ASSESSMENT OF COCOA FARMERS INFORMATION NEEDS AND SEARCH BEHAVIOUR IN EDO AND ONDO STATES, NIGERIA

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CERTIFICATION

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DEDICATION

This research work is dedicated to God Almighty my creator, my strong pillar, my source of inspiration, protection, wisdom, knowledge and understanding. He has been the source of my strength throughout this program and on His wings only have I soared.

I also dedicate this work to my lovely late parents; Chief E. O. Ogiamien, aka, kalamazoo and Mrs. E. Orumwense Ogiamien who has encouraged me all the way and whose encouragement has made sure that I gave it all it took to finish that which I have started.

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ABSTRACT

The primary purpose of this study was to assess the information needs of cocoa farmers in Edo and Ondo states. Specifically, the study was conducted to investigate the information needs assessment of cocoa farmers; ascertain the farmers' preference for cocoa information sources; examine cocoa farmers information needs and farmers search behavior and examine cocoa farmers' constraints to information accessibility in the study area. Multistage random sampling procedure was used to select 432 respondents while a structured interview schedule was used to solicit information from the respondents.

The data were analyzed using descriptive statistics and inferential statistics (Binary logit regression, Pearson's Product Moment Correlation (PPMC) and 2x2 matrix used to establish the priorities mean score). The result revealed that the mean age of cocoa farmers was 52 years while majorities (70.4%) of the farmers were male. Majorities (35.4%) of the farmers had formal education, higher membership of a group (93.5%) and were married (80.3%). Majority (74.3%) of the cocoa farmers' cultivated farm lands of less than 10 hectares with a mean farming experience of 22 years. This study revealed that the most prominent sources of information was input dealers/suppliers ($\overline{X}$ =2.86±0.40), while Television ($\overline{X}$ =2.76±0.56), extension posters ($\overline{X}$ =2.80±0.50) and face to face advice by other farmers ($\overline{X}$ =2.87±0.45) were the most preferred

among the institutional bodies, mass media electronics, print media and traditional sources of information respectively. The mean score for weed control ($\overline{X}$ =3.14) and pest and disease control ($\overline{X}$ =3.14) which were ranked 2nd in cocoa production information needs were ranked 1st and 4th in level of information search with the mean values of ($\overline{X}$ =2.24) and ($\overline{X}$ =2.03) respectively. Hence, the farmers need training in their information search behaviour.

From the Matrix presentation, it was observed that cocoa production information with the discrepancies scores of farm layout with a weighted mean score of 5.48, farm cultivation system with a weighted mean score of 4.82 and seed selection and planting materials which had a weighted mean score of 4.67 were the critical areas where cocoa farmers need training or education in cocoa production information needs. Binary Logistic Regression indicated that the Nagelkerke R square value of 0.15 and 0.29 for Edo and Ondo States respectively indicated that the determinants would collectively explain about 15.0% and 29.5% variation in cocoa production information needs of farmers, respectively in the study area. Also the binary logistic regression test indicated that extension agents (t= 1.61; p≤0.01); input dealers/suppliers (t= 2.89; p≤0.01); internet (t= - 1.65 p≤0.01), cable network (t= 2.56; p≤ 0.01); family members (t= 0.92; p≤0.05) and face to face contact with other farmers (t =0.67; p≤0.01) were the most significant preferred sources of information on farmers production information needs. The finding of Pearson's Product Moment Correlation indicated that positive and significant correlation exists between production information needs (r=0.271; p≤0.01) and postharvest information needs (r=0.303; p≤0.01) and farmers' search behaviour for information.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Cocoa (*Theobroma Cacao*) was one of the major agricultural stakes of Nigeria's economy until the 1970's when crude oil was discovered in commercial quantities (Ajayi & Oyejide, 1974; International Cocoa Organisation, 2001). Cocoa is cultivated in at least fourteen states of the federation but mostly in the southern States with an average rain fall of 1500mm (Oguntade, 2000). However, the production has improved over the years from 310,000 tonnes in the 1960s to the current production level of 350,000 tonnes in 2013 and 385,000 tonnes in 2015 (Olaiya,

2016 and International Cocoa Organisation, 2015). The slight increase in production has been linked with poor information system and behaviour among farmers and extension agents by numerous scholars (Osarenren, Ejuetueyin and Eweka, 2016; Ogungbeni, Ogungbo, & Adeleke, 2013; Nkang, Abang, Akpan & Offem, 2006 and Oduwole, 2000).

Agricultural information is an important tool used in the realization of any plan objective or goal set by individuals, thus acquiring and using information are critical but important to the farmers as it enhances increased productivity, family income and family welfare. Agricultural information, as suggested by Agbamu (2006), is all published or unpublished knowledge in all aspects of agriculture. In the study, agricultural information was classified into four categories namely, technical, commercial, socio cultural and legal information. Devadson and Lingam (1996) indicated that information needs represent the gaps in the current knowledge of the farmers or user and needs assessment is a systematic process for determining and addressing needs, or gaps between current conditions and desired conditions or "wants" of the farmers' (Dervin & Nilan, 1986).

Thus, the slight increase in cocoa output over the years in Nigeria could be as a result of inadequate agricultural information flow to farmers which is an important factor in developing agricultural production as well as helping the cocoa farmers to become updated about new agricultural technologies. The information delivery system from agricultural institutes to farmers as integrated with other government development programmes to address the numerous agricultural related problems that face farmers in cocoa production systems is faulty (Osarenren *et al.,* 2016**)**.

Similarly, extension personnel who are close to cocoa farmers are not able to access needed information relevant to their task, which are logged in the internet thereby living the farmers to

their traditional method of cocoa production and traditional information search behaviour. The weak linkages between the cocoa farmers, extension workers, and researchers mean that the farmers are not included in the planning of the innovation hence; they do not know where to get information, despite the fact that they are the end users (Nmadu, Omojeso and Halima, 2014). Therefore, cocoa farmers in Nigeria are in need of information that are essentially generated and provided by research institutes, cooperate bodies and the government to transform the traditional system known to the farmers to improved farm practices.

1.2 Problem Statement

Cocoa used to be the highest source of foreign exchange earnings in Nigeria before the oil boom of the 1970s. Since then, crude oil has remained the highest source of foreign exchange earnings while cocoa, a versatile, renewable and sustainable source of revenue is yet to reclaim its lost glory (Alamu, 2013).

Nigeria was ranked among the highest cocoa producers in the world in the 1970s when cocoa output peaked at 308,000 tonnes but this figure dropped to 250,000 metric tonnes in 2011 and a slight increase in production from 350,000 metric tonnes in 2013 (Adefila, 2013; ICCO, 2003 and ICCO, 2015).

This decline in cocoa output could be as a result of inadequate agricultural information flow to farmers which is an important factor in developing agricultural production as well as helping the cocoa farmers to become updated about new agricultural technologies. For this information to reach cocoa farmers it will depend on information sources which are relevant and cost effective. The effectiveness of any information source depends mainly on its selection as an appropriate channel or medium of communication by the farmers. The information delivery system from

agricultural institutes to farmers as integrated with other government development programmes to address the numerous related problems that face farmers in production systems is faulty (Osarenren, Ejuetueyin and Eweka, 2016**)**. Despite the agricultural technologies that have been generated through research in Nigeria, the impact of such technologies is yet to be felt in most households owing to inefficiency in communicating and sharing agricultural information and knowledge between the research institute and the farmers and among farmers.

There is therefore, a gap between agricultural development and available agricultural technologies for sustainable agricultural development. There is a poor transfer of agricultural information and knowledge to farmers and other agricultural stakeholders by information providers, researchers, communication information technology, and agricultural information centers to satisfy farmers' information needs (International Cocoa Organization, 2014). The gap also explains that cocoa farmers in Nigeria may not search for information through extension workers whose ratio to farm family in Nigeria is 1:3000 to 3011 as against world recommended ratio of 1:500 to 1: 800, Ghana ratio of 1:1500, Indonesia ratio of 1: 1200 and Cote d Ivoire ratio of 1: 1000 to farm family.

Consequently extension personnel who are close to cocoa farmers are not able to access cocoa farmers' information needs that are logged in the internet and thereby leaving the farmers to their traditional method of cocoa production and traditional information search behaviour. The weak linkages between the cocoa farmers, extension workers, and researchers mean that the farmers are not included in the planning of the innovation hence; they do not know where to get information, despite the fact that they are the end users (Nmadu, Omojeso and Halima, 2014).

Against this background, it is clear that Nigeria cocoa farmers are in need of information that are essentially generated and provided by research institutes, cooperate bodies and the government to transform the traditional system known to the farmers to improved farm practices.

It is against this back ground that the following research questions were outlined for the study;

i. what are the cocoa farmers' socioeconomic characteristics?
ii. what are the cocoa farmers' preferred information sources?
iii. what are the farmers' level of information needs in both cocoa production and postharvest activities?
iv. do cocoa farmers' search for both production and postharvest information in the study area?
v. what are the constraints encountered by cocoa farmers in accessing information needs?

It's in view of these facts, that it was essential to study the information needs and search behaviour of cocoa farmers in Edo and Ondo States of Nigeria.

1.3 Objectives of the study

The broad objective of the study was to assess the information needs and search behaviour of cocoa farmers in Edo and Ondo States. The specific objectives were to:

1. describe the socioeconomic characteristics of cocoa farmers in the study area;
2. ascertain the cocoa farmers' preference for cocoa farmers information sources in the study area;.
3. examine cocoa farmers' information needs at various stages of production;
4. analyse cocoa farmers' information search behaviour in the study area and

5. identify cocoa farmers' constraints associated with their access to information in the study area.

1.4 Justification of the Study

The demand for cocoa is increasing due to the increase for the product by developed countries. The supply of cocoa from Nigeria, particularly from cocoa producing states to the world market is however decreasing rapidly because of the inability of the farmers to increase productivities due to inconsistent production pattern and inadequate information and knowledge which are the major factors responsible for the decline in production in Nigeria.

There are several studies such as Nmadu, Omojeso and Halima, (2014) on the efficiency of innovation uptake among cocoa farmers in Ondo State. Also, Nmadu, Omojeso and Halima (2015) conducted a study on the socio-economic characteristics of registered cocoa farmers in Ondo State while Amos (2007) worked on the analysis of productivity and technical efficiency of smallholder cocoa farmers in Nigeria. Similarly, Nkang, Abang, Akpan and Offem (2006) researched into co-integration and error correction modeling of agricultural export trade in Nigeria using cocoa as a case study while the World Cocoa Conference (2014) report observed that the current production level of cocoa production in Africa is not sustainable due to the use of chemicals that do not conform to standards. Osarenren and Emokaro (2015) conducted a study on cocoa farmers' perceived influence of communication on utilization of improved cocoa seed technologies in Owan – East local government area of Edo State. However, despite the fact that many of these studies focus on cocoa production, there is a research gap in the area of information needs and search behaviour of farmers in States like Ondo and Edo in Southern part of Nigeria that are regarded as cocoa belt of the nation.

Therefore, findings from this study will contribute to literature by unveiling the information needs and search behavior of cocoa farmers in the two States. It will enable policy makers for adequate planning to meet local and international standard. Also, it will enable research institute, co-researchers, extension organizations and stakeholders to know cocoa farmers' information needs and search behavior with a view to knowing where to channel research effort in cocoa related research work and production. Finally, it will be useful to cocoa farmers as this will serve as a basis to know there pattern of information search for an improved cocoa production.

1.5 Hypotheses of the Study

The four hypotheses were tested in this study. They were stated in the null form as follows;

1. There is no statistically significant relationship between the socioeconomic characteristics of cocoa farmers and their cocoa information needs in the study area.

2. There is no statistically significant relationship between farmers' information sources preferences and their cocoa information needs.

3. There is no significant relationship between cocoa farmers search behaviour and their cocoa information needs.

4. There is no significant relationship between cocoa farmers' constraints and their cocoa information needs.

CAPTER TWO

LITERATURE REVIEW

2.1 History of Cocoa in Nigeria

Cocoa was introduced into Nigeria in 1874 from Ferhando Po (Ayorinde, 1966 and Opeke, 1987). As at 1965, Nigeria was the second largest cocoa producer in the world with an annual output of about 270,000 tons, though due to the discovery and commercial exploration of crude oil since late 1960s, emphasis shifted from cocoa and this made the crop to account for less than 2% of

Nigeria's export earnings (Aigbekaen, 2004). Globally, an estimated average of 3 million metric tons of cocoa are produced every year (UNCTAD, 2004). Of these 3 million metric tons, 90% of the world's production comes from eight countries which are Ivory Coast (38%), Ghana (21%), Indonesia (13%) Nigeria and Cameroon (5%) respectively, Brazil (4%) Ecuador (3%), Dominican Republic (1.4%) and Malaysia (0.9%) (United Nations Conference on Trade and Development, 2004). Therefore, Nigeria became the fourth largest cocoa producer in the world with about 5% to world and third largest producer of cocoa in Africa after Cote d'Ivoire and Ghana (Adejumo, 2005; Adebile & Amusan, 2011 and Verter & Becvarova, 2014). Nigeria has dropped to the seventh position from fourth as a top cocoa producer in the world, according to data made available by the International Cocoa Organisation (Ogunfuwa, 2016). The production ranking is as a result of poor political will to boost the industry, poor production practices, non-compliance to importing countries' specification, lack of improved seeds for farmers and also to bring more farmers into both cocoa farming and value-added cocoa processing through awareness (Daniel, 2018; Nigeria First International cocoa summit, 2017).

Cocoa is the second largest foreign exchange earner for Nigeria after crude oil and has generated over two million jobs directly and indirectly along its value chain (Anthony, 2017)**.** The importance of cocoa as food and as a major source of industrial raw material for the industry cannot be over emphasized as it touches the lives of a large percentage of the population of the world. Cocoa is cultivated in at least fourteen states of the federation but mostly in the southern states with an average rain fall of 1500mm.The states are; Abia State in South East, Adamawa and Taraba States in North East, Akwa-Ibom and Cross River States in south south, Kogi and Kwara States in Middle belt, Delta, Edo, Oyo, Ondo, Ogun, Osun and Ekiti States in south west agro-ecological zone of Nigeria (Oluyole, 2005; Oluyole & Sanusi, 2009).

Cocoa is a shade loving plant. The plant can be grown as a mixed crop with other plants like spices and rubber mainly under rain fed conditions. The study shows that multiple cropping is good for biodiversity conservation and income generation for farmers (Bernard, 2011). Apart from the socio-economic variables of farmers that have been found to have substantial impact on production. The bulk of cocoa output is derived from numerous small scale farmers who live in rural areas which are devoid of social amenities (such as electricity, pipe borne water, hospitals and schools) (Nkang, Abang, Akpan & Offem, 2006).

However, the production of this important cash crop for export has suffered a reduction in the recent years in the country owing to a number of factors such as: low yield planting materials, inconsistent production patterns, disease incidence, pest attack and use of simple farm tools, ageing cocoa farms, especially, in south western Nigeria and poor socio-economic variables of farmers. Also the bulk of cocoa output is derived from numerous small scale farmers who live in rural areas which are devoid of social amenities (such as electricity, pipe borne water, hospitals and schools) (Villalobos, 1989; Oduwole, 2004; Oluyole *et al*. 2009; Balogun, 2011 and Nkang *et al*. 2006). Also, in spite of research and extension services efforts, Adereti, Fapojuwo & Onasanya (2006) stated that there are improved packages on agricultural production, but they are not being adequately used by farmers.

In an effort to achieve increased cocoa production in Nigeria, a number of initiatives were introduced toward increasing yields. Among such initiatives is the presidential initiative on cocoa rehabilitation and production sustainability pronounced by the Federal Government of Nigeria in 1999 and a New Agricultural Policy and the Integrated Rural Development Policy initiated in 2001 (Opeke, 2003). In 2011, the former Honorable Minister of Agriculture, Dr Akinwumi Adesina, set out clear goals for the cocoa sector through the Agricultural

Transformation Agenda, which is to double cocoa production in Nigeria from 250,000 to 500,000 metric tonnes by 2015 through increased farm-level productivity (Akinwumi, 2013).

The set goal saw production increasing to 370,000 and 385,000 metric tonnes in 2014 and 2015 respectively but fall short of the former Minister prediction of 500,000 metric tonnes, (Akinwumi, 2013) as represented in Table 2.1 (CBN, 2016). Also, the Nigeria First International Cocoa summit, 2017 held in Abuja indicated the decreased in production. The aim of the Summit, is to create an enabling environment for all stakeholders to strategize and map out the way forward towards repositioning, restructuring the Cocoa revitalization initiative and that Government will come up with an action plan to kick start the implementation of Cocoa revolution geared towards reviving the lost glory of Nigeria as a leader among the committee of Cocoa producing nations of the world (Nigeria First International Cocoa summit, 2017).

Plates 2.1 Cocoa Plants

Table 2.1 Nigeria cocoa production Output

Years	Cocoa Production Output (‘000Tonnes)	Change in Production
1970	305	-
1971	257	-48

1972	241	-16
1973	215	-26
1974	214	-1
1975	216	+2
1976	181	-35
1977	193	+12
1978	157	-35
1979	151	-6
1980	153	+2
1981	174	+21
1982	156	-18
1983	140	-16
1984	140	0
1985	160	+20
1986	148	-12
1987	100	-48
1988	253	+153
1989	256	-3
1990	244	-12
1991	268	+24
1992	292	+24
1993	306	+14
1994	323	+17
1995	203	-10
1996	323	+10
1997	325	+2
1998	345	+20
1999	165	-100
2000	170	+10
2001	171	+1
2002	172	+1
2003	185.5	+13.5
2004	202	+16.5
2005	215.4	+13.5
2006	228	+12.5
2007	200	-28
2008	215	+15
2009	205	-10
2010	210	+5
2011	250	+40
2012	300	+50
2013	350	+50
2014	370	+20
2015	385	+15

Source: Central Bank of Nigeria Statistic Bulletin, 2016; Olaiya, (2016); ICCO, 2015) and Federal Ministry of Agriculture and Rural Development and State Ministries of Agriculture

2.2 Concepts of Knowledge and Information

Knowledge process was developed by Nonaka & Takenuchi in 1995 that data develops into information and information develops into knowledge and this develops into wisdom (Nonaka & Takeuchi, 1995). Similarly, knowledge of farming is expected to be acquired from farming experience (Adesoji & Kerere, 2013). Also, farming experience plays a vital role in the transformation of data to wisdom. That is when knowledge is put into practice it develops into experience and experience matures into wisdom (Adesoji & Kerere, 2013).

Knowledge is information combined with experience, context, interpretation, and reflection. It is a high-value form of information that is ready to apply to decisions and action (Davenport, De Long & Beer, 1998). It is also a range of information gained from experience about technology, environment and farming related conditions (Hadeja, 1999). Information is ideas, facts, and imaginative works of the mind and data of value potentially useful in decision making, question answering and problem solving (Kaniki, 1989). While, Kantumoya (1992) asserts that information is power, an essential resource to which individuals in every society should have easy access. One of the key ingredients for farmers to increase yield and productivity is information (Tologbonse, Fashola & Obadiah, 2008).

Agbamu (2006) opined that information is the first and indispensable step of an adoption process. Agricultural information covers all published and unpublished knowledge on general aspects of agriculture and consists of innovations, ideals and technologies of agricultural policies (Aina, 1990 and Agbamu, 2006). According to Ozowa (1995), agricultural information provides the data used in decision making. Obinne (1994) believes that the major setback in agricultural production in Nigeria is not lack of recommended practices needed for economic growth and rural transformation but that of disseminating the recommended practices to end-users.

Interestingly, agricultural information is not static but can be replenished through research and development. This is why Opara (2008) reports that agricultural activities can arguably be improved by relevant, reliable and useful information and knowledge. Aina (1995), Mooko and Aina (2007) reported that agricultural information is an essential recipe for successful farming. Therefore, the recipes or information can be used by Nigerian famers to increase productivity. Hence, information *per se* cannot increase productivity unless farmers are provided with the right type of information and at the right time, using the right channels and with all other necessary components in place, like telecommunication facilities, good roads, education, good agricultural policies (Aina, 1995; Mooko & Aina, 2007 and Radhakrishna, 2007). For information to be of optimum use, it must have the following qualities: relevance, accuracy, timeliness, currency, clarity and must be cost effective (Vidanapathrina, 2012). However, Adereti, Fapojuwo & Onasanya (2006) indicated that the quality of information rest solidly on three pillars which are accuracy, timeliness and relevance. Accuracy implies that information is free from bias; timeliness means that recipients can get information when they need it, while relevance implies whether the piece of information specifically answers the users or farmers question. Thus, the quality of information must contain the required farmers' needs which have the potentials of improving efficiency in all the spheres of Agriculture.

The central theme in all the definitions is that information is knowledge or data communicated from a source to the receiver and used for a purpose. In this study, agricultural information or knowledge is operationally defined as the various sets of information and messages that are relevant to agricultural production activities of cocoa farmers, such information on cocoa cultivation practices, pre and main nursery establishment techniques, plantation establishment and management, post harvest techniques and marketing operations in cocoa sub-sector.

Significance of Communication and Information to Farmers

Adebayo (1997) conceptualized communication as a process of information flow by which ideas are transferred from a source to a receiver with the intent to change his/her knowledge, attitude and/or skills. Communication is a key process in information dissemination in agriculture. The development of agriculture requires, among others, a timely and systematic transmission of useful and relevant agricultural information from the technology generation system (source) via various communication changes to the intended audience (receiver). It is expected that the client's changes in behaviour as a result of the message received (effect) be passed back to the source (feedback) for the communication process to be complete (Adebayo, 1997).

Communication in agricultural extension is defined as a process of interaction to transmit information, ideas, technology and feelings from extension agents to the farmers which result in a changed situation (Umar, Hamidu & Ndantisa, 2006). They further stated that, communication is significant to any teaching as it is a vital tool for promoting knowledge flow, information dissemination and delivery of learning content in extension services. According to Agbamu (2006), the main purpose of communication in agriculture is to influence farmers by helping them understand new farming methods and to perceive the use of proven agricultural innovations. The role of information in agriculture development is summarized as an essential production factor in agricultural and rural development as well as agricultural technology transfer being a process with multiple functions which include information, teaching technology transfer and transfer services. It involves technology production delivery, monitoring and evaluation of the use of technologies. According to Dankwah & Hawa (2014), an improved information and knowledge flow to, from and within the agricultural sector are important factors in improving small-scale agricultural production and linking increased production to remunerative markets,

thus, leading to improved rural livelihoods, food security and national economies. The major problem militating against the development of agricultural sector includes cultural, social, economical, legal, educational and most importantly lack of information to improve farming. Therefore, lack of comprehensive and reliable information is considered one of the major hindrances to agricultural development in Africa. According to Ozowa (1995), the ineffectiveness of smallholder farmers in Nigeria can also be attributed to the treatment of information delivery as a matter of course by most African governments and that agricultural information is not integrated with other development programs to address the numerous related problems that face farmers (Mgbenka & Mbah, 2016). Information is an essential ingredient in agricultural development programs but Nigerian farmers seldom feel the impact of agricultural innovations either because they have no access to such vital information or because it is poorly disseminated. The non-provision of agricultural information is a key factor that has greatly limited agricultural development in developing countries (Ozowa, 1995). The objectives of agricultural information can hardly be realized if farmers have no access to information (Olawoye, 1996)

The studies of Nkang, Ajah, Aban & Edet (2007) on investment in Cocoa Production in Nigeria indicated a Cost and Return Analysis of three Cocoa Production Management Systems in the Cross River State Cocoa Belt. The study documented lack of updated information in both production and postharvest activities in cocoa as a major constraint to cocoa production in the study area while Ogunlade, Oluyole & Aikpokpodion (2009) with a study on the evaluation of the Level of Fertilizer Utilization for Cocoa Production in Nigeria, equally ascertained accessibility to information on production as a major setback in cocoa production. The study of Ogunlade *et al.* (2009); Oduwole (2000) and Nmadu, Omojeso & Halima, (2015) reported that

socio-economic variables such as income, years of schooling, marital status and level of travelling as factors influencing information gathering of cocoa farmers in Nigeria. The findings established that information sourcing is as important as inputs in cocoa plantation and thus, certain personal and demographic features of individual farmers are germane to the level of information sourcing among farmers. Therefore, access to and ability to use information among Nigerians remain the most important factors by which Nigeria can remain giant of Africa and achieve its dream to emerge among the twenty largest economies by the year 2020 (Gwang, 2011).

2.3 Concept of Need and Information Needs

Need is a psychological state associated with uncertainty and the desire to fill a gap in knowledge (Ojiambo, 1995). It can also be defined as an imbalance, lack of adjustment or gap between the present situation or status quo and a new or changed set of conditions assumed to be more desirable (Leagans & Charles, 1971). Need refers to the discrepancy or gap between a present state "what is," and a desired end state "what should be" or between the actual and the ideal (Kaufman, 1992 and Witkin & Altschuld, 1995). The need is neither the present nor the future state; it is the gap between them. Therefore, a need in this study is the problem or issue of concern to cocoa farmers in meeting increased productivities.

A need is said to be a subjective experience that occurs only in the mind of a person in need and consequently, is not directly accessible to an observer (Wilson, 1997). For instance, when a person experiences a problem or wants to accomplish a particular task and does not know how to tackle that problem or how to accomplish that task, a need for information arises. When they obtain and use information, their needs can be fully or partly met. Wilson (1997) suggested that needs emerge from three kinds of motives, namely, physiological motives such as hunger and

thirst, unlearned motives such as curiosity of sensory stimulation, and social motives such as desire for affiliation, approval or status. Based on the explanations above, an information need appears not to be a primary need, but a secondary need that arises out of another need of a more basic kind (Wilson, 1999). These explanations entail that information needs are generated by the situations in which people find themselves. These situations generate needs, and these needs become information needs when people in those situations do not know how to deal with a situation.

The "information" and "need" in "information needs" always move together. According to Devadson and Lingam (1996) information needs is a lack of self sufficiency in one's day to day work. Information needs represent the gaps in the current knowledge of the user. This implies that, whenever an individual is rendered incapable of completing his work or activity, then the issue of information need arises Accordingly, understanding and helping in meeting the information needs of cocoa farmers can serve as a catalyst for national development and when this is not done, governments and other stakeholders may provide interesting agricultural packages and increment in production will be an illusion. This is because all these things provided by the government may not be the urgent needs of these farmers. It is therefore necessary to develop mechanisms and institutions for identifying and meeting the information needs of these cocoa farmers in a suitable form (Dankwah and Hawa, 2014). Information needs is construed in the sense of data or a set of data specially required, enabling the user to make an appropriate decision on any related problem facing the farmers at any particular time (Solomon, 2002).

Line (1974) described information needs as a necessity or what an individual ought to have for his work, his research, and his education in order to achieve results. The state of information

need from psychological viewpoint is a state of uncertainty. This state of uncertainty requires information as a stimulus to create a change in ones level or degree of uncertainty (Faibisoff & Ely, 1976). Therefore, when a person is in a state of uncertainty, provision of appropriate information reduces the degree of uncertainty. Kaniki (1995) indicated that the information specialist should be able to provide the information the clientele needs from within the collection or from elsewhere, if such information is not available.

Wilson (1981) and Wilson (2005), in the report on the difficulties in the concept of information need, suggested that information need be abandoned and replaced with the term information-seeking behaviour". He indicated that the term "information-seeking behaviour" should be adapted as behaviour is observable, whereas needs being internal mental states, are not".

2.4 Classification of Information Needs

Information is multidisciplinary and has universal applicability and can follow many classifications. Aina (1990) and Aina (1986) classified information into; Technical or scientific information, Commercial information, Socio-cultural and Legal information while Agbamu (2006) also classified agricultural information into four categories namely, technical, commercial, socio-cultural and legal information.

2.4.1 Scientific Information: It is refers to agricultural information that is generated from universities and research institutes. In India, for instance, Chandrasekan, Dipesh, Jitendra, Kamlesh & Dinesh (2010) and Rao (2007), opine that agricultural information in India is mainly derived from universities and research institutes. Scientific information is aimed at providing information on new crops varieties, their requirements, and technical assistance during growing season.

2.4.2 Commercial Information: it's information generated by research institutes as well as the universities. This information deals with price control, price of fertilizers, price of seeds, and sale of agricultural products. Opara (2008) support the fact that agricultural information is generally generated in universities and research institutes and that such information pertains to credit facilities, fertilizer and legislations on agriculture generally. Mokotjo and Kalusopa (2010) attested that farmers need to have access to agricultural information in order to improve their agricultural production and that farmers need to have access to financial information for their actual performance as well as access to credit.

2.4.3 Legal Information: These are generally laws grouped under the heading "agricultural laws", that relate to the production activities, as they are carried out in a commercial setting (Kaniki, 1995).

2.4.4 Social Information: this type of information is focused on traditional agriculture practices, local cultures, background information on local communities and availability of labour (Aina, Kaniki & Ojiambo, 1995). Agricultural information that is transmitted to and from farmers through the agricultural extension system can be classified into two broad groups: pure agricultural information and agricultural information inherent tied to new physical inventions. Pure agricultural information refers to any information which can be used without the acquisition of specific physical technology while agricultural inventions or technologies come in form of agricultural inputs, management technologies facilitating farm management and marketing and processing equipment (Umali, and Schwartz, 1994). While Ozowa (1995) classified farmers' information needs into five headings; agricultural input; extension education; agricultural technology; agricultural credit and marketing. He maintains that no one can categorically claim to know the information needs of farmers, especially in a sector like agriculture which depends

so much on information for optimum productivity where new and rather complex problems facing farmers emerge every day.

2.5 Socio-Economic Characteristics of Farmers

Household's socio-economic and demographic variables are among the common household characteristics which are mostly associated with farmer's access to information and search behaviour. The variables are age, sex, years of experience, marital status and education which were reviewed in this study.

2.5.1 Age: Age is also one of demographic character that is important to describe households and can also provide a clue as to age structure of the sample and the population too. Young farmers are keen to get knowledge and information than older farmers. It may be also older farmers are more risk averse and less likely to be flexible than younger farmers and thus have a lesser likelihood of information utilization and new technologies (Haba, 2004). Haba (2004), assessed that the willingness to pay for agricultural information delivery technologies such as print, radio, farmer-to-farmer, expert visit, and television. He revealed that, as age increased, the willingness to pay for these agricultural information delivery technologies decreased, meaning that older farmers were less willing to get information than younger ones. Torimiro (1997) pointed out that people in the active age group, specifically below 45 years of age have a higher drive for information. Young people are more inquisitive than older people; they have a higher tendency to seek information more about issues that interest them. A study conducted by Katungi (2006) on social capital and information exchange in rural Ethiopia reported that older men are less likely to engage in simultaneous receiving and providing of information, perhaps due to the low ability to communicate associated with old age. All this points assure that, as age increase the getting of agricultural information also decrease. Uwagboe, Ndagi, Agbongiarhuoyi, Adebiyi &

Aigbekaen (2010) and Iremiren (2011) reported that those into cocoa production in Nigeria are mainly old farmers over 60 years. This implies that youth which are groups of more energetic hands are no more into cocoa production but left it in the hands of aged farmers that are less active to perform farm work and who may find it difficult to embrace new programme that can positively affect their farming enterprises. Age is said to be a primary latent characteristic in adoption decisions.

However, Adeogun, Olawoye, & Akinbile (2010) had reported that, the younger farmers would most likely be willing to spend more time to obtain information on improved technologies compared to the old farmers. This finding does not agree with Zbinden (2013) who stated that the older the farmer, the more risk averse he/she is. Abdul (1999) and Uwagboe (2010) reported that cocoa farmers mean age in Nigeria is 50 years and the mean age were within the age defined by FAO (1997) as economically productive in population (16 to 64 years) and such group is most likely active in farming and tends to develop more interest in sourcing for agricultural information through the available sources of information. However, in earlier study, Opeke (2005) reported that mean age among cocoa farmers was as high as 70 years. It shows that more young people are entering cocoa farming which may be a means of solving the old age problem in the enterprise. Also, Uwagboe, Famuyiwa & Agbebaku (2016) in their study on Cocoa Farmers Attitude towards Utilization of Integrated Pest Management in Edo and Ogun States of Nigeria indicates that 44.2% of the farmers had above 30 years' experience which shows that the farmers have moderate years of experience in cocoa farming. The old age of the farmers translates to high farming experience as majority could have started farming at an early age. This is in agreement with Amos (2007) whose findings suggested that farming experience is important for day-to-day running of the farming activities including access and search for

information, as cocoa cultivation is very tasking. Many years of farming experience might have exposed them to similar programmes in the past which can help their decision to participate in the programme introduced to them. Agwu & Adeniran (2009) find that farming experience has positive significant relationships with the use of various information sources.

A study of technical efficiency of cocoa production in southwest Nigeria showed that more than 80% of cocoa farmers in the region had more than 10 years of coca farming experience and were relatively technically efficient in their use of resources although they were largely resource constrained (Popoola, Ogunsola & Salman 2015). Famuyiwa, Torimiro & Adesoji, 2013), in their study showed that the farmers were well experienced with a mean age of 24 years. Which collaborate the report findings of Lawal and Sanusi (2010) in a study of cocoa farmers in Ondo and Kwara States and Uwagboe (2010) in a study of cocoa farmers in Edo State, that most cocoa farmer in Nigeria have more than 20 years of farming experience while Uwagboe, Famuyiwa, and Agbebaku, (2016) also reported that most cocoa farmer in Nigeria have more than 30 years of farming experience**.**

2.5.2 Sex: Sex is another factor that limits female to agricultural production. A study conducted by Katungi (2006), reveal that male-headed households tend to build and maintain larger networks with relatives and friends than female-headed households. Male headed households are said to have better access to agricultural information than female headed households, which is attributed to negative influence of cultural norms and traditions. Oluyole & Sanusi (2009) in their finding reported that 92 % of cocoa farmers were male, which is an indication that cocoa farming is still dominated by male farmers. This can be attributed to the claims of Oladipupo, Kareem, Adereti & Abubakar (2010) that distribution in farm work is skewed towards the male gender as a result of gender in equalities which corroborate Agom, Susan, Kingsley & Nyambi

(2012) in their study on the Analysis of Technical Efficiency of Smallholder Cocoa Farmers in Cross River State, Nigeria, that indicates that majority of the farmers were males while few were females. The cultural setting of the area allows the males to have easy access to land especially, where majority of them are the heads of their respective households. Also, majority of the farmers were within the 47 to 57 years age bracket. The Policy makers and administrators typically still assume that men are the farmers and women play only supportive role as farmers' wives. This attitude by both planners and implementers has significant adverse effects on women's access to agricultural extension services (Habtemariam, 1996). Hence, Adetunji, Olaniyi & Raufu (2007) reported that men actively participate in cocoa production than the female cocoa farmers.

Uwagboe, (2010) indicated that more males were involved in cocoa farming than the females. The present findings indicate that cocoa farming is a male dominated profession and that most farms in the study area are owned by males. This could be due to the limitations women have in acquiring land for tree crop cultivation in Nigeria (Uwagboe, Famuyiwa & Agbebaku, 2016).

Otitoju & Arene (2010) indicated that cocoa cultivation involves the permanent ownership of farmland as many societies in Nigeria prohibit women from holding land. Otitoju *et al*. (2010) find that majority of cocoa farmers were males while very few were females. The results indicate that cocoa farming in the study area is gender sensitive gives its required tedious operations, such as, bush clearing, chemical application, pruning and harvesting of pods. This further buttress the fact that Nigerian agriculture is still male dominated, implying that men have more access to the resources and information required to produce cocoa more efficiently than their female counterpart while the female farmers have their own roles to play, especially, in the maintenance and processing of cocoa beans as indicated by Adetunji *et al*. (2007). Omoare, Oyediran and

Fakoya (2016) indicated in their study that most (82.8%) of the respondents were male while few (17.2%) were female in cocoa production. This is possible because of the perennial nature of cocoa farming and it is tedious farming enterprise which makes more men to dominate cocoa production compare to the women who carry out processing and marketing of cocoa bean (Omoare *et al*. (2016).

2.5.3 Marital Status: As regards farmers' marital status, Bammeke (2003) reported that individuals who undertake agricultural activities in the rural area are married. Adedoyin, Fapojuwo & Torimiro (1999) observed that unmarried person will have a freer frame of mind and even resources to seek for information that will further increase his/her productive capacity compared with the married persons.

2.5.4 Farm Size: Farm sizes in Nigeria have been described as small, medium or large scale, if they fall into categories of less than five hectares, between five hectares and 10 hectares, or more than 10 hectares, respectively (Upton, 1972). Most of the farms in Nigeria are of small to medium scale categories (Oluyole *et al*. 2009). When judged by international standards where by farms less than 10.00 hectares are classed as small, then 94.37% (or 28 million holdings) of all farm holdings in Nigeria in 1973/74 were classified as small scale farms while the remaining 5.63% or 1.7 million were medium scale holdings. This is a reflection of small holdings common among Nigerian and West African cocoa farmers (Oluyole *et al*. 2009). They observed that cocoa farmers owned an average farm size of six hectares that were scattered in different locations in the locality. Olayide & Ogunfiditimi (1980) and Oluyole & Sanusi (2009) indicated that majority of farmers in Nigeria were small scale farmers as they cultivated less than 10 hectares of farm land probably due to farm old age as in Ondo State, inadequate technological packages for improved cocoa cultivation, continued adherence to their old practices, use of

unselected planting materials and problems of traditional land tenure system (Aikpokpodion, Badaru, Kolesnikova-Allen, Ingelbrecht, Adetimirin, & Eskes, 2005). According to their study, farmers who operated on land less than 10 hectares were small-scale farmers while the mean farm size for Edo and Ondo State was 10 and six hectares respectively.

2.5.5 Education: On farmers education, Uwagboe, (2010) reported that the effect of education on access and adoption of information in most cases relate to years of formal schooling and that education is thought to create a favorable mental attitude for the acceptance of new practices especially of information-intensive and management-intensive practices. Their level of education affects information accessibility, comprehension and adoption of new agricultural innovations and practices (Aina & Dulle, 1999). Well educated farmers can easily access information from various sources, and can create knowledge out of those sources. This showed that educational background of the farmers' increases the attitude of farmers towards cocoa improvement practices and production sustainability implying that educated people tend to be more responsible to new innovations (Cocoa Research Institute of Nigeria (CRIN), 2001). Katungi (2006) found that four years of primary education raised farm output by 13% on average if complementary inputs (improved seed, irrigation and transport to market) were available and by 8% if complementary inputs were not available. Katungi (2006) in his study observed that more educated farmers had more access to agricultural information. Torimiro (1997) observed that the attainment of higher level of education and professional qualification is a very good springboard for the assessment of agricultural information intake or access by farmers. It will be very difficult for a farmer who cannot read to access agricultural information package in print media.

A farmer who cannot write may not be able to access agricultural information package presented in mass media such as television, radio and internet. Oluyole *et al*. (2009) reported in their study

that a large farm size requires appropriate and adequate information in areas of cocoa production to maximize profits.

2.5.6 House Hold Size: Agom, *et al*. (2012) in their study indicates that family size, with a high proportion (86.5%) of the farmers had family sizes of 5 persons and above, while 13.5% had less than 5 persons in their household and the mean family size of the cocoa farmers was 7 persons (Agom, Susan, Kingsley & Nyambi 2012). Effiong (2005) reported that a relatively large household size enhances the availability of family labour which reduces constraints on labour cost in agricultural production. House hold size according to Peil (1976) implies that the large household size will ensure more net working for information and enhance more availability of information to farmers. In the tradition of African society, a household size is made up of a man, his wife/wives, children and number of dependents (Peil, 1976).

2.5.7 Labour: Inadequate labour is a problem in cocoa production according to Dormon *et al*. (2004). Farmers identified the high cost of labour as a challenge in ensuring high quality cocoa beans. In Nigerian agriculture, hired labour is predominantly used. In fact, it carries 88% of the total labour used on farms (Okuneye, 2000). Apart from hired labour, the other types of labour that could be employed are family labour and cooperative labour. The availability of labour has been found to have impact on planting precision, better weed control, timely harvesting and crop processing (Oluyole, Adebiyi, & Adejumo, 2007).

Therefore, labour is a major constraint in peasant production especially during planting, weeding and harvesting (Gocowski & Oduwole, 2003). Farmers used traditional technologies called hoe-cutlass culture and their capital structure is in form of small tools and predominant usage of family labour (Oluyole, Oni, Omonona & Adenegan, 2009).

The decrease in family labour is not unconnected to the urban migration of farmers' children and able youth in search for better living conditions due to lack of basic amenities in the rural communities. Hired labour is prominent among the farmers during peak period of weeding and harvesting and contributes 88% of the total labour use on farms (Kassim & Alfred, 2012).

2.5.8 Group Membership: Yahaya & Omokhaye (2001) in their study reported that, the social participation of cocoa farmers through their involvement in farmers' co-operatives will enhance diffusion of information among the farmers. Similarly, Abel, Ali & Johanna (2015) also observed that associations' membership are useful to farmers in the areas of information dissemination, timely supply of input and pest and disease control measures among others. Oduwole (2011) opined that one major benefit of belonging to organization is the share of knowledge on innovation; such as approved pesticides and chemicals, government policies and more importantly in the areas of innovation platform where seminars and demonstration are being carried out.

2.5.8 Income: According to Swanson (1997), income influence farmer's information source preferences. The impact of high income is to access agricultural information by any cost, as it supported by extension officer who observed that, the farmers with good harvest are those who always come to them for different information and sometimes go outside the villages seeking for additional.

2.6 Cocoa Farmers' Information Needs

Majority of Africa farmers are illiterate and therefore need information in a simplest and quickest way to discharge their farming duties effectively (Kaniki (1995). Oladele (1999) indicated that despite the attempts at technological innovation transfer, there is a wide gap between the levels of production which research contends is attainable and that which farmers achieve, and suggests

a missing link. What is more therefore, weak linkages between the farmer, extension workers, and researchers mean that the farmers are not included in the planning of the innovation hence, they do not know where to get information, despite the fact that they are the end users.

Many a times, farmers do not always know what their information needs are. They do not know they have an information gap. It could be that they are not aware that there is information out there that could help them to a great deal. They also do not know that new information has rendered obsolete what they previously knew. As a result, this leads to a quest for new information which arises, in that it is so much needed by the farmers. It is only when they are exposed to the relevant information that the need is recognized, this is called dormant need (Nikolas, 2005). The other type of information need is unexpressed need. This is a situation where users are aware of their information needs, but do nothing about them, either because they cannot or will not disclose their information needs (Ballantyne, 2009). Information need is identified by the information seeker or expert, expressed or unexpressed and where levels of need of similar information need differ (Ballantyne, 2009). It is the task of information experts in all these instances to provide appropriate information to meet these needs; and to successfully use extension workers and ICT to support farmers and rural communities, the first step is to empower farming communities to define their own need through awareness (Ballantyne, 2009). Devadson & Lingam (1996) had stated that, information needs are thus a factor that may drive cocoa farmers to seek information to fill the gaps in their information and knowledge. Farmers require different types of information for day to day agricultural activities. Moreover, the level of information needs may differ between village, farmer or people, or a group of people, depending on a range of factors, such as age, level of education, socio-economic status, range of information sources available, level of awareness, and ease of use of information (Kaniki, 2003).

In order to provide timely, appropriate and relevant information to farmers, it is necessary to classify their information needs as farmers needs differ and range from how and where to purchase agricultural equipments, information on improved seeds varieties, information on marketing, loans or credits, weather condition, irrigation and information on soil fertility (Mtega & Benard, 2013). Byamugisha, Ikoja-Odongo, Nasinyama & Lwasa (2008) in their study on information seeking and use of urban farmers in Uganda found that the information needs of the urban farmers in study area seemed to be as varied as the farming activities and also appeared to vary from one urban farmer to another.

For this study, the following cocoa farmers' information needs were identified;

2.6.1 Cultivation System: Bush clearing, Field burning, Soil testing for clay loamy , check for rock in the soil, Farm lay out: 3.1m x3.1m, Seeds selections and planting materials, Plant companion crops for shade: , plantain 3.1m x 3.1m, Weather information, Agricultural credit, banking procedure

2.6.2 Pre- Nursery: Dry season planting at the nursery and transplant at peak raining season, Shade nursery with bamboo and palm leaves, Fill polythene bags with good top soil, Arrangement of polythene bag on nursery beds, Selection of rootstock seeds, Processing of rootstock seeds, Sowing of rootstock seeds, Mulching with dry grass, Water regularly, Apply fertilizer when notice deficiency of nutrients, Pest and diseases control, Hand weeding control. Ring weeding when applying chemicals,

2.6.3 Main Nursery: land preparation, punching holes in prepared land, Transplanting of seedlings, Weed control, Fertilizer application, Apply cocoa boost foliar fertilizer for increase flowering, Pruning, Pest and diseases control / Remover of infested pod, Budding, Coppicing for regeneration

2.6.4 Plantation Establishment and Management: Land preparation, Transplanting of seedlings, Fertilizer application, Weed control, Pest and diseases control, Hand pollination techniques to improve pod production, Pruning, Fire tracing and Spacing.

2.6.5 Post Harvest Handling and Utilization: Harvesting of pod with Go to Hell or knife, Breaking of pod blunt object, Scooping cocoa bean from pod, Production of cocoa wine/juices, jam and Ginger, Types of fermentations methods and process, Five days fermentation process for good flavor, killing cotyledon, bleaching for colour, accelerating kinetic and acetic acid formation, Drying methods and process (Sun/oven drying) for good quality beans, The 7% moisture content for good quality beans, Using tapeline for drying, Grading, Packaging materials like jute bag for air circulation, Storage of harvested product, Transportation network, Marketing outlets through CAN or cocoa merchants and Post harvest techniques.

2.6.6 Marketing / Commercial: Market location, Credit sources, Future market price, Location of processing industries, Timing of harvesting, Timing of sale, Cost of transportation, Storage cost, Packaging cost, LGA fees, Communication cost, Processing cost, Stallage fees and Export of cocoa beans.

2.7 The Users of Agricultural Research Information in Nigeria

The main users of agricultural information include the following; researchers and research managers, extension workers, farmers, policy makers, trainers, consultants, bankers and the business community. Aina (1995) has categorized the various agricultural information user populations as follows: Farmers, Policy-makers, Extension workers and Agro-allied industries. Each of these sectors contributes directly to the improvement of agriculture.

2.7.1 Farmers: Farmers are people who cultivate the land for either subsistence or large scale farming. Farmers are key consumers of agricultural information for their sustenance and for

national development. Agricultural information is meant for all types of farmers. However, specific farmers will require specific information relevant to their product (LawalIro, Boadi, Oladokun and Kalusopa, 2014). Vidanapathrina (2012) notes that an effective and efficient delivery system of essential information and technology services to farmers will facilitate their critical role in decision-making towards improved agricultural production, processing, trading, and marketing.

2.7.2 Policy-Makers: These are mostly government officials and sometimes include persons from government or institutions bodies (Kaniki, 1995). Similarly, government policy makers through legislation also generate and use especially social, commercial and legal information (Aina, 1995). This is because most of the acts and laws on agriculture have direct bearing on farmers and the general improvement on agriculture. Successive Nigerian governments have lunched and executed many larger and smaller agricultural programmes with elements of extension.

2.7.3 Research Institutes: There are several organizations, which generate agricultural information in Nigeria. The agricultural research system comprises of 17 commodity-based research institutes, national extension institutes, over 45 faculties of agriculture in conventional federal, state and private universities, three universities of agriculture, several colleges of agriculture/ polytechnics. It also includes three international agricultural research centers. The major provider of public sector agricultural extension services in Nigeria is Agricultural Development Programme (ADP) in each of the 36 state of the Nigeria (Okwu, and Ejembi 2001). Farmers' organizations; Cocoa Association of Nigeria (CAN), Cocoa Farmers Association of Nigeria (CFAN), licensed buying agents, Cocoa Research Institute of Nigeria (CRIN), Agricultural Banks, National Cocoa Development Committee (NCDC), Agrochemical Industries,

Processors, Produce Inspectors, Sustainable Tree Crop Programme (STCP) analysis showed that farmers received some kind of support from these stakeholders including finance, input supply, information and technical advice while farmers provided feed back to the stakeholders in respect of support from the stakeholders (Aikpokpodion and Adeogun, 2011).

These institutions are mandated by law to collect process and disseminate data with respect to the performance of agricultural projects and programs.

2.7.4 Agro-allied Industries: These are corporate entities working in full symbiosis operation with the agricultural industry by providing or deriving goods or services to other industries dependent on them (Chandrasekan *et al*. 2010). In the view of Kaniki (1995), agro-allied industries personnel are another subgroup of agricultural information user population. Most of these personnel are educated beyond secondary school level of education and are employed in private agricultural industry (Chandrasekan *et al*. 2010).

2.7.5 Extension Education and Extension Workers: The general lack of awareness among small scale farmers can be attributed to their high level of illiteracy which contributes to the low level of adoption of agricultural production technology. Extension education is better provided by extension workers whose main task is to convey information in a meaningful form to farmers. One of the ways they do this is by training a group of model farmers with the hope that such farmers come in contact with other farmers. However, in Nigeria, farmers outnumber available extension workers with the present ratio of 1:3000 (Ozowa, 1995 and Mgbenka & Mbah, 2016).

Studies have shown that there is an existing gap between available knowledge of improved technology and actual practice. The extension workers are responsible for the dissemination of information about these improved technologies to farmer in order to bridge the gap. Therefore, extension workers must have access to information about the improved technology before they

can disseminate the information to the farmers (Odefadehan & Alfred, 2005). There are weak linkages in the Research Extension farmer input Linkage System (REFILS) in Nigeria as in most developing countries has been a major limiting factor to increase food productivity and sustainable development (Ojiambo, 1995). Such factors are that extension agents lacked communication skills, transportation and faced cultural barriers.

According to Moris (1991), extension is the mechanism for information and technology delivery to farmers. While, Purcell & Aderson (1997) defined extension as a process that helps farmers become aware of improved technologies through information and skill, adopt them in order to improve their efficiency, income and welfare. Extension services are provided by varieties of agencies in the public, commercial, voluntary sectors and government (Adebayo, 2004).

The extension agents carried out the responsibilities of educating and disseminating useful and timely agricultural information to the farmers (Anaeto, Asiabaka, Nnadi, Ajaero, Ugwoke, Ukpongson & Onweagba, 2012). These groups of people who disseminate information to farmers or even educate them on how to use information derived from research institutes which empowers them to take control over their decision-making processes and increase productivity (Vidanapathirana, 2012).

In Nigeria, the small number of extension workers and policy makers is an issue that has contributed to low yields in the rural areas (Lawal, Boadi, Oladokun & Kalusopa, 2014). Consequently, extension workers must be able to examine the appropriateness of various ICTs and their accessibility in both rural and remote areas. This suggests that in addition to their role in bridging the gap of information dissemination, extension workers can play the role of suggesting the best ICT tool to use within a particular farming community (Hosseini, Mehrad & Gholamreza, 2009). Also, Extension workers in the developing nations are expected to promote

market oriented agriculture, assist in how to sell their produce, buy seedlings and control of pests, assist the poor farmers to cope with vulnerability and help in poverty reduction in the rural areas (Ladebo, 2006). They are involved in advising farmers, training of farmers, and participating in field demonstration to provide relevant agricultural information and to enhance the utilization of improved agricultural technologies (Chisita, 2010). Kansana, Sharma & Sharma (1996) in their study indicated that participation in training, access to communication sources and number of information sources had significant association with level of knowledge and adoption of improved wheat varieties. Farmers who had more extension visits, teachings and training, tend to be more technically efficient in cocoa production. Extension teachings and training affords the farmers the opportunity to learn improved technologies and how to acquire needed inputs and services (Ayanwale, 1995).

However, Williams, Fenley and Williams (1984) in their study found that in Nigeria there are many farmers that are not reached by extension agents and are therefore not exposed to new technology in agriculture.

2.8 Sources of Agricultural Information

Information source is an institution or individual that creates or brings about a message (Statrasts, 2004). The characteristics of a good information source are timelessness, accuracy, relevance, cost effectiveness, trustworthiness, usability, exhaustiveness and aggregation level (Statrasts, 2004). The selection of an information source depends on a number of factors; including level of income, farm size, age, geographical location, level of education, level of development or infrastructure available, government or workplace policy, religion, as well as other socio-cultural and economic factors (Riesenberg & Gor, 1999).

There is an array of sources of information available to farmers, the information sources are radio, television, extension publications, farm newspapers, agricultural exhibitions and shows, training, church, government agencies, agricultural cooperatives, websites via VSAT broadband technology, practical education and consultation services such as extension advisory are available to farmers in Sub-Saharan Africa (Ha, Okigbo & Igboaka, 2008 and Ekoja, 2003).

Mtega & Benard (2013), in their study mentions some information sources used by farmers in accessing their agricultural information to include; newspapers, journals, bulletins, community leaders, and famer groups. In the study of Musib (1989) identified that the farmers in the West Bengal, India, relied on their personal experience, friends, neighbours, relatives, family members, fellow professionals and persons in agricultural offices.

In Pakistan Chaudhry, Muhammad, Saghir & Ashraf (2008), in their study confirmed that farmers relied mainly on interpersonal relationships with friends, neighbours, relatives, and co-workers and mass media such as radio and television while the use of formal information sources was very low for obtaining agricultural advice. In Nigeria, Ayoade (2010) in the study indicated that cowpea farmers perceived friends, village head, and television and radio as the most effective sources of information on cowpea production. In KwaZulu-Natal, Stefano, Hendriks, Stilwell, & Morris (2005) discovered that intermediaries such as NGOs and church -based development facilitators, university researchers and the Department of Agriculture and Environmental Affairs' and extension officers were the main information channels to obtain new research-based agricultural information. In Delta State, Nigeria female farmers did not have enough access to the required agricultural information. However, the community leaders and children of farmers were their main sources of agricultural information (Irivwieri, 2007). Furthermore, a study by (FAO, 1997) revealed that fellow farmers, neighbors and farmers'

cooperative society used as preference sources of information used by farmers in accessing agricultural information. Ogboma (2010) noted the sources of information used by rice farmers were personal experience, workshops and Seminars, training, friends and neighbors, Ministry of agriculture, magazines of agriculture, extension officers, local Government officers, non Government organization, libraries of agriculture and posters. The study by Daudu, Chado & Igbashal (2009) in Nigeria further showed that the main sources of information used by farmers in accessing agricultural information were Extension agents, Friends, Televisions, and Radio and Libraries. Similarly, Bozi & Ozcatalbas (2010) in their study revealed that family members, neighbor farmer, extension services, input providers and mass media were key sources of information for Turkish farmers.

The study of Opara (2008) investigated the overall sources of agricultural information available to farmers in Imo State (Nigeria), as well as the farmers' preferred sources. The study reveals that 88.1% of the farmers' source of agricultural information was through extension agents. Similarly, Ozowa (2008) in the study shows that among all the existing channels of communication, Nigerian farmers ranked extension workers the highest in providing credible information and advice. Mokotjo & Kalusopa (2010) in their survey study found out that print sources are among the sources of information to farmers in Lesotho. Their study reveals that, though most of the farmers have acquired primary education, the agricultural information delivered to them is written in local languages. This enables them to utilize the information effectively. However, Lwoga, Stilwell & Ngulube (2011) in survey stated that the print materials have low usage due to their unavailability and illiteracy levels of most of the farmers in Tanzania.

Mass media also play a great role in provision of information in shortest possible time over a large area (Yahaya, 2002). Information and Communication Technology (ICT) is a term that

combines computer and telecommunications technology in handling, acquiring, processing, storing and disseminating information (Chauhan, 2009 and Malhan, 2007). Information and Communication Technology is a general or an all-inclusive term that embraces all those technologies that are employed in collecting, storing, organizing and communicating information in various forms (Chisita, 2010). Rao (2007) in the study indicated that an effective deployment of ICT can lead to increase in agricultural competitiveness through cuts in production and transaction costs, raising production efficiencies and farm incomes, conserving natural resources, and by providing more information, choice and value to stakeholders. With wider access to and use of ICT, the potentials of opening up of communication as well as sharing information would be enhanced, so as to assist farmers, researchers, extension workers and policy makers. It will also narrow the information gap that exists between the farmers and the researchers on the other hand because there will be a feedback (Ballantyne, 2009). A study by Manu and Sultan (2002) reported that the radio is the most important ICT currently used for extension delivery and to lesser extent, TV and video both broadcast in English and local languages. However, the television and ICT have been the major information communication technologies used in agricultural delivery in Nigeria. This indicates that ICT is a very useful tool in the dissemination of agricultural information to the farmers especially in rural areas where cell phones have been embraced by both literate and illiterate farmers. In the same string of thought, Bolarin & Ayanlade (2010) in their survey reported that mobile phones and computer systems are the most used and widely owned tools today by extension workers and their organizations as in the North Central Zone of Nigeria. The use of film/slide and cable network in dissemination information is out of reach to farmers because in inadequate infrastructures in the rural area. However, Lwoga,

et al. (2011) reported that print materials like the text books have low usage due to their unavailability and illiteracy levels of most of the farmers in Tanzania.

Other sources of information for farmers that are equally important, but less recognized are the traditional sources. The traditional system is the form of information emanating from colleagues, during weddings, agricultural shows and festivals and in some cases through town criers (Aina, 1995). In the Caribbean, farmers rely heavily on traditional knowledge and informal meetings among themselves for farming (Renwick, 2010). Questions as to what to plant, what moon phase is best for sowing seeds and transplanting seedlings, and how often to rotate crops are answered through colleagues discussion. This suggests that, one of the sources of information to farmers in the Caribbean is the traditional source which is transmitted through oral channels by colleagues. Lwoga, *et al*. (2011) in their study on access and use of agricultural information and knowledge in Tanzania reports that the major sources of information for farmers are predominantly local (neighbors', friends and family) which implies that their major sources of information are traditional. To emphasize the importance of traditional information in Africa, Aina (1995) in the study points out that one of the sources of information of farmers in Nigeria is traditional. That is information is obtained not from official sources directly but through colleagues or family members. Aina holds the view that, though the majority of the farmers in Africa are illiterate, it is possible to supply them with necessary information through the information gate- keepers popularly known in North Western Nigeria as SARKIN NOMA (Information gate keeper), who is a literate farmer among the farming community with a wealth of experience and vast land (Aina 1995). Similarly, Opara (2008) reported that agricultural information in its broadest sense includes indigenous agricultural knowledge (IAK) which is transmitted orally from person to

person. This is a very common practice in Nigeria and hugely relied on by old farmers as well as the illiterate and many others who favour oral dissemination of information.

The studies of Adhiguru, Birthal & Ganesh (2009) on study of sources of information revealed that other progressive farmers and input dealers were the main sources of information due to convenient access to those sources and higher cost of information acquisition from other sources. Similarly, Van & Fortier (2000) in their study on information sources reported library as the least sources of information preferred by farmers in farming. This may be largely due to the fact that farmers may not have direct link to most library as a result of their socio-economic status such as level of education and relatively remote from formal sources of information (extension stations, libraries and information centres). There have been short-comings of traditional print and library based methods of providing agricultural information to rural farmers who are generally illiterate and relatively remote from formal sources of information such as extension stations and libraries (Van and Fortier, 2000)

Ugboma (2010) in a study conducted on access to agricultural information by fish farmers in the Niger Delta Region of Nigeria, reported that majority of the farmers indicates that, their source of information is through traditional, as well as personal experience. Wolf, Just and Zilberman (2001) in their survey on sources of information reported that agricultural information comes from informal contacts/neighbours, friends, and relatives. This notwithstanding, the study however revealed that some formal resources and services like libraries and internet were used by very limited farmers in their effort to meet their information need. David, Agordorki, Bassarggga, Couloud, Kumi, Okuubul & Wandi (2006) in their studies of sources of information reported that one of the major ways that cocoa farmers receive information is through extension

services. However, in most cocoa producing countries, cocoa extension services/agents are inadequate.

Of all the existing channels of agricultural communication, Nigerian farmers rank extension highest in terms of providing credible information and advice, especially on agricultural technology. A major function of extension is to get the farmer into a frame of mind and attitude conducive to acceptance of technological change. Apart from the use of extension for diffusion of agricultural innovation, other channels like rural development field staff, contact farmers, school teachers, private sector agri-business people, staff of the Ministry of Agriculture and the electronic and print media are used. These channels have their strengths and weaknesses (FAO, 2003 and Mgbenka & Mbah, 2016). Therefore, in view of the fact that each farmer prefers certain information sources or channels over others, it is important to do a thorough study before opting for an information source or channel to address their information needs

.2.9 Constraints' of Information Dissemination

Edeoghon and Okoedo-Okojie (2017) in their survey on information dissemination reported that farmers' preference for information is very important in ensuring that appropriate and timely information is disseminated to them but this is flow of information is affected by several constraints. Aina (2007) survey farmers constraints to information reported that their constraints with dissemination of agricultural information in Africa include: inadequate financial power of farmers in Africa; African farmers are illiterate; majority of them cannot read or write in any language; Farmers in Africa live in areas, where there is a lack of basic infrastructure, such as telephone, electricity, good road network and pipe borne water. Constraints also include few number of extension workers (the ratio of agricultural extension workers to farmers is low); and poor radio and television reception signals in most village communities in Africa. Various

constraints were discovered and which militate against information delivery to farmers such as, the information type, information needs, information barrier, extension agent personality, feedback and timeliness of feedback mechanism (Galadima, 2014).

Amobi (2010) in the study on information sources observed that mass media is one of the major sources of information that can be very helpful in creating awareness and changing the behavior of farmers towards better utilization of research findings and proper management of their resources. However, Ozowa (1995) in the survey on information identified the problems of agricultural information or communication as follows: One of the obvious constraints in the use of the broadcasting media in Nigeria is poor reception quality and the area covered. The messages carried are not tailored to the information needs of rural populations. Even when the information is irrelevant, it is seldom aired at the proper time and so does not get to the targeted audience. The use of print media, leaflets and newsletters as message carriers are of limited use in reaching illiterate farmers. Technical language used in communicating information is incomprehensible to the farmers. Lastly, many people in extension are ill - prepared for extension and an extension communication job. Hence an enormous gap exists between available knowledge of improved technology and actual practice. Van & Fortier (2000) in their survey on information sources reported that there have been short-comings of traditional print and library based methods of providing such agricultural information to rural farmers who are generally illiterate and relatively remote from formal sources of information (e.g. extension stations and libraries).

Another major constraint to agricultural information dissemination is the inadequacy of existing extension programs. Some of these programs are conceived without well thought out plans and are prepared in a hurry without the farmers whose attitudes are to be changed making any input.

Such agricultural information packages can neither sustain the farmers' interest nor effect the desired attitudinal change. Farmers' interests are disregarded even more as most of the agricultural innovations are written and broadcast in English instead of the local language (FAO. 2005; Ozowa, 1995 and Mgbenka & Mbah, 2016). When local language is used, emphasis is often on the three major Nigerian languages Hausa, Ibo and Yoruba. These programs are broadcast when farmers are far away in the fields or too tired to listen after the day's toil. A majority of the farmers do not own radio sets. Well intentioned agricultural programs can be marred by poor implementation and too much bureaucracy (Ozowa, 1995 and Ezinnehart, 2015). Aina (1995) reported that sometimes the form of information generated for farmers is not used because of the medium of communication, time allotted to air agricultural pogrammes, the language used in communicating information, and the attitude of the end user (farmers). A striking example is Nigeria, where most rural famers are illiterate and most of the information generated from universities and research institutes have not been stepped down to suit the end user.

The present ratio of one extension worker to 3,000 farmers is inadequate for effective agricultural information diffusion. The problem is compounded by the paucity of women in extension agents especially in a society where cultural and religious taboos make it impossible for male extension workers to reach women farmers who outnumber male small scale farmers

It was noted that many people in extension are ill-prepared for extension and an extension communication job, The emphasis in their training is more on technical proficiency rather than on rhetorical and persuasive skills. An extensionist trained in this way, is unlikely to make an impact on a conservative farmer who is not likely to put his farm inputs to risk by trying the extensionist's improved technique. There is real need for extension agents training to be relevant

to their jobs at the grass root (Ozowa, 1995 and Ray, 2008). Dutta (2009) stated that illiteracy and ignorance were the major barriers in seeking information which was very crucial to their development. There are also politics in taking decisions from government officials; poverty condition of the farmers for which reason they are unable to procure machines and high definition equipment that will enable them to compete with time. Failure to prioritize agriculture especially by government of Nigeria and that of North Western States; ineffective ICT policies that are geared towards informing farmers through the ICT tools and where they are available, there is poor access and reception. What is more, there is near absence of training and re-training of both the extension workers and farmers on new innovations as the extension workers are not adequate to take care of the teeming population of the farmers (LawalIro, Boadi, Oladokun & Kalusopa, 2014). Problems in Information Seeking (multiple responses) are Lack of timely access to the required information, Low level of education, Language barrier, No access, Lack of awareness about where to get required information, Electricity load shedding and bad timings of programmes, and Infrequent visit of extension staff in the village (Nnenna, 2011).

2.10 Needs Assessment

An assessment is a judgment based upon empirical evidence, observation, and logical reasoning. Therefore, needs assessment is a systematic process for determining and addressing needs, or "gaps" between current conditions and desired conditions or "wants" (Kizlik, 2010). Needs assessment is a survey used to identify what the community or an individual farmer sees as priority issues. Farmer needs assessment is evaluating what a certain population lacks and what they would need to have desired conditions. The discrepancy between the current condition and wanted condition must be measured to appropriately identify the need. The need can be a desire to improve current performance or to correct a deficiency (Kizlik, 2010).

2.10.1 Needs Assessment Measurement

There are key action steps in measurement of assessment. They are: exploration, data gathering and utilization phases (McKillip, 1998).These phases may also be referred to as Pre assessment, Assessment and Post assessment (Lepicki & Boggs, 2014).

Phase One: Exploration: The steps in the phase are to determine the purpose of the needs assessment, the potential uses of the assessment information, who are the potential users of the assessment information, Identify the parameters for the assessment, the number of town or county or a specific audience. Secondly, identify all of the existing information available that fits your parameters (McKillip, 1998 and Lepicki & Boggs, 2014). More data are available today from secondary sources than ever before (Borden, 2004), and thirdly, determine if other data still need to be collected. Identify the methods to collect this information.

Phase Two: Assessment: Collect, analyze and synthesize all of the data. Implement your needs assessment plan (Lepicki & Boggs, 2014).

Phase Three: Utilization: Use the data to set program priorities, develop an action plan to address the needs or issues, evaluate the needs assessment, and communicate the results. A needs assessment process is not completed until the results are shared and utilized (Lepicki & Boggs, 2014).

2.10.2 Important of Needs Assessment to the Study

A needs assessment is a part of planning processes, often used for improvement in individuals, education/training, organizations, or communities. It can refine and improve a product such as training or service a client receives. It can be an effective tool to clarify problems and identify appropriate interventions or solutions (Fulgham, & Shaughnessy, 2008). By clearly identifying the problem, finite resources can be directed towards developing and implementing a feasible

and applicable solution (Altschuld & Kumar, 2010). Needs assessments can help improve the quality of policy or program decisions, thus leading to improvements in performance and the accomplishment of desired results. Improving results, that is, moving from current to desired performance which is typically a worthwhile and valuable effort. The results of a needs assessment will guide subsequent decisions, including the design, implementation, and evaluation of projects and programs that will lead to achieving desired results (Watkins, West Meiers, & Visser, (2012).

Hence, this study used simple descriptive and inferential statistic such as Needs Assessment in accessing the cocoa farmers' information needs.

10.3 Types of Needs Assessment

There are two broad categories of needs assessment. There are extensive and intensive. The broad difference between extensive and intensive needs assessment is that extensive research uses a large number of cases to determine the characteristics of a population, while intensive research examines one or a few cases in depth to understand cause and effect. A variety of data collection and decision making tools and processes can be used for each analysis (Stoecker, 2005 and Watkins, West Meiers & Visser, 2012). The intensive needs assessment requires the ranking of priorities. While there are many methods to rank needs, it is important to develop ranking criteria. Feasibility is often used as criteria, but it is often useful for a group to identify their own set of criteria. This part of the research is not so much concerned with developing a detailed plan for solving the needs situation, but rather for examining the depth of the need and potentially required resources (Wikipedia, 1991).

According to McCawley (2009), Needs Assessment for agricultural programs and extension purposes is done by first learning what the audiences (in this case farmer) already know and

thinks, so that an educational product and services can be designed to address their need. For example, if farmers want to increase productivity of wheat per acre in a particular community. So many needs might have accounted for low productivity but the researcher or the program formulator cannot just guess the ones really responsible. The researcher must use any of the Needs Assessment techniques. Sometimes it can be one particular need or a combination of more than one. These needs may include inadequate machinery, inadequate pesticide and herbicides, inadequate labor and the inappropriate use of equipment (McCawley, 2009 and Abukari, Oztornaci & Budak, 2015).

A needs assessment is a part of planning processes, often used for improvement in individuals, education/training, organizations, or communities. It can refine and improve a product such as training or service a client receives. It can be an effective tool to clarify problems and identify appropriate interventions or solutions (Fulgham & Shaughnessy, 2008).

The results of needs assessment will guide subsequent decisions, including the design, implementation, and evaluation of projects and programs that will lead to achieving desired results (Watkins, *et al*., 2012). It also works to improve results through the implementation of non-training or training interventions, or both, Figure 2.1. If a training intervention is required, then you will have to do training needs analysis.

Once the root cause of a performance gap is determined, the solution may or may not include training or instruction. If the solution is training, the instructional objectives derive from the organizational, operational, and/or individual needs identified in the assessment (Rothwell, 1984).

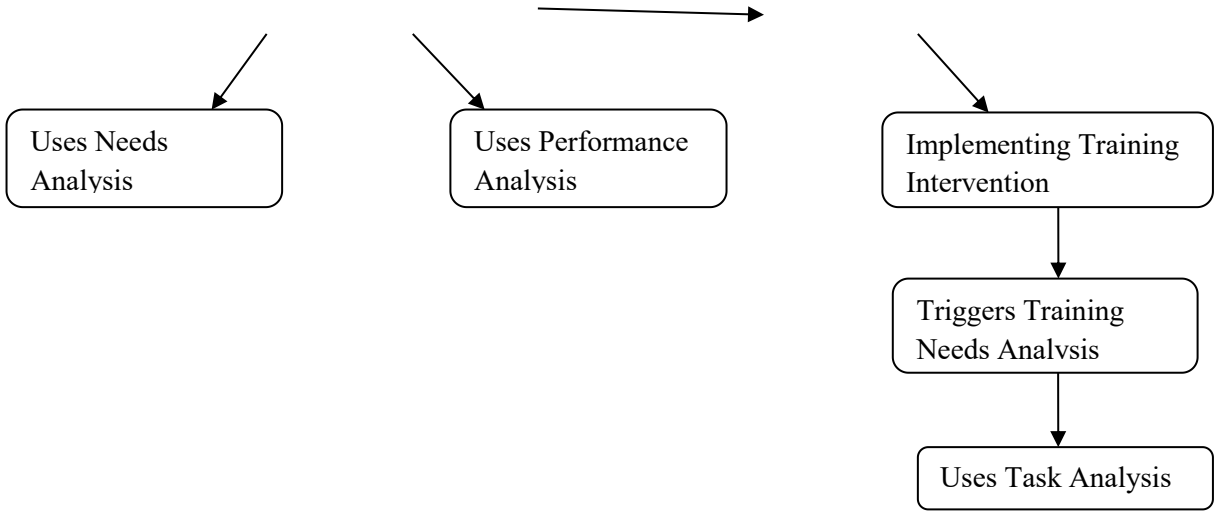


Figure 2.1 Needs Assessment and Needs Analysis (Christensen, 2016)

The Training needs assessment (TNA) uses task analysis to determine what has to be trained and what does not (Christensen, 2017)

At times, the term training needs assessment is described as needs assessment, but according to Watkins and Kaufman (1996), if the solution is training there is no need to do an assessment or analysis. A training needs assessment is more accurately described as a training requirements assessment that may follow a needs assessment and needs analysis. Therefore, Kaufman (1982) defined Needs assessment as gaps that exist between "what is" and "what should be" in terms of the outcomes of extension programmes and then determining the priority of these needs.

2.11 Needs Chain Model: A needs chain model is a framework that allows organizations to consider the individuals needs within an organization as well as the organizations needs simultaneously in order to come to solutions to prioritizing resources and areas of improvement for the organization. Once the organization has completed the model, it gives them a better picture of the organization's priorities in a timely manner. One of the benefits of this model is that it can be used to help decision makers quickly come to solutions to priorities that may change over time (Shafloot, 2011).

In order to conduct a needs chain model, the organization must identify the following: instrument needs, performance needs, conscious and unconscious needs on the organizational level and the individual level. The organizational level applies to behaviour or outcomes, where as the individual level pertains to individual attitudes to things such as job performance or how they view the organization. The data about each of these levels comes from different data collection methods: Organizational level: Goals of the organization while Individual level: Surveys or interviews (Shafloot, 2011).

Training Needs Assessment is a systematic inquiry of training needs within an organization for the purposes of identifying priorities and making decisions, and allocating finite resources in a manner consistent with identified program goals and objectives (Wikipedia, 1991).

Though beginning with training as the desired solution, it has been argued, diminishes the value of the needs assessment, the popularity of the term "training needs assessment" has made it part of the training and adult learning lexicon (Triner, Greenberry & Watkins, 1996).

There are three levels of a training needs assessment:

Organizational Assessment evaluates the level of organizational performance. An assessment of this type will determine the skills, knowledge, and ability needs of an agency. It also identifies what is required to alleviate the problems and weaknesses of the agency as well as to enhance strengths and competencies. Organizational assessment takes into consideration factors such as changing demographics, political trends, technology, and the economy (Wikipedia, 1991).

Occupational Assessment examines the skills, knowledge, and abilities required for affected occupational groups. Occupational assessment identifies how and which occupational discrepancies or gaps exist, as well as examining new ways to do work that could fix those discrepancies or gaps (Wikipedia, 1991).

Individual Assessment analyzes how well an individual employee is doing a job and determines the individual's capacity to do new or different work. Individual assessment provides information on which employees need training and what kind (Wikipedia 1991 and Triner, Greenberry & Watkins, 1996)

Conducting a Needs Analysis: Conducting a needs analysis is usually done to gauge what training is needed for new employees or to identify and find solutions to:

i. Problems with performance
ii. New system, task or technology
iii. An organizational need to benefit from an opportunity (Wikipedia, 1991).

A Community Needs Assessment is a combination of information gathering, community engagement and focused action with the goal of community improvement. A community needs assessment identifies the strengths and weaknesses (needs) within a community. A community needs assessment is also unique and specific to the needs within a community and is usually an extension of a community's strategic planning process. Community leaders, local government, advocacy groups or a combination of these then address these identified needs through policy change or development (Wikipedia, 1991).

A community needs assessment can be broadly categorized into three types;

Community needs assessment 1 – This type of needs assessment seeks to elevate the strengths and weaknesses within a community.

Also, create or improve services based on the identified weaknesses.

Community needs assessment II – This type of needs assessment is constructed around a known problem or potential problem facing the community.

Community needs assessment III – This type of needs assessment is based within an organization which serves the community at large, is currently addressing a need within the community, or is dedicated to an under-served population within the community. This type of needs assessment centers on improving the efficiency or effectiveness of such organizations (Wikipedia, 1991).

Needs Analysis: Needs analysis is taking the determine gaps between adjacent Organizational elements, and finding the causes of the inability for delivering required results (Kaufman and Watkins, 2000). A needs analysis also identifies possible ways and means to close the gaps in results needs but does not select them. It focused on identifying the possible barriers to successful program intervention in a community and possibly finding solutions to the challenges (Sharma, Lanum; Sanum Balcazar, 2000). Service providers in Monitoring and Evaluation (M&E) work and extension workers are also concerned with assessment and provision of services to different stakeholders Such services may include an assessment closely related to a needs assessment that focuses on whether current services are effective or not, and if not, identifying the gaps in implementation; or an assessment of whether potential services are likely to be effective once they have been implemented (Rossi, Lipsey & Freeman, 2004). These assessments highlight the close relationship between needs assessment, monitoring, and evaluation; while each applies similar tools, each also has independent objectives and requires unique skills (Watkins & Kaufman, 2002).

Needs Assessment Tools: According to the National Consumer Supporter Technical Assistance Center, the following are crucial components of a needs assessment tools aimed at gathering data that will answer what the researchers needs to know and inform the decisions also of the researchers, community/farmer demographics and service gaps (National Consumer Supporter Technical Assistance Center, 2005).

2.12 Community/Farmer Demographics: Community demographics assist the researchers to get a feel of the field that they are working in. Demographics include things like age ranges, the number of people living in a certain area within the community, the number or percentage of people within a certain socio economic status and gender characteristics (National Consumer Supporter Technical Assistance Center, 2005; Watkins & Kaufman, 2002 and Community Assessment Tools, 2013).

2.13 Service Gaps: An assessment of service gaps is meant to give an indication of the types of services that are needed the most at the particular point of time in which the assessment is being conducted. A scale measuring the availability, accessibility, provider choice and cultural responsiveness of services, rated on a scale from 0-no availability/non-existent, to 3-outstanding and responsive is provided (Wikipedia, 1991).

2.14 Methodology and Data Collection in Needs Assessment

The following are the actual tools that can be involved in the process of gathering data to be used in the needs assessment.

2.14.1 Community/Social Survey: Surveys can be used especially in relation to the gathering of community demographics where a large number of people may be involved, and also in which multiple variables such socio-economic status, education levels and employment are being measured in relation to the planned intervention. Large scale surveys involving many people can reveal useful information, while smaller surveys may be less generalizable and used only in the context within which they are conducted. Survey design will vary depending on context, such as internet and phone surveys for well resourced communities or face to face surveys for less resourced communities (Wikipedia, 1991).

2.14.2 Community Mapping: Community mapping is used to reveal people's different perspectives about a community. It requires few resources and little time and can be adapted for participants of virtually any age or educational back ground. In this facilitated activity, individuals or groups of participants draw a map of their community, marking certain points of importance and noting how often they visit these places. A facilitator leads a discussion about the maps, while another facilitator records the discussion. Community map-ping can be conducted at both informal community gatherings and at meetings to which community stakeholders are invited (Wikipedia, 1991). Also, Community mapping is where the researcher gets people in the community to draw a map of the community of the places that they visit the most and how often they go there. This will give an indication of where to locate a service so that it is conveniently placed and accessible to community participants whom it is intended to service (McKnight, 1992). Community engaged mapping (CEM) is a group mapping exercise designed to answer specific research questions and gather feedback from community members (who live, work or attend school in the area), for the purpose of developing place-based planning, policy, and interventions. It can be described as a focus group around a map (Janice, Dagmar & Silvia 2012).

2.15 Needs Assessment Techniques

2.15.1 Individual Techniques: Individual techniques involve collecting data from people one at a time. The people from whom the needs assessment data are collected do not interact with one another in the course of providing data. Individual techniques include face-to-face interviews, key informant interviews, questionnaires, informal personal observations, and formal personal observations (McCaslin & Tibezinda, 1997).

2.15.2 Face-to-Face Interviews: This technique is appropriate when dealing with less literate audiences or complex issues about which there is little available information. Both structured and

unstructured questions are appropriate for face-to-face interviews, depending on the issues involved and the time available for the interviews (McCaslin & Tibezinda, 1997).

2.15.3 Key Informant Interviews: Key informants are people who are considered experts in a given area because of their professional knowledge or their position of influence in the community or organization. Examples include teachers, religious leaders, grass-roots workers, and traditional and political leaders. Key informants are particularly useful if the needs assessment has to be done fast, using a limited budget (McCaslin & Tibezinda, 1997 and Witkin & Altschuld, 1995).

2.15.4 Questionnaire: This technique tends to be more structured than interview schedules and can be administered by phone, mail, or in group settings developed countries while in developing countries they are rarely administered in this manner because of the limited availability of telephones. It can be administered by hand-delivered to respondents and collected after they have been completed (McCaslin and Tibezinda, 1997). For best results, the questionnaire should cover pertinent issues and be short enough to be completed in the time the respondents have to save both time and money necessary for collecting the information. However, there might be the high possibility for biases in the information collected. This is because there is always a chance that the assembled group completing the questionnaire is not representative of the audience in mind.

Conducting Needs Assessment from Questionnaires: It involved the need to assess the training needs of extension personnel and farmers and then establish priorities, when using a questionnaire to collect needs assessment information (Maalouf & Contado, 1983).

Need assessment is “a systematic set of procedures undertaken for the purpose of setting priorities and making decisions about program or organizational improvement and allocation of resources. The priorities are based on identified needs (Witkin & Altschuld, 1995). However, the

use of matrix analysis in conducting needs assessments was suggested by Hershkowitz (1973) and also, identified a criticality function that is helpful in establishing such priorities. A 2 x 2 matrix is created in order to establish the priorities. First, an overall mean score is calculated for ability and importance scores for all items on the questionnaire. Then, the mean ability score is plotted on the Y axis and the mean importance score is plotted on the X axis. Perpendicular lines are then drawn from each of these points, resulting in a 2 x 2 matrix. The matrix has four quadrants-high ability-high importance (HH), high ability-low importance (HL), low ability-high importance (LH), and low ability-low importance (LL). Next, the mean ability and importance scores for each of the professional skills are computed and plotted in the matrix. Those falling in the low ability-high importance quadrant are those with the highest need for development. In this example, skill 1 (producing educational-teaching materials) and skill 5 (determining information needed for evaluations) were those most in need of development. This method helps correct the clustering of important scores toward the top of a category scale. It could be used for rating goals, information needs, educational and human service programs or service, and in making decision for a program (Hershkowitz, 1973 and McCaslin & Tibezinda, 1997).

2.15.6 Informal Personal Observations: This technique involved the observation of fieldworkers who see or experience a lot as they travel and work with farmers in the field. If noted or remembered, this information can be used in needs assessment. Keeping diaries or writing notes to themselves are more likely to provide more accurate observational data for assessing needs (McCaslin and Tibezinda, 1997).

2.15.7 Formal Personal Observations: This needs assessment technique is based on using rating forms, checklists, or observation schedules for collecting information. Formal observations differ from informal personal observations in that the items to be observed are

predetermined. This technique also can be used to collect both quantitative and qualitative data (McCaslin and Tibezinda, 1997; Witkin & Altschuld, 1995).

2.15.8 Group Techniques: Group techniques allow participants to interact with one another during needs assessment activities. Information can be collected in writing, as in the Delphi technique, or orally in a group setting such as a focus group. The successful needs assessment depends on competent leadership and on having participants who have both the knowledge and willingness to participate actively in the interactive group process (Caffarella, 1982).

2.15.9 Seasonal Calendar: A seasonal calendar allows the researcher and extension workers to look at seasonal trends that may affect the use or implementation of a service in a community (Community Assessment tools, 2013).

Seasonal calendars may reveal important reasons for the gaps between service utilization and intervention outcomes. This will allow the researcher and extension workers to plan for other things that may not have been considered as part of the intervention but which will greatly improve the quality of the intervention and make life better for the community members. To use the seasonal calendar as a data collection tool, the researcher and extension workers gets community members to write a list of the things that they have to do throughout the year. These things are related to work, cultural activities, certain times of the year in which participants are unavailable at all and so on, and to plot how they share them with other members of the community (Wikipedia, 1991; Mundie, 2014).

2.15.10 Focus Group Interviews: Krueger (1994) defines a focus group interview as a technique in which a group of people who possess certain characteristics provide data of a qualitative nature in a focused discussion. Each interview involves a group of six to eight people who discuss a common topic for one to two hours under the direction of a moderator and

assistant moderator (McCaslin and Tibezinda, 1997). The discussion is recorded on an audio tape and later transcribed and reported as qualitative data. It is also a good opportunity for addressing service gaps and what needs to be done about them (Witkin & Altschuld, 1995; Donaldson, Hastings, & Bower, 2013 and Nyumba, Wilson, Derrick & Mukherjee, 2018).

2.15.11 Meetings and Farm Visits: Whenever Block Supervisors come into contact with farmers there is an opportunity for discussing problems, constraints, scopes and information needs. For example, Block Supervisors may come into contact with farmers: during other extension events, such as field days, or method demonstrations; informally at communal places such as the market or community centres; during individual visits, when the Block Supervisor visits one farmer (McCaslin and Tibezinda, 1997).

2.15.12 The Nominal Group: This technique can be used to generate possible items and set priorities in conducting a needs assessment. Although the data are generated in a group setting, verbal communication is minimized. For example, a chairperson of a farmers' association invited their extension agent to facilitate a meeting of selected members assembled to determine the activities for the following year. After learning that the farmers could read and write their native language, the extension agent suggested that the nominal group technique be used to assess needs for the association (McCaslin & Tibezinda, 1997; Witkin & Altschuld, 1995).

2.15.13 Informal Group Methods: This category includes gathering information at group meetings and social gatherings. It is common for participants at meetings to talk about issues and problems in their family, community, or organization even when they are not part of the agenda. These side conversations may provide insights into the problems facing the organization or the individuals involved, as well as what can be done to address them (McCaslin & Tibezinda, 1997).

2.15.14 Rapid Rural Appraisal: Rapid rural appraisal refers to the use of several data collection methods to gather practical information on development issues in local communities quickly (Freudenberger, 1994). These might include interviewing key informants, reviewing secondary data sources, mapping exercises, and conducting semi structured interviews with groups and individuals. Refer to chapter 6 for a detailed description of both rapid rural appraisal (RRA) and participatory rural appraisal (PRA) (McCaslin & Tibezinda, 1997).

2.15.15 Participatory Rural Appraisal: Participatory Rural Appraisal (PRA) is a flexible set of techniques designed to enable rural people to appraise and analyse their situations. The information generated can be used to plan development activities. PRA is used by the Department to assist farmers analyse their constraints and opportunities; identify ways of overcoming problems or exploiting opportunities and implementing agreed solutions (Swanson, Bentz & Sofranko, 2005). PRA comprises a menu of techniques, which include: physical maps; social maps; transect walks; wealth ranking; Venn diagram; daily routine; seasonal diagrams; matrix ranking and matrix scoring; and problem census (McCaslin & Tibezinda, 1997).

Hence, this study used simple descriptive and inferential statistic in accessing the cocoa farmers' information needs.

2.16 Production Information Search: Training helps all categories of farmers improve production and income by making use of all available resources (Adesope, Asabiaka & Agumagu, 2007). Also, training is also required in cocoa farming because it bridges the gap between the known and the unknown, hence impacting cocoa farmers with basic knowledge and skills required for identification of farmers' information needs, sources and how, were and when to search for information. The utilization of information on cocoa farming technologies and provision of adequate training among farmers will always translate into efficiency in cocoa

production and increased productivity (Adesope, Asabiaka & Agumagu, 2007). The study of Banmeke & Olowu (2005) indicated that agricultural information dissemination is crucial to the productivity of farmers, that encourage the farmers learn about those things which they are not aware of while Omoregbee & Banmeke (2014) in their study also suggested that cassava farmers are in need training on the use of herbicides, pesticides and fertilizer in cassava production. Therefore, extension workers should organize farmers training through workshop and seminars to educate farmers on information needs and search. Ogungbeni *et al.* (2013) and Edeoghon & Okoedo-Okojie (2017) in their studies reported that farmers have access to those information sources that were available and that information needs determine farmers'' search behaviour. Also, it was further affirm that farmers search behaviour is on the increase when there is need for such information as it relates to increase in production.

2.17: Theoretical Framework: Farmers' Access to Agricultural Information

A theory is defined as a set of interrelated constructs (variables), definitions and prepositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining natural phenomena (Kerlinger, 1997).

The theoretical framework for this study is drawn from the following models found to be relevant to this study.

2.17.1: Extension Theory: The assumptions of extension theory traditionally, assumed that all farmers would eventually see the benefit of new or innovations and thus adopt them. Therefore, the views and measures of the success of an innovation were based on the level at which an innovation can be adopted. The goal of extension is to determine how to convey information regarding an innovation to a certain population (such as farmers) so that they will adopt it. The challenge then of extension is to design an appropriate communication channel (Roling, 1988).

Traditional extension models were widely accepted yet failed to adequately explain the adoption behaviour of farmers.

2.17.2 The Transfer of Technology Model: No Room for Communication: The transfer of technology (TOT) model, which considers research the starting point for disseminating agricultural knowledge, has been the standard for National Agricultural Research Systems (NARS) in many countries Figure 2.2. The simplified form is the delivery of research results from scientists to the extension agents, who in turn will transfer the information to the farmers. This model performs well when the scientist, extension agent and farmer come from similar backgrounds, speak the same language and share information of common relevance.

Figure 2.2: The transfer of technology (TOT) model concept (Roling, 1988)

In Nigeria, efforts have been made to link information technology generation and dissemination through setting up of the Agricultural Extension and Liaison Service (AERLS), National Accelerated Food Production Programme (NAFPP) and other such bodies to foster strong linkages between technology generation and dissemination. Effective information linkage between these three subsystems is necessary to bring about productive activities that will turn bring about the desired self-sufficiency in food production. Therefore these three subsystems are interdependent.

2.17.3 Agricultural knowledge and Information Systems: The Door to Integrate Communication into Agricultural R & D Systems.

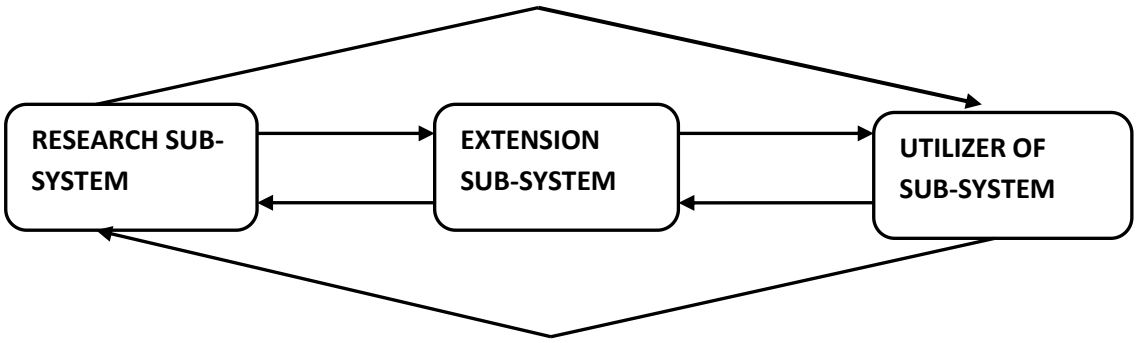
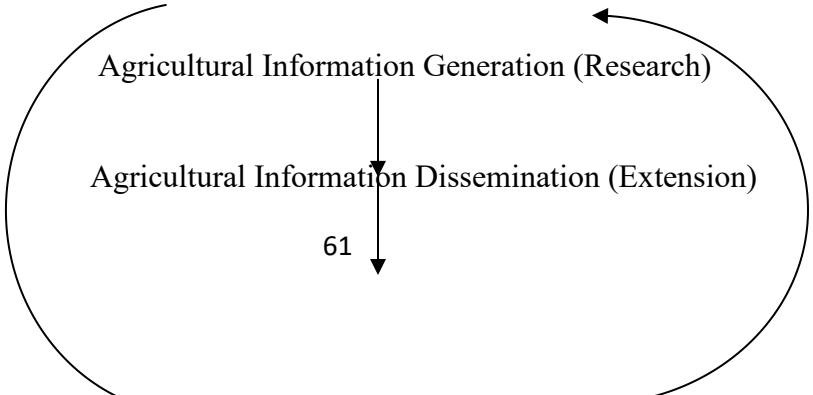


Figure 2.3: Agricultural knowledge and information Systems (Roling, 1988)

The model describes the two-way flow of information and knowledge among the research, dissemination and farmers sub-systems. Figure 2.3 indicated that the sub-systems play equally important roles in the system. The farmers' sub-system is a source of information and knowledge that feeds into the other two. For the farmers' sub-system to be on a more equal footing with the other two, the sub-system must have a demand capacity.

2.17.4 The Conventional Agricultural Communication is a process made up three interconnected systems. Agricultural information generation function is mainly performed by research institutions; agricultural information generated is usually transmitted by agricultural extension service delivery unit to end users (farmers) of agricultural information. End users' feedback is either transmitted through the extension service or directly to agricultural information generation system (Figure 2.4).



Agricultural Information Utilization (Cocoa farmers)

Figure 2.4: Conventional Information flows adopted from Omoregbee and Banmeke (2014)

In the conventional information flow from agricultural information generation (Research) to agricultural information dissemination (Extension) to agricultural information utilization (cassava farmers), a number of variables or elements interact to produce the desired outcome. Farmers' access to agricultural information is influenced by many variables. A two way communication process exits between agricultural information generation and agricultural utilization systems. As depicted in Figure 2.4, several actors constitute the agricultural information generation system, indicating that agricultural information available to the farmers, emanate from many sources. Farmers' extent of access to the agricultural information and their sources depends on farmers' socio-economic characteristics, extension organizations and media (channels), prevailing economic conditions as well as government policy. The nature and form in which agricultural information is packaged may require some specialized skills by farmers to access such agricultural information. The information packages which are in visual form are transferred to farmers to influence the adoption of such farming technique irrespective of socio economic and demographic factors.

2.17.5 Robert S. Taylor Theory: Robert S. Taylor Theory of Information need is an individual or group's desire to locate and obtain information to satisfy a conscious or unconscious need. The 'information' and 'need' in 'information need' are an inseparable interconnection. Information needs arise out of a desire to meet one or other of the three basic human needs: physiological needs (need for food, shelter.); psychological needs (need for domination, security) and cognitive

needs (need to plan, learn a skill) (Kaniki, 1995 and Nikolas, 2005). Human beings are regarded as an information seeker regardless of age.

2.17.6 Johnson's Comprehensive Model of Information Seeking (CMIS): The model consists of three categories of variables (Figure 2.5). The variables are Antecedents (demographics, experience, salience and beliefs) provide underlying imperatives to seek information. Demographics can refer to the individual's age, education, gender, income status, and ethnicity.

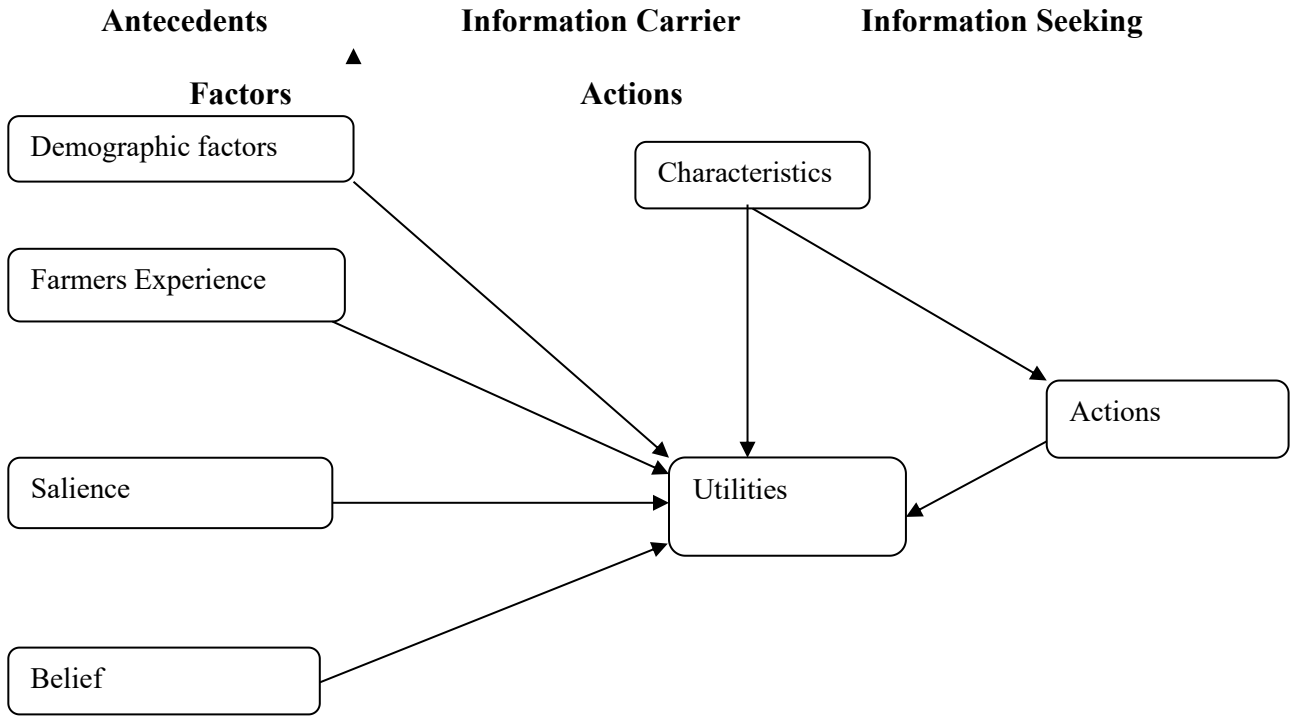


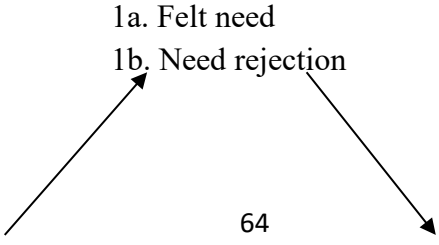
Figure 2.5: The Comprehensive Model of Information Seeking (Johnson *et al*. 1995).

The concept of experience involves the concepts of memory and recall, as well as resources a person may have on hand to be able to tap on knowledge regarding the topic of interest. The other two antecedents, salience and beliefs, form the second group of antecedents known as personal relevance**.** An information need arises when a gap is perceived between what one should know and what he actually knows. Information needs do not always result in information

seeking (Johnson, Donohew, Atkin & Johnson, 1995). People are only motivated to seek information when they both know that they are ignorant and the missing information becomes salient. Salience is one of the key concepts in the model, providing a key motivation to seek information. It captures the concept of how the missing information is perceived to be significant to an individual, and is closely associated with how individuals perceive that they are at risk and under threat. Beliefs on the other hand, can limit or hinder or empower individuals to seek information. (Case, Andrews, Johnson & Allard, 2005). For instance, if individuals do not believe that knowing more is important in helping them change their situation or cope with a crisis, they are less likely to seek information (Millers, 1980).

There are seven factors under three headings given in the Johnson's model (1987). The fundamental process flows from left to right. The four factors under the heading antecedents are grouped under two sub headings which are termed as background factor and personal relevance. The background factor includes the factors of demographics and personal experience and the personal relevance factor includes salience and beliefs. The second heading Information carrier factors include characteristics and Utilities of the information channels selected and used by the seekers. The last heading is information seeking actions (Johnson, 1997 and Wilson, 1999).

2.17.7 The Problem Solver Model: The model indicates that the end user or clientele is the main initiator of the change process. The model also advocates a strong linkage system between the sub-systems of technology dissemination that is researcher, extension agents and farmers. The end user in this model is actively involved in finding solution to his problems.



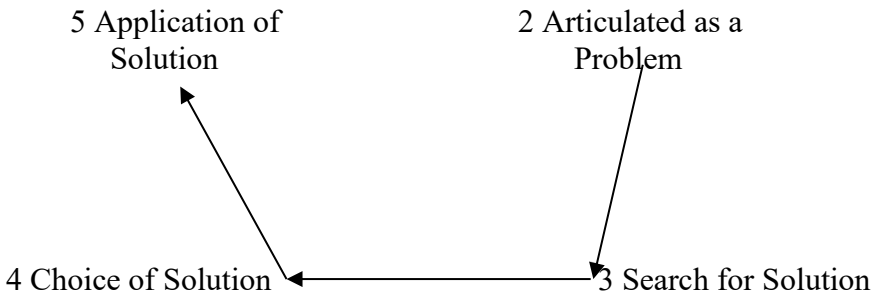


Figure 2.6: The Problem solver model (Havelock, 1979)

The stages within the model are: Need sensing or identification, Diagnosis and formulation of need, Search for relevant resources to solve the problem, Retrieval of potential solution, Translation of retrieved knowledge into specific solution and Application of solution which can either be accepted or rejected (Havelock, 1979). The implication of the stages indicate in the model is great for technological advancement in agriculture, base on information generation to dissemination to utilization relationships and the effectiveness of this model depends on the existence of the reciprocal and collaborative relationship between researchers, extension agents and farmers.

2.17.8 A Need Based Integrative Model: Yahaya (2000) reviewed the existing development models which include A need Based Integrative Model that was postulated by Nwosu and Megwa (1993). The model highlights a disparity between perception of farmers needs by government agencies and the real information needs of farmers. The main variables involved in this model are the farmer, government agency, technology of communication and the sub-system as shown in Figure 2.7. The four main variables are supposed to be fully integrated and interdependent on one another for effectiveness.

ENVIRONMENT

Sub-system

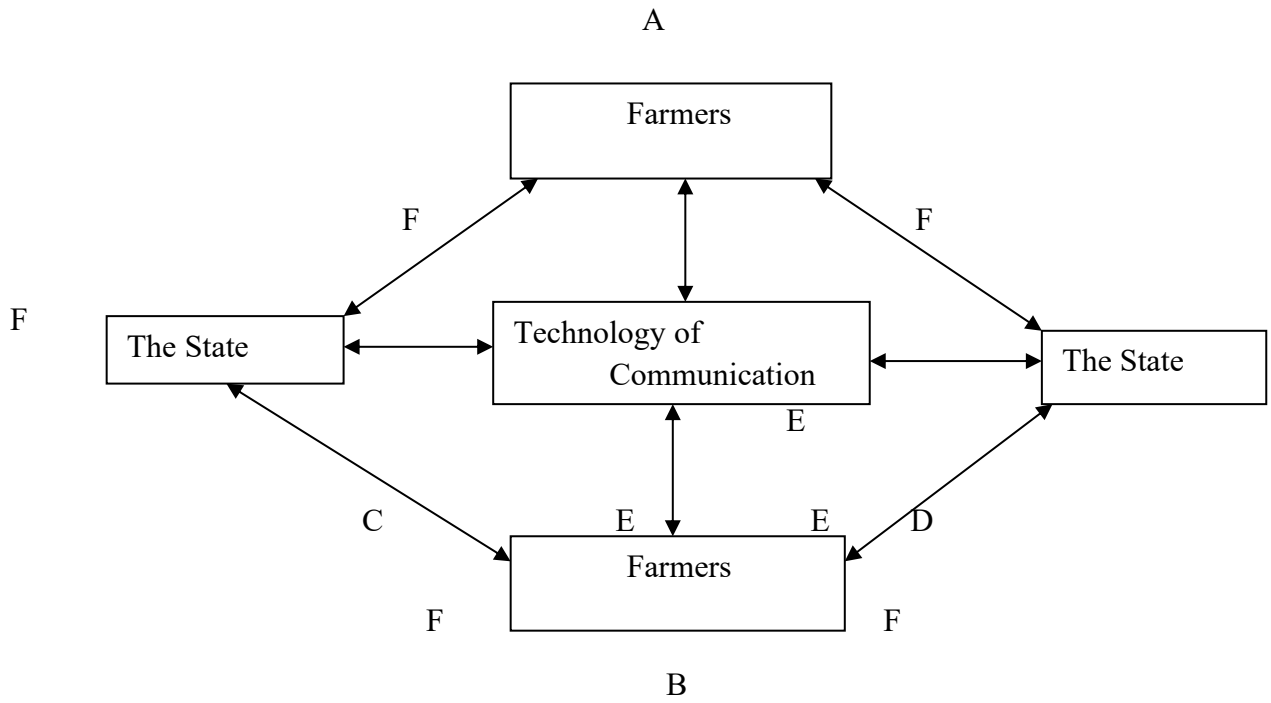


Figure 2.7: A Need Based Integrative Model (Nwosu and Megwa, 1993)

The stages involved in operation of this model are:

i. Need identification by farmers, to be assisted by government agency (such as IITA, CRIN, ADP, and Ministry of Agriculture). Farmer (A) information needs identification and establishment of priorities.

ii. Identification needs of farmers determine which information is to be disseminated via appropriate communication channel by the State D (government agencies such as extension agents.

iii. Monitoring, evaluation and coordination of the whole process is done by government agency

iv. In-built feedback (F) mechanism is present at all levels.

2.18 Information Seeking Theory

Human beings are regarded as an information seeker regardless of age. Information seeking theories often refer to the concept of information needs, a presumed cognitive state wherein an individual's need state triggers the search behaviour characteristic of information seeking in a given context. There are other lenses to view behaviour that focus on motive, goals, activity contexts, but not necessarily "need," whether information or other personal need. But information seeking can be a messy journey in reality. Searches and sources lead a seeker to unexpected resources, information "places" and objects that draw attention and bias or bend the journey to different perspectives (Vidanapathrina, 2012).

2.18.1 Information Search: An individual consciously or unconsciously engages in information search in order to find appropriate information which can fill the gap there by regaining physiological and psychological balance (Adereti, *et al*. 2006).

2.18.2 Information-Seeking Behaviour: Information seeking theories often refer to the concept of information needs, a presumed cognitive state wherein an individual's need state triggers the search behaviour characteristic of information seeking in a given context. Information seeking behaviour varies considerably from one individual to another according to age, gender, level of education, occupation, location, exposure, enlightenment, religion and even their culture (Afolabi, 2003 and Ekoja, 2010).

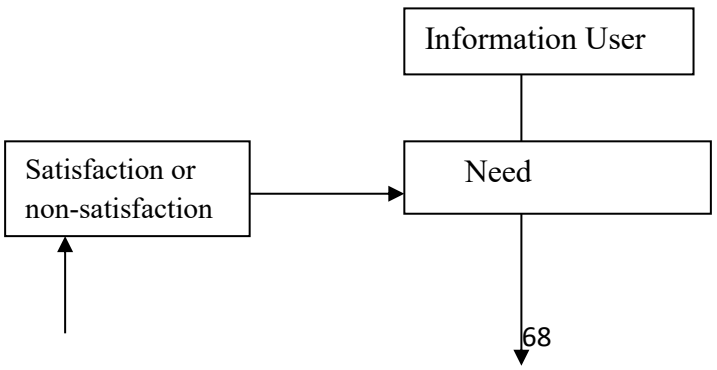
It can also be influenced by the sources of the information, content, medium and language of presentation, time and nature of information. Odini (1990) findings indicate that rural farmers often seek for information from friends/ relatives/neigbours and oral communication. In addition, Ofuoku (2008) found that sources of information for rural farmers include other farmers, farmers groups and extension agents (fadama workers). In the same vein, Okwu and Dauda (2011) reported that farmers seek for information through interpersonal communication channels,

relatives, friends, neigbours, extension agents, traditional rulers, billboard, posters and magazines. Wilson indicated the following assumption that include: Non-seekers: these are individual for whom information was either a problem, because of the difficulty of finding it, or disregarded, Lone-seekers: these are individual who subscribed to more journals, and regularly scanned for information outside their own subject fields, Unsettled, self-conscious seekers, who are either new to the organization or new to the problem area with which they were concerned - they used the library more heavily than any other group, Confident collectors who had abandoned regular information-gathering, but who kept personal files and used a variety of ways (including personal networks) to collect information.

For this study, it is important for agricultural information providers to have a good knowledge of the information seeking behaviour of farmers so as to be able to adequately meet their information needs. Extension worker and other information providers require a fuller understanding of the information seeking behaviour and information usage of farmers to be useful to them in that regard.

2.18.3 Wilson's (1981) Model of Information Behaviour

The aim of Wilson's 1981 model shown in figure 2.8 is to outline the various areas covered by what he proposed as 'information-seeking behaviour' as an alternative to 'information needs'. Wilson (1981) suggests that information-seeking behaviour arises due to the need perceived by an information user in different stages or sequences.



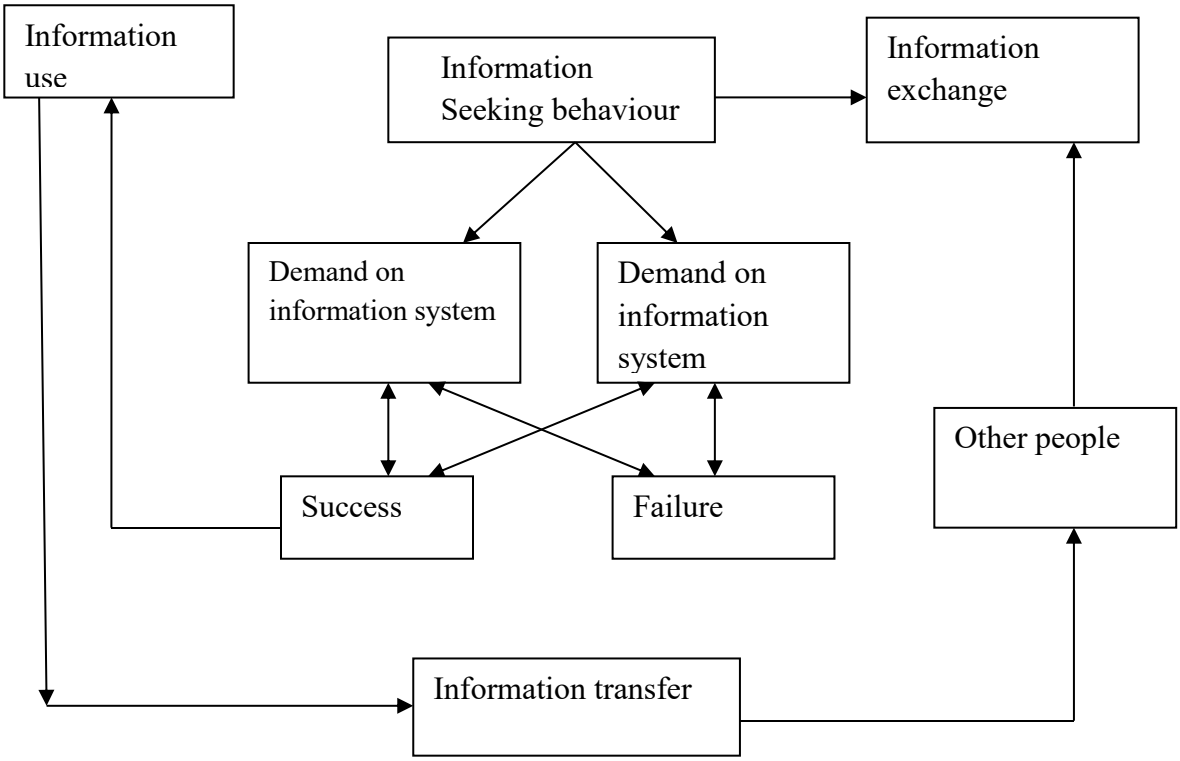


Figure 2.8: Wilson's information behaviour model: Wilson's (1981)

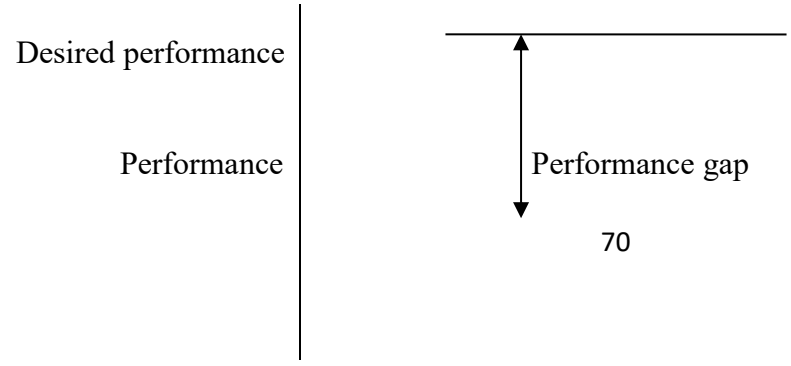
In order to satisfy that need, user makes demands upon formal or informal information sources or services. These demands for information result in success or failure to find relevant information. If the result becomes successful, the individual then makes use of the information found and may either fully or partially satisfy the perceived need or indeed.

The model also highlights that part of the information-seeking behaviour may involve other people through information exchange and that information perceived as useful may be passed to other people, as well as being used or instead of being used by the person himself or herself.

2.18.4 Kuhlthau's Information Seeking Process: Kuhlthau (1993) also identify stages of information search process to the associated feelings, thoughts and actions, and the appropriate

information tasks that clearly identify perspective as phenomenological, rather than simply cognitive. The stages of the model are: Initiation, Selection, Exploration, Formulation, Collection and Presentation. For example, the initiation of the process is said to be characterized by feelings of uncertainty, vague and general thoughts about the problem area, and is associated with seeking background information: the appropriate task at this point is simply to recognize a need for information. The remaining appropriate tasks are: Identify Investigate, Formulate, Gather, and Complete. The implication of these theories is that there is need for the understanding of how different organizational designs will influence the nature of information generation, transmission, absorption, and use. Therefore, understanding farmers' information needs helps in designing appropriate policies, programmes, and organizational innovations (Kuhlthau, 1993; Babu, Glendenning, Asenso-Okyere & Govindarajan, 2012 and Stiglitz, 2000).

2.19 Gap Analysis: Gap refers to the space between where we are (the present state) and where we want to be (the target state) or the point between where you are now and where you want to be is known as the gap (Moghnieh & Blat, 2009). A gap analysis may also be referred to as a needs analysis, needs assessment or need-gap analysis. Calculating the gap is known as gap analysis and can be demonstrated in the figure 2.9 below. Once a farmer has identified a performance gap, the first challenge in closing the gap is identify the causes behind the gap. This could be any number of reasons within the farmers' environment including (factors affecting information sources and type of information).



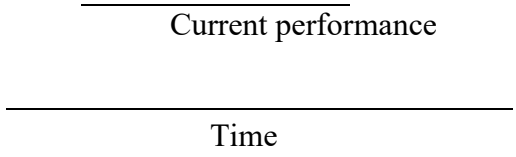


Figure 2.9 Performance Gap (Moghnieh & Blat, 2009).

Once an accurate cause or causes have been discovered the farmer can write an action plan with the help of the researcher and the extension workers. There are a number of remedial strategies available; the correct remedy will depend on the cause of the gap and the farmer resources and availability of information needs.

To perform the gap analysis, two independent teams work in parallel; one focuses on understanding the relation of the users and stakeholders with the platform, and draws a user model representing it; another team maps the current interface and produces a conceptual model representing its current conceptual architecture. Both models are then compared to study the gap between them, and propose an efficient design solution to remedy the interface with its users within the stakeholders' strategic perspective. The success of this method in tacking complex systems and reconciling them with users makes it a cheap, easy, and effective approach to facilitate the evolution of complex designs facing the evolving user requirements (Moghnieh & Blat, 2009).

2.20 Conceptual Framework of the Study

The conceptual framework of this study seeks to assess the relationship between the independent variables, which are the socio-economic characteristics of cocoa farmers, their information sources and preferences, their constraints to the sources of information and the dependent variable which are the information needs of farmers in cocoa production.

In conceptualizing the relationship that exists between dependent and independent variables listed above, this interaction is explained as follows in the framework shown in Figure 1.

The conceptual frameork has the components:

1) The Antecedents or background of the problem;
2) The independent variables;
3) The dependent variable; and
4) The intervening variables.

1) The antecedent or background characteristics: These are the prevailing situations that inform this research. It is the starting point which demostrates the current status of cocoa production in the study area. The variables such as decline in cocoa production output, poor quality of cocoa beans, poverty among cocoa farmers, poor transfer of information, inability to search for information among others formed the basis for this research.

2) Independent variables (which are the socio-economic characteristics of the farmers which include age, sex, years of formal educational, length of residence in city, membership of social groups, income among others), information sources and preferences, and information search behaviour are also part of the independent variables which interact to produce effect on the dependent variable (information needs). The continous interaction between the variables is seen by the direction of arrows in the framework.

3) Dependent variable: In this study, information needs in cocoa production and postharvest stages among cocoa farmers serves as the dependent variable for the study. The interaction of the independent variables will give a direction of the information needs

4) Intervening variables: These are variables which may likely influence the interaction of both the dependent and independent variables but much emphasis will not be placed on

their investigation in this study. Variables such as government policies on agriculture, climate change, political instability, cultural barriers etc formed the intervening variables and they are demostrated with the using of dotted arrow in the framework.

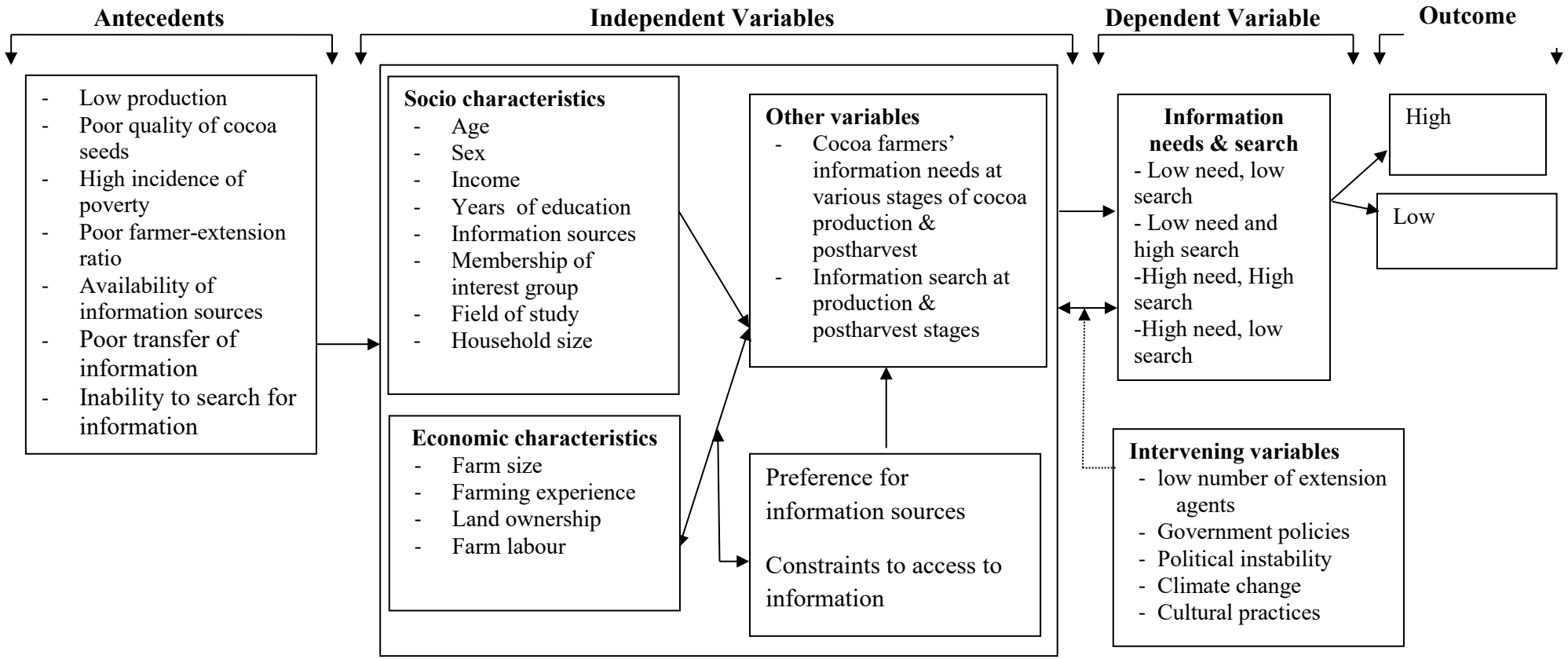
The various components of the conceptual framework as shown in Figure 10 are technically related.

In the conventional information flow from agricultural information generation (Research) to agricultural information dissemination (Extension) to agricultural information utilization (cocoa farmers), a number of variables or elements interact to produce the desired outcome. Farmers' access to agricultural information is influenced by many variables.

A two way communication process exits between agricultural information generation and agricultural utilization systems. As depicted in Figure 2.10, several actors constitute the agricultural information generation system, indicating that agricultural information available to the farmers, emanate from many sources. Farmers' extent of access to the agricultural information and their sources depends on farmers' socio-economic characteristics, extension organizations and media (channels), prevailing economic conditions as well as government policy.

The nature and form in which agricultural information is packaged may require some specialized skills by farmers to access such agricultural information.

The conceptual framework of this study is presented in Figure 10 below.



Legends

→ Arrow showing one-way relationship

↔ Arrow showing variables that interact with one another, producing effect on food security status

⋯→ This dotted line shows the intervening variables that are not investigated in the study.

Fig. 10: Conceptual Framework of the Study; Adapted and Modified from the Wilson's information behaviour model (1981)

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1. Area of Study/Scope

The study was conducted in Edo and Ondo States. The selection of the two States was due to their significant contribution to cocoa production in Nigeria and being part of major cocoa producing states in Nigeria. Cocoa is mostly grown in fourteen of the Thirty-six Nigerian States, the main producing states are Abia, Adamawa, AkwaIbom, Cross River, Delta, Edo, Ekiti, Kogi, Kwara, Ogun, Ondo, Osun, Oyo and Taraba (Oluyole and Sanusi, 2009).

Edo State

Edo State is composed of 18 Local government areas (LGAs). It is located between latitude 6^0 30^l North and longitude 6^0 08^l East of the equator, it is bounded in the west by Ondo State, in the north by Kogi State and in the south and east by Delta State. The State has a land area of 17,802 square kilometres with population of 3,218,332 (NPC, 2006). The predominant population of the State is made of different ethnic groups such as Ishan, Edo and Yoruba. The vegetation is mainly Rainforest while the people are mostly farmers who are engaged in cultivation of cash crops like cocoa, rubber, oil palm, cashew, cassava, rice, palm products, fruits, groundnuts, plantain, pineapple, yam, vegetables, tomatoes and maize. Cocoa is of economic value to the people of Edo state as it has served as a source of employment to the rural farmers and foreign exchange earner to Nigeria of its high international demand. The LGAs in the State are: Esan North-East, Esan Central, Esan West, Egor, Ikpoba Okha, Etsako Central, Igueben, Oredo, Ovia South-West, Ovia South-East, Orhionwon, Uhunmwonde, Etsako East and Esan South-East. The major cocoa producing areas of the state are Esan, Owan, Orhionmwon, Akoko-Edo, Ovia and Uhunmwode Local Government Areas.

Ondo State

Ondo State is located in the South-western part of the country and lies between latitude 5^{o} $15^{l}$and 8^{0} 15^{l}North and longitude 4^{0} $31^{l}$and 6^{0} 00^{l} East of the Greenwich Meridian of the Equator, It is bounded by Ekiti and Kogi States in the North; Edo State in the East; Ogun and Osun States in the West and the Atlantic Ocean in the South. The State has a population of 3,441,024 (NPC, 2006) and covers an area of 14,793sq.km at 120 kilometres North of the ocean. The State is made up of 18 local government areas. The tropical climate of the State is broadly of two seasons: rainy season (April-October) and dry season (November-March). Temperature throughout the year ranges between 21^{o}c to 29^{o}c and humidity is relatively high. The annual rainfall varies from 2,000mm in the Southern areas to 1,150mm in the Northern areas. The State enjoys luxuriant vegetation with high forest zone (rain forest) in the South and sub-savannah forest in the Northern fringe. Agriculture is the mainstay of the State and 65% of the State labour force is in agricultural sub-sector (Folayan, Oguntade and Ogundare, 2007). With a long coast line and several perennial rivers, the State has potentials for cocoa, oil palm, rubber, kola nut, citrus and cashew tree crops while valuable crops like rice, maize, cassava, sugar cane, yams, plantains, pineapple and vegetables such as tomato and pepper also thrive in the state. As regards cocoa production, Ondo State accounts for about 50% of Nigeria's annual cocoa production (Ajobo, 1980; Ajayi, Afolabi, Fayose, & Sunday, 2012). The State is made up of the following LGAs; Akoko North-East**,** Akoko North-West**,** Akoko South-East**,** Akoko South-West**,** Akure North**,** Akure South**,** EseOdo**,** Idanre**,** Ifedore**,** Igbara-oke**,** Ilaje**,** Ile Oluji/Okeigbo**,** Irele**,** Odigbo**,** Okitipupa**,** Ondo East**,** Ondo West and Owo. Out of these, fifteen Local Government Areas produce cocoa (Ojo, 2003).

The study covered both primary and secondary stages of cocoa production. That is, the cocoa farmers' activities from pre planting to post harvest stages of cocoa production chain.

3.2 Population for the Study

Population for the study is all cocoa farmers in Edo and Ondo States. The study covered registered cocoa farmers within the Ministry of Agriculture and Rural Development in collaboration with the Agricultural Development project (ADP), Cocoa Association of Nigeria (CAN) and Cocoa Research Institute of Nigeria (CRIN) in Ondo and Edo States, Nigeria. Also, cocoa dealers who owned cocoa farm and registered as cocoa farmers were part of the population as at the time of data collection between March-June, 2017. Nigeria makes up 5% of global cocoa production which is contributed by an estimated 300,000 cocoa farmers (Adelodun, 2017).

According to Adelodun (2017), and the list from the Ministry of Agriculture in Ondo State, there were about 13,000 registered cocoa farmers in Ondo State while about 1,235 cocoa farmers were registered according to the Edo State Ministry of Agriculture and Natural Resources as at 2012 in Edo State. The above number formed the population of the study.

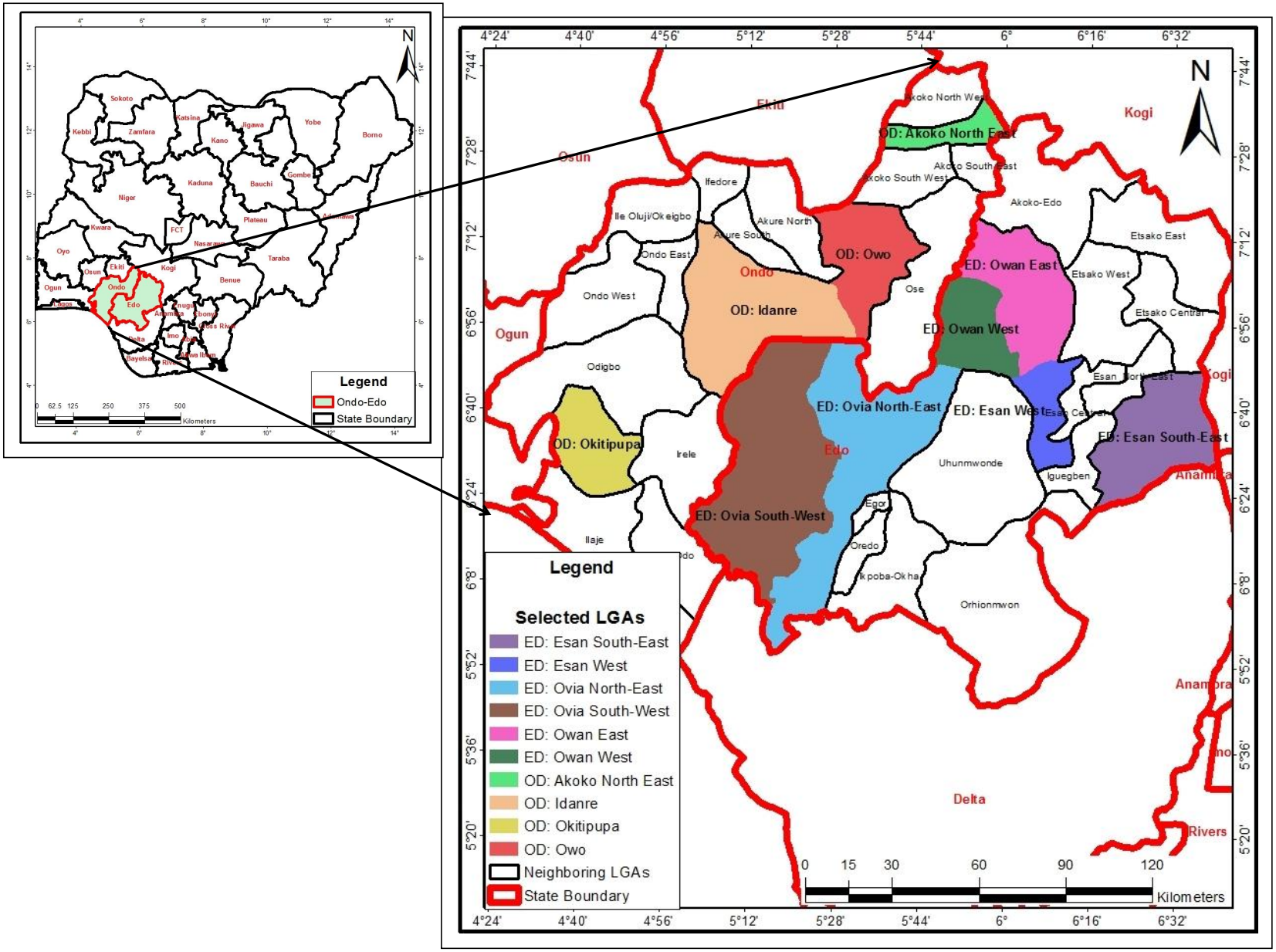


Figure 3.1: Map of Nigeria showing the Study Area (ED = Edo and OD = Ondo States

3.3 Sampling Procedure and Sample Size

Multi-stage sampling procedures were used in selecting respondents as indicated below.

Stage 1: The purposive sampling technique were used to select two (2) LGAs each from the three (3) agricultural zones in Edo state and one (1) LGA each from the four (4) zones in Ondo state. The purposive sampling technique is used in situations where an expert uses judgment in selecting cases with a specific purpose in mind (Adler, & Clark, 1999 and Neuman, 2003). The selections of the LGAs were based on the concentration of cocoa farmers and the intensity of cocoa farming in each of the States.

Stage 2: At the second stage, Yamane (1967) formula for calculating sample frame from a known population was used to compute the sampling frame for the study as given thus:

nf = $\frac{N}{1+N(e)^2}$ was used.

Where

nf = sample frame,

N = population size

e = level of precision (Confidence interval).

Therefore, at 95% Confidence Interval and probability of 0.05 for a population of 1,235 and 13,000 registered cocoa farmers in Edo and Ondo States, respectively gave 301 and 388 cocoa farmers respectively as the sample frame. Therefore, the third stage involved the use of simple random sampling of 216 cocoa farmers in each of the States for the purpose of comparison without bias. Thus, a total of 432 registered cocoa farmers were selected from the two States.

3.4 Data Sources

Data used for the study were generated from primary sources using questionnaire and interview schedule. Secondary source included reviewed literatures such as journals, past related empirical findings and other relevant materials.

3.5 Research Instrument

Two forms of instruments (questionnaire and scheduled interview) were used for data collection for this study. Section A of the questionnaire required the cocoa farmers' to supply the necessary bio-data and other information pertaining to their socio-economic characteristics. Section B, C, D and E of the questionnaire contained the core questions raised for the study. Each research question raised for the study had specific questions under it. Few selected farmers were interviewed to enable the researcher gather more information on their information needs, constraints, sources and search behaviour of the cocoa farmers in accessing production and agricultural postharvest information. The interview questions were structured in line with those of the questionnaire. The questionnaire were administered to literate farmers while interview schedule to illiterate farmers.

3.6 Validity and Reliability of Research Instruments.

A structured interview schedule was used to obtain necessary information relating to information needs of cocoa farmers and search behaviour. The instrument used was validated by Agricultural Extension experts in the Department of Agricultural Economics and Extension, University of Benin, Nigeria. The correction made on the instrument was incorporated before producing the final copies used for data collection. The instrument was pre- tested for validity and reliability in another cocoa producing state. Ogun State, a neighbouring state of the study area was chosen for the instrument validity and reliability. A Chronbach's Alpha Coefficient of 0.82 was obtained,

confirming the reliability of the instrument. This concurred with Osuala (2001) that a high correlation coefficient is an indication of high reliability of an instrument

3.7 Measurement of Variables

Sex: Male (coded 1), Female (coded 2). Measured as nominal values

Age in Years: coded as follows: 20-29 (coded 1); 30-39 (coded 2); 40-49 (coded 3); 50-59 (coded 4) 60-69 (coded 5) 70-79 (coded 6). Measured as interval values

Marital Status: Single (coded 1), Married (coded 2), Divorce (coded 3), Separated (coded 4), Widow/Widower (coded 5). Measured as ordinal value

Years of Formal Education: 1-6 (coded 1); 7-12 (coded 2); 13-18 (coded 3); 19-25 (coded 4) No formal education (coded 5). Measured as interval values

House Hold Size: 1-4 (coded 1); 5-9 (coded 2); 10-14 (coded 3); 15-19 (coded 4). Measured as ordinal values

Farming Experience (years): 01-09 (coded 1); 10-19 (coded 2); 20-29 (coded 3); 30-39 (coded 4); 40-49 (coded 5) 50-59 (coded 6). Measured as interval values

Sources of Farm Land: The farmers were required to indicate how they owned their cocoa farm: Direct ownership/self cultivated (coded 1); inherited farm/family cultivated (coded 2); Rent/Lease/Hired (coded 3); share cropping (coded 4).

Farm Size in Hectares: The farmers were required to indicate their farm size in hectares as follows: 1- 9 (coded 1); 10-19 (coded 2); 20-29 (coded 3); 30- 39 (coded 4).

Type of Farm Labour: the farmers were required to indicate the type of farm labour used in cultivating their farm land: Family (coded 1); Hired (coded 2); others (coded 3).

Type of Enterprise: cash crops (coded 1); arable crops (coded 2); fruits and vegetables (coded 3); mixed cropping (coded 4); livestock (coded 5); others (coded 6)

Estimated Income (N 000): N49,999 - N215,000 (coded 1); N216,000-N265,999 (coded 2); N266,000-N315,999 (coded 3); N316,000-N365,999 (coded 4); N366,000-N415,999 (coded 5); N416,000-N465,999 (coded 6); No response (coded 7). Measured as ration values

Membership of a Group: Members of co-operative society (coded 1); cocoa farmers' association (coded 2); young farmers club (coded 3); others: association of cocoa farmers (coded 4)

Frequency of Extension Agents Contact with Farmers: none (coded 1); weekly (coded 2); fortnightly (coded 3); monthly (coded 4); quarterly/3-6 months (coded 5)

Respondents' Preference for Cocoa Information Sources

Preference for cocoa information sources was measured in three-level Likert type scale as highly preferred scored three points, preferred scored two points and not preferred scored one point. A grand mean score of 2.0 was obtained through 1+2+3 =6/3 = 2.0. Preferred when the scores is greater than 2.0 and not preferred when the scores is less than 2.0.

A Likert scale measures the extent to which a person agrees or disagrees with the question. The most common scale is 1 to 5 (Bell, 2005).

Respondents' Information Needs and Search for Production and Postharvest Activities

Information needs for production and postharvest activities were measured in five-level Likert type scale of not needed scored one point, hardly needed scored two points, moderately needed scored three points, needed scored four points and highly needed scored five points. Information is needed when the score is greater than 3.0 and information is not needed when the score is less than 3.0.

Respondents' Information Search Behaviour: Information search for production and postharvest activities were measured in five-level Likert type scale as described in the

information needs above. Frequency of information search was measured on a five point likert scale type of never search scored one point; search yearly scored two points, searched monthly scored three points, searched weekly scored four points and searched daily scored five points. A grand mean score of 1+2+3+4+5 = 15/5 = 3.0 were used to make decision into high or low information search.

Respondents' Constraints Associated with their Access to Information

The respondents' constraints' to information needs were measured in five -level Likert type scale of undecided scored 1 point, not serious scored 2 points, fairly serious scored 3 points, serious scored 4 points and highly serious scored 5 points. The grand mean score of 3.0 were obtained through 1+2+3+4+5= 15/5= 3.0. These were used to make decision on the seriousness of the constraints as serious and not serious.

3.7.1 Conducting Needs Assessment and Analysis.

Modified Likert scales were used in order to obtain the respondent's attitude of search behaviour. In the analysis, mean scores of needs and search of respondents were calculated to establish critical levels on the X and Y axes of the graph. A model (Hershkowitz, 1973) consisting of four quadrants labeled 1st, 2nd, 3rd and 4th were created, including: High level of need, Low level of search (HN, LS) as the 1st, High level of need, High level of search (HN, HS) as the 2nd, Low level of need, High level of search (LN, HS) as the 3rd and Lower level of need, Low level of search (LN, LS) as the 4th. The quadrants were divided based on the grand mean of needs and the grand mean of search items (Witkin & Altschuld, 1995 and Martilla & James, 1977)

Step 1 Data were collected using Likert-type scale of five scale points for farmers' needs and farmers' search behaviour. The farmers' level of needs were; highly needed (5), needed (4), moderately needed (3), hardly needed (2) and not needed (1) while search behavior were; daily

(score 4), weekly (score 3), monthly (score 2), yearly (score 1) and never search for information (score 0)

Step 2 The score for each respondent were calculated for both level of needs and for level of search. For example, there were 8 variables under the production information needs. A maximum obtainable score of 8x5 = 40 points and a minimum of 1x8 = 8 points were obtained for any cocoa farmer who responded to highly needed and not needed, respectively.

Step 3 The means for level of needs and level of search were calculated. Then, the grand mean (mean of the means) for level of needs and level of search were also calculated. The scores obtained were used to calculate the mean and the grand mean scores.

Step 4 The discrepancy scores were calculated by deducting the means for level of needs from that of level of search for each of the variables that were used to operationalized information needs and search behaviour of farmers.

Step 5 The weighted score is calculated by multiplying the discrepancy ratio with the means on level of needs because information needs were the critical variable of interest for this study..

Step 6 The weighted scores were ranked in a descending order (highest = 1)

Step 7 The ranks were used to prepare the matrix in a quadrangular form

Step 8 The mean that is greater than the grand mean = High while the mean that is Lower than the grand mean =Low

Therefore, each mean is compared with the grand mean to arrive at:

High level of need, Low level of search (HN, LS), High level of need, High level of search (HN, HS), Low level of need, High level of search (LN, HS) and Lower level of need, Low level of search (LN, LS).

In summary therefore, the farmers' area of need was classified as follows: Category one: High need, Low search (HN, LS), information Needed, Category two: High need High search (HN, HS) information Highly needed, Category three: Low need High search (LN, HS) information Moderately needed and Category four: Low need Low search (LN, LS), information Not needed.

3.8 Data Analysis Technique

Descriptive statistics such as frequency counts, percentages, means and standard deviation were used to summarize and describe the data for objectives 1 to 5 for easier understanding. Inferential statistics like binary logistic regression analysis and Pearson product moment correlation PPMC were used to examine the relationships between the independent and dependent variables of the study and make deductions.

3.9 Model Specification

3.9.1 Binary Logistic Regression: It is used to examine the relationship between one or more independent variables on a single dependent variable. Binary logistic regression estimates the odds (likelihood) of any event occurring.

The relationship between socio-economic characteristics of respondents and their cocoa information needs and the respondents' information sources preferences and their cocoa information needs were examined using binary logit regression. The logit model (binary logistic regression analysis) were used to examine the relationship between the dependent variable (information needs) and the independent variables such as age, house hold size, years in school, farming experience, estimated income, size of farm land, sex, marital status, sources of farm land, membership of a group, type of farm enterprises and extension agents contact.

The binary logistic regression is given as:

$Pr(Y=1/X_i) = Ln\ [\frac{yi}{1-y1}] = a + \beta_i X_i + ... + \beta_n X_n + U..... (1)$

Where:
Ln = Natural Log

$Pr(Y=1/X_i)$ = Probability of Y occurring, giving that $X_i - X_n$ have occurred.

a = the coefficient of the constant term

$\beta_i - \beta_n$ = The coefficient of the independent variable

X_n- X_n= The independent variable
U Error term
The mathematical expression of the model is explicitly specified as:

$$Y_i = b_a+\beta_1X_1+\beta_2X_2+\beta_3X_3 +\beta_4X_4 +\beta_5 X_5 +\beta_6 X_6 +\beta_7 X_7 +\beta_8 X_8 +\beta_9 X_9 +\beta_{10} X_{10}+\beta_{11} X_{11}+\beta_{12} X_{12}+\beta_{13} X_{13} +\beta_{14}X_{14} + U\text{……..(2)}$$

$$Y = \alpha +\beta_1X_1+\beta_2X_2+\beta_3X_3 +\beta_4X_4 +\beta_5 X_5 +\beta_6 X_6 +\beta_7 X_7 +\beta_8 X_8 +\beta_9 X_9 +\beta_{10} X_{10}+\beta_{11} X_{11}+\beta_{12} X_{12}+\beta_{13} X_{13} +\beta_{14}X_{14} + U\text{……..(2)}$$

Where:

Y_i = Information needs (Production and Postharvest) the dependent variable

Where the independent variables are:

X_1 = Age (in years)

X_2 = Household size (in number)

X_3 = Level of education (years informal education) (Educated=1; otherwise= 0)

X_4 = Farming Experience (in years)

X_5 = Estimate Income (₦)

X_6 = Size of farm land (No of hectares cultivated)

X_7 = Sex (male 1 female 0)

X_8 = Marital status (Married=1, otherwise= 0)

X_9 = Sources of farmland (direct ownership =1, otherwise= 0)

X_{10} = Membership of Co-operative (member = 1, otherwise= 0)

X_{11} = Type of farm enterprises (cash crop =1, otherwise= 0)

X_{12} = Extension agents contact (contact = 1, otherwise= 0)

μ = Error term

3.9.2 Pearson Product Moment Correlation PPMC: it will be used to examine the relationship between information need and some selected socio-economic characteristics such as farmers' age, farming experience, house hold size.

The association between respondents search behaviour and their cocoa information needs were examined using PPMC.

The Pearson Product Moment Correlation PPMC model is stated thus:

$$\partial xYc = \frac{n\sum XY - \sum X \sum Y}{\sqrt{n\sum X^2 - (\sum X)^2}\sqrt{n\sum Y^2 - (\sum Y)^2}}$$

Where: ∂ = Correlation coefficient;

Yc = Potential imparts;

X = Determinants of cocoa production and postharvest information needs and information search

N = Number of observations

Pearson's product moment correlation analysis was used to test the relationship between cocoa production and postharvest information needs and socio-economic characteristics such as farmers' age, farming experience and house hold size.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1: Introduction

This chapter focuses on the data analysis, interpretation and discussion with a view to making inferences for policy formulations. About 450 copies of questionnaire were taken to the field. However, the target copies of 432 were found analysable as given in Table 4.1. Thus, the response rate of 96.0% was obtained. Results of analysis were presented on objective basis as follows:

Table 4.1: Response Rate Analysis

State	No of questionnaire taken to the field	Target obtained	Response rate
Ondo	225	216	96.0%
Edo	225	216	96.0%
Total	450	432	96.0%

Source: Response rate analysis, 2017.

4.2: Socio Characteristics of Respondents

The socio-economic characteristics of the respondents examined included age, household size, marital status, years of formal education, farming experience, type of farm labour, membership of social group, sources of farmland, types of enterprise, extension agents contact with farmers, farm size and income level are shown in Table 4.2.

4.2.1 Age

Table 4.2 showed that more than half of the respondents (55.6%) were within the age bracket of 40-59 years. Those within the age bracket of 60-79 years were only 29.8% with a mean age 52 years. At the state level, the mean age of farmers in Edo and Ondo States, respectively were 50 and 55 years. This implies that cocoa farmers in the study area were relatively young and they were within the economically active age as previously reported by Uwagboe (2010) that cocoa farmers mean age in Nigeria is 50 years. The results revealed that although, cocoa farmers in Edo State were slightly younger than their counterparts in Ondo. The younger age of farmers in Edo might not be unconnected to the fact that Ondo state is known as cocoa producing State in Nigeria for a long time compared to Edo State that comes into limelight probably as a result of its proximity to Ondo State. This implies that farmers in Edo State were younger and active than those farmers in Ondo State while farmers in Ondo are more experience in farming than those from Edo state but would tend to be slow in accepting new information. Adeogun *et al.,* (2010) had opined that, the younger farmers would most likely be willing to spend more time to obtain information compared to the old farmers. Also, the respondents were within the age as defined by FAO (1992) to be economically productive in population (16-64 years) and such group is most likely active in farming and tends to develop more interest in sourcing for agricultural information through the available sources of information.

Table 4.2 Distribution of Respondents Socio-Economic Characteristics (N = 432)

Variable	Edo		Ondo		Pooled	
	Freq	%	Freq	%	Freq	%
Age						
20 – 29	3	1.4	4	1.9	6	1.4
30 – 39	48	22.2	9	4.2	57	13.2
40 – 49	61	28.2	46	21.3	107	24.8
50 – 59	52	24.1	81	37.5	133	30.8
60 – 69	41	19	64	29.6	105	24.3
70 – 79	11	5.1	12	5.6	21	5.5
Mean	**50.0**		**55.0**		**52.0**	
Std. Dev	**12.0**		**10.0**		**11.0**	
Sex						
Male	150	69.4	154	71.3	304	70.4
Female	66	30.6	62	28.7	128	29.6
Marital Status						
Single	23	10.6	2	0.9	25	5.8
Married	162	75	185	85.6	347	80.3
Divorced	8	3.7	7	3.2	15	3.5
Separated	8	3.7	4	1.9	12	2.8
Widow/widower	15	6.9	18	8.3	33	7.7
Household size						
1.0– 4.0	47	21.8	21	9.7	68	15.7
5.0- 9.0	145	67.1	186	86.1	331	76.6
10 – 14	22	10.2	7	3.2	29	6.7
15 – 19	2	1	2	0.9	4	0.9
Mean	**7.0**		**7.0**		**7.0**	
Std. Dev	**2.6**		**4.7**		**3.8**	
Years of formal education						
1.0 – 7.0	58	26.9	81	37.5	139	32.2
7.0 – 12	85	39.4	68	31.5	153	35.4
13 – 18	72	33.3	51	23.6	123	28.5
19 – 24	1	0.5	2	0.9	3	0.7
No response			14	6.5	14	3.2
Mean	**10.8**		**9.55**		**10.20**	
Std. Dev	**4.676**		**5.557**		**5.15**	

Source: Computed from Field data, 2017.

4.2.2: Sex

Table 4.2 showed that majority of the respondents (70.4%) across the states were males. Highest proportion of male cocoa farmers was recorded in Ondo State (71.3%) and followed by Edo State (69.4%). This implies that cocoa farming is dominated by male farmers. This is expected as women were more involved as helpers or supplier of labour in light farm operations such as planting, weeding, harvesting, processing and marketing. This agreed with the finding of Oluyole & Sanusi (2009) who, in their study revealed that ninety-two per cent of cocoa farmers were male and that, they were usually involved in farming as helpers or suppliers of labour in light farm operations. The higher percentage of male farmers in Ondo State implies that more farm land are put into cocoa production since the cultivation of the cocoa is gender sensitive as a result of tedious operations such as bush clearing, chemical application, pruning and harvesting of pod.

4.2.3 Marital Status

Table 4.2 showed that that majority (80.3%) were married, (7.7%) widowed/widower, (5.5 %) single, (3.5%) divorced and (2.8%) separated farmers. At the state level, 75%, and 85.6% of the respondents were married in Edo and Ondo State respectively. This implies that the high proportion of married respondents in Ondo State shows that more members of farm family were likely to be available for cocoa production in the State. Also, marital status is strongly associated with responsibilities as reported by Nmadu *et al.* (2014).

4.2.4 Household Size

Data in Table 4.2 showed that 76.6% of the respondents had household size of 5 - 9 persons in the sampled States. The respondents' household size mean were seven persons while the mean household size for Edo and Ondo States was seven persons respectively. However, the average house hold size for Edo and Ondo States were between four to ten persons and three to thirteen

persons respectively. This implies that the relatively large household sizes in Ondo State might probably be utilized as a source of family labour and also the farm families might become additional channels to source information on cocoa farming.

4.2.5 Years of Formal Education

Table 4.2 showed that majority (64.6%) of the respondents had between 7 and 24 years of formal education and 32.2% had less than 7 years. This implies that farmers with primary, secondary and post-secondary education represented 64.6% of the total farmers sampled. The mean year of education was 10 years. This revealed that cumulative proportion of the farmers were literate, could read, write and therefore, exploit various sources of information to enhance cocoa production. At the State level, 72.8% and 56% of the respondents had between 7 and 24 years of formal education while 26.9% and 37.5% had less than 7 years for Edo and Ondo State respectively. The mean years of education were between 3 to 31years and 16-37 years for Edo and Ondo State respectively. This implies that Ondo State had more years of formal education than Edo State. The implication is that Ondo State farmers were typically assumed to be better and willing to process information and search for appropriate technologies to alleviate their production constraints. The belief is that education gives farmers the ability to perceive, interpret and respond to new information much faster than their counterparts without education. This agreed with the findings of Katungi (2006) in his study that more educated farmers had more access to agricultural information.

4.2.6 Farming Experience

Table 4.2 showed that farming experience mean age were 22 years. Most (29.9%) of the respondents had farming experience between 20 to 29 years, 25.7% had farming experience of between 10 to 19 years, 16.9% had farming experience of between one to nine years, 13% had

farming experience of between 30 to 39 years while 11% had farming experience of between 40 to 49 years and 4.6% had farming experience of between 50 to 59 years. At the state level, most respondents in Edo State 35.6% had farming experience of between 10 to 19 years and in Ondo State 45.8% had farming experience of between 20 to 29 years. The mean farming experience was between 3 to 31years and 16-38 years for Edo and Ondo State respectively. This implies that Ondo State had more farming experience than Edo State. The implication is that, the relatively long years of experience in Ondo State, might probably expose the cocoa farmers, in terms of experience, in cocoa production and related information. This agreed with the findings of Agwu and Adeniran (2009), that farming experience has positive significant relationships with the use of various information sources. Also, it agreed with Uwagboe (2010), that most cocoa farmers in Nigeria have more than 20 years of farming experience.

4.2.7: Membership of Interest Group

Table 4.2 showed that most (57.9%) of the respondents were members of cooperative societies, closely followed by 35.6% cocoa farmers' association while very few (2.1%) belonged to young farmers' club. Membership of a group at state level shows that Edo State had most (45.8%) of their farmers to be members of cocoa farmers' association which is closely followed by cooperative societies (48.1%) and young farmers' club (6%) while Ondo State had most of their farmers (67.6%) as members of cooperative societies which is closely followed by members of cocoa farmers' association (25.5%) and young farmers' club (9%). The result reveals that cooperative society and cocoa farmers' association was the prominent interest group of cocoa farmers in Ondo and Edo State respectively. This implies that efforts have to be made by important stakeholders in cocoa production to encourage formation of farmers' organizations in the cocoa producing states of Nigeria.

Table 4.2b Distribution of Respondents Socio-economic Characteristics cont'd (N = 432)

Variable	Edo		Ondo		Pooled	
	Freq	%	Freq	%	Freq	%
Farming experience (years)						
1.0 – 9.0	72	33.3	3	1.4	73	16.9
10 – 19	77	35.6	34	15.7	111	25.7
20 – 29	30	13.9	99	45.8	129	29.9
30 – 39	8	3.7	46	21.3	56	13
40 – 49	17	7.9	26	12	48	11.2
50 – 59	12	5.6	8	3.7	20	4.6
Mean	**18.0**		**27.0**		**22.0**	
Std. Dev	**13.79**		**10.47**		**13.13**	
Membership of a Group						
Co-operative society	104	48.1	146	67.6	250	57.9
Cocoa farmers association	99	45.8	55	25.5	154	35.6
Young farmers club	13	6	2	0.9	9	2.1
Others: Assoc. of cocoa farmers	-	-	13	6	19	4.4
Estimated income (₦)						
49999 - 216000	76	35.2	13	6	89	20.6
216000 – 265999	8	3.7			8	1.9
266000 – 315999	10	4.6	25	11.6	35	8.1
316000 – 365999	5	2.3	11	5.1	16	3.7
366000 – 415999	6	2.8			6	1.4
416000 - 465999	111	51.4	167	77.3	278	64.4
No response			27	6.3	27	6.3
Mean	**1222647**		**811807.1**		**1022806.2**	
Std. Dev	**1909928**		**981770.0**		**542384.6**	

Source: Computed from Field data, 2017.

According to Yahaya and Omokhaye (2001), the social participation of cocoa farmers through their involvement in farmers' co-operatives will enhance diffusion of information among the farmers. Similarly, Abel, Ali and Johanna (2015) also observed that membership of associations' are useful to farmers in the areas of information dissemination, timely supply of input and pest and disease control measures among others.

4.2.8: Estimated Income (₦)

Table 4.2 showed that majority (64.4%) of the respondents earned an estimated yearly income of between ₦416000 - ₦465999 at the aggregate level. The aggregate yearly mean income was ₦1022806.00. At the state level, Edo State estimated yearly income for most farmers (51.4%) was between ₦416000 - ₦465999 which was lower than that of Ondo State (77.3%) of between ₦416000 - ₦465999. The income earns by a farmer can have influence on the access and use of information sources. This means that farmer with higher income would tend to access more information from different sources. This collaborate the findings of Swanson (1997), that income influence farmer's preferences for sources of information.

4.3 Group-economic Characteristics of Respondents

4.3.1 Sources of Farmland

Table 4.3 showed that Half (50.9%) of the cocoa farmers' sources of farmland were through direct ownership, 33.3% inherited farmland, 14.4% had rented farmland and 1.4% had share cropping. At the state level, most of the cocoa farmers' in Edo State sources of farmland were direct ownership (42.3%) closely followed by inherited farmland (35.6%), rented farmland (20.8%) and share cropping (1.4%) while most farmers in Ondo State sources of farmland were through direct ownership (60.2%) closely followed by inherited farmland (31%), rented farmland (7.9%) and share cropping (0.9%). The findings revealed that most of the farmers in Ondo State

(60.2%) sources of farm land were through direct ownership as compared to Edo State of 42.3% direct ownership. This could increase the size of individual farm holdings in Ondo State. The size of cocoa farm holdings could determine the type of information needs, sources and search for information. The finding collaborate the study of Oluyole and Sanusi (2010) that a large farm size requires appropriate and adequate information in areas of cocoa production to maximize profits.

4.3.2: Farm Size (Hectares)

Table 4.3 showed that majority (74.3%) of the respondents cultivated farm lands of between one to nine hectares while 18.5% cultivated 10 – 19 hectares. A small proportion of 3.2% cultivated farm lands of between 20 to 29 hectares. At the state level, most of the cocoa farmers in Edo (61.1%) and Ondo (87.5%) cultivate farm lands of one to nine hectares. This implies that Ondo farmers were likely to cultivate more hectares of land on the bases of percentage distribution. The results showed that the mean farm size of cocoa farmers were eight hectares. The findings were that cocoa farmers in the study area were smallholders. The implications drawn were based on the criteria set by Olayide and Ogunfiditimi (1980) and Oluyole and Sanusi (2009) that all farmers who operate on land less than 10 hectares were small-scale farmers. The mean farm size for Edo and Ondo State were 10 and 6 hectares respectively.

4.3.3: Type of Farm Labour

Table 4.3 showed that majority (61.3%) of the respondents' source of farm labour were hired labour, closely followed by exchange or casual farm labour (26.1%) and family labour (12.2%). At the State level, majority of farm labour in cocoa production in Edo State were hired labour (79.6%), closely followed by family labour (18.5%) while most of farm labour in Ondo State were either exchange or casual labour (48.6%) which were closely followed by hired labour

(43.1%) and family laboure (8.4%). The decrease in family labour is not unconnected to the urban migration of farmers' children and able youth in search for better living conditions due to lack of basic amenities in the rural communities (Torimiro, Ayinde and Koledoye, 2014). Hired labour is prominent among the farmers during peak period of weeding and harvesting. The finding is in line with Kassim and Alfred (2012) who noted that hired labour contributes 88% of the total labour use on farms thus emphasizing its importance in agricultural activities.

4.3.4: Type of Enterprise

Table 4.3 showed that most (47.2%) of the respondents engaged in cash crops production while 28.7% engaged in mixed cropping with cocoa production. Only 8.1% and 6.9% cultivated arable crops and fruits, respectively in addition to cocoa production. At the state level, Edo (47.7%) and Ondo State 46.8% respondents had their farmers engaged more in cash crops production than 29.6% and 27.8% of mixed cropping with cocoa production in Edo and Ondo State respectively. The findings revealed that cocoa farmers in the study areas cultivated more of cash crops like kola nuts, coconut, plantain and banana in addition to their primary crop (cocoa) which provide shade for the cocoa plant during early stage of growth and also act as additional sources of income generation for the farmers before maturity of cocoa. Therefore, the higher the income the more request for cocoa production information and farmers search for information. The study agreed with the study of Bernard, (2011) that multiple cropping is good for biodiversity conservation and income generation for farmers, therefore, cocoa farmers should grow tree crops on their farms. Intercropping several tree crops is not only possible, but profitable.

4.3.5 Extension Agents Contact with Farmers

Table 4.3 showed that majority (71.3%) of the respondents had contact forthrightly with the extension agents, 13.2% had contact monthly, 10.9% had contact weekly, 1.2% had contact three

to six months with the agents and 3.5% of the cocoa farmers had no contact with the agents. At the State level, Edo and Ondo State respondents had most of their contact with extension agents weekly (65.7%) and forthrightly (76.9%) respectively. From the findings it can be deduced that there were relatively high level of farmers contact with extensions agents in the study area. This implied that majority 96.5% of the farmers were reached with adequate information from the extension agents. Frequency of contact may probably increase the knowledge of farmers on farm technologies and information needs. The implication of this finding is that farmers were exposed to information needs through extension agents. This is not in agreement with Williams, Fenley and Williams, (1984) who found that in Nigeria there are many farmers that are not reached by extension agents and are therefore not exposed to new technology in agriculture.

Table 4.3 Distribution of Respondents Group-Economic Characteristics (N = 432)

Variable	Edo		Ondo		Pooled	
	Freq	%	Freq	%	Freq	%
Source of farmland						
Direct ownership	91	42.3	130	60.2	220	50.9
Inherited farm	77	35.6	67	31	144	33.3
Rent	45	20.8	17	7.9	62	14.4
Share cropping	3	1.4	2	0.9	6	1.4
Farm size (Hectares)						
1.0 – 9.0	132	61.1	189	87.5	321	74.3
10 – 19	57	26.4	23	10.6	80	18.5
20 – 29	14	6.5	4	1.9	14	3.2
30 – 39	13	6			14	3.2
No response					3	0.7
Mean	**9.7**		**5.77**		**7.7**	
Std. Dev	**2.049**		**3.864**		**3.0**	
Type of farm labour						
Family labour	40	18.5	18	8.4	54	12.5
Hired labour	172	79.6	93	43.1	265	61.3
Others: exchange or casual labour	4	1.9	105	48.6	113	26.1
Type of enterprise						
Cash crops	103	47.7	101	46.8	204	47.2
Arable crops	18	8.3	17	7.9	35	8.1
Fruits and vegetables	13	6	17	7.9	30	6.9
Mixed cropping	64	29.6	60	27.8	124	28.7
Livestock	13	6	21	9.7	34	7.9
Others: livestock	5	2.3			5	1.2
Extension agents' contact						
None	14	6.5	1	0.5	15	3.5
Weekly	47	21.8	166	76.9	47	10.9
Forthnightly	142	65.7	45	20.8	308	71.3
Monthly	12	5.6	4	1.9	57	13.2
3-6 months	1	0.5			5	1.2

Source: Computed from Field data, 2017.

4.4: Cocoa Information Sources and Preferences by Farmers

The significance of information to farming enterprise had been emphasized by Dankwah and Hawa (2014). According to Dankwah and Hawa, an improved information and knowledge flow to, from and within the agricultural sector are important factor in improving small-scale agricultural production and linking increased production to remunerative markets, thus leading to improved rural livelihoods, food security and national economies.

This study revealed that at the state level, Input dealers/suppliers ($\overline{X}$ =2.76±0.46), mobile Phone ($\overline{X}$ =2.64±0.71), extension agents ($\overline{X}$ =2.63±0.55) and face to face advise by other farmers ($\overline{X}$ =2.87±0.43) were perceived to be the most preferred information sources in Edo State while the least preferred sources of information were library ($\overline{X}$ =2.25±0.83), cable network ($\overline{X}$ =1.11±0.84), text books ($\overline{X}$ =2.38±0.79) and town crier ($\overline{X}$ =2.57±0.78). The most preferred sources of information by Ondo State farmers were input dealers/suppliers ($\overline{X}$ =2.94±0.31), television ($\overline{X}$ =2.92±0.29), extension agents ($\overline{X}$ =2.85±0.45) and face to face advise by other farmers ($\overline{X}$ =2.87±0.47) while the least preferred information sources were agricultural institutes ($\overline{X}$ =2.44±0.87), cable network ($\overline{X}$ =1.26±0.61), text books ($\overline{X}$ =2.16±0.94) and town crier ($\overline{X}$ =2.68±0.67) as in Table, 4.4. This finding agree with the studies of Adhiguru, Birthaland Ganesh (2009) which revealed that other progressive farmers and input dealers were the main sources of information due to convenient access to those sources and higher cost of information acquisition from other sources.

Table 4.4: Cocoa Farmers' Information Sources and their Preferences

Sources of information	Edo			Ondo			Pooled		
	Preference scores								
	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank
Institutional bodies									
Input dealers/suppliers	2.79	0.46	1st	2.94	0.31	1st	2.86	0.40	1st
Extension agents	2.71	0.50	3rd	2.92	0.32	2nd	2.82	0.43	2nd
Farmers' union	2.76	0.49	2nd	2.75	0.63	5th	2.75	0.56	3rd
Other Govt. project	2.58	0.71	4th	2.85	0.47	4th	2.72	0.62	4th
Other NGOs	2.39	0.86	6th	2.89	0.42	3rd	2.64	0.72	5th
Agric. Institutes	2.52	0.70	5th	2.44	0.87	7th	2.48	0.79	6th
Library	2.25	0.83	7th	1.64	0.89	6th	1.95	0.91	7th
Mass media electronic									
Television	2.59	0.70	2nd	2.92	0.29	1st	2.76	0.56	1st
Mobile cell phone	2.64	0.71	1st	2.65	0.73	2nd	2.65	0.72	2nd
Radio	2.29	0.86	3rd	1.33	0.69	4th	1.81	0.91	3rd
Internet	2.23	0.83	4th	1.38	0.73	3rd	1.80	0.89	4th
Film/slide show	2.18	0.86	5th	1.28	0.65	5th	1.73	0.88	5th
Cable network	2.11	0.84	6th	1.26	0.61	6th	1.69	0.85	6th
Print sources									
Extension posters	2.75	0.55	1st	2.85	0.45	1st	2.80	0.50	1st
Extension manuals	2.63	0.62	3rd	2.76	0.57	2nd	2.69	0.60	2nd
Newspapers	2.52	0.74	4th	2.45	0.84	3rd	2.48	0.79	3rd
Bulletins/newsletter	2.66	0.64	2nd	2.20	0.93	4th	2.43	0.83	4th
Text books	2.38	0.79	5th	2.16	0.94	5th	2.27	0.87	5th
Traditional Sources									
Face to face advise by other farmers	2.87	0.43	1st	2.87	0.47	1st	2.87	0.45	1st
Cocoa buyers	2.83	0.44	2nd	2.86	0.48	2nd	2.84	0.46	2nd
Family members	2.81	0.43	3rd	2.77	0.57	3rd	2.79	0.51	3rd

Town crier	2.57	0.72	4th	2.68	0.67	4th	2.63	0.70	4th

Source: Computed from Field data, 2017

4.5: Production Information Needs by the Respondents

Production information needs and search for production information among cocoa farmers were analysed and result are presented in Table 4.5.

Data in Table 4.5 showed that farmers in Edo State ranked farm layout, land preparation, seed selection and planting materials, weed control, transplanting of seedling, dry season planting, cultivation system and weed control in plantation establishment and planting companion crops, shade nursery and water regularly as high information needs in a descending other. However, variables with grand mean of 2.82; general farm operations, 2.4; pre-nursery operations, 2.88; main nursery operations and 2.96; plantation establishment and above represent farmers highly needed and needed information while less than represent not needed information. While in Ondo State, cocoa farmers ranked pests and diseases control, pruning, weather information, agricultural credits, transplanting of seedlings, spacing, fire tracing, land preparation and cultivation system were ranked high. The least ranked in order of needs in Edo State were coppicing for regeneration, weather information, sowing rootstock, processing of rootstock and selection of rootstock seeds, budding, applying cocoa boost, hand pollination, field burning, agricultural credit and soil analysis. While, Ondo State cocoa farmers ranked processing of rootstock, water regularly, fertilizer application, applying cocoa boost and arrangement of poly pots and mulching with dry grass, coppicing for regeneration, sowing rootstock, and budding were the least information needs. However, variables with grand mean of 2.7; general farm operations, 2.16; pre-nursery operations, 2.20; main nursery operations and 2.88; plantation establishment and above represent farmers highly needed and needed information while less than represent not needed information. The study therefore, showed that there are many areas of

cocoa production where farmers needed more information to be high. However, their need for more information was very low especially in modern cocoa production practices. This finding conforms to the study of Ogungbeni, Ogungbo and Adeleke (2013) observed that farmers in Lagos State recorded low information needs especially in modern farming techniques. This may therefore, be applicable to farmers in the study area as there have been declined interests in cocoa production in Nigeria for many years (Folayan, Daramola, and Oguntade, 2006).

Table 4.5: Production Information Needs by the Respondents

Variable	Edo Need level			Ondo Need level			Pooled Need level	
	Mean	Rank	Remark	Mean	Rank	Remark	Mean	Rank
General farm operations								
Farm layout	3.60	1st	Highly needed	2.65	6th	N/N	3.13	1st
Seed selection & planting	3.24	2nd	H/N	2.83	4th	H/N	3.03	2nd
Cultivation system	3.08	3rd	H/N	2.84	3rd	H/N	2.96	3rd
Plant companion crops	3.05	4th	H/N	2.72	5th	Needed	2.88	4th
Weather information	2.69	5th	Not needed	3.08	1st	Highly needed	2.88	4th
Agricu1ltural credit	2.46	7th	N/N	3.04	2nd	H/N	2.75	6th
Field burning	2.49	6th	N/N	2.50	7th	N/N	2.50	7th
Soil analysis	2.27	8th	N/N	1.94	8th	N/N	2.11	8th
Grand mean	**2.86**			**2.7**			**2.78**	
Pre-nursery operations								
Shade nursery	3.05	2nd	H/N	2.30	1st	Highly needed	2.67	1st
Fill poly pots	3.04	4th	H/N	2.28	2nd	H/N	2.66	2nd
Dry season planting	3.09	1st	Highly needed	2.19	6th	Needed	2.64	3rd
Water regularly	3.05	2nd	H/N	2.15	8th	N/N	2.60	4th
Pests and diseases control	3.00	5th	H/N	2.21	5th	H/N	2.60	4th
Hand weeding control	2.86	9th	H/N	2.24	3rd	H/N	2.55	6th
Arrangement of poly pot	3.00	5th	H/N	2.05	9th	N/N	2.53	7th
Mulching with dry grass	3.00	5th	H/N	2.05	9th	Not needed	2.53	7th
Apply fertilizer	2.98	8th	H/N	2.05	9th	N/N	2.51	9th
Selection of rootstock seeds	2.59	11th	Needed	2.24	3rd	H/N	2.42	10th
Processing of rootstock seeds	2.59	11th	Needed	2.18	7th	Needed	2.38	11th
Sowing of rootstock	2.61	10th	Needed	2.02	12th	Not needed	2.31	12th
Grand mean	**2.4**			**2.16**			**2.53**	

Source: Computed from Field data, 2017. H/N=Highly Needed, N=Needed, N/N= Not Needed

Table 4.5b: Production Information Needs by the Respondents Cont'd

Variable	Edo Need level			Ondo Need level			Pooled Need level	
	Mean	Rank	Remark	Mean	Rank	Remark	Mean	Rank
Main nursery operations								
Land preparation	3.25	1st	Highly Needed	2.36	1st	Highly Needed	2.81	1st
Weed control	3.20	2nd	H/N	2.33	4th	H/N	2.76	2nd
Transplanting of seedlings	3.05	3rd	H/N	2.34	3rd	H/N	2.70	3rd
Pest and disease control	2.97	4th	Needed	2.36	1st	H/N	2.67	4th
Pruning	2.95	5th	N	2.30	6th	Needed	2.63	5th
Punching holes	2.73	7th	Not Needed	2.31	5th	Needed	2.52	6th
Fertilizer application	2.85	6th	N/N	2.08	7th	Not Needed	2.46	7th
Coppicing for regeneration	2.72	8th	N/N	2.03	9th	N/N	2.38	8th
Apply cocoa boost	2.51	10th	N/N	2.04	8th	N/N	2.27	9th
Budding	2.56	9th	N/N	1.90	10th	N/N	2.23	10th
Grand mean	**2.88**			**2.20**			**2.54**	
Plantation establishment								
Weed control	3.08	3rd	H/N	3.20	1st	Highly Needed	3.14	1st
Pest and disease control	3.07	4th	H/N	3.20	1st	H/N	3.14	1st
Transplanting of seedling	3.15	1st	Highly Needed	2.93	4th	N/N	3.04	3rd
Pruning	2.90	7th	Not Needed	3.13	3rd	H/N	3.02	4th
Spacing	3.00	5th	H/N	2.90	5th	Needed	2.95	5th
Fire tracing	2.94	6th	Not Needed	2.86	6th	Not Needed	2.90	6th
Land preparation	3.10	2nd	H/N	2.86	6th	N/N	2.98	7th
Fertilizer application	2.89	8th	N/N	2.63	8th	N/N	2.76	8th
Hand pollination	2.49	9th	N/N	2.22	9th	N/N	2.35	9th
Grand Mean	**2.96**			**2.88**			**2.92**	
Overall Mean	**2.77**			**2.57**			**2.68**	

Source: Computed from Field data, 2017. H/N=Highly Needed, N=Needed, N/N= Not Needed

4.6: Postharvest Information Needs by the Respondents

Table 4.6 showed that cocoa farmers in Edo State post harvest activities ranked harvesting pod, credit sources, braking of pod and packaging materials, timing of harvest and future market price, timing of sale, scooping cocoa bean, market location, post-harvest techniques as high information needs in a descending order. While in Ondo State postharvest activities such as market location, communication cost, scooping of cocoa beans, future market price, location of processing industry, storage coat, transportation network and braking of pod, timing of sale, and cost of transportation and local government area (LGA) fees were ranked high. The findings revealed that the level of information needs of cocoa farmers across the two States differed significantly. For instance, harvesting of cocoa pod that was ranked 1st in Edo with a mean of ($\overline{X}$=2.91) had the 25th ranking among farmers in Ondo State with a mean of ($\overline{X}$=1.68), breaking of pods and packing materials which ranked 2nd in Edo State with a mean of ($\overline{X}$=2.72) had 7th and 15th ranking in Ondo State. However, harvesting of cocoa, breaking of pods, postharvest techniques and scooping of cocoa bean were among the top ranking activities in terms of information needs among farmers. The findings showed that farmers indicated areas where their information needs were high in cocoa postharvest activities. For effective cocoa post-production activities, farmers should intensify search for more information in all the areas where the need for more information are high. The findings conformed to the study of Ogunlade, Oluyole and Aikpokpodion (2009), which evaluated the Level of Fertilizer Utilization for Cocoa Production in Nigeria and reported that poor accessibility to information on post-production of cocoa constituted a major setback in cocoa production.

Table 4.6: Postharvest Information Needs by the Respondents

Variable	Edo			Ondo			Pooled	
	Need level	Rank		Need level	Rank		Need level	Rank
Postharvest Information	**Mean**		**Remark**	**Mean**		**Remark**	**Mean**	
Harvesting of pods	2.91	1st	Highly Needed	1.68	25th	Not needed	2.81	1st
Breaking of pods	2.72	3rd	H/N	2.19	7th	Highly needed	2.75	2nd
Credit sources	2.76	2nd	H/N	1.58	29th	N/N	2.71	3rd
Postharvest techniques	2.62	10th	H/N	1.96	17th	N/N	2.71	3rd
Scooping of cocoa beans	2.65	8th	H/N	2.28	3rd	H/N	2.70	5th
Drying methods and process	2.57	11th	H/N	2.01	16th	H/N	2.69	6th
Timing of harvest	2.71	5th	H/N	1.94	20th	N/N	2.68	7th
Timing of sale	2.69	7th	H/N	2.16	9th	H/N	2.67	8th
Packaging materials	2.72	3rd	H/N	2.05	15th	H/N	2.67	8th
Types of fermentation methods	2.50	14th	Not Needed	2.06	14th	H/N	2.62	10th
Using tapeline for drying	2.51	13th	Needed	1.73	23rd	N/N	2.62	10th
Future market price	2.71	5th	H/N	2.26	4th	H/N	2.62	10th
Marketing outlet	2.44	18th	N/N	1.96	17th	N/N	2.55	13th
7% moisture content	2.34	24th	N/N	1.84	21st	N/N	2.52	14th
Five days fermentation process	2.23	27th	N/N	1.83	22nd	N/N	2.51	15th
Storage of harvested product	2.50	14th	N/N	2.07	12th	H/N	2.51	15th
Market location	2.64	9th	H/N	2.37	1st	H/N	2.48	17th
Grading	2.33	25th	N/N	2.07	12th	H/N	2.43	18th
Cost of transportation	2.5	14th	N/N	2.14	10th	H/N	2.42	19th
Location of processing industry	2.54	12th	N	2.23	5th	H/N	2.34	20th
Transportation network	2.37	24th	N/N	2.19	7th	H/N	2.33	21st
Storage cost	2.5	14th	N/N	2.22	6th	H/N	2.22	22nd
Packaging cost	2.44	18th	N/N	1.63	27th	N/N	2.18	23rd
Production of cocoa wine	2.18	29th	N/N	1.63	27th	N/N	2.09	24th
Communication cost	2.4	21st	N/N	2.3	2nd	H/N	2.07	25th
Local govt. area (LGA) fees	2.3	26th	N/N	2.14	10th	N/N	2.00	26th
Export of cocoa beans	2.41	20th	N/N	1.68	25th	N/N	1.89	27th
Stallage cost	2.4	21st	N/N	1.69	24th	N/N	1.88	28th
Processing cost	2.19	28th	N/N	1.96	17th	N/N	1.77	29th

Grand mean	**2.51**	**1.99**	**2.25**

H/N=Highly Needed, N=Needed, N/N= Not Needed

4.7: Production Information Search by the Respondents

Table 4.7 showed the order of search that Edo State farmers ranked water regularly, fire tracing, weed control in main nursery, fertilizer applications, pests and diseases control, hand weeding control, weed control in plantation establishment, fertilizer application, mulching with dry grass and pests and diseases control most preferred search. While, Ondo State cocoa farmers ranked weather information, agricultural credits, fertilizer application, weed control, pest and diseases control, fire tracing, pruning, spacing, hand pollination and transplanting of seedling as most preferred search. The results indicated that the information needs of the respondents in Edo State did not correspond to the level of information search which were very low, but in Ondo State the level of needs of the respondents were close to the level of information search. The 2.68 overall mean of information needs over a scale of 4 points implied that farmers had high information needs but low information search with the overall mean of information search of 1.60 over 4.0. This were an indication that cocoa farmers in the study area needed training and other sources of information in their information needs and search for cocoa production information needs. Adesope, Asabiaka, and Agumagu (2007), reported that training helps all categories of farmers improve production and income by making use of all available resources. Also, training is also required in cocoa farming because it bridges the gap between the known and the unknown, hence impacting cocoa farmers with basic knowledge and skills required for identification of farmers' information needs, sources and how, where and when to search for information.

Table 4.7: Production information search by the Respondents

Variable	Edo			Ondo			Pooled	
	Search level			Search level			Search level	
	Mean	Rank	Remark	Mean	Rank	Remark	Mean	Rank
General farm operations								
Weather information	1.69	2nd	H/N	2.75	1st	Highly needed	2.22	1st
Agricultural credit	1.77	1st	Highly needed	2.58	2nd	Highly needed	2.17	2nd
Seed selection and planting	1.38	3rd	H/N	1.6	3rd	Not Needed	1.49	3rd
Plant companion crops	1.37	4th	H/N	1.46	8th	N/N	1.41	4th
Farm layout	1.31	5th	Not Needed	1.45	6th	N/N	1.38	5th
Cultivation system	1.06	7th	N/N	1.59	4th	N/N	1.33	6th
Field burning	1.01	8th	N/N	1.55	5th	N/N	1.28	7th
Soil analysis	1.17	6th	N/N	1.37	7th	N/N	1.27	8th
Grand mean	**1.35**			**1.79**			**1.57**	
Pre-nursery operations								
Water regularly	2.73	1st	Highly needed	1.38	1st	Highly needed	2.05	1st
Fertilizer applications	2.16	2nd	H/N	1.27	3rd	H/N	1.72	2nd
Pests and diseases control	2.08	3rd	H/N	1.36	2nd	H/N	1.72	2nd
Hand weeding control	2.02	4th	H/N	1.25	4th	Needed	1.64	4th
Mulching with dry grass	1.91	5th	Needed	1.25	5th	N	1.58	5th
Fill poly pots	1.59	6th	Not Needed	1.17	6th	Not needed	1.38	6th
Shade nursery	1.56	7th	N/N	1.17	6th	N/N	1.37	7th
Sowing of rootstock	1.5	8th	N/N	1.15	10th	N/N	1.32	8th
Selection of rootstock seeds	1.45	9th	N/N	1.09	11th	N/N	1.27	9th
Arrangement of poly pots	1.4	11th	N/N	1.11	8th	N/N	1.26	10th
Dry season planting	1.38	12th	N/N	1.11	8th	N/N	1.25	11th

Processing of rootstock seeds	1.42	10th	N/N	1.08	12th	N/N	1.25	11th
Grand mean	**1.77**			**1.2**			**1.48**	

Table 4.7b: Production Information Search by the Respondents Cont'd

Variable	Edo Search level			Ondo Search level			Pooled Search level	
	Mean	**Rank**	**Remark**	**Mean**	**Rank**	**Remark**	**Mean**	**Rank**
Main nursery operations								
Pests and diseases control	1.81	4th	Highly needed	1.44	3rd	Highly needed	1.63	1st
Weed control	1.92	1st	H/N	1.26	5th	Not needed	1.59	2nd
Fertilizer application	1.87	2nd	H/N	1.29	4th	Needed	1.58	3rd
Budding	1.41	8th	N/N	1.72	2nd	H/N	1.56	4th
Transplanting of seedlings	1.86	3rd	H/N	1.21	6th	N/N	1.53	5th
Pruning	1.7	6th	Needed	1.35	1st	H/N	1.52	6th
Apply cocoa boost	1.75	5th	H/N	1.23	8th	N/N	1.49	7th
Punching holes	1.53	7th	N/N	1.08	7th	N/N	1.30	8th
Coppicing for regeneration	1.27	10th	N/N	1.11	9th	N/N	1.19	9th
Land preparation	1.32	9th	N/N	0.98	10th	N/N	1.15	10th
Grand mean	**1.64**			**1.27**			**1.45**	
Plantation establishment								
Weed control	2.16	2nd	Highly needed	2.31	2nd	Highly needed	2.24	1st
Fertilizer application	1.92	3rd	H/N	2.38	1st	H/N	2.15	2nd
Fire tracing	2.17	1st	H/N	2.1	4th	H/N	2.13	3rd
Pests and diseases control	1.89	4th	Needed	2.17	3rd	H/N	2.03	4th
Transplanting of seedling	1.87	5th	N	1.81	8th	Not needed	1.84	5th
Pruning	1.69	7th	Not needed	1.96	5th	N/N	1.83	6th
Hand pollination	1.76	6th	N/N	1.87	7th	N/N	1.81	7th
Spacing	1.58	8th	N/N	1.92	6th	N/N	1.75	8th
Land preparation	1.46	9th	N/N	1.7	9th	N/N	1.58	9th
Grand mean	**1.83**			**2.02**			**1.93**	

Overall Mean	**1.60**

Source: Computed from Field data, 2017. H/N=Highly Needed, N=Needed, N/N= Not Needed

4.8: Cocoa Farmers' Postharvest Information Search

Table 4.8 showed that farmers in Edo State post harvest search ranked drying methods and process, five days fermentation process, postharvest techniques, breaking of pod, scooping of cocoa bean, types of fermentation methods, using tapeline for drying, harvesting of pod, 7% moisture content and credit sources as most preferred search. Ondo State farmers ranked credit sources, future market price, market location, postharvest techniques, marketing outlet, timing of harvest, cost of transportation, timing of sale, location of processing industry and breaking of pods as most preferred search.This implies that the information needs of Edo and Ondo State did not correspond to their search level which were very low. Also, using the overall mean scores, it is obvious that cocoa farmers in the study area had 2.67 out of a total of 4 points in information needs; indicating that they had high information needs but the overall mean of 1.89 within a scale of 4 points indicated that their information search were low. Hence, they need training in their information search behaviour in postharvest activities in cocoa production. The finding is in consonant with the study of Nick (2012) that farmers in Nigeria have high information needs in postharvest activities.

Table 4.8: Postharvest Information Search by the Respondents

Variable	Edo Search Mean	Rank	Remark	Ondo Search Mean	Rank	Remark	Pooled Search Mean	Rank
Postharvest Information								
Market location	2.31	19th	N/N	2.21	3rd	H/N	2.26	1st
Future market price	2.52	17th	Needed	2.32	2nd	H/N	2.42	1st
Location of processing industry	2.15	21st	Not needed	2.00	8th	H/N	2.08	3rd
Scooping of cocoa bean	2.75	5th	H/N	1.93	11th	H/N	2.34	4th
Cost of transportation	2.35	18th	N	2.04	7th	H/N	2.19	5th
Timing of sale	2.64	13th	H/N	2.00	8th	H/N	2.32	6th
Breaking of pods	2.77	4th	H/N	1.96	10th	H/N	2.37	6th
Marketing outlet	2.65	12th	H/N	2.15	5th	H/N	2.40	8th
Postharvest techniques	2.80	2nd	H/N	2.16	4th	H/N	2.48	8th
Timing of harvest	2.66	10th	H/N	2.05	6th	H/N	2.36	10th
Credit sources	2.66	10th	H/N	2.39	1st	Highly needed	2.52	10th
Types of fermentation methods	2.74	6th	H/N	1.90	12th	H/N	2.32	12th
Transportation network	2.30	20th	N/N	1.74	19th	N/N	2.02	13th
Storage of harvested product	2.53	15th	N	1.85	16th	H/N	2.19	14th
Drying methods and process	2.81	1st	Highly needed	1.90	12th	H/N	2.36	14th
Packaging materials	2.63	14th	H/N	1.86	15th	H/N	2.25	16th
Storage cost	1.94	23th	N/N	1.63	21st	Not needed	1.79	17th
Communication cost	1.74	25th	N/N	1.47	24th	N/N	1.61	18th
Five days fermentation process	2.80	2nd	H/N	1.88	14th	H/N	2.34	19th
Grading	2.53	15th	N	1.60	22nd	N/N	2.07	20th
Local govt. area (LGA) fees	1.69	26th	N/N	1.5	23rd	N/N	1.59	21st
7% moisture content	2.69	9th	H/N	1.79	17th	Needed	2.24	22nd
Using tapeline for drying	2.72	7th	H/N	1.75	18th	N/N	2.24	23rd
Harvesting of pods	2.71	8th	H/N	1.73	20th	N/N	2.22	24th
Packaging cost	1.93	24th	N/N	1.47	24th	N/N	1.70	25th
Processing cost	1.35	28th	N/N	1.08	27th	N/N	1.21	26th
Production of cocoa wine	2.00	22nd	N/N	1.25	26th	N/N	1.62	27th
Stallage cost	1.35	28th	N/N	0.95	29th	N/N	1.15	28th
Export of cocoa beans	1.38	27th	N/N	0.96	28th	N/N	1.17	28th

Grand mean	**2.35**	**1.78**	**2.07**

Source: Computed from Field data, 2017. H/N=Highly Needed, N=Needed, N/N= Not Needed

4.9: Cocoa Farmers' Production Information Needs and Information Search Using Discrepancy Scores

The discrepancy scores of information need and search behaviour of farmers were calculated alongside the weighted mean scores to determine the training or education of farmers for each of the farming activities under cocoa production. It were observed that farm layout with a weighted mean score of 5.48 were ranked 1st while cultivation system with a weighted mean score of 4.82 were ranked 2nd and seed selection and planting materials had a weighted mean score of 4.67 and this were ranked 3rd in position. This indicates that the critical areas where farmers need production information were farm layout, cultivation system and seed selection and planting materials. In contrasts, fertilizer application having a weighted mean score of 1.68 and agricultural credit sources with a weighted mean 1.60 were ranked 36th and 37th in that order. The implication of this finding is that these are areas with the least training or education of farmers in cocoa production information needs. It was indicated by Ogungbeni *et al*. (2013) that farmers in Lagos State need training or education in modern farming techniques and activities such as farm layout, and cultivation systems which are now done in modern ways with a view to enhancing productivities.

Table 4.9: Cocoa Farmers' Production Information Needs and Information Search

Variable	Need level		Search Level		Discrepancy	Weighted Mean	Rank
Production Information	**Mean (A)**	**SD**	**Mean (B)**	**SD**	**A-B**	**A(A-B)**	
General farm operations							
Farm layout	3.13	0.44	1.38	0.77	1.75	5.48	1st
Cultivation system	2.96	1.08	1.33	0.85	1.63	4.82	2nd
Seed selection and planting materials	3.03	1.07	1.49	0.84	1.54	4.67	3rd
Plant companion crops	2.88	1.1	1.41	0.78	1.47	4.23	4th
Field burning	2.5	1.25	1.28	0.9	1.22	3.05	5th
Weather information	2.88	1.04	2.22	1.27	0.66	1.90	6th
Soil analysis	2.11	1.4	1.27	0.92	0.84	1.77	7th
Agricultural credit	2.75	1.22	2.17	1.32	0.58	1.60	8th
Pre-nursery operations							.
Dry season planting	2.64	1.19	1.25	0.64	1.39	3.67	1st
Shade nursery	2.67	1.22	1.37	0.66	1.30	3.47	2nd
Fill poly pots	2.66	1.31	1.38	0.82	1.28	3.40	3rd
Arrangement of poly pots	2.53	1.22	1.26	0.66	1.27	3.21	4th
Selection of rootstock seeds	2.42	1.32	1.27	0.65	1.15	2.78	5th
Processing of rootstock seeds	2.38	1.3	1.25	0.72	1.13	2.69	6th
Mulching with dry grass	2.53	1.25	1.58	1.11	0.95	2.40	7th
Hand weeding control	2.55	1.2	1.64	0.82	0.91	2.32	8th
Sowing of rootstock	2.31	1.24	1.32	0.82	0.99	2.29	9th
Pests and diseases control	2.6	1.24	1.72	0.93	0.88	2.29	9th
Apply fertilizer	2.51	1.23	1.72	0.91	0.79	1.98	11th
Water regularly	2.6	1.32	2.05	1.44	0.55	1.43	12th

Source: Computed from Field data, 2017

Table 4.9b: Cocoa Farmers' Production Information Needs and Information Search Cont'd

Variable	Need level		Search Level		Discrepancy	Weighted Mean	Rank
Production Information	**Mean (A)**	**SD**	**Mean (B)**	**SD**	**A-B**	**A(A-B)**	
Main nursery operations							.
Land preparation	2.81	1.27	1.15	0.8	1.66	4.66	1st
Weed control	2.76	1.25	1.59	0.84	1.17	3.23	2nd
Transplanting of seedlings	2.7	1.32	1.53	0.92	1.17	3.16	3rd
Punching holes	2.52	1.31	1.30	1.03	1.22	3.07	4th
Pruning	2.63	1.21	1.52	0.64	1.11	2.92	5th
Coppicing for regeneration	2.38	1.19	1.19	0.62	1.19	2.83	6th
Pests and diseases control	2.67	1.22	1.63	0.98	1.04	2.78	7th
Fertilizer application	2.46	1.24	1.58	0.94	0.88	2.16	8th
Budding	2.23	1.23	1.56	1.14	0.67	1.49	9th
Apply cocoa boost	2.27	1.32	1.49	0.97	0.78	1.77	10th
Plantation establishment							
Land preparation	2.98	1.04	1.58	0.86	1.40	4.17	1st
Transplanting of seedlings	3.04	1.01	1.84	1.1	1.20	3.65	2nd
Pruning	3.02	1.02	1.83	0.94	1.19	3.59	3rd
Spacing	2.95	0.92	1.75	1	1.20	3.54	4th
Pests and diseases control	3.14	0.94	2.03	1	1.11	3.49	5th
Weed control	3.14	0.83	2.24	0.93	0.90	2.83	6th
Fire tracing	2.90	1.02	2.13	1.24	0.77	2.23	7th
Hand pollination	2.35	1.17	1.81	1.1	0.54	1.27	8th
Fertilizer application	2.76	1.03	2.15	0.91	0.61	1.68	9th
Overall Mean	**3.68**		**2.60**				

Source: Computed from Field data, 2017

4.9.1 The Use of Matrix for the Analysis of Discrepancy Scores for Cocoa Production Information Needs and Information Search

The summary of Table 4.9 is equally shown in Matrix to determine the training or education of cocoa farmers in cocoa production activities using the production information need and search.

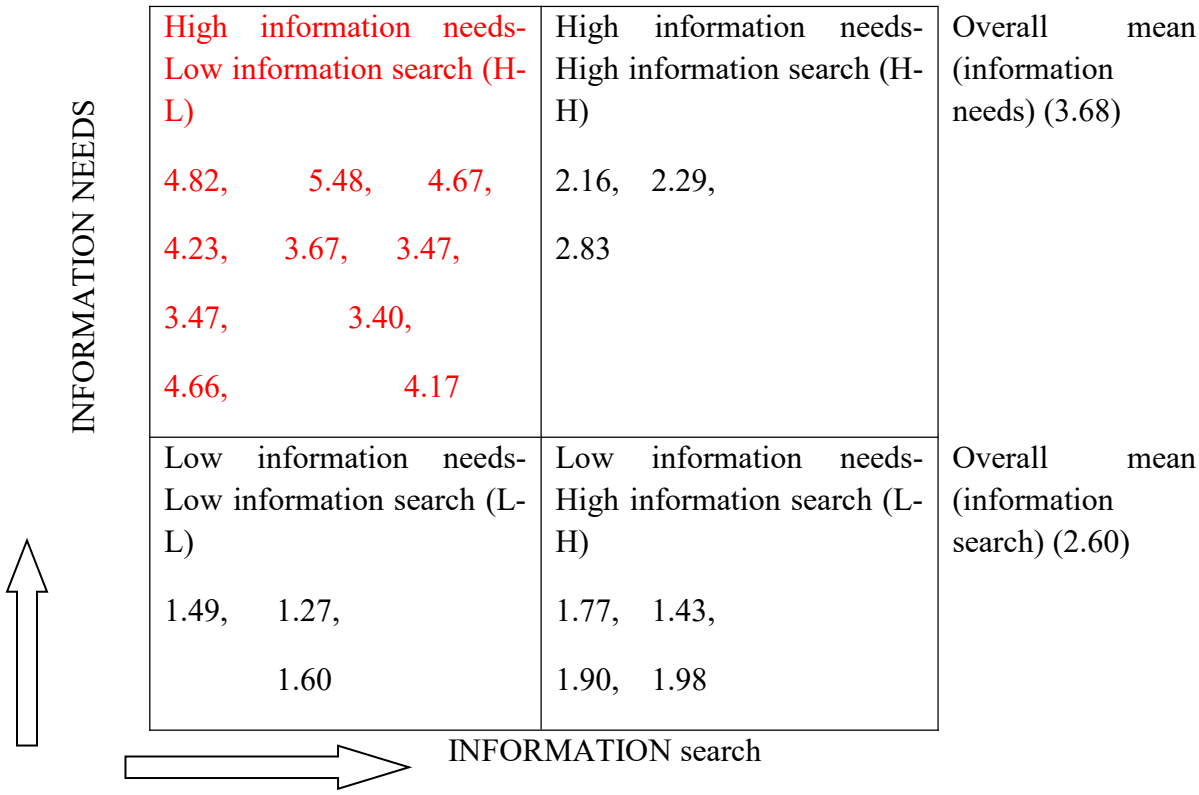


Figure 4.1: **Results of Matrix with Weighted Mean scores of cocoa production activities Showing Critical Areas Farmers Needs Training in Cocoa Production**

Note: Cocoa production activities with High information needs and low information search become the critical activities where farmers training or education are needed.

The critical areas where farmer training or education is needed by the farmers were those farming activities that fall within the high production information needs and low production information search. From the Matrix, it was observed that cocoa production information with the discrepancies scores of 5.48, 4.66, and 4.88 among others were the critical areas where cocoa farmers require training or education. These areas become critical because their discrepancy scores were above the overall mean scores for both farmers information needs and farmers information search as indicated in Figure 4.1 above. The findings is in line with the study of Omoregbee and Banmeke (2014), that cassava farmers are in need of training on the use of herbicides, pesticides and fertilizer in cassava production. Extension workers should organize farmers training through workshop and seminars to educate farmers on information needs and information search.

4.10: Cocoa Farmers' Postharvest Information Needs and Information Search Using Discrepancy Scores

It was observed that harvesting pods with a weighted mean score of 3.12 were ranked 1st while using tapeline for drying with a weighted mean score of 2.31 were ranked 2nd and drying methods and process had a weighted mean score of 1.96. This were ranked 3rd in position. Also, credit sources with a weighted mean score of 1.96 was ranked 4th and packaging materials with a weighted mean score of 1.92 were ranked 5th. This implies that the critical areas where cocoa farmers' postharvest information needs and search are harvesting pods, using tapeline for drying, drying methods and process, credit sources and packaging materials. In contrasts, processing cost having a weighted mean score of 0.44, communication cost with a weighted mean score of 0.39 and local government area (LGA) fee with a weighted mean 0.36 were ranked 27th,28th and 29th in that order. The implication of this finding is that these were areas with the least farmers

training or education needs in cocoa postharvest information needs and search. The study revealed that farmers need training in areas of harvesting that may improve the cocoa beans for acceptability as method of harvesting and processing are very crucial to the cocoa beans. Tologbonse, Fashola and Obadiah (2008) opined that farmers' postharvest information needs were very important to the end product in rice production. This may also be true in cocoa production as cocoa beans in Nigeria are currently being rejected and this may be due to the processing method.

Table 4.10: Cocoa Farmers' Postharvest Information Needs and Search

Variable	Need level		Search Level		Discrepancy	Weighted Mean	Rank
	Mean (A)	SD	Mean (B)	SD	A-B	A(A-B)	
Postharvest Information							
Harvesting of pods	2.81	1.24	1.70	0.95	1.11	3.12	1st
Using tapeline for drying	2.62	1.24	1.74	0.95	0.88	2.31	2nd
Drying methods and process	2.69	1.21	1.96	1.09	0.73	1.96	3rd
Credit sources	2.71	1.07	1.99	1.04	0.72	1.95	4th
Packaging materials	2.67	1.18	1.95	1.13	0.72	1.92	5th
Timing of harvest	2.68	1.13	1.99	1.01	0.69	1.85	6th
Breaking of pods	2.75	1.26	2.08	1.27	0.67	1.84	7th
7% moisture content	2.52	1.25	1.81	0.97	0.71	1.79	8th
Postharvest techniques	2.71	1.05	2.06	1.03	0.65	1.76	9th
Types of fermentation methods	2.62	1.19	1.98	1.06	0.64	1.68	10th
Five days fermentation process	2.51	1.24	1.86	1.10	0.65	1.63	11th
Scooping of cocoa beans	2.70	1.23	2.11	1.28	0.59	1.59	12th
Timing of sale	2.67	1.14	2.08	1.07	0.59	1.58	13th
Grading	2.43	1.30	1.84	1.88	0.59	1.43	14th
Storage of harvested products	2.51	1.19	1.96	1.11	0.55	1.38	15th
Packaging cost	2.18	1.26	1.55	0.99	0.63	1.37	16th
Production of cocoa wine	2.09	1.28	1.44	0.93	0.65	1.36	17th
Marketing outlet	2.55	1.12	2.06	1.17	0.49	1.25	18th
Export of cocoa beans	1.89	1.32	1.32	0.97	0.57	1.08	19th
Stallage cost	1.88	1.33	1.32	0.91	0.56	1.05	20th
Future market price	2.62	1.10	2.29	1.20	0.33	0.86	21st
Transportation network	2.33	1.14	1.97	1.35	0.36	0.84	22nd
Cost of transportation	2.42	1.14	2.09	1.22	0.33	0.80	23rd
Storage cost	2.22	1.25	1.93	1.38	0.29	0.64	24th
Location of processing industry	2.34	1.25	2.12	1.34	0.22	0.51	25th
Market location	2.48	1.12	2.29	1.23	0.19	0.47	26th
Processing cost	1.77	1.30	1.52	1.31	0.25	0.44	27th
Communication cost	2.07	1.25	1.88	1.37	0.19	0.39	28th
Local govt. Area (LGA) fees	2.00	1.30	1.82	1.47	0.18	0.36	29th
Overall mean	**2.67**		**1.89**				

Source: Computed from Field data, 2017.

4.10.1 The Use of Matrix for the Analysis of Discrepancy Scores for Cocoa Farmers' Postharvest Information Needs and Search.

Matrix in Figure 4.2 below summarized the information in Table 4.10 which identifies the most critical areas with high information needs and low information search as activities where farmer training or education were needed in cocoa postharvest activities. The critical areas were shown in red colour as indicated below. This result is in consonance with the findings of Ogungbeni *et al.,* (2013) and Tologbonse *et al.* (2008) submissions that farmers in Nigeria lack information in postharvest activities in crop production.

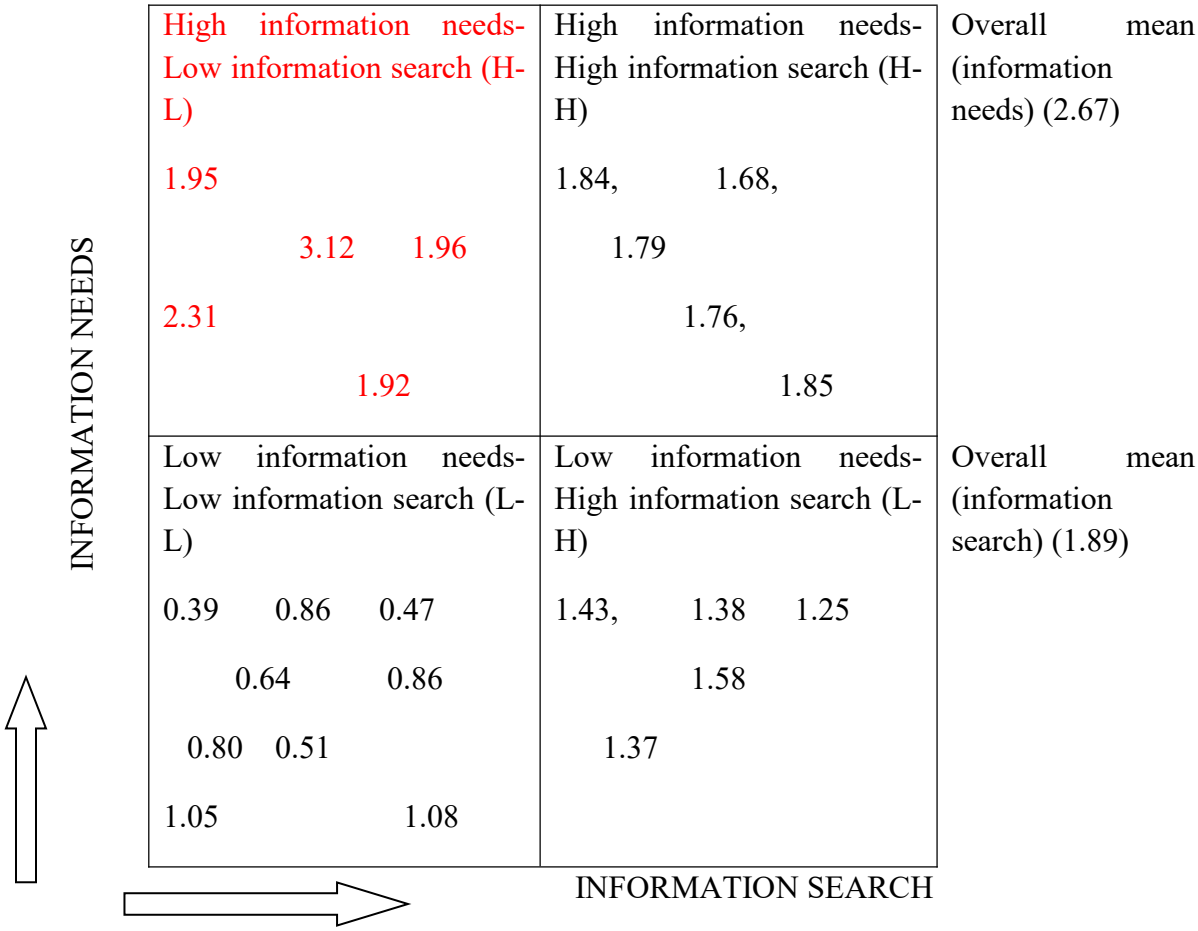


Figure 4.2: **Results of Matrix with Weighted Mean Scores of Postharvest Activities Showing Critical Areas Farmers Needs Training or Education in Cocoa Productions**

Note: Cocoa postharvest activities with High information needs and low information search become the critical activities where farmers training or education are needed.

This has resulted to a lot of losses being generated by farmers especially among arable crops farmers.

Similarly, ineffective and inefficient postharvest handlings in crop production may be problematic to farmers as losses have been observed to be high in crops after harvest.

4.11: Constraints to Information Needs and Search Behaviours among Cocoa Farmers

Data in Table 4.11 show the various constraints to agricultural information needs and search behaviour among cocoa farmers in the study area. It was observed that inadequate power to watch agricultural based television programmes had a mean of 4.31 and it was ranked 1st while little or no information broadcasted on radio had a mean of 3.78 and were ranked 2nd and limited internet access with a mean of 3.73 were ranked 3rd. However, constraints such as odd broadcasting periods for radio and low rate of farmers contact with a mean of 3.00 were ranked 19th and 19th respectively, high cost of recharging phones had a mean of 2.98 and were ranked 21st while inability to read had a mean of 2.91 and was ranked 22nd. On the individual state basis, inadequate power to watch agricultural based television programmes were also found to be a major constraint in the two sample states. Edo State respondents experienced more serious constraints to information needs and search behaviours among cocoa farmers having had 3.00 mean scores in 20 of the 22 identified constraints as against Ondo State with 3.00 mean scores in 14 of the 22 identified constraints. In addition, all other constraints indicated by farmers were rated serious based on the fact that their means were above their grand mean score of 3.0 that were used as benchmark in Chapter three. The high number of constraints factors in Edo State respondents to information needs and search behaviour may have been due to socioeconomic factors such as farmers' age, education and experience as earlier shown in Table 4.1. This implies that constraints relating to mass media means of information sources were rated high

among the farmer as constraints militating against their information needs and search while constraints associated with farmers socio-economic characteristics such as educational status and time of broadcasting information as well organisational characteristics such as low extension-farmers contact were rated low. These findings agree with, Samuel (2011) and Babu and Govindarajan (2011), that information needs and search behaviours among cocoa farmers were hindered by different constraints.

Table 4.11: Constraints to Agricultural Information Needs by Cocoa Farmers

	Edo		Ondo		Pooled	
Constraints	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
Inadequate electricity to watch agric based television program	4.04	2nd	4.58	1st	4.31	1st
Very little or no information on cocoa was broadcast on radio/newspaper	4.16	1st	3.41	7th	3.78	2nd
Limited internet access	3.35	18th	4.12	2nd	3.73	3rd
Use of difficult terminologies	3.69	6th	3.76	3rd	3.72	4th
Lack of computer skills	3.81	3rd	3.44	5th	3.63	5th
Cost of electronics	3.75	5th	3.50	4th	3.63	5th
Poor road linkage	3.78	4th	3.34	8th	3.56	7th
Lack of awareness of information sources	3.65	9th	3.30	9th	3.47	8th
Odd broadcasting periods by TV stations	3.42	14th	3.42	6th	3.42	9th
Lack of information centers	3.61	11th	3.17	11th	3.39	10th
Low extension agents-farmers ratio	3.63	10th	3.16	12th	3.39	10th
Poor communication network	3.42	14th	3.28	10th	3.35	12th
Language barrier	3.68	7th	2.87	16th	3.27	13th
Norms and tradition of people	3.67	8th	2.82	18th	3.25	14th
Lack of technical know how	3.40	17th	3.01	14th	3.21	15th
Lack of money to purchase newsletter, leaflet on agricultural information	3.47	13th	2.81	19th	3.14	16th
Inadequate extension facilities	3.29	20th	2.93	15th	3.11	17th
Inappropriate or poor quality information	3.52	12th	2.64	20th	3.08	18th
Low rate of farmers contact	3.35	18th	2.64	20th	3.00	19th
Odd broadcasting period by radio stations	2.91	22nd	3.08	13th	3.00	19th
High cost of recharging phones	3.42	14th	2.55	22nd	2.98	21st
Illiteracy, inability to read and write	2.96	21st	2.87	16th	2.91	22nd

Source: Computed from Field data, 2017.
Mean ≥3.0 = Serious constraints

4.12: Cocoa Farmers' Socio-Economic Characteristics and their Cocoa Production Information Needs.

Binary Logistic Regression was used to identify determinants of cocoa production information needs. Based on the results in Table 4.7, in Edo State, household size (b=2.02), years of schooling (b= 3.05), sex (b= 2.50), sources of farmland (b=4.25), membership of social group (b=3.42) and extension agent contact (b= -4.25) were significant at 0.05 level of significance. This implies that these were the socio-economic variables that determine the information needs of cocoa farmers in Edo State. Similarly, in Ondo State, it was revealed that age (b= 3.80), income level (b = 4.08), marital status (b = 4.02), membership of interest group (b = -5.40), and type of farm enterprise (b = 3.20) were the determinants of information needs of cocoa farmers in the study area at 1% probability.

The Nagelkerke R square value of 0.15 and 0.295 for Edo and Ondo States respectively indicated that these determinants would collectively explain about 15.0% and 29.5% variation in cocoa production information needs of farmers, respectively in the two States. This indicated that larger percentages of variation in cocoa information needs are not explained by these significant variables. However, it could be deduced from the findings that the higher the farmers' income level in Ondo State, the higher their information needs. This may be due to the fact that farmers with high income level may have higher propensity for information for the prosper management of their farms. Also, sources of farmland and membership of social group were factors that associated with farmers' production needs as they will have positive effect on their information. Usually, one of the reasons for joining social organisation is to secure regular and up to date information on whatever business or farm enterprise farmers is involved. Therefore, cocoa farmers who were members of social organisations may likely enjoy cocoa production

information needs better than those who are not members. In the same development, cocoa product marketing system could also determine farmers' information needs as this platform will establish relationship between demand and supply and information is central in maintain these relationships as market forces. The findings is in line with the assertions of Anaeto *et al*. (2012) and Folayan *et al.* (2006) that socio-economic variables such as sex, membership of social organization, sources of farmland and contact with extension agents were factors that influence information behaviour of farmers in Nigeria

Table 4.12: Binary Logistic Regression Showing the Influence of Socio-economic Characteristics and Cocoa Production Information Needs by States

	Edo				Ondo			
Variable	**B**	**S.E.**	**Wald**	**Odd ratio**	**B**	**S.E.**	**Wald**	**Odd ratio**
Age	-0.03	0.02	1.68	0.08	3.80	0.03	7.05**	2.17
Household size	2.05	0.09	2.43*	0.14	0.01	0.04	0.04	0.02
Years of formal education	3.05	0.04	3.60*	0.14	2.07	0.04	3.02*	0.11
Farming experience	0.02	0.02	0.64	0.05	-0.01	0.03	0.25	0.62
Estimated income	-0.04	0.24	0.02	0.11	4.08	0.33	10.53**	2.94
Farm size	-0.05	0.47	0.01	0.14	-0.19	0.42	0.21	0.52
Sex	2.50	0.35	2.02*	1.36	0.07	0.30	0.05	0.19
Marital status	-0.25	0.35	0.51	0.68	4.02	0.31	11.10**	0.84
Source of farmland	4.25	0.14	3.10*	0.68	-0.10	0.13	0.53	0.27
Membership of a group	3.42	0.27	2.35*	1.14	-5.40	0.57	6.10**	1.55
Type of farm enterprise	0.02	0.08	0.08	0.05	2.20	0.46	6.74**	1.25
Extension agents contact	-4.25	0.14	3.39*	0.68	0.15	0.25	0.38	0.41
Constant	9.35	0.35	7.84**	25.42	8.34	0.36	2.17*	23.62

States Summary	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Edo	212.279	0.102	0.150
Ondo	215.886	0.220	0.295

Source: Field survey, 2016.

4.13: Relationship between Socio-Economic Characteristics and Postharvest Information Needs of Cocoa

For the postharvest information needs, it was observed that age (b= 2.04), farm size (b= -3.48), marital status (b= 3.52) and sources of farmland (b = 2.23) were the factors that determined postharvest information needs of farmers in Edo State. While, in Ondo State, factors such as age (b = 3.06), years of formal education (b = 4.20), sex (b= 4.92), marital status (b =2.68) and sources of farmland (b = 5.47) determined information needs of cocoa farmers in postharvest activities. The Nagelkerke R Square value of 0.207 and 0.283 for Edo and Ondo States respectively indicated that these significant variables would be able to explain about 20.7% and 28.3% variations in information needs of cocoa farmers in postharvest activities in the study areas, all things being equal. The study is in consonance with the findings of Ogunlade *et al.* (2009), Oduwole (2000) and Nmadu *et al.* (2015) that reported socio-economic variables such as income, years of formal education, marital status and level of travelling were factors influencing information gathering of cocoa farmers in Nigeria. The findings established that information sourcing is as important as inputs in cocoa plantation and thus, certain personal and demographic features of individual farmers are germane to the level of information sourcing among farmers

Table 4.13: Binary Logistic Regression Showing the Influence of Socio-economic Characteristics and Cocoa Postharvest Information Needs by States

	Edo				Ondo			
Variables	**B**	**S.E.**	**Wald**	**Odd ratio**	**B**	**S.E.**	**Wald**	**Odd ratio**
Age	-2.04	0.02	3.16**	0.10	3.06	0.03	3.48**	0.16
Household size	-0.05	0.09	0.28	0.13	0.04	0.05	0.07	0.10
Years of formal education	0.05	0.04	1.61	0.13	4.20	0.06	13.45**	0.54
Farming experience	0.01	0.02	0.09	0.03	-0.02	0.03	0.56	0.05
Estimated income	-0.31	0.25	1.53	0.84	-0.15	0.34	0.18	0.41
Farm size	-3.48	0.46	-2.07*	1.30	-0.10	0.43	0.05	0.27
Sex	0.24	0.38	0.40	0.65	4.92	0.38	5.93**	2.50
Marital status	3.52	0.39	2.82*	1.41	2.68	0.32	4.56**	1.85
Source of farmland	2.23	0.15	2.41*	0.63	-5.47	0.17	7.31**	1.28
Membership of a group	0.06	0.36	0.03	0.16	-0.54	0.56	0.95	0.41
Type of farm enterprise	0.27	0.25	1.09	0.73	0.03	0.42	0.01	0.50
Extension agents contact	0.04	0.14	0.07	0.10	0.33	0.24	1.90	0.42
Constant	3.57	0.48	2.94	0.05	4.44	0.04	8.02**	12.07

States Summary	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Edo	212.261	0.144	0.207
Ondo	193.883	0.201	0.283

Source: Computed from Field data, 2017.

4.14: Preference for Information Sources and Production Information Needs

Multiple Regression analysis was used to determine farmers' preference for information sources and their production information needs. It was observed that the study established that extension agents (b= -13.98; p≤0.01); input dealers/suppliers (b= -15.68; p≤0.01); internet (b= - 13.55; p≤0.01), cable network (b= 25.44; p≤ 0.01); family members (b=7.41; p≤0.05) and face to face contact with other farmers' (b =8.38; p≤0.01) were the most significant preferred sources of information to cocoa farmers' Table 4.14. The R^2 value of 0.17 implies that only 17.0% changes in cocoa production information needs is brought about by the cumulative effect of the significant variables in Edo State. While, in Ondo State most of the information sources were significant. However, 93.0% variation in cocoa production information needs could be explained by the significant variables. This implies that almost all the variation in production information needs can be explained by the combination of the significant variables in this study in Ondo State. The implication of this finding is that farmers had better preferences for information sources such as library, input dealers/supplier, cable network, newspapers, bulletins/newsletters among others compared to the other sources of information in cocoa production information needs in the study area. It can be deduced from the findings that farmers would prefer information disseminated through electronic media in as much as they prefer such information to be disseminated through interpersonal sources as well. Therefore, for effective cocoa production system, both electronic and the usual face to face sources of information should be used in disseminating useful information to cocoa farmers in the study area. The finding conforms with the assertions of Edeoghon and Okoedo-Okojie (2017) that farmers' preference for information is very important in ensuring that appropriate and timely information is disseminated to them.

Table 4.14 Influence of Information Sources on Production Information Needs on States Basis

Variable	Edo			Ondo		
	B	T	Sig.	B	T	Sig.
(Constant)	-5.26	-0.19	0.85	58.89**	4.47	0.00
Extension agents	-13.98**	-1.61	0.01	12.31**	2.59	0.01
Agric. Institutes	0.80	0.12	0.91	-18.23**	-7.55	0.00
Library	3.97	0.74	0.46	4.95**	4.30	0.00
Farmers' union	3.10	0.37	0.71	7.57**	4.46	0.00
Other Govt. project	-0.23	-0.03	0.97	-10.92**	-3.60	0.00
Other NGOs	-5.43	-0.84	0.40	13.51**	4.99	0.00
Input dealers/Suppliers	15.68*	2.89	0.01	5.79	1.13	0.26
Television	2.97	0.45	0.66	-1.45	-0.41	0.68
Internet	-13.55**	-1.65	0.01	7.68**	3.18	0.00
Mobile cell phone	2.76	0.38	0.71	6.49**	4.14	0.00
Film/Slide show	-0.95	-0.15	0.88	-5.58**	-1.68	0.10
Cable net work	25.44**	2.56	0.01	21.22**	6.96	0.00
Radio	2.24	0.42	0.68	13.09**	4.40	0.00
Newspapers	-9.42	-1.72	0.09	-12.70**	-5.34	0.00
Extension manuals	-1.66	-0.28	0.78	5.69**	2.72	0.01
Extension posters	6.48*	0.86	0.39	-17.95**	-4.83	0.00
Bulletins/newsletter	5.09	0.87	0.39	-6.32**	-4.71	0.00
Text books	-4.00	-0.69	0.49	-4.70**	-4.26	0.00
Town crier	-2.23	-0.41	0.68	-11.80**	-4.95	0.00
family members	7.41*	0.92	0.05	31.34**	10.48	0.00
Face to face advise by other farmers	8.38**	0.67	0.01	7.07	0.83	0.41
Cocoa buyers	9.96**	0.80	0.01	-19.23	-2.09*	0.04

States Summary	R	R Square	Adjusted R Square	Std. Error of the Estimate
Edo	0.42	0.17	0.08	32.37
Ondo	0.96	0.93	0.92	9.88

Source: Computed from Field data, 2017.

4.15: Influence of Information Sources on Postharvest Information Needs in Cocoa Production

It was revealed in Table 4.15 that extension agents (b= -5.38; p≤0.01), library (b= 3.94; p≤0.01), radio (b= 3.12; p≤0.05) and text books (b= 5.59; p≤0.01) were the significant preferred sources of information to cocoa postharvest information needs in Edo state. While, in Ondo State most of the information sources were significant. The R Square value of 0.42 means that about 42.0% of the changes that may occur in postharvest information needs will be brought about by the combined effects of the significant variables identified above. The farmers' preference for these information sources may be due to their availability as the study indicated that the significant information sources have influence on farmers postharvest information of the farmers. Kughur, Ortindi, and Katikpo (2015) submitted that information sources that were available and accessible will have a great influence on farmers farming activities.

Table 4.15: Influence of Information Sources and Postharvest Information Needs

	Edo			Ondo		
Variables	**B**	**T**	**Sig.**	**B**	**T**	**Sig.**
(Constant)	131.10**	6.85	0.00	100.94**	6.40	0.00

Extension agents	-5.38**	-2.94	0.01	-34.13**	-5.99	0.00
Agric. Institutes	3.26	0.73	0.47	6.79**	9.26	0.00
Library	3.94**	2.09	0.01	5.84*	4.23	0.05
Farmers' union	-0.50	-0.79	0.43	-1.87	-0.92	0.36
Other Govt. project	-0.71	-1.02	0.31	9.20**	2.53	0.01
Other NGOs	1.42	0.31	0.70	6.55*	2.02	0.05
input dealers/suppliers	-1.09	-0.14	0.33	-7.77	-1.26	0.21
Television	-1.73	-0.62	0.11	-23.01**	-5.43	0.00
Internet	-0.12	-1.47	0.51	-4.61	-1.60	0.11
Mobile cell phone	0.83	1.79	0.71	2.36	1.25	0.21
Film/Slide show	-1.34	-1.75	0.28	2.13	0.54	0.59
Cable net work	5.08	0.76	0.45	-7.20*	-1.97	0.05
Radio	3.12**	2.30	0.01	-7.67*	-2.15	0.03
Newspapers	-1.57	-1.78	0.08	-1.21	-0.42	0.67
Extension manuals	1.56	1.37	0.17	-9.29**	-3.71	0.00
Extension posters	0.54	0.11	0.92	27.40**	6.15	0.00
Bulletins/newsletter	0.39	0.86	0.39	-4.53*	-2.81	0.05
Text books	5.59**	-3.77	0.01	-6.94*	-5.26	0.05
Town crier	-1.72	-0.47	0.64	-2.37	-0.83	0.41
Family members	-1.73	-1.43	0.45	-15.01**	-4.19	0.00
Face to face advise by other farmers	-1.04	-0.72	0.44	31.31**	3.08	0.00
Cocoa buyers	1.82	1.76	0.61	-8.46	-0.77	0.45

States Summary	R	R Square	Adjusted R Square	Std. Error of the Estimate
Edo	0.65	0.42	0.36	21.80
Ondo	0.87	0.71	0.74	11.85

Source: Computed from Field data, 2017.
**Sig. at 0.01; *Sig. at 0.05

4.16: Relationship between Information Search Behaviour and Level of Information Needs

Pearson's Product Moment Correlation was used to analyse relationship that exists between cocoa production and postharvest information needs and search behaviour of farmers for

information. It were observed that positive and significant correlation exists between postharvest information needs and search among farmers (r = 0.54; p ≤0.01) in Edo State and production information needs and search in Ondo State (r = - 0.49; p ≤0.01). This implies that information need determines farmers' search behaviour in many of the production and postharvest activities in cocoa production among farmers in the study area. Ordinarily, farmers may make attempt to search for information that seems very critical in their production activities especially in crops like cocoa that represents a major cash crop in Nigeria. The above findings were in consonance with the studies of Ogungbeni *et al.,* (2013) submitted that there is a strong correlation between information needs and search among farmers in Lagos State. This may be due to the fact that Lagos State has high demand for agricultural produce. Hence, farmers search for information that could make them sell at profitable prices.

Table 4.16: Pearson's Product Moment Correlation Showing Relationship between Cocoa Information Search and Information Needs for Production and Postharvest

	Production Information Search	**Production information needs**	**Postharvest Information Search**	**Postharvest information needs**

Edo				
Production Information Search	1.00	0.09	0.99**	0.54**
Production information needs	0.09	1.00	0.08	0.32
Postharvest Information Search	0.99**	0.08	1.00	0.54**
Postharvest information needs	0.54**	0.32*	0.54**	1.00
Ondo				
Production Information Search	1.00	-0.49**	0.99**	0.20*
Production information needs	-0.49**	1.00	-0.43**	0.27*
Postharvest Information Search	0.99**	-0.43**	1.00	0.24*
Postharvest information needs	0.20*	0.27*	0.24*	1.00

Source: Computed from Field data, 2017.

4.17: Relationship between Information Needs and Search of Cocoa Farmers

Results showed that significant relationship existed between production information needs (r = 0.271) and production information search (r = 0.303) of cocoa farmers in the study area. The

findings showed that there is a strong correlation between information needs and search of farmers. This implies that those farmers that need information on cocoa production usually will have to search for it all things being equal. Therefore, the need for information may be a criterion to the need for the search of such information. This findings conforms with the claims of Ogungbeni *et al.* (2013) and Edeoghon and Okoedo-Okojie (2017) that farmers have access to those information sources that were available and that information needs determine farmers'' search behaviour. The findings further affirm that farmers search behaviour is on the increase when there is need for such information as it relates to increase in production.

Table 4.17: Pearson's Product Moment Correlation Showing Relationship Between Cocoa Information Search and Information Needs for Production

Variable	Correlation Coefficient	P-value
Production information needs	0.271**	0.01

Production information search	0.303**	0.01

Source: Computed from Field data, 2017.
*Significant at 0.01 level of significance

4.18: There is no Significant Relationship between Cocoa Farmers' Constraints and their Cocoa Information Needs

It was observed in Table 4.18 that low extension agents-farmers' ratio (r = -0.31); low extension contact (r = -0.33), illiteracy (r = -0.36), inadequate extension facilities (r = -0.29) and odd broadcasting periods/time by radio stations (-0.22) among others were constraints that had correlations with cocoa farmers information needs and search in the study area. This implied that these identified constraints must be given attention if farmers' information needs and search in cocoa production in the stud area is to bring about improvement in their production.

This implied that farmers must be able to overcome these constraints if cocoa production in the study area is to be improved. This is in line with the study of Tologbonse *et al,* (2008) and Kughur *et al.* (2015) that opined that constraints to production are impediments to effective and efficient production among farmers in Nigeria.

Table 4.18: Pearson's Product Moment Correlation Showing Relationship Between Constraints Facing Cocoa Information Needs

	Correlation	
Variable	**Coeff**	**P-value**

Low extension agent-farmers ratio	-0.31**	0.01
Low rate of extension contacts	-0.33**	0.01
Illiteracy: Inability to read and write	-0.36**	0.01
Inadequate extension facilities	-0.29**	0.01
Odd broadcasting periods / time by Radio stations	-0.22*	0.05
Odd broadcasting periods / time by TV stations	0.05	0.45
Inadequate electricity supply to watch television-based agric. program	-0.13**	0.01
Poor communication network	-0.07	0.88
High cost of recharging phones	-0.23**	0.01
Lack of technical know how to operate modern information gadgets	-0.20	0.32
Lack of money to purchase newsletters, leaflets on agricultural information	-0.16**	0.01
Poor road linkage	-0.03	0.49
Norms and tradition of people	-0.14**	0.01
Lack of information centers	-0.11	0.50
Lack of awareness of information sources	-0.22**	0.01
Lack of computer skills	-0.16**	0.01
Cost of electronic devices , computer, phone, radio and television	-0.20**	0.01
Use of difficult terminology especially with the use of computer, phone , radio and television	-0.26**	0.01
Limited internet access	-0.12*	0.05
Language barrier	-0.18**	0.01
Very little or no information on cocoa was broadcast on radio / newspaper	0.02	0.49
Inappropriate or poor quality information	-0.32**	0.01

Source: Computed from Field data, 2017.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The primary purpose of this study were to assess the information needs of cocoa farmers in Edo and Ondo States, Nigeria. Specifically, the study were conducted to ascertain the farmers' preference for cocoa information sources; examine cocoa farmers' information needs and information search behaviour as well as examine cocoa farmers' constraints to information accessibility in the study area. To achieve these objectives, the multistage random sampling procedure were used to select 432 respondents and a well-structured interview schedule were used to elicit information from the respondents. Data obtained were described and analyzed using descriptive (frequency, percentage, mean and standard deviation) and inferential statistics (Binary logit regression, Pearson's Product Moment Correlation (PPMC) to establish the relationships between response and explanatory variables of the studies). Also a 2x2 matrix were used to establish the priorities mean of farmers needs and search behaviour.

The result revealed that the mean age of cocoa farmers' were 52 years while majority (70.4%) of the farmers' were male. Low proportion (35.4%) of the farmers' had formal education, most (93.5%) of them where members of a group and were married (80.3%). Majority (74.3%) of the cocoa farmers' cultivate farm lands of less than 10 hectares with a mean farming experience of 22 years. This study revealed that the most preferred sources of information were input dealers/suppliers ($\overline{X}$ =2.86±0.40), Television ($\overline{X}$ =2.76±0.56), extension posters ($\overline{X}$ =2.80±0.50) and face to face advice with other farmers' ($\overline{X}$ =2.87±0.45) in the study area.

Farm layout ($\overline{X}$ =3.13), shade nursery ($\overline{X}$ =2.16), land preparation in main nursery operations ($\overline{X}$ =2.18), weed control ($\overline{X}$ =3.14), pest and disease control ($\overline{X}$ =3.14) in plantation establishment constituted the major farm operations where farmers' information needs are high in cocoa production chain while harvesting pods ($\overline{X}$ =2.81), breaking of pods ($\overline{X}$ =2.75), credit

sources ($\overline{X}$ =2.71) and post harvest techniques ($\overline{X}$ =2.71) were farmers post harvest information needs where high. It were also observed that cocoa production information needs and search for farm layout ($\overline{X}$ =5.48), farm cultivation system ($\overline{X}$ =4.82) and seed selection and planting materials ($\overline{X}$ =4.67)were the critical areas where farmers' needed more information in cocoa production. While, harvesting pods ($\overline{X}$ =3.12), using tapeline for drying ($\overline{X}$ =2.31), drying methods and process ($\overline{X}$ =1.96) and credit sources ($\overline{X}$ =1.96) were the critical areas where cocoa farmers' postharvest information needs and search.

The findings revealed that in Edo State, household size (b=0.05), years of schooling (b= 0.05), sex (b=0.50), estimated income (b= 1.08), marital status (b = 1.02), sources of farmland (b=0.25), membership of a group (b=0.42) and extension agent contact (b= -0.25) were significant at 0.05 level of significance. Similarly, in Ondo State, it was revealed that age (b=0.80), income level (b=1.08), marital status (b=1.02), membership of interest group (b=-1.40), and type of farm enterprise (b=1.20) were the determinants of information needs of cocoa farmers in the study area at 1% probability. This implies that these were the socio-economic variables that determine the information needs of cocoa farmers in the study area. For the postharvest information needs, it was observed that age (b=-0.04), farm size (b=-0.48), marital status (b=0.52) and sources of farmland (b=0.23) were the factors that determined postharvest information needs of farmers in Edo State. While, in Ondo State, factors such as age (b=0.06), years of formal education (b=0.20), sex (b=0.92), marital status (b=0.68) and sources of farmland (b=-0.47) determined information needs of cocoa farmers in postharvest activities.

It was observed that the study established that extension agents (b= -13.98; $p \leq 0.01$); input dealers/suppliers (b= -15.68; $p \leq 0.01$); internet (b= - 13.55; $p \leq 0.01$), cable network (b= 25.44; $p \leq 0.01$); family members (b=7.41; $p \leq 0.05$) and face to face contact with other farmers' (b =8.38;

p≤0.01) were the most significant preferred sources of information to cocoa farmers' Table 4.12. The R^2 value of 0.17 implies that only 17.0% changes in cocoa production information needs is brought about by the cumulative effect of the significant variables in Edo State. While, in Ondo State most of the information sources were significant. However, 93.0% variation in cocoa production information needs could be explained by the significant variables. It was revealed in Table 4.13 that extension agents (b= -5.38; p≤0.01), library (b= 3.94; p≤0.01), radio (b= 3.12; p≤0.05) and text books (b= 5.59; p≤0.01) were the significant preferred sources of information to cocoa postharvest information needs in Edo state. While, in Ondo State most of the information sources were significant. The finding of Pearson's Product Moment Correlation indicated that positive and significant correlation exists between production information needs (r=0.271; p≤0.01) and postharvest information needs (r=0.303; p≤0.01) and farmers' search behaviour for information.

5.2 Conclusion

As information remains a key component in ensuring agricultural development and productivity in Nigeria. The following conclusions are made from the findings of the study: cocoa farmers should be seen as major player in this sector therefore, it is important to understand their information need and search level as this is expected to influence the sector's productivity level as well as the service providers on what strategies to adopt for disseminating of agricultural information. Therefore, the information needs of the farmers' does not correspond to their search level which were very low, probably due to the fact that most of their information needs were unfelt needs. Also, in spite of the wide range of channel of information available to these farmers to source with the observed average preference to these sources of information, cocoa farmers still expressed relatively high need for agricultural information especially those that will enhance

productivity but with low search behaviour. Hence, cocoa farmers' need training in those areas. Similarly, they still source more of interpersonal and media sources with little or no significant exploit of the modern Information and Communication Technologies with the exception of mobile phones, hence cocoa farmers' in the study area need training on how to identify their major sources of information needs and search.

5.3 Recommendations

Based on the findings of this study, it is thus recommended that policy measures should be directed at:

1. Agricultural extension agencies should take note of the information needs of cocoa farmers particularly in areas of cocoa production, postharvest technique and also endeavour to step up their services in these areas of need.

2. It is therefore recommended that farmers' need to be adequately and regularly trained by the agricultural extension agents who are professional on how to identify critical areas of cocoa farmers' information needs, information accessibility and dissemination.

3. Farmers adult literacy education programme is required to help cocoa farmers acquire basic skills and abilities to seek or search and receive needed agricultural information through modern communication channels such as mass media, extension agents and face-to-face with other farmers. Therefore, adequate workshops, training and awareness should be given to the cocoa farmers by government agencies, private organizations and other farmers association for ease of identification of their information needs and sources.

4. Information service providers need to explore modern sources such as use of information and communication technologies for disseminating agricultural information technology centers in the

communities. Also, farmers should be linked to information service and inputs providers for ease of identification and dissemination of information needs and sources.

5. Extension agents should utilize cooperative forum to reach the farmers on information to increased productivity. Therefore, farmers should be encourage to join cooperative societies for ease of access to adequate information needs and information sources

6. The government should support the rural electrification and improve the rural transport system so that modern agricultural information services/facilitates; information centers at strategic location, radio station, television viewing center, internet centers and library made available for farmers use in cocoa production areas for easy accessibility to information sources.

7. Due to the shortage of funds and extension officers, Private Organisations and cocoa farmers association should provide assistance in disseminating agricultural information to cocoa farmers so that farmers can have wide access to current and relevant agricultural information.

8. Media owners should broadcast more agricultural information programmes in farmers local languages on both radio and television and should ensure that the programmes are broadcast at appropriate and convenient times for farmers. Public libraries in collaboration with researchers and other agricultural institution should identify, translate and provide relevant information materials in local languages for the rural farmers.

5.4 Contribution to Knowledge

The study has contributed to knowledge in the following ways:

1. the study unveiled the areas of training needs in cocoa production and postharvest activities.

2. the study contributes to literature by identifying the areas of critical importance in cocoa production and postharvest in the study area

3. the study revealed the various determinants of information needs and search in cocoa production.

4. the study unveiled the various constraints to information accessibility to farmers in cocoa production in the study area

5. the study revealed the sources of information preferred by cocoa farmers in the study area.

6. the study will be useful for policy formulation for improving cocoa production and postharvest handling in terms of information needs and search among farmers in the study area as it has revealed the critical areas where farmers need information but their search for information in such areas was rated low.

Suggestions for further studies

1. Assessment of cocoa farmers' information needs and human behaviour to information sources in Edo and Ondo states, Nigeria.

2. Assessment of cocoa farmers' information needs and human behaviour to information sources in cocoa producing states, Nigeria.

REFERENCES

Abel, G., Ali, S.E. & Johanna, J. (2015). Analysis of the Impact of Savings and Credit Cooperative Societies on Output among Crop Farmers in Niger State, Nigeria: Double Difference Estimator from a Regression Analysis Approach: Journal of Economics and Sustainable Development, Vol 6, No 15 93-99. (2015) ISSN (Paper) 2222-1700 ISSN

Abdul, R.M (1999). Cocoa Farming and Income Diversification in South-western Nigeria. African Studies Centre, 1999 - Cacao - 39 pages

Abukari, A.T; Oztornaci, B & Budak, D. B (2015). Prioritizing needs assessment techniques for agricultural programs implementation: The case of Northern Region, Ghana. Journal of Agricultural Extension and Rural Development . Vol.7(12), pp. 330-340, December, 2015

Adebayo, K (2004). Private Sector Participation in Agricultural Extension Services in Nigeria. Paper prepared for presentation at the Farm Management Association of Nigeria Conference, Abuja, Nigeria Oct. 19-21, 2004

Adebayo, K. (1997). Communication in Agriculture, Greenlinks International Abeokuta, Nigeria, 102.

Adebile, O. A. and Amusan, A. S. (2011). The Non-Oil Sector and the Nigeria Economy a Case Study of Cocoa Export Since 1960: *International Journal of Asian Social Science,* 1 (5): 142-151

Adejumo, T.O. (2005). Crop protection strategies for major disease of cocoa, coffee, and cashew in Nigeria *In African Journal of Biotechnology.* 4 (25) 143-150.

Adedoyin, S.F., Fapojuwo, D.E. and Torimiro, D.O. (1999): Educational Communication materials in agricultural technology promotion: A survey of extension agents in Ijebu Area of Ogun State, Nigeria. Proceedings of the fifth annual national conference of the Agricultural Extension society of Nigeria. 41-45.12th – 14th April.

Adefila, J.O. (2013). Spatial Effects of Cocoa production on rural economy in idanre-ifedore Area, Ondo State of Nigeria. ISSN (P): 2304-1455, ISSN (E): 3: 2224-4433.

Adelodun A, 2017 Cocoa Production in Nigeria: A Literature Review November 7, 2017 In Analysis, Food & Agribusiness

Adeogun, S.O., Olawoye, J.E. and Akinbile, L.A. (2010). Information sources to cocoa farmers on cocoa rehabilitation techniques (CRTs) in selected states of Nigeria. Journal Media and communication studies, Vol. 2(1), 009-015,

Adereti, F.O., Fapojuwo, O.E and Onasanya, A.S. (2006). Information Utilization on Cocoa production Techniques by Farmers in Oluyole Local Government area of Oyo State, Nigeria. *European Journal Social Science* 3(1); pp. 1-7.

Adesoji, S.A. and Kerere, F.O. (2013). Assessment of the knowledge level of fishers and fish farmers in Lagos State, Nigeria. International Journal of Knowledge, Innovation and Entrepreneurship, 1(1– 2): 41-56

Adetunji, M. O., Olaniyi, O. A., & Raufu, M. O. (2007). Assessment of benefits derived by cocoa farmers from cocoa development unit activities of Oyo State. *Journal of Human ecology,* Vol. 22, No. 3, Pp. 212-214.

Adesope, O.M., Asabiaka, C. C. & Agumagu, A. C. (2007): Effect of personal characteristics of extension managers and supervisors on information technology needs in the Niger Delta Area of Nigeria. International Journal of Education and Development using IC; 4(3): 123- 128.

Adhiguru, P., Birthal, P. S. & Ganesh, K. B. (2009).Strengthening pluralistic agricultural information delivery systems in India.*Agricultural Economics Research Review.*22:71 79.

Adler, E S & Clark, R. (1999). How It Is Done: An Invitation To Social Research. Canada: Wadsworth Publishing Company.

Afolabi, A.K. (2003). Information Needs, Information Sources and Information Seeking Behaviour of Commercial Vehicle Drivers in Ondo State. *Gate way Library Journal, 6(2), 90-95*

Agbamu, J. U. (2006). Essentials of Agricultural Communication in Nigeria. Lagos: Malthouse Press Limited.

Agom, D I, Susan B O, Kingsley O I and Nyambi N. I (2012) Analysis of Technical Efficiency of Smallholder Cocoa Farmers in Cross River State, Nigeria. International Journal of Agricultural Management & Development (IJAMAD).

Agwu A. E & Adeniran A. A. (2009). Sources of Agricultural Information used by Arable Crop Farmers in isaleOsun Farm Settlement, Osogbo local Government area of Osun State. J Agric Ext 2009;13(1):24-34

Aigbekaen.E.O. (2004). Export potentials of cocoa in Nigeria. Paper presentation at the National workshop on Re-positioning of Nigeria agriculture for, export: Prospect and Challenges ARMTI, Ilorin, Nigeria. 2004.

Aikpokpodion P O and Adeogun S O (2011). A Diagnostic Study of Constraints to Achieving Yield Potentials of Cocoa (Theobroma cacao L.) Varieties and Farm Productivity in Nigeria. Journal of Agricultural Science Vol. 3, No. 4; December 2011

Aikpokpodion, P.O., Badaru, K., Kolesnikova-Allen, M., Ingelbrecht, I., Adetimirin, V.O. & Eskes, A. (2005). Farmer-researcher participatory on farm selection of improved cocoa varieties: the Nigerian experience. In: Bekele Frances L. (ed.), End Michelle (ed.) & Eskes Albertus (ed.). *Proceedings of the International workshop on cocoa breeding for improvedproduction systems: 19th-21th October 2003, Accra, Ghana. Reading :INGENIC, p. 183-188. International Workshop on Cocoa Breeding for Improved Production Systems. 4, 2003-10-19/2003-10-21, Accra, Ghana.*

Aina, L.O. 1986. An empirical analysis of the information component of agricultural extension services in Ibadan area. PhD thesis. Ibadan: University of Ibadan.

Aina, L.O. (1990). Information Africa farmers: Some obstacles to information flow. Information Development, 6(4):201 – 205.

Aina, L. O. (1995). Information and agriculture in Africa. In: Aina, L. O., Kaniki, A. M., and Ojiambo, J. B. (eds.), Agricultural Information in Africa, Ibadan, Nigeria: ThirdWorld Information Services, 1-11.

Aina, L.O; Kaniki, A.M, Ojiambo B.J (1995). Agricultural information in Africa Third World Information Services, 1995 - Technology & Engineering - 221 pages

Aina, L.O and Dulle, F.W. (1999). The information needs of small scale dairy farmers in Tanzania, *International Association of Association of Agricultural information Specialists (IAALD) Quarterly Bulletin* 44 (3-4), 173- 176.

Aina, L.O. (2007). Globalisation and Small- Scale Farming in Africa: What role for Information Centres? World libraries and information congress 73rd IFLA General conference and council. Durban, South Africa

Ajayi, I. R., Afolabi, O. M., Fayose, R. S. & Sunday A.G. (2012). Modeling Temperature as a Constraining Factor for Cocoa Yield in Ondo State. American International Journal of Contemporary Research, 2(7): 172 –178.

Ajayi S.I. & Oyejide T. A (1974). The Role of Cocoa in Nigeria Economic Development. Nigeria: The Economics of Cocoa Production and Marketing in Nigeria. Cocoa Development Unit of Oyo State 2007.Information Bulletin of Cocoa Development Unit, Oyo State Press, Pp 1-30

Ajobo, O. (1980). Economic of Cocoa Production. In: Production of Cocoa, Coffee and Tea in Nigeria. The Cocoa Board, Cocoa House, Ibadan, Nigeria. pp. 137-140.

Akinwumi, A.A. (2013). The Opportunity in Nigeria's Cocoa Sector: Special Address by Dr. Akinwumi A. Adesina Honourable Minister of Agriculture & Rural Development Federal Republic of Nigeria to the World Cocoa Foundation Washington, D.C. June 5, 2013.

Alamu, S.A. (2013). Analysis of Seedling Subsidy Policy and Cocoa Production in South-West Nigeria. Nigerian Institute of Social and Economic Research (NISER). *Journal of Educational and Social Research Vol. 3 (4) July 2013*

Altschuld, James W. and David Devraj Kumar (2010). Needs Assessment: An Overview. Thousand Oaks: Sage. ISBN 978-1-4129-7584-1

Amos, T. T. (2007). An Analysis of Productivity and Technical Efficiency of Smallholder cocoa farmers in Nigeria. *Journal of Social Sciences.*15(2):127-133.

Amobi, B.O. (2010). Solving Unemployment Problems through Sustainable Agricultural Production. President's address delivered at 34th Annual Conference of Nigeria Statistical Association held in Owerri from 22nd-24th Sept, 2010.

Anaeto, F. C., Asiabaka, C. C., Nnadi, F. N., Ajaero, J. O, Aja, O. O., Ugwoke, F. O., Ukpongson, M. U. and Onweagba, A. E. (2012). The role of extension officers and extension services in the development of agriculture in Nigeria. Wudpecker J. Agric. Res., 1(6): 180-185.

Anthony, O (2017).Decline in Nigeria's cocoa production not acceptable, says Buhari: Nigeria Business News Published 29 August 2017

Ayanwale, A.B. (1995). "Resources – use Efficiency in cassava processing in Oyo North Area of Oyo stat, Nigeria" Ife Journal of Agriculture 17: 123 – 135

Ayoade, A.R. (2010). Effectiveness of information sources on improved farm practices among cowpea farmers in Oyo State. Global Journal of HumanSocial Science, Vol. 10, no.4: 39 - 45.

Ayorinde, J. A. (1966). Historical Notes on the introduction and development of cocoa industry in Nigeria. Nigeria Journal of Agriculture, Vol.3 No 2.

Babu, S.C; Glendenning, C.J; Asenso-Okyere, K & Govindarajan, S. K (2012). Farmers Information Needs and Search Behaviors. Case Study in Tamil Nadu, India, Report for International Food Policy Research Institute, Washington, DC.

Ballantyne, P. (2009).Accessing, Sharing and Communicating Agricultural Information for Development: An Emerging Trends and Issues. Information Development, 25(4), 260 271.

Balogun, O.L. (2011). Determinants of Managerial Abilities of Small Scale Cocoa Farmers: Akinyele LGA of Oyo State of Nigeria. 10, October *2011*. ISSN 1990-6145 University of Ibadan, Nigeria.

Bammeke, T.O.A. (2003). Accessibility and utilization of agricultural information in the economic empowerment of women farmers in South Western Nigeria. Ibadan: University of Ibadan.

Bammeke, T.O.A and Olowu, T.A. (2005): Accessibility of women farmers to agricultural information in South Western Nigeria. South African Journal of Agricultural Extension 34 (2): 237 – 246.

Bell, J. (2005). Doing your Research Project: A Guide for First-Time Researchers in Education, Health and Social Science, 4th edition. Berkshire: Open University Press.

Bernard, A. (2011). Cocoa farmers may boost yields by intercropping; Bringing science and development together through news and analysis. *Journal of Ecological Economics*. 03.013.

Bolarin, O. & Ayanlade, A. (2010) Utilization of Satellite Imaging and Information Communication Technology in Agricultural Information Dissemination in Nigeria. Journal of Agricultural and Food Information, 11, 351-357

Borden, B. (2004). Secondary data and analysis. In L. Singletary (Ed.), *Conducting community situational analyses: A field guide to dynamic Extension programmin*g (pp. 8-16).

Bozi, I. and Ozcatalbas, O (2010). Determining information sources used by crop producers: A case study of Gaziantep province in Turkey, *African Journal of Agricultural Research,* Vol.5 (10), 980-987.

Byamugisha, H.M. Ikoja-Odongo, R. Nasinyama, G.W. and Lwasa, S (2008). Information seeking and use among urban farmers in Kampala district, Uganda, *Agricultural information and IT proceedings of IAALD AFITA*. *24 to 27August 2008*, Tokyo University, Japan.

Caffarella, R. S. (1982). Identifying client needs. *Journal of Extension, 20* (July -August), 5-11.

Case, D., Andrews, J.E., Johnson, J.D., & Allard, S.L. (2005). Avoiding versus seeking: the relationship of information seeking to avoidance, blunting, coping, dissonance, and related concepts. *Journal of Medical Library Association, 93*(3), 353-362.

Central Bank of Nigeria.(2016). *Annual Reports and Statistical Bulletin* 2015. Abuja: Central Bank of Nigeria.

Chandrasekan, S., Dipesh, D.M., Jitendra, K.J.D., Kamlesh,J. S., & Dinesh, K.J.N. (2010). Context Aware Mobile Service Deployment Model of Agricultural Information System for Indian Farmers. International Journal of Computer Application,1(29),8-12.

Chaudhry, K.M., Muhammad, S., Saghir, A. and Ashraf, I. (2008). Rural women‘s access to various sources of information. Journal of Animal & Plant Sciences, Vol. 18, no.2-3: 99 101.

Chauhan, A.V. (2009). Use of ICT (Information and Communication Technology) in Technology Libraries. Journal of Library Philosophy and Practice, 2, 1-16

Chisita, C. T. (2010).An investigation in to the use of ICT in the provision of agricultural information to small scale farmers in Harare. World Library and Information Congress: Procceding of the 76th IFLA General Conference and Assembly, Gothenburg Sweden.1 14.

Christensen, B. D. (2016). Needs Assessment or Needs Analysis. International Society for Performance Improvement.

Christensen, B. (2017).Needs Assessment vs Needs Analysis: What's the Diff. Annual Conference, 2019 - ispi.org International Society for Performance Improvement

Cocoa Research Institute of Nigeria (CRIN), (2001). A Guide to Cocoa Production in Nigeria Extension Bulletin No 14.

Community Assessment Tools (2013). A communities in Action: A Guide to Effective Project. A (605A). (PDF). *RT journal. Rotary International. Archived from the Original* (PDF). *July 2013*

Dankwah, D.A and Hawa, O, (2014). Meeting Information Needs of Cocoa Farmers in Selected Communities in the Eastern Region of Ghana. Part of the Interpersonal and Small Group Communication Commons, and the Library and Information Science Commons. *Library Philosophy and Practice (e-journal)*. 1103.

Daniel, E. (2018). 'How Nigeria can increase GDP with cocoa export' - The Nation. The Nation Newspaper, November 5, 2018.

Daudu, S., Chado, S. S. and Igbashal, A. A 2009. Agricultural Information Sources Utilized by Farmers in Benue State, Nigeria. University Library, University of Agriculture, Makurdi, Nigeria. Publication Agriculture and Technology Vol.5 (1):39–48.

Davenport, T.H. De Long, D.W & Beer, M.C (1998): Successful Knowledge Management Project. Sloan Management Review, 39 (2), 43-57.

David, S.; Agordorki, S.; Bassarggga, S.; Couloud, J.Y.; Kumi, M.A. ; Okuubul, I. and Wandi, D. (2006).A Guide for Conducting Farmer Field Schools on Cocoa Integrated Crop and Pest Management: Sustainable Tree Crops Programme. International Institute of Tropical Agriculture, 102 pp.

Dervin, B., & Nilan, M. (1986). Information needs and uses. Annual Review of Information Science and Technology,21, 3–33.

Devadson, F. J. and Lingam, P. P., (1996). A Methodology for the Identification of Information Needs of Users. Paper presented at the World Library and Information Congress: 62nd IFLA General Conference–Conference proceedings. 25th -31st August 1996, Beijing, China.

Donaldson, J. L., Hastings, S., & Bower, L. K. (2013). Advancing Tennessee: *Focus group interviews facilitation guide for FCS programs*.

Dormon, E.N.A., Van Huis A., Leeuwis C., D. Obeng D O & Sakyi-Dawson, O, (2004). Causes of Low Productivity of Cocoa in Ghana: Farmers' Perspectives and Insights from Research and the Socio-Political Establishment. NJAS Wageningen J. Life Sci., 52(3-4): 237-259.

Dutta, R. (2009). Information Needs and Information Seeking Behaviour in Developing Countries: A Review of the Research. *The International Information and Library Review* 41 (1): 44-51.

Edeoghon, C. O and Okoedo-Okojie, D. U (2017). Correlates of information accessibility among urban maize farmers in Edo State, Nigeria: Implications for poverty alleviation. Ethiopian Journal of Environmental Studies & Management 10(5): 10-17.

Effiong, E. O. (2005). Efficiency of Production in Selected Livestock Enterprises in Akwa Ibom State, Nigeria. Unpublished Ph.D Dissertation, Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike, Nigeria.

Ekoja, I.I. (2010). Personal variables affecting the adoption of Agricultural Innovations by Nigeria Farmers. *Forthcoming in the South Africa Journal of Agricultural extension*

Ezinnehart (2015). The Importance of Information Technology in Farming Practices in Nigeria. ITFPN. April 15, 2015.

Faibisoff, S. G., and Ely, D. P. (1976). Information and information needs. *Information Reports and Bibliographies*, 5, 2-16.

Famuyiwa, B S, Torimiro, D. O. & Adesoji, S. A (2013). Determination of Cocoa Farmers' Knowledge on Environmental Hazards Associated with Cocoa Farming Operations in Nigeria. International Journal of Knowledge, Innovation and Entrepreneurship Volume 1 Nos. 1– 2, 2013, pp. 58—70

FAO, (1997). Sustainable Seed System in SSA, Food and Agricultural Organization of the United Nation; Rome Italy.

FAO (1992): Population Education and Nutrition: Version for Africa.

FAO, (2003). The One to Watch, Radio, New ICTs and Interactivity. Rome: FAO, 57: 105

FAO. (2005). Agricultural Knowledge and Information Systems for Rural Development (AKIS/RD).Strategic Vision and Guiding Principles.

Folayan, J. A, Oguntade, A. E. and Ogundare, K. (2007). Analysis of profitability and operational efficiencies of cocoa marketing: Empirical evidence from Nigeria: *Journal SocialScience,* 15(2): 197-199.

Folayan, J.A., Daramola, G.A. and Oguntade, A.E. (2006). Structure and performance evaluation of cocoa marketing institutions in Southwestern Nigeria: analysis. *Journal of Food, Agriculture and Environment.* 4 (2): 123-128.

Freudenberger, K. S. (1994). *Tree and land tenure: Rapid appraisal tools.* Rome: FAO.

Fulgham, S. M. & Shaughnessy, M. (September–October 2008). Q & A with Ed Tech Leaders: Interview with Roger Kaufman. Educational Technology. pp. 49–52.

Galadima. M. (2014). Constraints on Farmers Access to Agricultural Information Delivery: A Survey of Rural Farmers in Yobe state, Nigeria IOSR Journal of Agriculture and Veterinary Science -ISSN: 2319-2372. Volume 7, Issue 9 Ver. II (Sep. 2014), PP 18-22

Gocowski, J. & Oduwole, S. (2003). Labour Practices in the Cocoa Sector of Southwest Nigeria with a special focus on the role of children. STCP/IITA monograph IITA, Ibadan, Nigeria. 2003.

Gwang, J. M. (2011). The Provision of Information Services to Nigerians: Meeting the Challenges of 21st Century. *Library Philosophy and Practice (e-journal)*. 570.

Ha, L., Okigbo, R. and Igboaka, P. (2008). Knowledge Creation and Dissemination in Sub Saharan Africa. Management Decision, Volume 46, Number 3, Pages 392-405.

Haba, S. (2004). Factors influencing the willingness to pay for agricultural information delivery technologies by cooperative-oriented agribusinesses in Rwanda: evidence from the Abahuzamugambi Coffee Growers Cooperative of Maraba. Master's thesis, Texas A&M University. Available electronically from http://handle.tamu.edu/1969.1/2414.

Habtemariam. K., (1996). Agricultural Education, Research and Extension in Ethiopia: Problems and Linkages. In: Mulat, D., Aregay W., Tesfaye Z, Solomon B., Sustainable Intensification of Agriculture in Ethiopia. Proceedings of the Second Conference of the Agricultural Economics Society of Ethiopia, held in Addis Ababa 3-October 1996. Agricultural Economics Society of Ethiopia, Addis Ababa, PP. 229-236.

Havelock, R. (1979). Planning for Innovation Through Dissemination and Utilization of Knowledge Centre for Research on Utilization for Scientific Knowledge , University of Michigan Ann Arbor.

Hedeja, M. (1999). Investigation of Smallholders' Behaviour as factors Influencing Farm Performance in Ethiopia: The Case of Smallholders in Eastern Harrarghe. Msc. Thesis, Department of Horticulture, Hanover University.

Hershkowitz, M. (1973). A Regional ETV Network: Community Needs and System Structure. *Report for Regional Education Service Agency of Appalachian Maryland.* Silver Spring, MD: Operations Research Inc.

Hosseini, S., Mehrad, N., & Gholamreza, H. (2009). Policies Affect the Application of Information and Communication Technologies by Agricultural Extension Services. *American Journal of Applied Science*, 6(8), 1478

International Cocoa Organisation (2001). Bulletin of International Cocoa Organization ICCO

International cocoa organization (2003). . Bulletin of International Cocoa Organization ICCO

International Cocoa Organization, ICCO (2014). International Cocoa Organization Regional Seminar on the functioning of cocoa futures markets and Econometric Modelling of the cocoa market. Indonesia, July 2014.

International Cocoa Organisation (ICCO), (2015). Production of cocoa beans. ICCO Quarterly Bulletin of Cocoa Statistics, XLI (1), Cocoa Year 2014/15, International Cocoa Organisation (ICCO), London, UK

Iremirem, G.O. (2011). Soil fertility and ageing cocoa farms in Nigeria. A paper presented in World cocoa foundation.

Irivwieri, J.W. (2007). Information Needs of Illiterate Female Farmers in EthiopeEast Local Government Area of Delta State,Library Hi Tech News, Vol. 24,nos. 9/10: 38 –42.

Janice, C., Burns, M.A.; Dagmar P. P; & Silvia R. Paz, B.A (2012). Participatory Asset Mapping: A Community Research Community Research, Lab Tool Box A ToolKit. Advancement Project – Healthy City Updated April 2012.

Johnson, J. D., Donohew, W. A., Atkin, C. K., & Johnson, S. H. (1995). A Comprehensive Model of Information Seeking: Tests Focusing on a Technical Organization," Science Communication, 16, 274-303.

Johnson, J.D (1997). Cancer-related information seeking. Cresskill, NJ: Hampton Press:70–100.

Kansana, H. S., Sharma, R.P & Sharma, S.K (1996). Knowledge and Adoption of Wheat Technology Among Contact and Non-Contact Farmer. Agricultural Science, Digest Karnal. 16:154 -156

Kaniki, A.M. (1989). Agricultural Information Needs in Zambia: A Study of A Two-Way Information Flow. PhD Thesis, University of Pittsburgh. Ann Arbor: UMI Dissertation Service.

Kaniki A.M (1995): Agricultural User Populations and Critical Tasks in African in LO Aina, A.M Kaniki and J.B Ojimbo (eds). Agricultural Information in African Ibadan Third World Information Services.

Kaniki, A.M (2003). Information Needs for Basic Research: African Perspective, Symposium on Open Acess and the Public Domain in Digital Data and Information for Science, UNESCO Head Quarters, Paris, France, 10-11-2003.

Kantumoya, A. (1992). Public Libraries and Community Information Services in Africa. Africa Journal, Arch. Information . Science. 2(1): 33-38

Kassim, A. A & Alfred, O. D, (2012). Analysis of Labour-Use Patterns among Small Holder Cocoa Farmers in South Western Nigeria: *Journal of Agricultural Science and Technology* B 2 (2012) ISSN 107-113

Katungi, E. (2006). Gender, Social Capital and Information Exchange in Rural Uganda. IFPRI and Melinda Smale, IFPRI (International Food Policy Research Institute) CAPRi Working Paper No. 59, University of Pretoria, Uganda.

Kaufman, R. A. (1982). Identifying and Solving Problems: A Systems Approach (3rd ed.). San Diego, CA: University Associates

Kaufman, R., (1992). Strategic planning plus: An organizational guide. Newbury Park, CA: Sage

Kaufman, R., and Watkins, R. (2000). Getting serious about results and payoffs: We are what we say, do and deliver. *Performance Improvement,* 39(4), 29-32. doi: 10.1002/pfi.414039040

Kerlinger, F. N., (1997). Perspectives on nursing theory. In Nicoll LH and Hinshaw AS (Eds), Nursing science: The challenge to develop knowledge, pp334-346. Lippincott-Raven Publishers, Philadelphia.

Kizlik, B. (2010). Need Assessment Information (Wants determine needs). . ADPRIMA.

Kughur PG, Ortindi PI, Katikpo G (2015). Factors affecting farmers' accessibility to agricultural information in Gwer-East local government area of Benue State, Nigeria, International journal of information and communication technology research, 5:10.

Kuhlthau, C. C. (1993). A Principles of Uncertainty for Information Seeking: *Journal of Documentation,* 49(4).

Krueger, R. A. (1994). Focus Groups: A Practical Guide for Applied Research. Thousand Oaks, CA: Sage Publications.

Ladebo, O. J. (2006). Perception of Trust and Employee Attitudes: A look at Nigeria's Agricultural Extension Workers. *Journal of Business* and *Psychology*, 20(3), 409427

Lawal J.O. & Sanusi, R.A. (2010) Social Capital and Credit Access Among Cocoa Farming Households in Ondo and kwara States, Nigeria. In CRIN 2009 Research Review and 2010 Research Activity Planining Meeting Part ! 2010 pp 146-156.

LawalIro Sani; Boadi, B.Y.; Oladokun, O.; Kalusopa, T (2014). The Generation and Dissemination of Agricultural Information to Farmers in Nigeria: A Review LawalIro Sani; Boadi, B.Y ; Oladokun, O.; Kalusopa, TOSR Journal of Agriculture and Veterinary Science .Volume 7, (Mar-Apr. 2014), PP 102-111

Leagans, J.P. & Charles, P.L (1971). Behavioral Change in Agriculture. Concepts and Strategies for Influencing Transition. Ithaca: Cornell University Press, 1971.

Lepicki, T., & Boggs, A. (2014). Needs Assessments to Determine Training Requirements. In J. W. Altschuld & R. Watkins (Eds.), Needs Assessment: Trends and a View Toward the Future (pp. 61-74). New Directions for Evaluation. No.144.

Line, M. B. (1974). Draft Definitions: Information and Library Needs, Wants, Demands and Users, *Aslib Proceedings* 26(2), 87.

Lwoga, E. T., Stilwell, C. and Ngulube, P., (2011). Access and use of agricultural information and knowledge in Tanzania.*Library Review*, Vol. 60 Issue 5

Maalouf, W. D., and Contado, T. E. (1983). Basic and in-service training for agricultural extension. *Training for Agriculture and Rural Development, 31,* 39-47.

MacCaslin, N.L, Tibezinda, J.P. (1997). Assess target group needs. In Improving Agricultural Extension, Reference manual. Food and Agriculture organization Corporate Document Repository of the United Nations Rome, 1997.

Martilla, J. A., & James, J. C. (1977). Importance-Performance Analysis. *Journal of Marketing*, *10*(1), 13–22. American Marketing Association.

Malhan, I.V. (2007) Agricultural Knowledge Transfer in India: A Study of Prevailing Communication Channels. Journal of Library Philosophy and Practice, 1-12.

Manu, P. and A. Sultan (2002). Information Revolutions, how Information and Communication Management is Chaining in the Lives of Rural People. CTA Wagenigen. The Netherlands.

Mccawley, P.F. (2009). Methods for Conducting an Educational Needs Assessment: Guidelines for Cooperative Extension System Professionals. Moscow, Idaho, University of Idaho Extension.

McKillip, J. (1998). Need Analysis: Process and Techniques. In L. Bickman & D. J. Rog (Eds.), Handbook of Applied Social Research Methods (pp. 261-284). Thousand Oaks, CA: Sage Publications.

McKnight, J. (1992). *Mapping Community Capacity*. Chicago, IL: Northwestern University: Center for Urban Affairs and Policy Research.

Mgbenka, R.N. & Mbah, E.N (2016). A Review of Smallholder Farming in Nigeria: Need for Transformation. International Journal of Agricultural Extension and Rural Development StudiesVol.3, No.2, pp.43-54, May 2016. Published by European Centre for Research Training and Development UK

Miller, S.M. (1980). When is a Little Information a Dangerous Thing? Coping with Stressful Life-Events by Monitoring Vs Blunting. In S.Levine and H.Ursin (Eds), *Coping and Health*. New York: Plenum Press.

Moghnieh, A. Blat, J. Using conceptual models to improve the translation from requirements into design. CHI2009

Mokotjo, W. & Kalusopa, T. (2010). Evaluation of the agricultural information service (AIS) in Lesotho. International Journal of Information Management, 30, 350-356.

Mooko, N. & Aina, L.O. (2007). Information Environment of Artisans in Botswana. LibriJournal, 57.1-7.

Moris J. 1991. Extension Alternatives in Tropical Africa. Overseas Development Institute, London, UK.

Mtega, W. & Benard, R. (2013). The State of Rural Information and Communication Services in Tanzania: A Meta-Analysis. International Journal of Information and Communication Technology Research, 3(2), 64 – 73

Mundie, S. (2014). Seasonal Calendar; Better Evaluation, Sharing Information to Improve Evaluation.

Musib, S.K. (1989). Information Needs and Sources of Information of the Rural Agriculturalists. Annals of Library Science and Documentation, Vol. 36, nos.1-2: 63-70.

National Consumer Supporter Technical Assistance Center (2005). Community Needs Assessment (PDF). Mental Health America of South Carolina

National Population Commission, (2006). The Nigeria Population Census 2006. Accessed on 12th June, 2016.

Neuman W Lawrence 2003: social Research Methods: Qualitative and Quantitative Approaches 5th edition. USA: A and B Company

Nigeria First International Cocoa summitN, (2017). 'Cocoa, A Strategic Commodity for National Economic Development; FG to reposition and revitalize Cocoa Production in Nigeria. Federal Ministry of Information; Published August 30, 2017

Nick, M. (2012). A Model of Social Information Need. Accessed on December 6, 2017.

Nikolas, D. (2005).Assessing information needs: Tools, Techniques and Concepts for the Internet Age 2ndEd. ASLIB Taylor and Francis e-library.

Nkang, N. M.,Abang, S. O., Akpan, O. E. and Offem, K. J. (2006). Co-integration and error correction modelling of agricultural export trade in Nigeria: The case of cocoa. *Journal of Agriculture and Social Sciences.*

Nkang, M. Ajah, E. A., Aban, S. O. and Edet, E. O. (2007). Investment in Cocoa Production in Nigeria: a Cost and Return Analysis of three Cocoa Production Management Systems in the Cross River State Cocoa Belt. *Journal of Central and European Agriculture.*8(1):81 90.

Nmadu, J. N., Omojeso, B.V. and Halima, S. (2014). Efficiency of Innovation Uptake among Cocoa Farmers in Ondo State.*European Journal of Business and Accountancy,* 3(2): 58-66.

Nmadu, J. N., Omojeso, B. V. and Halima, S. (2015). Socio-economic Factors Affecting Adoption of Innovations by Cocoa Farmers in Ondo State, Nigeria.

Nnenna, A. O. (2011). Rural Farmers' Problems Accessing Agricultural Information: A Case Study of Nsukka Local Government Area of Enugu State, Nigeria University of Nebraska – Linco ln Digital Commons@University of Nebraska – Lincoln Library Philosophy and Practice (e-journal) Libraries at University of Nebraska-Lincoln

Nonaka, I. & Takeuchi, H. (1995). The Knowledge Creating Company, New York: Oxford University Press.

Nwosu, P. O. & Megwa, E. (1993). Communication and Rural Development in Swaziland in Africa Media Review. Vol. 7, No. l

Nyumba, T.O, Wilson, K, Derrik. C. J & Mukherjee, N. (2018). The Use of Focus Group Discussion Methodology: Insights from Two Decades of Application in Conservation. Qualitative Methods for Eliciting Judgments for Decision Making. First published: 11 January 2018. British Ecological Society.

Obinne, C. P. O. (1994). *Fundamental of Agricultural Extension.* 2nd Edition, Enugu: ABIC Publishers.

Odefadehan, O.O and Alfred, S.D.Y (2005). A Study on Information Needs of Agricultural Extension workers in Ondo State, Nigeria. Federal University of Technology Akure, Publisher. **:** http://hdl.handle.net/123456789/1392

Odini, C. (1990). Planning for Public Library Development in Developing Countries with Special Reference to African countries. *Libri*40, 1:33-48.

Oduwole, O. O. (2000). Sustainable Cocoa Production in Nigeria: Farmers' Perception of Technology Characteristics and Socio-Economic Factors in Adoption Decision. In: Proceedings of the 13th International Cocoa Research Conference Sabah, Malaysia pp. 1147 – 1152.

Oduwole, O. O. (2004). *Adoption of Improved Agronomic Practices by Cocoa Farmers in Nigeria: A Multivariate Tobit Analysis.* Ph.D. Thesis (Unpublished), Akure: Federal University of Technology, Nigeria.

Oduwole, O. (2011) Adoption of Modern Agronomic Practices by Cocoa Farmers in Nigeria. A Multivirate Tobit Analysis. Lambert Academic Publishing GmbH & co. KG.

Ofuoku, G.N. (2008). Information Utilization among Rural Fish Farmers in central, Agricultural Zone of Delta State, Nigeria.

Ogboma,M.U. (2010). Access to Agricultural Information by Fish Farmers in Niger DeltaNigeria, *Journal of Library Philosophy and Practice*

Ogunfuwa, I. (2016).Nigeria Drops to Seventh Position as Cocoa Producer: Punch Newspaper Published September 18, 2016

Ogungbeni, J; Ogungbo, W & Adeleke, O (2013). Agricultural Information Needs of Farmers in Lagos State, Nigeria. International Journal of Agricultural Science Research Vol. 2(4): 116-123.

Ogunlade, M. O., Oluyole, K. A. and Aikpokpodion, P. O. (2009). An Evaluation of the Level of Fertilizer Utilization for Cocoa Production in Nigeria.*Journal of Human Ecology* 25(3):175-178.

Oguntade, A.E. (2000). Cocoa Value Chain in Nigeria past and present. Department of Agricultural and Resource Economics, Federal University of Technology Akure.

Ojo, A. (2003). The problem of cocoa marketing and trade in Nigeria: Pre-liberalisation and Liberalisation Era. Occasional publication.Number 2, Cocoa Association of Nigeria (CAN), Precious Pearls Communications, Akure, Nigeria.5-14.

Ojiambo, J.B (1995). Developing Human Resources Capacity for Information Services in African Journal of Library, Archives and Information Science 2(2) 83-90

Okuneye, P. A. (2000). Employment Generating Potentials of Agricultural Processing and Storage Technology: Additional Gain in Increased Food Availability Pursuit. Paper presented at the workshop for local government officials in Lagos state. 2000

Okwu, O.J. and E.P. Ejembi, 2001. The historical Development of Agricultural Extension in Nigeria. Journalof Sustainable Tropical Agricultural Research, 2(3): 93-99

Okwu, J and Daudu, S (2011). Extension Communication Channels' Usage and Preference By Farmers in Benue State, Nigeria

Oladele, O.I. (1999) Extension Communication Methods for Reaching Small-Ruminant Farmers in South Western Nigeria. Proceedings of the 26th Annual Nigerian Society of Animal production Conference, Ilorin, 20-25 June 1999.

Oladipupo, F. O., Kareem, O. W., Adereti, F. O., and Abubakar H. N(2010) Gender discrimination among the rural household in Edu Local Government Area of Kwara State, Nigeria. Journal of Agriculture and Rural Development. Vol. 6 2010

Olaiya, T. A. (2016). Examining the Political-Economy of Cocoa Exports in Nigeria; The International Journal of Applied Economics and Finance. Volume 10 (1-3): 1-13, 2016

Olayide, S.O. and Ogunfditimi, T. (1980)."Agricultural Extension and Nigeria small farmers" In Olayedeet. al. (eds) Nigeria small farmers problems and prospects of Rural development Ibadan university press Ibadan pp 35-53.

Olawoye, J. E. (1996). Agricultural Production in Nigeria in Utilizing Research to Increase Food Production: The Role of Mass Media. Proceedings of the One Day Seminar Organized by Oyo State Chapter of the Media Forum for Agriculture.

Oluyole, K.A. (2005). Evaluation of the Economics of Post Harvest Processing of Cocoa in Cross River State, Nigeria. Journal of Agriculture, Forestry and the Social Sciences. 3 (2): 58-64.

Oluyole, K.A., Adebiyi, S. & Adejumo, M.O. (2007). An Assessment of the Adoption of Cocoa Rehabilitation Techniques Among Cocoa Farmers in Ijebu East Local Government Area of Ogun state. *Journal of Agricultural Research and Policies*. 2 (1): 56-60. 2007

Oluyole, K.A., Oni, O.A., Omonona, B.T. & Adenegan, K.O. (2009). Food Security Among Cocoa Farming Households of Ondo State, Nigeria. *Journal of Agricultural and Biological Science*. 4 (5): 7-13.

Oluyole, K.A. and Sanusi, R.A. (2009).Socio-economic variables and cocoa production in Cross River State, Nigeria.*J. Hum. Ecol*. 25(1), 5-8.

Omoare, A.M, Oyediran, W.O & Fakoya, E.O (2016). Comparative Assessment of Cocoa Farmers' Knowledge and Attitude to Trainings on Good Cultural Management Practices (CMP) in Ogun And Ondo States, Nigeria. International Journal of Agricultural Extension and Rural Development StudiesVol.3, No.3, pp.36-51, July 2016

Omoregbee, F.E. and Banmeke, T.O.A (2014).Information Needs of Cassava Farmers in Delta State of Nigeria.*Tanzania Journal of Agricultural Sciences* 12 (2) 20 - 25.

Opara, U.N. (2008). Agricultural Information Sources Used by Farmers in Imo State, Nigeria. Information Development, 24(4), 289-292.

Opeke, L.K (1987). Tropical Tree Crops. Ibadan: Spectrum Books Ltd., pp.108-120.

Opeke, L.K. (2003). Increasing Cocoa Production in Nigeria during the Third Millenium. In Occasion publications No. 2 Cocoa Association of Nigeria. 2(1): 56-60.

Opeke, I. K. (2005). Introduction of Cocoa to West Africa. Tropical commodity Tree Crop. Spectrum Books Limited, Ibadan, Nigeria. Pp 91-179

Osarenren, C. O and Emokaro, C. O (2015).Profitability of Cocoa Production Under Different Management Systems in Edo State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment.* 11(1):38-43.

Osarenren, C. O; Ejuetueyin, J. O; Eweka, K.I (2016): Socio-economic characteristics of Registered Cocoa Farmers in Edo State, Nigeria. *Journal of Applied Science Environment Management*, 20 (2): 261 –266.

Osuala, E.C. (2001). Introduction to research methodology. Third Edition. Ausha: Africana-Fep Publishers Ltd.

Otitoju, M. and C. J. Arene. (2010), "Constraints and Determinants of Technical Efficiency in Medium-Scale Soybean Production in Benue State, Nigeria*." African Journal of Agricultural Research* 5(17), 2276–2280

Ozowa, V. N. 1995. The Nature of Agricultural Information Needs of Small Scale Farmers in Africa: The Nigerian Example." Quarterly Bulletin of the International Association of Agricultural Information Specialists 40(1):15–20.

Ozowa, V. N. (2008). Information needs of small scale farmers in Africa the Nigerian example. Quarterly Bulleting of the International Association of Agricultural Information Specialist, 40(1), 1-6.

Peil, Margaret (1976). Consensus and Conflict in African Societies: An Introduction to Sociology. Birmingham, Longman.

Popoola Olufemi A.1, Ogunsola Grace O.2and Salman Kabir K.1 (2015)Technical Efficiency of Cocoa Production in SouthwestNigeria International Journal of Agricultural and Food Research [IJ AFR]. Vol. 4 No. 4, pp. 1-14 (2015)

Purcell, D. L. and Anderson, J. R. (1997). Agricultural research and extension: Achievements and problems in national systems. World Bank Operations Evaluation study, World Bank, Washington, DC, USA.

Radhakrishna, R.B. (2007). Approaches for linking markets and farmers to foster Indian's rural development. Proceedings of the 24thAnnual Meeting, E.A.R.T.H. CostaRica,1-17.

Rao, N. H. (2007). A frame work for implementing information and communication technologies in agricultural development in India. Journal of technological forecasting and social change, 74, 491-518.

Ray, P (2008). Library and information services to rural communities and other disadvantaged groups. Abuja Inforlib: Journal of Library and Information Science.4(1), 80 – 88.

Renwick, S. (2010). Current Trends in Agricultural Information Services for Farmers in Trinidad and Tobago/Caribbean. World Library and Information Congress: 76th IFLA General Conference and Assembly 10-15 August 2010, Gothenburg, Sweden.

Riesenberg, L.E and Gor, C.O (1999). Farmers' Preferences for Methods of receiving information on new or innovative farming practices, Graduate Student University of Idaho 5th April 2007,

Rolling, N.G., (1988). Extension Science: Information systems in Agricultural development. Cambridge: Cambridge University Press.

Rossi, P. H., Lipsey, M. W. and Freeman, H. E. (2004). *Evaluation: A systematic approaches* (7th ed.). Thousand Oaks, CA: Sage Publications.

Rothwell, W. J. (1984). Strategic needs assessment. *Performance and Instruction Journal,* 23(5), 19-20.

Samuel, G. S. (2011). The Development of Integrated management Information Systems for Agricultural Extension Institutions of Developing Countries: The Case of Oromia Agricultural Development Bureau of Ethiopia. Aachen, Shaker, Ethiopia.

Sharma, A.; Lanum, M.; Saurez-Balcazar, Y. (2000). A Community Needs Assessment Guide: A Brief Guide on how to Conduct a Needs Assessment. Chicago: Loyola University

Shafloat, F (2011). Needs Chain Model, Presented in AEA 2010, San Antonio. Retrieved 20 September 2011

Solomon, P. (2002). Discovering Information in Contect. Annual Review of Information Service and Technology 36

Statrasts, A. M. (2004). Battling the Knowledge Factor: A Study of Farmers' Information Seeking Learning and Knowledge Process with an online Environment in Queensland. Unpublished Ph.D Thesis.

Stefano, L.A., Hendriks, S.L., Stilwell, C. and Morris, C. (2005). Printed Information Needs of Small-scale Organic Farmers in KwaZulu- Natal. Libri, Vol. 55, no.1:56-66.

Stiglitz, J. 2000. "The Contributions of the Economics of Information to Twentieth Century Economics." Quarterly Journal of Economics 115 (4): 1441–1478

Stoecker, R. (2005). Research Methods for Community Change. Thousand Oaks: Sage.

Swanson, B. E. (1997). The Changing Role of Extension in Technology Transfer. Journal of International Agricultural Resource and Extension Education, 4(2). 87 – 94.

Swanson, B.E; Bentz, R.P and and Sofranko, A.J (2005). Improving Agricultural Extension : A Reference Manual. Prepared under the guidance of the Extension, Education and

Tologbonse, D., Fashola, O. and Obadiah, M. (2008). PolicyIssues in Meeting Rice Farmers Agricultural Information Needs in Niger State. J. Agric. Ext., 12(2): 84-94

Torimiro, D.O. (1997). The Relationship between Socio-Economic Characteristics of Farmers and Adoption of Improved Agricultural Technology in Ogun State, Nigeria. The Rural Sociologist, vol. 2 PP 22-28.

Torimiro, D. O., Ayinde, J. O and Koledoye, G. F (2014). Youth Migration and Agricultural Production: Analysis of Farming Communities of Osun State, Nigeria. Journal of Agricultural Extension Vol.18 (1) 11, ISSN 1119-944X.

Triner, D.,Greenberry, A. and Watkins, R. (1996). Training Needs Assessment: A Contradiction in Terms. Educational Technology, 36 (6), 51-55.

Ugboma, M. U. (2010).Access to agricultural information by fish farmers in Niger Delta region of Nigeria. Journal of Library Philosophy and Practice, 1-7.

Umali, D. L. and Schwartz, L. (1994). Public and Private Agricultural Extension: Beyond Traditional Frontiers. World Bank Discussion Paper No. 236 15-26. Washington, D.C.: World Bank Publications

Umar, S.I., Hamidu, B.A. and Ndantisa, M.A. (2006). Sources of Information for Rice Prtoduction Technologies in Lavun Local Government Area of Niger State. Proceedings of 20thAnnual National Conference Farm Management Association of Nigeria. p. 101.

UNCTAD, (2004). United Nations Conference on Trade and Development, 2004. Handbook of International Trade and Development Statistics. Geneva Switzerland

Upton, M. (1972). Farm Management in Nigeria. Occasional Report Department of Agricultural Economics, University of Ibadan Nigeria

Uwagboe, E. O. (2010). Effect of integrated Pest Management (IPM) utilisation on cocoa farmers' yield in selected states of Nigeria. Unpublished M.phil Thesis. University of Ibadan, Faculty of Agriculture, 2011.

Uwagboe, E.O., Ndagi, I., Agbongiarhuoyi, A. E., Adebiyi, S., and Aigbekaen, E.O. (2010). Assessment of Insect pest and disease control by cocoa farmers in relation to their income in Kwara State, Nigeria *Middle East Journal of scientific Research.* 2010. 6(2) Pp.147 151.

Uwagboe, E O, Famuyiwa, B and Agbebaku, E E O (2016) Cocoa Farmers Attitude towards Utilisation of Integrated Pest Management in Edo and Ogun States of Nigeria. Journal of Agricultural Extension .6. Vol. 20 (2) December, 2016.

Van, C. L., and Fortier, F. (2000). National Agricultural and Rural Knowledge and Information System (NARKIS): A proposed component of the Uganda National Agricultural Advisory Service (NAADS) FAO. P. 22.

Verter, N & Becvarova, V. (2014). Analysis of some Drivers of Cocoa Export in Nigeria in the Era of Trade Liberalization. Agris on Line papers in Economics & Information. 6 (4): 208-218.

Vidanapathirana, N.P. (2012). Agricultural Information Systems and their Applications for Development of Agriculture and Rural Community, A Review Study. 1- 14.

Villalobos, V.M (1989). Advances in Tissue Culture Methods Appliied to Coffee and Cocoa Plant Biotechnology for Developing Countries. United Kingdom: CTA/ FAO Chayce Publication Services.

Watkin, B. R. and Altschuld, J. W. (1995). Planning and conducting needs assessments: A practical guide. Newbury Park, CA: Sage Publications

Watkins, R and Kaufman, R (1996). An Update on Relating Needs Assessment and Needs Analysis. Performance Improvement 35 10), 10-13.

Watkins, R. and Kaufman, R. (2002). Assessing and Evaluating: Differentiating perspectives. Performance Improvement Journal, 41(2), 22-28.

Watkins, R., West Meiers, M. and Visser, Y. (2012). A Guide to Assessing Needs: Tools for collecting information, making decisions, and achieving development results. Washington, DC: World Bank.pp.5-7

Wikipedia (1991): Needs Assessment. From: Wikipedia, the Free Encyclopedia. Training Needs Assessment. *United States, Office of Personnel Management*.

Wikipedia (1991): Needs Assessment. From: Wikipedia, the Free Encyclopedia. *Clark, Don. Needs Assessments in Instructional Design.*

Wilson, T.D. (1981). On User Studies and Information Needs. *Journal of Documentation*, 37(1): p. 3-15.

Wilson, T.D. (1997), Information Behaviour: An Interdisciplinary Perspective: Information Processing and Management, 33 (4): 551-572.

Wilson, T. (1999). Models in information behaviour research. The Journal of Documentation, 55(3), 249–270.

Wilson, T. D. (2005). Evolution in Information Behavior Modeling. Wilson's model. IN: Fisher, K. E., Erdelez, S. & McKechnie, L. (eds.). *Theories of information behavior*. Medford, NJ: Information Today. (Pp. 31-36).

Williams, S.K.T., Fenley, J.M. and Williams, C.E. (1984). A manual for Agricultural Extension Workers in Nigeria Department of Agricultural Extension; University of Ibadan, Nigeria pp. 25-30.

Wolf, S. Just., D.R. and Zilberman, D. (2001). Between data and decisions: the organization of agriculture economic information systems. Research Policy, Vol. 30 pp.121-41.

World Cocoa Conference, (2014). Ensuring a Sustainable Cocoa Value Chain to Guarantee Quality Supply and Enable Future Growth, Amsterdam, the Netherlands. 9–13th June 2014.

Yahaya, M.K. 2000. Gender and communication variables in agricultural information dissemination in two agroecological zones of Nigeria. Corporate Graphics Ltd. Ibadan, pp 20–23. Agricultural information needs of women farmers in Mubi region

Yahaya, M.K., 2002. Outreach Communication Strategy in Community Mobilization for Reproductive Health Education in Niger State of Nigeria. J. Social Sci., 6: 189-196.

Yahaya, M. K. and Omokhafe, S. B. 2001. Cocoa Farmers' Perceived Influence of Communication on Utilization of Improved Cocoa Seed Technologies in Owan –East Local Government area of Edo State. Moor Journal of Agricultural Research, 2 (2): 199 207.

Yamane, Taro. (1967): Statistics: An Introductory Analysis, 2nd Ed., New York: Harper and Row.

Zbinden, S. (2013). Costa Rica's Payments for Environmental Services Programs: An Economic Analysis of Program Participation and Performance. Cornell University, August, 2003 402 pages

APPENDIX

Appendix 1: QUESTIONNAIRE

Dear Sir/Madam,

This questionnaire seeks to collect relevant data for this study on Assessment of cocoa farmers information needs in Edo and Ondo States, Nigeria**.**

Thank you.

Ogiamien Divis Idehen

Instruction: please response appropriately

i. State: (I) Edo ( ) (ii) Ondo ( )

ii. Local Government Area (LGA)…….

iii. Village/Community…….

SECTION A: RESPONDENTS SOCIO-ECONOMIC CHARATERISTICS

1. Sex (i) Male ( ) (ii) Female ( )

2. Age (years): ……..

3. Marital status: Single ( ) Married ( ) Divorced ( ) Separated ( ) Widow/Widower ( )

4. Household size: ……..

5. Years spent in school: …….

6. Farming experience (years): ……

7. Sources of farm land: Direct ownership (Self-cultivated) ( ); Inherited farm (family-cultivated) ( ); Rent ( ); and Shear cropping ( ).

8. Type of farm labour: family ( ); Hired ( ); and others (specify) ……

9. Membership of social group: Co-operative society ( ) Cocoa farmers association ( ) Young farmers club ( ) others (specify) …….

10. Types of farm enterprise: Cash crops ( ) Arable crops ( ) Fruits and Vegetables ( ) Mixed cropping ( ) Livestock ( ) others (specify) …

11. Extension agents contact with farmers: None ( ); Weekly ( ); Fortnightly ( ); Monthly ( ); 3 – 6 Months ( ); Annually ( ).

12. Cocoa farmers contact with Extension agents: None ( ); Weekly ( ); Fortnightly ( ); Monthly ( ); 3 – 6 Months ( ); Annually ( ).

13. Cocoa Product marketing: Direct sale to customers ( ); Government agents ( ); Cocoa merchant ( ); through middle men ( ); through other farmers ( ).

14. Income level (N) 000 I Naria: ……..

15. Size of farm land in acreage: ……

16. In your family, who plays the main role in convening new agricultural information to you: your children ( ) your spouse ( ) brother ( )

17. Which positive outcomes have resulted from the information you have received from the provider: increasing the amount of productivity ( ); high quality of productivity ( ); lower cost ( ) higher selling price ( ) others specify……

18. Which negative outcomes have resulted from the information you have received from the provider: Failure of productivity ( ); high cost but lower productivity ( ); lower selling price ( ) complicated process ( ) no follow up process to stimulate the process ( ) others specify……

19. Are you involve in cocoa export trade a) Yes [ ] b) No [ ]

20. If no why ……..

SECTION B: FARMER INFORMATION NEEDS

21. Did you previously utilize cocoa production information a) Yes [ ] b) Yes [ ]

22. Do you require agricultural information? a) Yes [ ] b) No [ ]

23. Do you look for agricultural information? a) Yes [ ] b) No [ ]

SECTION C: FARMER INFORMATION NEEDS AND SEARCH BEHAVIOUR

24. Indicate the extent you need the cocoa production and post harvest information listed below and the frequency of search for cocoa information using the following scale

Level of need for cocoa information **Farmers' frequency of search for cocoa information**

1 = Not at all needed 1 = never search for information
2 = Hardly needed 2 = yearly
3 = moderately needed 3 = monthly
4 = needed 4 = weekly
5 = highly needed 5 = daily

Please Tick under the number that best represents your response for each item.

Level of preference					**Information needs**	**Level/ Period of search**				
5	**4**	**3**	**2**	**1**	**Information needs variables**	**5**	**4**	**3**	**2**	**1**
					Cultivation system – Bush clearing					
					Field burning					
					Soil testing for clay loamy , check for rock in the soil					
					Farm lay out: 3.1m x3.1m					
					Seeds selections and planting materials					
					Plant companion crops for shade: plantain 3.1m x 3.1m					
					Weather information					
					Agricultural credit, banking procedure					
5	**4**	**3**	**2**	**1**	**Pre- nursery**	**5**	**4**	**3**	**2**	**1**
					Dry season planting at the nursery and transplant at peak raining season					
					Shade nursery with bamboo and palm leaves					
					Fill polythene bags with good top soil					
					Arrangement of polythene bag on nursery beds					
					Selection of rootstock seeds					
					Processing of rootstock seeds					
					Sowing of rootstock seeds					
					Mulching with dry grass					
					Water regularly					
					Apply fertilizer when notice deficiency of nutrients					
					Pest and diseases control					
					Hand weeding control. Ring weeding when applying chemicals					
5	4	3	2	1	Main nursery	5	4	3	2	1
					land preparation					
					Punching holes in prepared land					
					Transplanting of seedlings					
					Weed control					
					Fertilizer application					
					Apply cocoa boost foliar fertilizer for increase flowering					
					Pruning					

					Pest and diseases control / Remover of infested pod					
					Budding					
					Coppicing for regeneration					
5	4	3	2	1	Plantation establishment and management	5	4	3	2	1
					Land preparation					
					Transplanting of seedlings					
					Fertilizer application					
					Weed control					
					Pest and diseases control					
					Hand pollination techniques to improve pod production					
					Pruning					
					Fire tracing					
					Spacing					
5	4	3	2	1	Post harvest handling and utilization	5	4	3	2	1
					Harvesting of pod with Go to Hell or knife					
					Breaking of pod blunt object					
					Scoop cocoa bean from pod					
					Production of cocoa wine/juices, jam and Ginger					
					Types of fermentations methods and process					
					Five days fermentation process for good flavour, kill cotyledon, bleaching for colour, accelerate kinetic and acetic acid formation					
					Drying methods and process (Sun/oven drying) fo26r good quality beans					
					The 7% moisture content for good quality beans					
					Using tapeline for drying					
					Grading					
					Packaging materials i.e. jut bag for air circulation					
					Storage of harvested product					
					Transportation network					
					Marketing outlets through CAN or cocoa merchants					
					Post harvest techniques					
5	**4**	**3**	**2**	**1**	**Marketing / Commercial**	**5**	**4**	**3**	**2**	**1**
					Market location					
					Credit sources					
					Future market price					
					Location of processing industries					
					Timing of harvesting					
					Timing of sale					

					Cost of transportation					
					Storage cost					
					Packaging cost					
					LGA fees					
					Communication cost					
					Processing cost					
					Stallage fees					
					Export of cocoa beans					

SECTION D: FARMERS INFORMATION SOURCES AND THEIR PREFERENCES

25**.** Below is a range of possible sources of information needs sought by cocoa farmers.

Tick where appropriate the type of source of information need that applies to you

Sources of cocoa information	**Sources of Information preferences**		
	Highly preferred	**Preferred**	**Not preferred**
Institutional/Organized bodies			
Extension agents/services (NADP);seminar, farm demonstrations, agric show,			
Agric. Institute/University			
Library			
Farmers' Unions/Cooperative			
Other Govt. Projects			
Other NGOs			
Input dealers/ suppliers			
Mass media Electronic Sources			
Television			
Internet; facebook, twitter, google, whatsapp			
Mobile/Cell phone			
Film / Slide Projection			
Radio			
Cable net work			
Print sources			
Newspaper or magazines			
Extension Manuals			
Extension posters			
Bulletins/ Newsletter			
Text books			
Traditional Information Sources			
Town crier			
Family members			
Face-to-face advise by other farmers			
Cocoa buyers			

SECTION D: Constraints to agricultural information needs by cocoa farmers

26. Tick where appropriate the level challenges you encounter when trying to obtain information from the various information sources

Cocoa farmers Information needs constraints	**Highly serious 4**	**Serious 3**	**Fairly Serious 2**	**Not serious 1**	**Undecided 0**
Low extension agent-farmers ratio					
Low rate of extension contacts					
Illiteracy: Inability to read and write					
Inadequate extension facilities					
Odd broadcasting periods / time by Radio stations					
Odd broadcasting periods / tim e by TV stations					
Inadequate power supply to watch television-based agric. Program					
Poor communication network					
High cost of recharging phones					
Lack of technical know how to operate modern information gadgets					
Lack of money to purchase newsletters, leaflets on agricultural information					
Poor road linkage					
Norms and tradition of people					
Lack of information centers					
Lack of awareness of information sources					
Lack of computer skills					
Cost of electronic devices , computer, phone, radio and television					
Use of difficult terminology especially with the use of computer, phone , radio and television					
Limited internet access					
Language barrier					
Very little or no information on cocoa was broadcast on radio / newspaper					
Inappropriate or poor quality information					

APPENDIX 2

Logistic Regression

Case Processing Summary

Unweighted Cases(a)		N	Percent
Selected Cases	Included in Analysis	376	87.0
	Missing Cases	56	13.0
	Total	432	100.0
Unselected Cases		0	.0
Total		432	100.0

a. If weight is in effect, see classification table for the total number of cases.

Block 0: Beginning Block

Classification Table (a, b)

	Observed			Predicted		
	Postharvest information needs (Banded)			Percentage Correct		
	0	<70.44				
Step 0	Postharvest information needs (Banded)		0	0	103	.0
			<70.44	0	273	100.0
	Overall Percentage					72.6

a. Constant is included in the model.
b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.975	.116	71.055	1	.000	2.650

Variables not in the Equation (a)

			Score	df	Sig.
Step 0	Variables	Age	13.504	1	.000
		household	1.695	1	.193
		Years in school	24.688	1	.000
		Farming experience	18.629	1	.000
		Income level	.371	1	.542
		Size of farmland	21.575	1	.000
		Sex	.141	1	.707
		Marital status	11.521	1	.001
		Source of farmland	.307	1	.580
		Membership of social group	15.969	1	.000
		Type of farm enterprise	3.363	1	.067
		Extension agents contact	.139	1	.709
		Cocoa farmers contact	.906	1	.341
		Cocoa farmers product marketing	.545	1	.460

a. Residual Chi-Squares are not computed because of redundancies.

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	91.151	14	.000
	Block	91.151	14	.000
	Model	91.151	14	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	350.375(a)	0.215	0.312

a .Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Classification Table (a)

	Observed		Predicted		
	Postharvest information needs (Banded)		Percentage Correct		
	0	<70.44			
Step 1	Postharvest information needs (Banded)	0	44	59	42.7
		<70.44	13	260	95.2
	Overall Percentage				80.9

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1(a)	Age	.006	.019	.112	1	.738	1.006
	Household	.029	.057	.253	1	.615	1.029
	Years in school	.150	.037	16.794	1	.000	1.162
	Farming experience	-.011	.016	.436	1	.509	.990
	Income level	.000	.000	2.170	1	.141	1.000
	Size of farmland	-.136	.025	29.094	1	.000	.873
	Sex	-.290	.331	.770	1	.380	.748
	Marital status	-.225	.143	2.463	1	.117	.799
	Source of farmland	.052	.210	.061	1	.804	1.053
	Membership of social group	.891	.260	11.772	1	.001	2.437
	Type of farm enterprise	-.028	.097	.084	1	.771	.972
	Extension agents contact	-1.154	.351	10.817	1	.001	.315
	Cocoa farmers contact	.633	.245	6.669	1	.010	1.884
	Cocoa farmers product marketing	.016	.125	.016	1	.898	1.016
	Constant	1.315	1.535	.733	1	.392	3.725

a. Variable(s) entered on step 1: age, household, years in school, farming experience, income level, size of farmland, sex, marital status, source of farmland, membership of social group, type of farm enterprise, extension agents contact, cocoa farmers contact, cocoa farmers product marketing.

PLUM - Ordinal Regression

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	2595.336			
Final	2036.095	559.241	41	.000

Link function: Logit.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	219321.821	4266	.000
Deviance	1943.018	4266	1.000

Link function: Logit.

Pseudo R-Square

Cox and Snell	.726
Nagelkerke	.727
McFadden	.179

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
	Ext. agents/services=3=Most Pref	-1.999	1.028	3.778	1	.052	-4.014	.017
	Ext. agents/services=2=Pref	-16.896	1816.981	.000	1	.993	-3578.114	3544.322
	Ext. agents/services=1=Not Pref	0(a)	.	.	0	.	.	.
	Agric. Institute=3=Most Pref	.445	.393	1.281	1	.258	-.326	1.216
	Agric. Institute=2=Pref	18.396	1816.982	.000	1	.992	-3542.823	3579.614
	Agric. Institute=1=Not Pref	0(a)	.	.	0	.	.	.
	Library=3=Most Pref	-1.061	.297	12.778	1	.000	-1.643	-.479
	Library=2=Pref	3.880	2.126	3.331	1	.068	-.286	8.047
	Library=1=Not Pref	0(a)	.	.	0	.	.	.
	Farmers union=3=Most Pref	-.177	.520	.116	1	.733	-1.196	.841
	Farmers union=2=Pref	-9.138	2.199	17.264	1	.000	-13.449	-4.828
	Farmers union=Not Pref	0(a)	.	.	0	.	.	.
	Other govt project=3= Most Pref	-.809	.504	2.572	1	.109	-1.797	.180
	Other govt project=2=Pref	11.210	2.247	24.893	1	.000	6.806	15.613
	Other govt project=1=Not Pref	0(a)	.	.	0	.	.	.
	Other NGO=3=Most Pref	-.577	.421	1.875	1	.171	-1.402	.249
	[other NGO=2]	-12.216	2.642	21.378	1	.000	-17.394	-7.037
	[other NGO=3]	0(a)	.	.	0	.	.	.
	[input dealers=1]	-16.656	1.092	232.508	1	.000	-18.797	-14.515
	[input dealers=2]	-17.719	2.689	43.410	1	.000	-22.990	-12.448
	[input dealers=3]	-16.565	.000	.	1	.	-16.565	-16.565
	[input dealers=4]	0(a)	.	.	0	.	.	.
	[television=1]	-.745	.640	1.356	1	.244	-1.999	.509
	[television=2]	-4.252	2.365	3.232	1	.072	-8.887	.384
	[television=3]	0(a)	.	.	0	.	.	.
	[internet=1]	-1.072	.658	2.652	1	.103	-2.362	.218
	[internet=2]	3.749	2.157	3.020	1	.082	-.479	7.977
	[internet=3]	0(a)	.	.	0	.	.	.
	[mobile cell phone=1]	.343	.371	.855	1	.355	-.384	1.071
	[mobile cell phone=2]	3.294	1.854	3.157	1	.076	-.340	6.927
	[mobile cell phone=3]	0(a)	.	.	0	.	.	.
	[film slide projection=1]	.746	.623	1.433	1	.231	-.475	1.967
	[film slide projection=2]	-.565	1.477	.146	1	.702	-3.461	2.330
	[film slide projection=3]	0(a)	.	.	0	.	.	.

	[cable network=1]	-4.390	.850	26.693	1	.000	-6.055	-2.724
	[cable network=2]	-11.939	2.445	23.836	1	.000	-16.732	-7.146
	[cable network=3]	0(a)	.	.	0	.	.	.
	[mobile cinema=1]	-2.665	.479	30.966	1	.000	-3.603	-1.726
	[mobile cinema=2]	-1.352	1.961	.476	1	.490	-5.195	2.490
	[mobile cinema=3]	0(a)	.	.	0	.	.	.
	[news paper or magazine=1]	4.536	.518	76.697	1	.000	3.521	5.552
	[news paper or magazine=2]	10.481	2.231	22.072	1	.000	6.109	14.854
	[news paper or magazine=3]	0(a)	.	.	0	.	.	.
	[extension manual=1]	-.676	.566	1.423	1	.233	-1.786	.434
	[extension manual=2]	2.085	2.013	1.073	1	.300	-1.860	6.030
	[extension manual=3]	0(a)	.	.	0	.	.	.
	[extension posters=1]	2.206	.607	13.205	1	.000	1.016	3.396
	[extension posters=2]	-7.966	1.965	16.427	1	.000	-11.818	-4.114
	[extension posters=3]	0(a)	.	.	0	.	.	.
	[bulletins newsletter=1]	1.377	.326	17.889	1	.000	.739	2.015
	[bulletins newsletter=2]	9.008	2.507	12.915	1	.000	4.095	13.921
	[bulletins newsletter=3]	0(a)	.	.	0	.	.	.
	[textbooks=1]	1.319	.339	15.170	1	.000	.655	1.983
	[textbooks=2]	0(a)	.	.	0	.	.	.
	[textbooks=3]	0(a)	.	.	0	.	.	.
	[town crier=1]	2.371	.493	23.113	1	.000	1.404	3.337
	[town crier=2]	-8.553	1.237	47.825	1	.000	-10.976	-6.129
	[town crier=3]	0(a)	.	.	0	.	.	.
	[family members=1]	-4.314	.877	24.188	1	.000	-6.033	-2.595
	[family members=2]	0(a)	.	.	0	.	.	.
	[family members=3]	0(a)	.	.	0	.	.	.
	[face to face advise=1]	.127	1.795	.005	1	.943	-3.391	3.646
	[face to face advise=2]	0(a)	.	.	0	.	.	.
	[face to face advise=3]	0(a)	.	.	0	.	.	.
	[cocoa buyers=1]	-.438	1.675	.068	1	.794	-3.721	2.845
	[cocoa buyers=2]	0(a)	.	.	0	.	.	.
	[cocoa buyers=3]	0(a)	.	.	0	.	.	.

Link function: Logit.

a .This parameter is set to zero because it is redundant.

Logistic Regression

Case Processing Summary

Unweighted Cases(a)		N	Percent
Selected Cases	Included in Analysis	432	100.0
	Missing Cases	0	.0
	Total	432	100.0
Unselected Cases		0	.0
Total		432	100.0

a If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
0	0
<81.90	1

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.384	.098	15.375	1	.000	1.469

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	465.040	41	.000
	Block	465.040	41	.000
	Model	465.040	41	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	118.180(a)	.659	.890

a. Estimation terminated at iteration number 20 because maximum iterations has been reached.

Final solution cannot be found.

Classification Table (a)

	Observed			Predicted		
	Prod information needs (Banded)			Percentage Correct		
	0	<81.90				
Step 1	Prod information needs (Banded)		0	155	20	88.6
			<81.90	2	255	99.2
	Overall Percentage					94.9

a The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Extension agents services			.000	2	1.000	
	Extension agents services(1)	-37.776	10830.785	.000	1	.997	.000
	Extension agents services(2)	-110.923	71161.572	.000	1	.999	.000
	Agric Institute			2.149	2	.341	
	Agric Institute(1)	-4.020	2.742	2.149	1	.143	.018
	Agric Institute(2)	180.337	73434.394	.000	1	.998	2.087E+078
	Library			5.233	2	.073	
	library(1)	4.804	2.100	5.233	1	.022	121.965
	library(2)	-51.386	36953.023	.000	1	.999	.000
	Farmers union			.000	2	1.000	
	Farmers union(1)	17.733	6956.837	.000	1	.998	50270782.162
	Farmers union(2)	-26.154	37680.331	.000	1	.999	.000
	Other govt project			.134	2	.935	
	Other govt project(1)	.974	2.656	.134	1	.714	2.648
	Other govt project(2)	19.874	41674.377	.000	1	1.000	427932965.612
	Other NGO			.001	2	1.000	
	Other NGO(1)	-.041	1.725	.001	1	.981	.960
	Other NGO(2)	-.143	52191.844	.000	1	1.000	.867
	Input dealers			.000	3	1.000	
	Input dealers(1)	12.394	29570.137	.000	1	1.000	241260.820
	Input dealers(2)	-105.313	62827.442	.000	1	.999	.000
	Input dealers(3)	-19.732	28420.597	.000	1	.999	.000
	Television			2.489	2	.288	
	television(1)	-7.002	4.439	2.488	1	.115	.001
	television(2)	-97.272	47542.940	.000	1	.998	.000

	Internet			2.724	2	.256	
	internet(1)	3.714	2.250	2.724	1	.099	41.012
	internet(2)	55.860	42447.111	.000	1	.999	18181836984936900000000000.000
	Mobile cell phone			.638	2	.727	
	Mobile cell phone(1)	1.979	2.477	.638	1	.424	7.238
	Mobile cell phone(2)	73.975	37618.940	.000	1	.998	13400565887084300000000000000000000.000
	Film slide projection			.000	2	1.000	
	Film slide projection(1)	22.774	4016.445	.000	1	.995	7773093616.023
	Film slide projection(2)	-10.840	29789.996	.000	1	1.000	.000
	Cable network			.000	2	1.000	
	Cable network(1)	-38.966	4016.447	.000	1	.992	.000
	Cable network(2)	-43.317	41581.986	.000	1	.999	.000
	Mobile cinema			.133	2	.936	
	Mobile cinema(1)	1.283	3.518	.133	1	.715	3.609
	Mobile cinema(2)	64.854	42259.188	.000	1	.999	14648220735557580000000000000000.000
	News paper or magazine			8.319	2	.016	
	News paper or magazine(1)	10.888	3.775	8.319	1	.004	53520.823
	News paper or magazine(2)	9.034	37800.689	.000	1	1.000	8385.793
	Extension manual			1.329	2	.515	
	Extension manual(1)	2.347	2.036	1.329	1	.249	10.455
	Extension manual(2)	72.980	39652.494	.000	1	.999	4950306957402570000000000000000000.000
	Extension posters			3.686	2	.158	
	Extension posters(1)	6.859	3.572	3.686	1	.055	951.945
	Extension posters(2)	-36.041	28165.873	.000	1	.999	.000
	Bulletins newsletter			3.481	2	.175	
	Bulletins newsletter(1)	2.890	1.549	3.481	1	.062	17.986
	Bulletins newsletter(2)	4.474	49743.753	.000	1	1.000	87.675
	Textbooks			.645	1	.422	
	textbooks(1)	-2.168	2.698	.645	1	.422	.114
	Town crier			1.523	2	.467	
	Town crier(1)	4.041	3.274	1.523	1	.217	56.864
	Town crier(2)	-22.589	12118.636	.000	1	.999	.000
	Family members			.000	1	.998	
	Family members(1)	-16.095	6020.030	.000	1	.998	.000
	Face to face advise			.000	1	1.000	

	Face to face advise(1)	-16.083	29051.302	.000	1	1.000	.000
	Cocoa buyers			.000	1	1.000	
	Cocoa buyers(1)	-8.999	29327.632	.000	1	1.000	.000
	Constant	21.203	28420.597	.000	1	.999	1615482701.076

a Variable(s) entered on step 1: extension agents services, agric Institute, library, farmers union, other govt project, other NGO, input dealers, television, internet, mobile cell phone, film slide projection, cable network, mobile cinema, news paper or magazine, extension manual, extension posters, bulletins newsletter, textbooks, town crier, family members, face to face advise, cocoa buyers.

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.683(a)	.466	.437	19.27929

a Predictors: (Constant), cocoa buyers, extension manuals, internet, other Govt. project, agric. institutes, mobile cell phone, input dealers/suppliers, town crier, extension posters, farmers' union, other NGOs, bulletins/newsletter, extension agents, library, text books, television, family members, mobile cinema, newspapers, face to face advise by other farmers,
film or slide show, cable net work

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	41.332	10.913		3.787	.000
	extension agents	1.095	3.148	.018	.348	.728
	agric. Institutes	-1.941	1.927	-.060	-1.007	.314
	Library	4.080	1.537	.145	2.655	.008
	farmers' union	.974	2.442	.021	.399	.690
	other Govt. Project	.842	2.468	.020	.341	.733
	other NGOs	-.026	2.047	-.001	-.013	.990
	input dealers/suppliers	8.427	3.596	.131	2.343	.020
	Television	3.649	2.605	.080	1.400	.162
	Internet	-1.045	2.464	-.036	-.424	.672
	mobile cell phone	-.930	1.750	-.026	-.531	.596
	film/slide show	-2.380	2.780	-.082	-.856	.392
	cable net work	16.971	3.083	.604	5.505	.000
	mobile cinema	4.814	2.285	.159	2.106	.036
	Newspapers	-11.133	2.233	-.343	-4.986	.000
	extension manuals	-.968	2.471	-.023	-.392	.696
	extension posters	-2.465	2.781	-.048	-.887	.376
	bulletins/newsletter	-4.759	1.676	-.154	-2.839	.005
	text books	-5.224	1.683	-.177	-3.104	.002
	town crier	-6.511	1.969	-.176	-3.307	.001
	family members	8.747	3.086	.172	2.834	.005
	face to face advise by other farmers	11.114	4.659	.195	2.385	.018
	cocoa buyers	-4.814	5.433	-.086	-.886	.376

a .Dependent Variable: production information needs

Regression
Variables Entered/Removed (b)

a. All requested variables entered.

b Dependent Variable: postharvest information needs

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.383(a)	0.147	.101	25.27079	1.613

a Predictors: (Constant), cocoa buyers, extension manuals, internet, other Govt. project, agric. institutes, mobile cell phone, input dealers/suppliers, town crier, extension posters, farmers'

union, other NGOs, bulletins/newsletter, extension agents, library, text books, television, family members, mobile cinema, newspapers, face to face advise by other farmers, film/slide show, cable net work

b. Dependent Variable: postharvest information needs

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	96.512	14.305		6.747	.000
	extension agents	-12.142	4.126	-.197	-2.943	.003
	agric. Institutes	1.940	2.528	.057	.767	.443
	Library	5.336	2.015	.183	2.648	.008
	farmers' union	1.306	3.211	.028	.407	.684
	other Govt. project	-5.350	3.266	-.123	-1.638	.102
	other NGOs	3.332	2.684	.090	1.241	.215
	input dealers/suppliers	4.829	4.714	.073	1.024	.306
	Television	-2.107	3.423	-.044	-.616	.539
	Internet	-1.477	3.229	-.049	-.457	.648
	mobile cell phone	2.316	2.299	.063	1.007	.314
	film/slide show	-6.470	3.649	-.214	-1.773	.077
	cable net work	9.279	4.043	.319	2.295	.022
	mobile cinema	-2.480	2.997	-.079	-.827	.409
	Newspapers	-2.470	2.928	-.073	-.843	.399
	extension manuals	-3.704	3.240	-.084	-1.143	.254
	extension posters	5.077	3.645	.096	1.393	.164
	bulletins/newsletter	-2.234	2.198	-.070	-1.016	.310
	text books	-8.319	2.206	-.272	-3.771	.000
	town crier	-3.355	2.582	-.088	-1.299	.195
	family members	6.030	4.046	.114	1.491	.137
	face to face advise by other farmers	5.499	6.108	.093	.900	.368
	cocoa buyers	-5.423	7.124	-.093	-.761	.447

a .Dependent Variable: postharvest information needs

Residuals Statistics (a)

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	42.5181	103.9680	70.4408	10.20422	431
Residual	-75.34353	51.24070	.00000	24.61584	431
Std. Predicted Value	-2.736	3.286	.000	1.000	431
Std. Residual	-2.981	2.028	.000	.974	431

a Dependent Variable: postharvest information needs

Logistic Regression

Case Processing Summary

States	Un weighted Cases(a)		N	Percent
Edo	Selected Cases	Included in Analysis	205	94.9
		Missing Cases	11	5.1
		Total	216	100.0
	Unselected Cases		0	.0
	Total		216	100.0
Ondo	Selected Cases	Included in Analysis	192	88.9
		Missing Cases	24	11.1
		Total	216	100.0
	Unselected Cases		0	.0
	Total		216	100.0

a If weight is in effect, see classification table for the total number of cases.

Block 0: Beginning Block

Classification Table (a, b)

States		Observed			Predicted	
		Postharvest information needs (Banded)			Percentage Correct	
		0	<70.44			
Edo	Step 0	Postharvest information needs (Banded)	0	0	58	.0
			<70.44	0	147	100.0
		Overall Percentage				71.7
Ondo	Step 0	Postharvest information needs (Banded)	0	0	59	.0
			<70.44	0	133	100.0
		Overall Percentage				69.3

a. Constant is included in the model.

b. The cut value is .500

Variables in the Equation

States			B	S.E.	Wald	df	Sig.	Exp(B)
Edo	Step 0(a)	Constant	.930	.155	35.971	1	.000	2.534
Ondo	Step 0(a)	Constant	.813	.156	27.001	1	.000	2.254

a Variable(s) entered on step 1: age, household, years in school, farming experience, source of farmland, sex, type of farm labour, membership of social group, type of farm enterprise, extension agents contact, cocoa farmers contact, cocoa farmers product marketing.

Variables not in the Equation

States				Score	df	Sig.
Edo	Step 0	Variables	Age	13.918	1	.000
			Household	5.956	1	.015
			Years in school	7.152	1	.007
			Farming experience	11.993	1	.001
			Source of farmland	.126	1	.723
			Sex	.308	1	.579
			Type of farm labour	1.239	1	.266
			Membership of social group	12.492	1	.000
			Type of farm enterprise	12.144	1	.000
			Extension agents contact	4.443	1	.035
			Cocoa farmers contact	1.802	1	.179
			Cocoa farmers product marketing	.000	1	.994
		Overall Statistics		29.005	12	.004
Ondo	Step 0	Variables	Age	1.351	1	.245
			Household	.027	1	.870
			Years in school	16.483	1	.000
			Farming experience	5.054	1	.025
			Source of farmland	1.102	1	.294
			Sex	.359	1	.549
			Type of farm labour	3.388	1	.066
			Membership of social group	1.943	1	.163
			Type of farm enterprise	3.573	1	.059
			Extension agents contact	.066	1	.797
			Cocoa farmers contact	.485	1	.486
			Cocoa farmers product marketing	.813	1	.367
		Overall Statistics		35.981	12	.000

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

States			Chi-square	Df	Sig.
Edo	Step 1	Step	31.975	12	.001
		Block	31.975	12	.001
		Model	31.975	12	.001
Ondo	Step 1	Step	43.013	12	.000
		Block	43.013	12	.000
		Model	43.013	12	.000

Model Summary

States	Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Edo	1	212.261(a)	.144	.207
Ondo	1	193.883(b)	.201	.283

a .Estimation terminated at iteration number 6 because parameter estimates changed by less than .001 for split file states = Edo.

b .Estimation terminated at iteration number 5 because parameter estimates changed by less than .001 for split file states = Ondo.

Classification Table (a)

States		Observed		Predicted			
		Postharvest information needs (Banded)		Percentage Correct			
		0	<70.44				
Edo	Step 1	Postharvest information needs (Banded)		0	20	38	34.5
				<70.44	6	141	95.9
		Overall Percentage					78.5
Ondo	Step 1	Postharvest information needs (Banded)		0	25	34	42.4
				<70.44	14	119	89.5
		Overall Percentage					75.0

a .The cut value is .500

Variables in the Equation

States			B	S.E.	Wald	Df	Sig.	Exp(B)
Edo	Step 1(a)	Age	-.038	.021	3.162	1	.005	.963
		Household	-.048	.091	.277	1	.599	.953
		Years in school	.052	.041	1.614	1	.204	1.053
		Farming experience	.005	.018	.089	1	.766	1.005
		Source of farmland	-.306	.247	1.534	1	.216	.736
		Sex	-.476	.460	1.070	1	.301	.621
		Type of farm labour	.239	.379	.398	1	.528	1.271
		Membership of social group	.521	.386	1.822	1	.177	1.684
		Type of farm enterprise	.228	.147	2.405	1	0.05	1.256
		Extension agents contact	.060	.357	.028	1	.866	1.062
		Cocoa farmers contact	.266	.254	1.091	1	.296	1.304
		Cocoa farmers product marketing	.036	.140	.066	1	.797	1.037
		Constant	1.075	1.787	.362	1	.547	2.931
Ondo	Step 1(a)	Age	.062	.033	3.484	1	.02	1.064
		Household	-.003	.047	.003	1	.956	.997
		Years in school	.203	.055	13.454	1	.01	1.225
		Farming experience	-.022	.029	.556	1	.456	.979
		Source of farmland	-.145	.337	.184	1	.668	.865
		Sex	-.096	.427	.050	1	.823	.909
		Type of farm labour	.923	.379	5.929	1	.015	2.516
		Membership of social group	.682	.319	4.562	1	.033	1.978
		Type of farm enterprise	-.468	.173	7.310	1	.007	.627
		Extension agents contact	-.544	.559	.947	1	.331	.580
		Cocoa farmers contact	.032	.419	.006	1	.940	1.032
		Cocoa farmers product marketing	.328	.238	1.902	1	.168	1.389
		Constant	-4.618	2.804	2.713	1	.100	.010

a .Variable(s) entered on step 1: age, household, years in school, farming experience, source of farmland, sex, type of farm labour, membership of social group, type of farm enterprise, extension agents contact, cocoa farmers contact, cocoa farmers product marketing.

APPENDIX 3

Correlations

States			Production information search	Postharvest information search	Production information needs	Postharvest information needs
Edo	Production information search	Pearson Correlation	1	.092	.993(**)	.537(**)
		Sig. (2-tailed)		.177	.000	.000
		N	216	216	216	215
	Postharvest information search	Pearson Correlation	.092	1	.082	.315(**)
		Sig. (2-tailed)	.177		.230	.000
		N	216	216	216	215
	Prod inform needs	Pearson Correlation	.993(**)	.082	1	.540(**)
		Sig. (2-tailed)	.000	.230		.000
		N	216	216	216	215
	Postharvest information needs	Pearson Correlation	.537(**)	.315(**)	.540(**)	1
		Sig. (2-tailed)	.000	.000	.000	
		N	215	215	215	215
Ondo	Production information search	Pearson Correlation	1	-.485(**)	.992(**)	.202(**)
		Sig. (2-tailed)		.000	.000	.003
		N	216	216	216	216
	Postharvest information search	Pearson Correlation	-.485(**)	1	-.426(**)	.267(**)
		Sig. (2-tailed)	.000		.000	.000
		N	216	216	216	216
	Prod inform needs	Pearson Correlation	.992(**)	-.426(**)	1	.236(**)
		Sig. (2-tailed)	.000	.000		.000
		N	216	216	216	216
	Postharvest information needs	Pearson Correlation	.202(**)	.267(**)	.236(**)	1
		Sig. (2-tailed)	.003	.000	.000	
		N	216	216	216	216

** Correlation is significant at the 0.01 level (2-tailed).