ten items were added, eight items were modified and 62 items were accepted. Their suggestions and comments were properly incorporated before making the final copy of the instrument to ensure it measures what it is supposed to measure. This is in line with Robson (2011), who stated that the validity of the instrument assesses the extent to which the instrument measures what it is designed to measure.

3.4.2 Pilot Study

The instrument was pilot-tested with 20 respondentsin Olomi-Oja Kwara South agricultural zone who are not part of the sample size but within the study population. The reason for choosing the farmers is because they have the same characteristics and alsoto ensure that the subjects of the pilot study are not involved in the main study.

3.4.3 Reliability of the Instrument

The data collected from the pilot study was subjected to a reliability test in order to ensure the accuracy and consistency of the research instrument. This is in line with Braun, Clark, Hayfield and Terry (2018), who stated that the reliability of the instrument should be accurate and consistent. The instrument wasdivided into two halves of ‘even’ and ‘odd’ number by using split half method to analyse the data.The Cronbach's Alpha of part one and two of the instrument was 0.77 and 0.60 respectively, while the Guttman Spilt-Half Coefficient was 0.73.

3.5 Procedure for Data Collection

The researcher obtained a letter of introduction from the Head, Department of Vocational and Technical Education, Ahmadu Bello University. The introductory letter was presented to the coordinator of FFS in Kwara State in order to facilitate access to cocoa farmers. The researcher discussed with the respondents how to answer the questionnaire. Items on the questionnaire were explained to the respondents where necessary to remove any possibility of misinterpretation. Two research assistants were employed and trained for one day. Data was collected with the help of two trained research assistants to administer copies of the instrument to the respondents. The administration of the copies of the instrument lasted for a period of 10 weeks.

3.6 Procedure for Data Analysis

Data collected was analyzed using descriptive statistics of frequency count, percentage, mean and standard deviation were used to answer all the research questions while, Chi-square was used to test hypothesisone.

The formula for the Chi-square was expressed and specified as follows:

$$x^2 = \sum \frac{(0i - Ei)^2}{Ei}$$

$0i =$ Observed Value (actual value)

$Ei =$ Expected Value

While linear regression was used to test hypothesis two.

The general formula for linear regression was expressed as:

$Y= b_1X_1+b_2X_2+b_3X_3\ldots+b_nxb_n+ E$

Y= Yield of cocoa in kg

X_1= Farmer field school activities

E= Error term

Y= Income (₦)

X_1= Farmer field school activities

E= Error term

Y= Expenditure

X_1= Farmer field school activities

E= Error term

Y is dependent variable, X_1, X_2, $X_3$are independent Variables and E is error term.

Decision Rule

Null hypotheseswere rejected if the P-value is less than or equal to 0.05 level of significant, if otherwise it wasaccepted.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

This chapter presents the results of the data collection. The presentation was done under the following headings:

4.1 Answers to Research Questions

4.2 Testof Hypotheses

4.3 Summary of findings

4.4 Discussion of findings

4.1 Answers to Research Questions

The results of data used to answer the five research questions were presented in Table 3 to 10.

Research Question One: What are the socio-economic characteristics of small-holder cocoa farmers in Kwara State, Nigeria?

Table 3: Descriptive results of socio-economic characteristics of small-holdercocoa farmers in Kwara State, Nigeria

Variables	Frequency(n=160)	Percentage	Mean
Sex			
Male	146	91.3	
Female	14	8.7	
Age (Year)			
30-45	39	24.4	Mean=51.50
46 - 60	96	60.0	SD=9.506
>60	25	15.6	
Farm size (Hectares)			
≤1	38	23.8	Mean=2.01
>1-3	83	51.9	SD=.696
>3-5	39	24.4	
Farming Experience (Years)			
< 10	28	17.5	Mean:17.93
10 - 20	79	49.4	SD:6.333
Above 20	53	33.1	
Household Size			
< 5	3	1.9	Mean = 9
6-10	85	53.1	SD = 2.578
11 and above	72	45.0	
Education			
No formal education	15	9.2	
Quranic education	11	6.9	
Primary education	63	39.4	
Secondary education	47	29.4	
Tertiary education	14	8.8	
Adult education	10	6.3	

Source: Field Survey (2022)

The result presented in Table 3, shows that 91.3%of the respondents were male and 8.7% were female. This implies that majority of cocoa farmers who participated in FFS were male. The result revealed thatthe average age of small-holder cocoa farmer in Kwara State is 52 years with Standard Deviation of 9.50. it shows that cocoa farmers were still in their very active stage of farming. The result shows that majority (51.9%) of the small-holder cocoa farmerhad greater than 1to 3 hectares of land with an average mean of an average mean of

2.01(ha) of land.Further, the study shows that most (39.4%) of the small-holder cocoa farmer had primary education. This shows that all of the farmers had someform of education and most of the farmers had primary school education.Theresult shows that most(49.4%) of small-holder cocoa farmers had 10–20 years of farming experience with a mean of 17.93. This implies that most ofsmall-holdercocoa farmers were experienced. The study shows that the majority (53.1%) of small-holder cocoa farmers had 6 to 10 household size with a mean of 9. This implies that the majorityhad a large household size.

Table 4:Distribution of the respondents according to access to credit facilities

Variables	Frequency(n=160)	Percent
Access to credit facility		
Do not have access	45	28.1
Have access	115	71.9
Sources of credit		
Commercial Banks	7	6.1
Cooperative Society	25	21.7
Money lenders	4	3.5
Friends and Relatives	79	68.7
Total	**115**	**100.0**

Source: Field Survey (2022)

The result presented in Table 4, shows that majority (71.9%) had access to credit facility. The result also shows that majority (68.7%) source credit facility through friends and relatives. This implies that majority of the small-holder cocoa farmers source their credit facility through friends and relatives.

Table 5: Distribution of the respondents accordingaccessibility to subsidized farm inputs

Variables	Frequency (n=160)	Percent
Access to farm inputs		
Do not have access	120	75.0
Have access	40	25.0
Subsidized Inputs (n=40)		
Seeds	6	15
Fertilizers	25	62.5
agro-chemicals	7	17.5
farm implements	2	5
Total	**40**	**100.0**

The result presented inTable 5, showsthat (25%) of the cocoa farmers had access to farm inputs. Yet, the resultshows that 15%, 62.5% and 5%, respectively got seeds, agro-chemicals and farm implements at subsidized rates. This implies that majority of the small-holder cocoa farmers had no access to farm inputs.

Table 6: Distribution of the respondents based on membership in cooperative society

Membership of cooperative	Frequency	Percent
No	54	33.8
Yes	106	66.2
Total	**160**	**100.0**

Source: Field Survey (2022)

The result presented in Table 6, shows that 33.8% of small-holder cocoa farmers had no access to cooperative society, while66.2%belongs to cocoa farmer's association of Nigeria. This indicated that majority of small-holder cocoa farmers belongs to cooperative society

Research Question Two: Identify the skills provided by FFS to small-holder cocoa farmersin Kwara State, Nigeria?

Table 7: Descriptive result of skills provided by FFS to small-holder cocoa farmers in Kwara State, Nigeria

S/N	Skills provided by FFS	Frequency(n=160)
i	Site selection techniques for cocoa farm	159(99.4)
ii	Land preparation for planting of cocoa.	159(99.4)
iii	Soil testing to determine the fertility of the soil on the cocoa farm.	159(99.4)
iv	Nursery preparation for planting of cocoa seedlings	159(99.4)
v	Selection of appropriate varieties of cocoa seedlings.	158(98.8)
vi	Identification of healthy seeds of cocoa for planting.	159(99.4)
vii	Appropriate and recommendation of planting space of cocoa on the field.	158(98.8)
viii	Determining the depth of planting of cocoa seeds	158(98.8)
ix	Provision of shade for young cocoa seedlings	158(98.8)
x	Pruning techniques.	160(100)
xi	Determine fertilizer type to be applied to the cocoa plant.	160(100)
xii	Appropriate methods of fertilizer application.	158(98.8)
xiii	Pest and diseases control of cocoa plant.	160(100)
xiv	Mixing and spraying of agrochemical on the cocoa farm.	160(100)
xv	Recognizing matured and ripe cocoa pods.	159(99.4)
xvi	Harvesting using Appropriate techniques	159(99.4)
xvii	Cocoa beans processing techniques	159(99.4)
xviii	Cocoa beans storage	159(99.4)
xix	Cocoa beans marketing strategies	159(99.4)

Source:Field Survey (2022)Figures in parenthesis are percentages

The result present in Table 7 shows the skills provided by FFS tosmall-holder cocoa farmers. It reveals that all the skills highlighted in theTable were provided to the farmers. The skills included but not limited to pruning techniques, determining fertilizer type to be applied to the cocoa plant, pest and disease control of cocoa plants, mixing and spraying of agrochemicals on the cocoa farm as affirmed by the respondents. Other responses to the skills are: site selection for cocoa farm, land preparation for planting of cocoa. Nursery preparation

for planting of cocoa seedlings, selection of appropriate varieties of cocoa seedlings, and identification of healthy seeds of cocoa for planting, recognizing matured and ripe cocoa pods, Cocoa bean harvesting using appropriate techniques, cocoa bean processing techniques, cocoa bean storage and cocoa bean marketing strategies were affirmed by all except one respondent. This showed that all the skills were provided.

Research Question Three: What isthe relationship between skills provided and thetrainingneeds of small-holder cocoa farmers?

Table 8:Descriptive analysis of trainingneeds of small-holder cocoa farmers

S/N	Training Needs	Frequency(n=160)
i	Site selection technique for cocoa farm	130(81.3)
ii	Land preparation for planting of cocoa	109(68.1)
iii	Soil testing to determine the fertility of the soil on the cocoa farm.	124(77.5)
iv	Nursery preparation for planting of cocoa seedlings	117(73.1)
v	Selection of appropriate varieties of cocoa seedlings.	138(86.3)
vi	Identification of healthy seeds of cocoa for planting.	126(78.8)
vii	Appropriate and recommendation of planting space of cocoa on the field.	125(78.1)
viii	Determining the depth of planting of cocoa seeds	119(74.4)
ix	Provision of shade for young cocoa seedlings	118(73.8)
x	Pruning techniques.	115(71.9)
xi	Determine fertilizer type to be applied to the cocoa plant.	120(75.0)
xii	Appropriate methods of fertilizer application.	123(76.9)
xiii	Pest and diseases control of cocoa plant.	136(85.0)
xiv	Mixing and spraying of agrochemical on the cocoa farm.	121(75.6)
xv	Recognizing matured and ripe cocoa pods.	127(79.4)
xvi	Harvesting using Appropriate techniques	135(84.4)
xvii	Cocoa beans processing techniques	139(86.9)
xviii	Cocoa beans storage	120(75.0)
xix	Cocoa beans marketing strategies	135(84.4)

Source: Field Survey (2022) Figures in parenthesis are percentages

The result in Table 8 showed that 81.3% of the farmers frequently need training on site selection,68.1% cocoa farmer frequently need training on land preparation; 77.5 %of cocoa farmers frequently need training on soil testing; 73.1% frequently need training on nursery preparation for planting of cocoa seedlings;86.3% frequently need training on appropriate varieties of cocoa seedlings;78.8% frequently need training onIdentification of healthy seeds of cocoa for planting; The result further showed further that 78.1% frequently need training onappropriate and recommendation of planting space of cocoa on the field;

74.4% frequently need training on determining the depth of planting of cocoa seeds; 73.8% frequently need trainingonProvision of shade for young cocoa seedlings; 71.9% frequently need training onPruning techniques; 75.0%frequently need trainingon determine fertilizer type to be applied to the cocoa plant; 76.9% frequently need training on appropriate methods of fertilizer application; 85.0% frequently need training onpest and diseases control of cocoa plant;75.6% frequently need trainingon mixing and spraying of agrochemical.The result further revealed that 79.4% frequently need trainingon recognizing matured and ripe cocoa pods;84.4% of cocoa farmers frequently need trainingon harvesting using appropriate techniques; The result revealed that 86.9% of cocoa farmers frequently need training on cocoa beans processing techniques,75.5% of cocoa farmers frequently need training on cocoa beans storage; 84.4% of cocoa farmers frequently need training on cocoa beans marketing strategies. Based on this result it can be deduced that skills provided by FFS was in line with the training needs of small-holder cocoa farmers.

Research Question Four: What is the difference between yield, income and expenditure of small-holder cocoa farmers before and after participation in FFS?

Table 9: Difference between yield, income and expenditure of small-holder cocoa farmers before and after participation in FFS.

Variables	Sub-Variable	Before	Mean Before	After	MeanAfter
Cocoa Yield (kg)	<500	37(23.1)	M=965.86,	1(0.6)	M=1381.29,
	500 - 1000	69(43.1)	SD=1107.152	41(25.6)	SD=1634.62
	> 1000	54(33.8)		118(73.8)	
Annual Income (₦)	< 100,000	2(1.3)	M=957629,	1(0.6)	M=1467484,
	100,000 -500, 000	25(15.6)	SD=455234	4(2.5)	SD=613097
	>500,000	133(83.1)		155(96.9)	
Expenditure (₦)	<50,000	115(71.9)	M=46244,	36(22.5)	M=61975,
	50,000 - 100, 000	44(27.5)	SD=34808	124(77.5)	SD=21076
	>100,000	1(0.6)		0(0)	

Field Survey (2022)Figures in parenthesis are percentages

The result in Table9 shows the average cocoa yield before and after FFS to be 966kg and 1381kg respectively. This shows an increase of 415kg after participating in FFS. The average income for before and after participation in FFS was₦957,629 and ₦1,467,484. This shows an increase of₦509,855 in farmers' income after participating in FFS. The findings revealed further that, the average monthly expenditure of cocoa farmers before and after FFS were₦46,244, and ₦61,975 respectively.This shows an increase of₦15,731 in farmers' expenditure after participating in FFS.

Research Question Five: What are the constraints faced by cocoa farmers participating in FFS activities in Kwara State, Nigeria?

Table 10: Descriptive analysis of Constraints faced by cocoa farmers participating in FFS activities in Kwara State, Nigeria

Constraints	Frequency	Percentage	Rank
Inadequately trained facilitators	150	93.8	1
School location	142	88.8	2
Inadequate Social amenities	136	85.0	3
Limited time to make fieldpreparations	90	56.3	4
Unreliable weather information	83	51.8	5
Inadequate Farm implements	78	48.8	6
Inadequate Instructional facilities	69	43.1	7
Inadequate funding	40	25.0	8
Scarcity of or inadequate land for practical	32	20.0	9

Source:Field Survey (2022)

The result in Table10 shows the constraints faced by cocoa farmers participating in FFS activities in Kwara State. The constraints were ranked according to the magnitude as stated by the farmers.It was found that inadequate trained facilitators (93.8%) ranked first followed by school location (88.8%). Again, scarcity/inadequate land for practical ranked the least with (20%). This reveals that most salient constraint encountered by the participants wereinadequate trained facilitators, School location, lack of social amenities, Limited time to make field preparations and Unreliable weather information.

4.2 Testof Hypotheses

Result of test of the two null hypotheses were presented in Table 11 to 12

Research Hypothesis One: There is no significant relationship between the skills provided by FFS and training needs of small-holder cocoa farmers in Kwara State, Nigeria

Table11:Chi-square analysis of the relationship between the skills provided by FFS and training needs of small-holder cocoa farmers in Kwara State, Nigeria

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	100.033[a]	48	.001
Likelihood Ratio	30.738	48	.975
Linear-by-Linear Association	6.193	1	.013
N of Valid Cases	160		

Source:Field Survey (2022)$\alpha \leq 0.05$, NS: Not Significant

The result in Table 11 presents thechi-square analysis of the relationship between the skills provided by FFS and training needs of small-holder cocoa farmers in Kwara State, Nigeria. The finding reveals that the p-value of 0.001 is less than the alpha value of 0.05. This implies that null hypothesis one which stated that "there is no significant relationship between the skills provided by FFS and training needs of small-holder cocoa farmers in Kwara State, Nigeria" is hereby rejected. Consequently, there is a positive relationship between the skills provided by FFS and training needs of small-holder cocoa farmers in Kwara State, Nigeria.

Research Hypothesis Two: Farmer Field School activities have no significant effects on yield and living standard of small-holder cocoa farmers in Kwara State, Nigeria

Table 12: Regression analysis of effects of farmer field school activities on yield and living standard ofsmall-holdercocoa farmers in Kwara State,Nigeria

Variable	B	S.E.	t.	R^2	Adj.R^2	Sign
Yield	-393.721	1629.366	-1.424	0.13	.006	0.156
Income	-14129.345	614997.986	-.135	0.000	-.006	0.892
Expenditure	-3962.454	21060.864	1.109	0.008	.001	0.269
Asset Possession	-350859	7119763.143	0.4806	-517	-.006	0.631

Source: Field Survey (2022)

Result in Table 12 shows that FFS activities do not have significant effect on small-holder cocoa farmers yield (B -393.721 and S.E. 1629.366), income (B-14129.345 and S.E. 614997.986), (B-3962.454 and S.E. 21060.864) and asset possession (B-350859 and S.E. 7119763.143) with p value (0.16, 0.89, 0.27 and 0.63) greater than the alpha value of 0.05.The null hypotheses which state that FFS have no significant effect on yield and living standard of cocoa farmers in Kwara State is hereby accepted. The result shows that FFS had no significant effects on the yield and living standard of small-holder cocoa farmers. This may be due to inadequate training facilitators reported by small-holder cocoa farmers in Kwara State.

4.3 Summary of Findings

From the results, the following are the summary of the major findings:

i. Majority of small-holder cocoa farmers that participated in FFS were male (91.3%).
ii. The skills provided by FFS were found to be in line with the training needs of the FFS small-holder cocoa farmers in Kwara State.
iii. The FFS activities had no significant effects on the yield and living standard of small-holder cocoa farmers in Kwara State.
iv. Inadequate training facilitators (93.8%), school location (88.8), inadequate social

amenities (85.0) and limited time to make field preparation (56.3%) among others were the major constraint faced by small-holder cocoa farmers among others in Kwara State

4.4 Discussion of Findings

The findings of research question oneindicated that majority of cocoa farmers who participated in FFS were male.This finding is in line with that of Faloni, Tijani and Kehinde (2022) who stated that the majority of the cocoa farmers were male. It also agreed with the findings ofOgunya and Tijani(2022) who reported that majority of the cocoa farmers were male. The finding also revealedthat majority of the cocoa farmers are of very active age, this finding agreed with that of Ogunkunle, Olarinde, Adebusola, Adepoju and Adio (2022) who reported that majority of the cocoa farmers with the mean age of 54.45 yearsare very active.Also, majority of the respondents had a farm size of two hectares.This findingis also similar to that ofOwolabi and Okunlola (2015) who reported that the majority of small-holder farmers have average farm size was 2.5 hectares.This finding also contradicts that of Nwaobiala*et al*. (2016) who found that farm size ofsmall-holder cocoa farmers was 4.5 hectares in Abia State.

The findings of this study discovered that majority (90.8%) of thesmall-holder cocoafarmers had received one form of education had primary school education. This finding agreed with that of Aneaeto*et al*. (2017) who discovered that most of FFS participants received some form of education and the finding also tallies with that of Ayi and Undiandeye (2022) who stated that majority of farmers who participated in FFS had primary education and with respect to farming experience, majority of the farmers had between 11–20 years of cocoa farming experience. This result agrees with the findings of Ayi (2022) who stated that FFS farmers had farming experience of 11-20 years. This also aligned with the finding of Ogunkunle*etal*. (2022) who reported that farming experience of most respondents fell within

the range of 11-20 years.The result showed that most of the respondents fell within the range of 6-10 numbers as the household sizes.The finding is in line with that of Ogunkunle (2022) who reported that most of the respondents fell within the range of 6-10 household sizes. This negates the finding of Julis and Jimoh (2020) who stated that farmers had family size of between 7 and 9 household size. The study further discovered that majority of cocoa farmers had access to credit facilities and belongs to cocoa farmer association of Nigeria. The finding negates that of Faloni *et al.* (2021)who found that majority of the farmers had no access to credit facilities

From research question two it was discovered that cocoa farmers were exposed to the skills provided by FFS in Kwara State, Nigeria. This is in line with the findings of Anaeto*etal.*(2017) who observed that farmers were knowledgeable on all activities of FFS listed as a result of their participation in FFS.

Outcome of research question three and null hypothesis one revealed that FFS activities had significant relationship between the skills provided by FFS and the training needs of cocoa farmers in Kwara State, Nigeria. The p-value of 0.001 is less than the alpha value of 0.05. The findingrevealed thatskills provided by farmer field school had significant relationship on training needs of cocoa farmers in Kwara State, Nigeria. This finding agreeswith that of Aderibigbe *et al*. (2014) who reporteda significant relationship between the skills provided and farmers level of production. Furthermore, the benefit that is derived from farmer field school activities will enable the farmers to use the skill acquired from the school to improve their level of production.

The finding of research question four hypothesis two revealed that FFS activities had no significant effects on the yield and living standard of cocoa farmers in Kwara State, Nigeria. This is not in line with the finding of Gbawoquiya (2017) who reported that FFS improved agricultural productivity among rice farmers. The finding also differs from the

results of the study of Cai, Shi and Hu (2016)who reported that FFS had a positive impact on the yield of tomato in Beijing.

The study revealed that FFS had no significant effects on income of small-holder cocoa farmers and this contrary to the findings of Bhuiyan and Mahrajan (2022) who researched on the impact of FFS activities on crop income, agroecology, and farmer's behaviours. Their findings showed a positive and significant effects on farmers' income.

The constraints faced by cocoa farmers participating in FFS activities in Kwara State, Nigeria were; school location, inadequately trained facilitators, Limited time to make field preparations,Unreliable weather information and inadequate social amenities among others. This agree with the findings reported byDavid *etal.,* (2017) who observed that limited time to make field preparation and unreliable weather information are constraints faced by farmers that participated in FFS.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents summary, conclusion, and recommendations of this study. The primary objective was to assess the effects of farmer field school activities on the livelihood of small-holder cocoa farmers in Kwara State, Nigeria.

5.1 Summary

This study was structured into five chapters in order to effectively carry out this research. Chapter one presented the background and five objectives of the study, statement of the problem; five research questions including the two hypotheses formulated for the study, and delimitations. Chapter two reviewed related literature to the concepts and components of farmer field school with their effects on farmers' yield and living standard. The cited literature was duly acknowledged. The literature showed that previous studies focused on areas of study such as technical efficiency, adoption and adaption, diffusion of knowledge, productivity, and other related agricultural aspects. But this study focused on the yield and livelihood of small-holder cocoa farmers in Kwara State, Nigeria, this identified gap formed the basis for this study. This study was conducted in six FFS in Kwara State, Nigeria.

Chapter three explained the methodology used in the collection of data. A descriptive research design was used for the study which had 180 cocoa farmers who served as the population of the study. Based on the nature of the farmer’s population, 20 farmers were selected for a pilot study, while the remaining 160 were used for the main study. The instruments were distributed to the 160 cocoa farmers in all the five local governmentareasand their responses formed the basis of this study. The collected data was coded and analyzed with SPSS version 20, and the statistical analysis and interpretation of the findings from the analyzed data presented in chapter four.

The findings showed that FFS activities hadpositive relationship between the skills provided and the training needs of the FFS small-holder cocoa farmers in Kwara State, Nigeria. The finding also showed that FFS activities hadno significant effects on the yield and living standards of the FFS small-holder cocoa farmers.

5.2 Contribution to Knowledge

Based on the findings of this study, it was established that:

1. Positive relationship existedbetween the skills provided by FFS and training needs of FFS small-holder cocoa farmers in Kwara State, Nigeria, with the (P = 0.001).
2. FFS activities improved the yield of small-holder cocoa farmers but did not statistically and significantlyaffect the yield (P =0.156).
3. There is an increased income, household expenditure and assets possessedby FFS smallholder cocoa farmers, butdid not show statistical and significant effects (p=0.892), (p=0.269) and (0.631)respectively.

5.3 Conclusion

Cocoa production in Kwara State is largely dominated by male farmers perhaps aligned with the general belief that cocoa farming is laborious. Similarly, this may bedue to the fact thatCocoa farming requires tedious operations such as bush clearing, chemical application, pruning and harvesting of pods. Majority of the cocoa farmers were still in their active age,will be able to learn techniques and principle necessary for better production of cocoa,and had primary school education. TheFFS activities showed positive relationshipbetween the skills provided and the training needs of cocoa farmers and this may be because skills provided by FFS were in line with the agronomic activities and needs of the FFS smallholder cocoa farmers.The FFS activities had no significant effects on yield, and living standard of the FFS smallholder cocoa farmers. This may imply that the inadequate training facilitators, school location and limited time to make field preparations being the

constraints to FFS implementation in the area were responsible.

5.4 Recommendations

Based on the findings of the study; the following recommendations were made:

i. *Kwara State Ministry of Agriculture through the FFS should continue to serve as a training base that involve more farmers into the programme and encourage extension service delivery to encourage capacity building and increase productivity.*

ii. The Government should recruit, train and retrain more facilitators to enable FFS to have significant effects on yield and living standard ofsmall-holder cocoa farmers in Kwara State.

iii. The Government through extension institutes should set up proper monitoring and evaluation process to access facilitatorsin other to make FFS have significant effects on yield and living standard of small-holder cocoa farmers.

iv. Kwara State government should provide more extension support services that will improve the income level of the farmers.

5.5 Suggestions for further studies

The following suggestions are made in related area of this study for further research work:

i. Effects of farmer field school activities on small-holdercassava farmers' productivity and livelihood inKwara State, Nigeria.

ii. Effects of Farmer Field School activities onsmall-holder maize farmers' productivity in Kwara State, Nigeria.

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APPENDIX I

DEPARTMENT OF VOCATIONAL & TECHNICAL EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA
Telephone: 069 - 51755, 50692
VICE CHANCELLOR: Professor Kabir Bala, B.Sc (Hons) Building, M.Sc. (Bldg. Serv), MBA, Ph.D (Const. Mgt) (ABU), FNIOB, MAPM, MCABE, C. Bldg E, MICIArb
HEAD OF DEPARTMENT: Dr. Hussein A. Abdullahi, B.Sc, Ed, M.Sc. (ABU) PhD (SUA) MASN, MAESON, MAETAN

Your Ref: _____ Date: 24th November, 2021

Our Ref: P18EDVE8028

The Head
Kwara State Ministry of Agriculture and Rural Development
Kwara State, Nigeria

LETTER OF IDENTIFICATION
FATAI KAMORUDEEN (P18EDVE8028)

This is to certify that the above named candidate is a Masters student (Agricultural Education) in the Department. He is carrying out a research on *Assessment of Effects of Farmer Field Schools Activities on Livelihood of Small holder Cocoa Farmers in Kwara State, Nigeria.*

Kindly give him every assistance he may require.

Thank you.

Yours faithfully,

Dr. Hussein A. Abdullahi
HEAD OF DEPARTMENT

HON. COMMISSIONER FOR AGRIC & RURAL DEVELOPMENT

DCN. OLOYEDE EZEKIEL
CFAN CHAIRMAN
KWARA STATE
08-12-2021

DEPARTMENT OF VOCATIONAL & TECHNICAL EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA

Telephone: 069 - 51755, 50692

VICE CHANCELLOR: Professor Kabir Bala, B.Sc (Hons) Building, M.Sc. (Bldg. Serv), MBA, Ph.D (Const. Mgt) (ABU), FNIOB, MAPM, MCABE, C. Bldg E, MICIArb
HEAD OF DEPARTMENT: Dr. Hussein A. Abdullahi, B.Sc, Ed, M.Sc. (ABU) PhD (SUA) MASN, MAESON, MAETAN

Your Ref: _____

Date 16th February, 2022

P18EDVE8028

Our Ref: _____

The Liaison Officers
Isin
Local Government Area
Kwara State, Nigeria.

LETTER OF IDENTIFICATION
KAMORUDEEN FATAI - (P18EDVE8028)

This is to certify that Kamorudeen Fatai, with registration number P18EDVE8028), is a postgraduate student of Agric. Education. He is carrying out research on **Assessment of Effects of Farmer Field Schools Activities on Livelihood of Smallholder Cocoa Farmers in Kwara State, Nigeria**

Please, kindly give him every assistance he may require.

Thank You.

Yours sincerely

Dr. Hussein A. Abdullahi
HEAD OF DEPARTMENT

cc: Oyun, L .G. A -Kwara State, Nigeria
" Offa L .G. A -Kwara State, Nigeria
" Ifelodun, L .G. A -Kwara State, Nigeria
" Irepodun, L .G. A -Kwara State, Nigeria

DEPARTMENT OF VOCATIONAL & TECHNICAL EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA

Telephone: 069 - 51755, 50892

VICE CHANCELLOR: Professor Kabir Bala, B.Sc (Hons) Building, M.Sc. (Bldg. Serv), MBA, Ph.D (Const. Mgt) (ABU), FNIOB, MAPM, MCABE, C. Eng F. MCIArb
HEAD OF DEPARTMENT: Dr. Hussein A. Abdullahi, B.Sc, Ed, M.Sc. (ABU), PhD (SUA) MASN, MAESON, MAETAN

Your Ref: P18EDVE8028

Our Ref:

Date: 16th February, 2022

The Community Heads
Isin
Local Government Area
Kwara State, Nigeria.

LETTER OF IDENTIFICATION
KAMORUDEEN FATAI - (P18EDVE8028)

This is to certify that Kamorudeen Fatai, with registration number P18EDVE8028), is a postgraduate student of Agric. Education. He is carrying out research on **Assessment of Effects of Farmer Field Schools Activities on Livelihood of Smallholder Cocoa Farmers in Kwara State, Nigeria**.

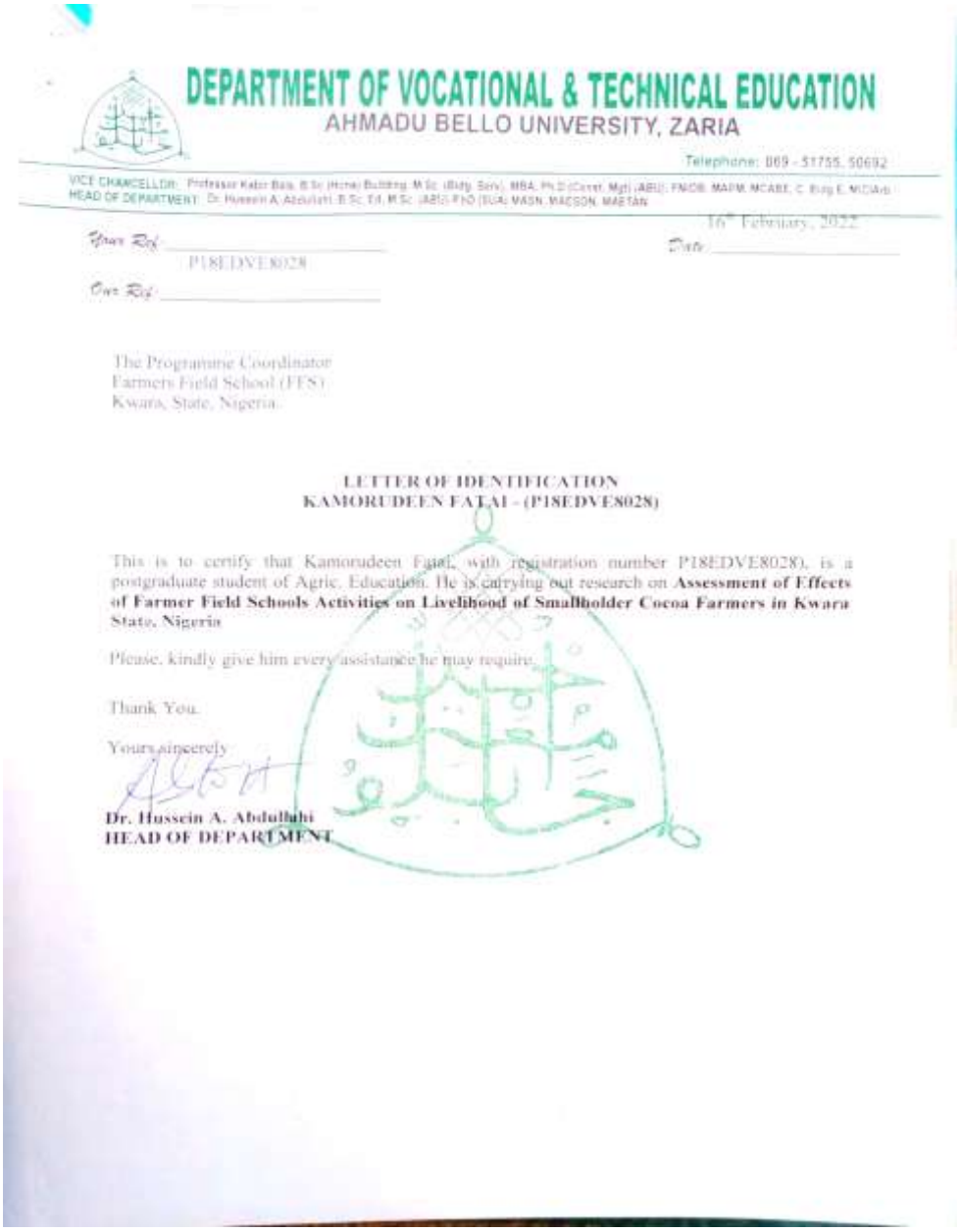
Please, kindly give him every assistance he may require.

Thank You.

Yours sincerely

Dr. Hussein A. Abdullahi
HEAD OF DEPARTMENT

cc: Oyun, L.G.A. Kwara State, Nigeria.
cc; Offa, L.G.A. Kwara State, Nigeria
cc: Ifelodun, L.G.A. Kwara State, Nigeria
cc: Irepodun L.G.A. Kwara State, Nigeria



DEPARTMENT OF VOCATIONAL & TECHNICAL EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA

Telephone: 069 - 51755, 50692

VICE CHANCELLOR: Professor Kabir Bala, B.Sc (Hons) Building, M.Sc. (Bldg. Serv), MBA, Ph.D (Const. Mgt) (ABU), FNOB, MAPM, MCABE, C. Eng E. MCIArb
HEAD OF DEPARTMENT: Dr. Hussein A. Abdullahi, B.Sc, Ed, M.Sc. (ABU) PhD (SUA) MASN, MACSON, MAETAN

Your Ref: P18EDVE8028

Our Ref: _____

Date: 16th February, 2022

The Programme Coordinator
Farmers Field School (FFS)
Kwara, State, Nigeria.

LETTER OF IDENTIFICATION
KAMORUDEEN FATAI - (P18EDVE8028)

This is to certify that Kamorudeen Fatai, with registration number P18EDVE8028), is a postgraduate student of Agric. Education. He is carrying out research on **Assessment of Effects of Farmer Field Schools Activities on Livelihood of Smallholder Cocoa Farmers in Kwara State, Nigeria**

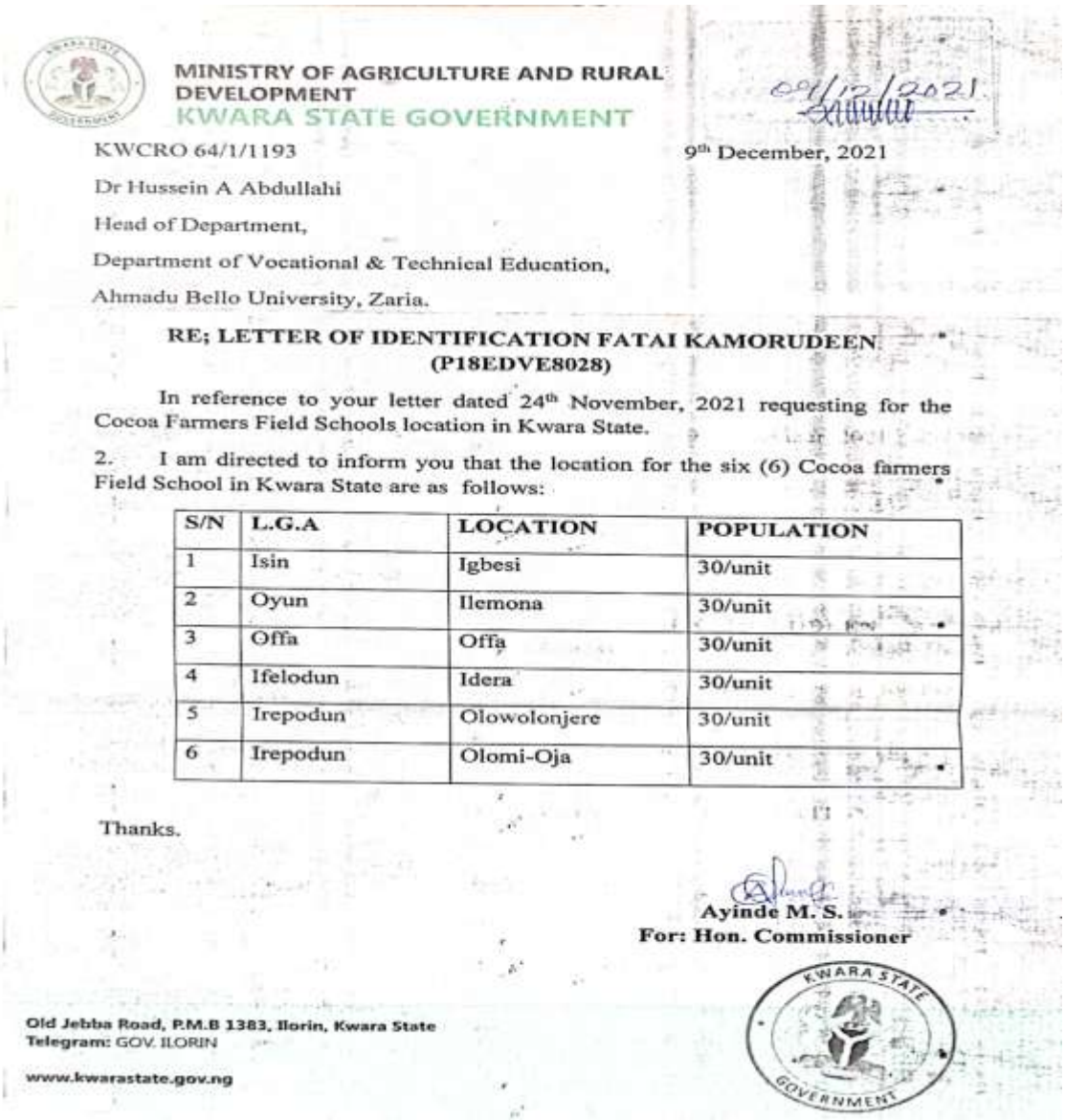
Please, kindly give him every assistance he may require.

Thank You.

Yours sincerely

Dr. Hussein A. Abdullahi
HEAD OF DEPARTMENT

APPENDIX II



MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
KWARA STATE GOVERNMENT

09/12/2021

KWCRO 64/1/1193

9th December, 2021

Dr Hussein A Abdullahi

Head of Department,

Department of Vocational & Technical Education,

Ahmadu Bello University, Zaria.

RE; LETTER OF IDENTIFICATION FATAI KAMORUDEEN (P18EDVE8028)

In reference to your letter dated 24th November, 2021 requesting for the Cocoa Farmers Field Schools location in Kwara State.

2. I am directed to inform you that the location for the six (6) Cocoa farmers Field School in Kwara State are as follows:

S/N	L.G.A	LOCATION	POPULATION
1	Isin	Igbesi	30/unit
2	Oyun	Ilemona	30/unit
3	Offa	Offa	30/unit
4	Ifelodun	Idera	30/unit
5	Irepodun	Olowolonjere	30/unit
6	Irepodun	Olomi-Oja	30/unit

Thanks.

Ayinde M. S.
For: Hon. Commissioner

KWARA STATE GOVERNMENT

Old Jebba Road, P.M.B 1383, Ilorin, Kwara State
Telegram: GOV. ILORIN

www.kwarastate.gov.ng

APPENDIX III

TOPIC: ASSESSMENT OF EFFECTS OF FARMER FIELD SCHOOLS ACTIVITIES ON LIVELIHOOD OF SMALL-HOLDER COCOA FARMERS IN KWARA STATE, NIGERIA

Interview Schedule for Small-holder Cocoa Farmers

Instruction: Please read the question carefully and interpret appropriate to the small-holder cocoa farmers

Section A: Socio-economic Characteristics of small-holder cocoa farmers

(1) Age in (years)……

(2) Sex a. Male ( ) b. Female ( )

(3) Educational Level

a. No formal Education ( ) b. Quranic Education ( ) c. Primary Education ( ) d. Secondary Education ( ) e. Tertiary Education ( ) f. Adult Education ( )

(4) Household size …… (Number)

(5) Size of your farm……..(Hectare)

(6) Year of coca farming experience …….Years

(7) Do you have access to credit facilities? Yes ( ) No ( )

(8) If yes, what is the source of your credit

a. Bank ( ) b. Cooperative Society ( ) c. Money lender ( ) d. Friend/Relative ( ) e. Others ( )

(9) Do you have access to subsidized farm input? Yes ( ) No ( )

(10)If yes, Tick the farm input you have access to

a. Subsidized seeds ( ) b. Subsidized Fertilizers ( ) c. Subsidized Agro-Chemicals ( ) d. Subsidized Farm implements ( ) e. Others: Specify ……..

(11)Do you belong to a cooperative society? Yes ( ) No ( )

(12)If yes, state the type(s) of cooperative you belong to ……

Section B: Identify the types of skills provided by FFS to small-holder cocoa farmers

(1)Instruction: Select which of the following skills provided by FFS in Kwara State, Nigeria

S/N	ITEMS	YES	NO
a	Site selection for cocoa farm		
b	Land preparation for planting of cocoa.		
c	Soil testing to determine the fertility of the soil on the cocoa farm.		
d	Nursery preparation for planting of cocoa seedlings		
e	Selection of appropriate varieties of cocoa seedlings.		
f	Identification of healthy seeds of cocoa for planting.		
g	Appropriate and recommendedplanting space of cocoa on the field.		
h	Determining the depth of planting of cocoa seeds		
i	Provision of shade for young cocoa seedlings		
j	Pruning techniques.		
k	Determine fertilizer type to be applied to the cocoa plant.		
l	Appropriate methods of fertilizer application.		
m	Pest and diseases control of cocoa plant.		
n	Mixing and spraying of agrochemical on the cocoa farm.		
o	Recognizing matured and ripe cocoa pods.		
p	Harvesting using Appropriate techniques		
q	Cocoa beans processing techniques		

r	Cocoa beans storage		
s	Cocoa beans marketing strategies		

(2) Are you applying all the skills you have learned from the FFS training? Yes ( ) No ( )

(3) If yes ,which of the skills above do you apply for cocoa production on your farm…….,…….,…….,……
…….,…….,…….,……
…….,…….,…….,……
…….,…….,…….,…
……

(4) IfNo, State the skills that you are not using.....
.....

(5) Explain why you are not using the skill(s)
…….

Section C: Relationship between the skills provided by FFS and training needs of small-holder cocoa farmers

(1) To what extent are the following Trainings needed?

S/N	Training Needs	Frequently	Not frequently
a	Site selection for cocoa farm		
b	Land preparation for planting of cocoa.		
c	Soil testing to determine the fertility of the soil on the cocoa farm.		
d	Nursery preparation for planting of cocoa seedlings		
e	Selection of appropriate varieties of cocoa seedlings.		
f	Identification of healthy seeds of cocoa for planting.		
g	Appropriate and recommended of planting space of cocoa on the field.		
h	Determining the depth of planting of cocoa seeds		
i	Provision of shade for young cocoa seedlings		
j	Pruning techniques.		
k	Determine fertilizer type to be applied to the cocoa plant.		

l	Appropriate methods of fertilizer application.		
m	Pest and diseases control of cocoa plant.		
n	Mixing and spraying of agrochemical on the cocoa farm.		
o	Recognizing matured and ripe cocoa pods.		
p	Harvesting using Appropriate techniques		
q	Cocoa beans processing techniques		
r	Cocoa beans storage		
s	Cocoa beans marketing strategies		

Section D: Research Question 4: Effects of FFS activities on yield and living standard of small-holder cocoa farmers.

1. What was the yield of your cocoa before participating in FFS?.....Kg
2. What is the yield of your cocoa after participating in FFS?.....Kg
3. What was the level of your incomebefore participating in FFS?.....
4. What is the level of your income in naira after participating in FFS?.....
5. How many house(s) did you have before participating in FFS?.....
6. How many house(s) do you have after participating in FFS?.....
7. What was your monthly expenditure on household medical, education, food, electricity and clothing before participating in FFS?.....
8. What is your monthly expenditure on household medical, education, food and clothing after participating in FFS?.....
9. What is the value of household item put together like television, fans, motorcycle, fridge, furniture, pressing iron, car, gas cylinder before participating in FFS ?…….
10. What is the value of household item put together like television, fans, motorcycle, fridge, furniture, pressing iron, car, gas cylinder after participating in FFS ?…….

Section E: Which of the following constraintsare faced by cocoa farmers participating in FFS Activitiesin Kwara State, Nigeria?

S/N	CONSTRAINTS TO FFS Activities	Tick
a	School location	
b	Scarcity of or inadequate land for practical purposes	
c	Inadequately trained facilitators	
d	Inadequate funding	
e	Limited time to make field preparations	
f	Unreliable weather information	
j	Inadequate Farm implements	
h	Inadequate Instructional facilities	
i	Inadequate Social amenities	

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FACULTY OF EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA

RESEARCH INSTRUMENT VALIDATION
(To Be Completed per Instrument)

Name of Instrument (To Be Completed per researcher) Survey Questionnaire for Smallholder Cocoa Farmers

Title of the Research (To Be Completed per researcher) Assessment of effects of Farmer Field Schools Activities on Livelihood of Smallholder Cocoa Farmers in Kwara State, Nigeria.

AGRICULTURAL EDUCATION
DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FACULTY OF EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA

TOPIC: ASSESSMENT OF EFFECTS OF FARMER FIELD SCHOOLS ACTIVITIES ON LIVELIHOOD OF SMALLHOLDER COCOA FARMERS IN KWARA STATE, NIGERIA

Simple to spell

Survey Questionnaire for smallholder cocoa farmers.

Instruction: Please read the question carefully and interpret appropriate to the smallholder cocoa farmers

Section A: Socio-economic Characteristics of smallholder cocoa farmers

(1) Age in (years).....

(2) Sex a. Male ( ) b. Female ( )

(3) Educational Level

a. Quranic Education ( ) b. Primary Education ( ) c. Secondary Education ( ) d. Tertiary Education ( ) (e) Adult Education

(4) Household size .....(Number)

(5) Size of your farm..... Provide options to ease the work of the respondents e.g 0.5 – 1 Hec, 1.5 – 2 Hec

(6) Year of farming experience .....Years

(7) Do you have access to credit facilities? Yes ( ) No ( )

If yes, what is the source of your credit

a. Bank ( ) b. Cooperative Society ( ) c. Personal Saving ( ) d. Friend/Relative ( ) e. Others ( )

(8) Do you have access to subsidized farm input? Yes ( ) No ( )

If yes, Tick the farm input you have access to

a. Subsidized seeds ( ) b. Subsidized Fertilizers ( ) c. Subsidized Agro-Chemicals ( )

d. Subsidized Farm implements ( ) e. Others ~~( )~~ Specify

(9) Do you belong to a cooperative society? Yes ( ) No ( )

10 If Yes, state the type(s) of cooperatives you belong to.

Section B: Assess the types of skills provided by FFS to smallholder cocoa farmers

11. Instruction: State which of the following skills provided by FFS in Kwara State, Nigeria

S/N	ITEMS	YES	NO
1	Site selection for cocoa		

1

	farm		
2. ii	Land preparation for planting of cocoa.		
3 iii	Soil testing to determine the fertility of the soil on the cocoa farm.		
4 iv	Nursery preparation for planting of cocoa seedlings		
5 v	Selection of appropriate varieties of cocoa seedlings.		
6 vi	Identification of healthy seeds of cocoa for planting.		
7 vii	Determining the depth of planting of cocoa seeds.		
8 viii	Provision of shade for young cocoa seedlings		
9 ix	Pruning techniques.		
10 x	Determine fertilizer type to be applied to the cocoa plant.		
xi xi	Application of fertilizer using appropriate methods		

2

12	Pest and diseases control of cocoa plant.		
13	Mixing and Spraying of agrochemical on the cocoa farm.		
14	Determination of planting space of cocoa on the field.		
15	Recognizing matured and ripe cocoa pod.		
16	Harvesting using appropriate techniques		
17	Cocoa bean storage		
18	Cocoa bean marketing		

(12) Are you applying what you have learned from the FFS training? Yes ( ) No ( )

If "Yes", which one of the skills you do not apply for cocoa production on your farm

If No, please explain why?.....

Section C: Relationship between the skills provided by FFS and training needs of smallholder cocoa farmers

(13) Instruction: To what extent are the following Training needed?

S/N	Training needs	Frequently	Not Frequent
1 (i)	Site selection for cocoa farm		

2	Land preparation for planting of cocoa		
3	Soil testing to determine the fertility of the soil on the cocoa farm.		
4	Nursery preparation for planting of cocoa seedlings		
5	Selection of appropriate varieties of cocoa seedlings.		
6	Identification of healthy seeds of cocoa for planting		
7	Determining the depth of planting of cocoa seeds		
8	Provision of shade for young cocoa seedlings		
9	Pruning techniques		
10	Determine fertilizer type to be applied to the cocoa plant.		
11	Application of fertilizer using appropriate methods		

4

12	Pest and diseases control of cocoa plant.		
13	Mixing and Spraying of agrochemical on the cocoa farm		
14	Determination of planting space of cocoa on the field.		
15	Recognizing matured and ripe cocoa pod		
16	Harvesting using appropriate techniques		
17	Cocoa bean storage		
18	Cocoa bean marketing		

Section D: Research Question 4: Effects of FFS activities on yield and living standard of smallholder cocoa farmers.

14 1. What is the yield of your cocoa before participating in FFS per hectare?.....
15 2. What is the yield of your cocoa after participating in FFS per hectare?.....
16 3. What is the level of your income before participating in FFS?.....
17 4. What is the level of your income after participating in FFS?.....
18 5. What is your monthly expenditure on household health before participating in FFS?.....
19 6. What is your monthly expenditure on household health after participating?.....
20 7. What is your monthly expenditure on household food before participating in FFS?.....

5

21 8. What is your monthly expenditure on household food after participating in FFS?.....

22 9. What is your monthly expenditure on household on education before participating in FFS?.....

23 10. What is your monthly expenditure on household on education after participating in FFS?.....

S/N	Items	Number
A a.	House	
5 b	Car	
6 c	Television	
7 d	Telephone	
8 e	Motorcycle	
9 f	Labour	

others specify

24 **Section E:** Which of the following constraint to FFS Activities most affect affect the programme in Kwara State, Nigeria? Is this for the farmers?

S/N	CONSTRAINTS TO FFS Not Complete	Tick
1 a	School location	
2 b	scarcity of or inadequate land for practical purposes	
3 c	resource use conflicts	
4 d	inadequately trained facilitators	
5 e	inadequate funding	

6

6 f	unavailability of improved seed	
7 g	inadequate irrigation facility	
8 h	limited time to make field preparations	
9 i	Unreliable weather information	
10 j	Farm implements	
11 k	Instructional facilities	
12 l	Social amenities	

7

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
FACULTY OF EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA

RESEARCH INSTRUMENT VALIDATION
(To Be Completed per Instrument)

Name of Instrument (To Be Completed per researcher) Survey Questionnaire for Smallholder Cocoa farmers

Title of the Research (To Be Completed per researcher) Assessment of effect of Farmer field Schools activities on Livelihood of smallholder Cocoa Farmers in Kwara state, Nigeria

Adequacy and Relevance of Instrument

Structure and Grammatical Accuracy of the Instrument

Number of Instruments Validation All

Number of Items Recommended for Use All

Detail Comments/ Remarks

Suggestions/Recommendations

Name of Validator

Address of Validator

Signature of Validator/Date

TOPIC: ASSESSMENT OF EFFECTS OF FARMER FIELD SCHOOLS ACTIVITIES ON LIVELIHOOD OF SMALLHOLDER COCOA FARMERS IN KWARA STATE, NIGERIA

Instruction: Please read the question carefully and interpret appropriate to the smallholder cocoa farmers

Section A: Socio-economic Characteristics of smallholder cocoa farmers

(1) Age in (years).....

(2) Sex a. Male ( ) b. Female ( )

(3) Educational Level

a. Quranic Education ( ) b. Primary Education ( ) c. Secondary Education ( ) d. Tertiary Education ( )

(4) Household size .....

(5) Size of your farm.....

(6) Year of farming experience .....Years

(7) Do you have access to credit facilities? Yes ( ) No ( )

If yes, what is the source of your credit

a. Bank ( ) b. Cooperative Society ( ) c. Personal Saving ( ) d. Friend/Relative ( ) e. Others ( )

(8) Do you have access to subsidized farm input? Yes ( ) No ( )

If yes, Tick the farm input you have access to

a. Subsidized seeds ( ) b. Subsidized Fertilizers ( ) c. Subsidized Agro-Chemicals ( ) d. Subsidized Farm implements ( ) e. Others ( )

(9) Do you belong to a cooperative society? Yes ( ) No ( )

Section B: Assess the types of skills provided by FFS to smallholder cocoa farmers

Instruction: State which of the following skills provided by FFS in Kwara State, Nigeria

S/N	ITEMS	YES	NO
1	Site selection for cocoa		

1

	farm		
2	Land preparation for planting of cocoa.		
3	Soil testing to determine the fertility of the soil on the cocoa farm.		
4	Nursery preparation for planting of cocoa seedlings		
5	Selection of appropriate varieties of cocoa seedlings.		
6	Identification of healthy seeds of cocoa for planting.		
7	Determining the depth of planting of cocoa seeds.		
8	Provision of shade for young cocoa seedlings		
9	Pruning techniques.		
10	Determine fertilizer type to be applied to the cocoa plant.		
11	Application of fertilizer using appropriate methods		

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12	Pest and diseases control of cocoa plant.		
13	Mixing and Spraying of agrochemical on the cocoa farm.		
14	Determination of planting space of cocoa on the field.		
15	Recognizing matured and ripe cocoa pod.		
16	Harvesting using appropriate techniques		
17	Cocoa bean storage		
18	Cocoa bean marketing		

(2) Are you applying what you have learned from the FFS training? Yes ( ) No ( )

If "Yes", which one of the skills you do not apply for cocoa production on your farm

If No, please explain why?.....

Section C: Relationship between the skills provided by FFS and training needs of smallholder cocoa farmers

Instruction: To what extent are the following Training needed?

S/N	Training needs	Frequently	Not Frequent
1	Site selection for cocoa farm		

2	Land preparation for planting of cocoa		
3	Soil testing to determine the fertility of the soil on the cocoa farm.		
4	Nursery preparation for planting of cocoa seedlings		
5	Selection of appropriate varieties of cocoa seedlings.		
6	Identification of healthy seeds of cocoa for planting		
7	Determining the depth of planting of cocoa seeds		
8	Provision of shade for young cocoa seedlings		
9	Pruning techniques		
10	Determine fertilizer type to be applied to the cocoa plant.		
11	Application of fertilizer using appropriate methods		

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12	Pest and diseases control of cocoa plant.		
13	Mixing and Spraying of agrochemical on the cocoa farm		
14	Determination of planting space of cocoa on the field.		
15	Recognizing matured and ripe cocoa pod		
16	Harvesting using appropriate techniques		
17	Cocoa bean storage		
18	Cocoa bean marketing		

Section D: Research Question 4: Effects of FFS activities on yield and living standard of smallholder cocoa farmers.

1. What is the yield of your cocoa before participating in FFS per hectare?.....
2. What is the yield of your cocoa after participating in FFS per hectare?.....
3. What is the level of your income before participating in FFS?.....
4. What is the level of your income after participating in FFS?.....
5. What is your monthly expenditure on household health before participating in FFS?.....
6. What is your monthly expenditure on household health after participating?.....
7. What is your monthly expenditure on household food before participating in FFS?.....

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8. What is your monthly expenditure on household food after participating in FFS?.....

9. What is your monthly expenditure on household on education before participating in FFS?.....

10. What is your monthly expenditure on household on education after participating in FFS?.....

S/N	Items	Number
4	House	
5	Car	
6	Television	
7	Telephone	
8	Motorcycle	
9	Labour	

Section E: Which of the following constraint to FFS Activities most affect affect the programme in Kwara State, Nigeria?

S/N	CONSTRAINTS TO FFS	Tick
1	School location	
2	scarcity of or inadequate land for practical purposes	
3	resource use conflicts	
4	inadequately trained facilitators	
5	inadequate funding	

6	unavailability of improved seed	
7	inadequate irrigation facility	
8	limited time to make field preparations	
9	Unreliable weather information	
10	Farm implements	
11	Instructional facilities	
12	Social amenities	

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APPENDIX IV

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Part 1	Value	.778
		N of Items	18[a]
	Part 2	Value	.609
		N of Items	18[b]
	Total N of Items		36
Correlation Between Forms			.754
Spearman-Brown Coefficient	Equal Length		.859
	Unequal Length		.859
Guttman Split-Half Coefficient			.737

a. The items are: VAR00001, VAR00002, VAR00003, VAR00004, VAR00005, VAR00006, VAR00007, VAR00008, VAR00009, VAR00010, VAR00011, VAR00012, VAR00013, VAR00014, VAR00015, VAR00016, VAR00017, VAR00018.

b. The items are: VAR00019, VAR00020, VAR00021, VAR00022, VAR00023, VAR00024, VAR00025, VAR00026, VAR00027, VAR00028, VAR00029, VAR00030, VAR00031, VAR00032, VAR00033, VAR00034, VAR00035, VAR00036.

Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	2.908	1.650	3.350	1.700	2.030	.242	18[a]
	Part 2	2.336	1.500	4.250	2.750	2.833	1.168	18[b]
	Both Parts	2.622	1.500	4.250	2.750	2.833	.769	36

a. The items are: VAR00001, VAR00002, VAR00003, VAR00004, VAR00005, VAR00006, VAR00007, VAR00008, VAR00009, VAR00010, VAR00011, VAR00012, VAR00013, VAR00014, VAR00015, VAR00016, VAR00017, VAR00018.

b. The items are: VAR00019, VAR00020, VAR00021, VAR00022, VAR00023, VAR00024, VAR00025, VAR00026, VAR00027, VAR00028, VAR00029, VAR00030, VAR00031, VAR00032, VAR00033, VAR00034, VAR00035, VAR00036.

Scale Statistics

	Mean	Variance	Std. Deviation	N of Items

Part 1	52.3500	76.555	8.74959	18[a]
Part 2	42.0500	17.208	4.14824	18[b]
Both Parts	94.4000	148.463	12.18455	36

a. The items are: VAR00001, VAR00002, VAR00003, VAR00004, VAR00005, VAR00006, VAR00007, VAR00008, VAR00009, VAR00010, VAR00011, VAR00012, VAR00013, VAR00014, VAR00015, VAR00016, VAR00017, VAR00018.

b. The items are: VAR00019, VAR00020, VAR00021, VAR00022, VAR00023, VAR00024, VAR00025, VAR00026, VAR00027, VAR00028, VAR00029, VAR00030, VAR00031, VAR00032, VAR00033, VAR00034, VAR00035, VAR00036.



Researcher with one of the Cocoa Farmer in Isin Local Government Area



Researcher in Oyun Local Government Area