



Cocoa Farmers` Involvement in Cocoa Production- Related Activities in Oyo State, Nigeria

**A. O. Orimogunje¹, B. A. Ogundeji^{1*}, T. I. Ademola², T. I. Omirin³,
E. E. Agbebaku¹, T. M. Orisasona¹ and D. J. Awodumila¹**

¹Cocoa Research Institute of Nigeria, Ibadan, Nigeria.

²Forestry Research Institute of Nigeria, Ibadan, Oyo State, Nigeria.

³University of Ibadan, Ibadan, Nigeria.

Authors' contributions

This work was carried out in collaboration between all authors. Authors AOO, BAO and TIO read and approved the final manuscript.

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ABSTRACT

Aims: Assessment of the involvement of farmers in cocoa production-related activities with a view to improving qualities and quantities of cocoa production in Oyo State, Nigeria.

Study Design: Random sampling.

Place and Duration of Study: Oyo State, Nigeria; 2017/2018.

Methodology: This study specifically ascertained the socio-economic characteristics (of the respondents in the study area), the source of information on cocoa production-related activities and constraints faced by farmers in cocoa production-related activities. The involvement of farmers in pre-planting, post-planting, processing and marketing activities were also looked into. A purposive sampling technique was used to select 110 cocoa farmers in the study area. Data was collected using a comprehensive questionnaire and analysis was done using means, frequencies, percentages, Chi-square and Pearson Product Moment correlation.

Results: The study revealed that 42.8% of the respondents cultivated between 2-4 acres, 39.1% had a yield of 343 kg-513 kg per hectare, while 43.8% sold their cocoa beans between ₦685-₦777 (1.90-2.16USD) per kilogram during the peak season. 45.0% of the respondents were fully involved

*Corresponding author: E-mail: tundeji1@gmail.com;

in weed control, 50.9% of them were fully involved in planting, 50.9% of the respondents were fully involved in pest and disease control. About 55.5% of the respondents accessed information from Cocoa Farmers' Association of Nigeria (CFAN).

Conclusion: Myriads of financial and infrastructural constraints militated against the mostly small cocoa farmholders' production capabilities in Oyo State, Nigeria. This study is therefore expected to assist local and state governments, non-governmental organisations and policy makers to begin appropriate development interventions to boost the quantity and quality of cocoa production in the country.

Keywords: Cocoa; involvement; fermentation; store management.

1. INTRODUCTION

Cocoa is a tropical perennial tree crop that is grown worldwide. African countries play a significant role in the growing of cocoa. Ivory Coast, Ghana, Cameroun, Indonesia and Nigeria are the highest producers [1] of cocoa worldwide. Cocoa is a highly competitive and inactive commercial cash crop and ranks highest regarding income generation among other agricultural alternatives in the global market. African countries accounted for about 68 percent of world cocoa production.

Cocoa production has been on the decline in recent years due to many factors, some of which are the problem of pests and diseases attacks, improper primary processing which include fermentation and drying. Accordingly, Amano [2] stated that the quality of Nigeria cocoa is declining due to pest and disease infestations and improper fermentation practices. About 25-30% losses in yield in Nigeria has been attributed to the cocoa mirids (*Sahlbergella singularis*), 17% loss due to cocoa pod borer (*Charalomastrictigrapha*) while losses attributed to the major diseases of cocoa, the black pod disease caused by *Phytophthora megakarya*, range from 30-90% in the country [3]. Also, the acceptance quality of Nigeria's cocoa beans in the world market is reducing and this has an indirect effect on the quality of finished products derivable from it, such as chocolate and businesses [3]. Interestingly, more than three hundred health beneficial compounds are present in cocoa beans, some of which include phenylethylamine, theobromine and many polyphenols like flavonoids [4].

From cocoa farmers' point of view, primary processing of cocoa beans is time-consuming and laborious. Primary processing activities include harvesting, gathering the ripe pods, breaking of pods, removal of the beans, fermenting and drying of the beans. Lahriam and

Patterson [5] noted that without fermentation, cocoa beans will have no flavour. Fresh cocoa beans are usually fermented using the heap method, tray method, basket method, sweatbox method. The beans are fermented for 5–7 days, depending on weather condition. Drying is an excellent way to preserve food and solar dryers are appropriate food preservation technology for sustainable development. Drying can be done naturally by open sun drying or artificially [6] by solar cabinet dryer, tray dryer, microwave oven, etc. The moisture content is reduced to 7% to increase the storage life-span and reduce mould attack. This will enable farmers to produce high-quality cocoa beans that would offer them premium prices in the market.

Folayan [7] explained that the root causes of quality anomalies in cocoa could be traced to poor farm management, infestation and another disease, poor handling, bad formulation, inadequate drying leading to a high moisture content which makes the product vulnerable to mould and bacterial growth. The study was hence carried out to determine cocoa farmers' involvement in cocoa production-related activities by considering the following objectives:

1. Describe the personal characteristics of cocoa farmers;
2. Determine the sources of information available to cocoa farmers;
3. Determine cocoa farmers' involvement in cocoa production-related activities;
4. Determine the constraints faced by cocoa farmers during cocoa production-related activities.

1.1 The Hypothesis of the Study

There is no significant relationship between the personal characteristics of farmers and the involvement in cocoa production-related activities.

2. MATERIALS AND METHODS

The study was carried out in Ido local government area of Oyo State. Ido shares boundaries with Iseyin and Afijio local government areas to the north, Akinyele to the East, Ibarapa East local government area to the west and Ogun State to the south. It has a land area of 986km² and a population of 103,261 [8]. The people are mostly farmers cultivating food crops like cassava, yam, maize and cash crops like cocoa, kola, cashew, etc. The population of the study comprised of cocoa farmers in the study area. The multistage sampling procedure was used to select respondents for the study. In the first stage, Ido local government was purposively selected due to the concentration of cocoa farmers in the area. Eleven cocoa farmers were randomly selected from the ten wards in the local government, making a total of 110 respondents. The interview schedule was used to collect data from the cocoa farmers. Sources of information were measured on a three-point scale of "always", "occasionally" and "never", with scores of 3, 2 and 1 respectively assigned. The sources of information were afterwards ranked using their mean scores. Involvement in cocoa production-related activities comprised of four components; pre-planting/planting practices, post-planting practices, store management practices and marketing practices. Involvement in cocoa production-related activities were measured on a three-point scale of "fully involved", "partially involved" and "not involved", with scores of 3, 2 and 1 respectively assigned. The mean scores of the activities of these four components were obtained and used to rank them according to the extent to which cocoa farmers were involved in them. The constraint was measured on a three-point scale of severe constraint, minor constraint and not a constraint, with scores of 3, 2 and 1 respectively assigned. The constraints were afterwards ranked using their mean scores.

3. RESULTS AND DISCUSSION

3.1 Personal Characteristics of Respondents

Table 1 shows that about half (49.1%) of the respondents fell within the age bracket of 36-45 years. This implies that most of the farmers were of middle age and expected to energetic and economically active. Oyesola [9] reported individuals within this age form the active labour force and are capable of undertaking income

generating activities that are labour intensive. The majority (62.7%) of them were male, implying that men are more involved in cocoa production-related activities in the study area. This aligns with Alfred [10], who observed the male dominance of cocoa production and attributed it to the drudgery associated with it. Most (59.1%) of them were married, indicating that most cocoa farmers in the study area are married. This is in accordance with what Olujide [11], said that most married cocoa farmers relied on family labour to carry out some production activities and thereby reducing their financial obligations. They may decide to engage in the enterprise to cater for their family needs using proceeds from it. Additionally, 44.5% of the respondents had a secondary education while 39.1% had tertiary education. This means the majority (83.6%) had one form of formal education. This is in conformity with Odebode [12], that education among rural farmers brings about change in their productivity and standard of living. This enhances their chance adhering to processing standards that will ensure high-quality cocoa beans. Also, 70.9% of them were Christians, 25.5% were Muslims, and 3.6% were traditionalists, implying religion is not a barrier to cocoa production-related activities. 50% of the respondents practice farming as their primary occupation, 30% of them do other businesses with farming, and 13.6% are civil servants and 6.4% are artisans. This shows that they are involved in other livelihood activities besides farming, which may not be unconnected with their levels of education.

3.2 Sources of Information on Cocoa Production-related Activities

In Table 2, Cocoa Farmers' Association (CFA) ranked 1st (mean = 2.52) as the most important source of information available to the respondents in the study area. This is because information on cocoa is disseminated to them in their monthly meetings. According to Akinbode [13], farmers' groups are vital tools for passing information to farmers. Cocoa Research Institute of Nigeria and friends/ neighbours equally ranked 2nd (mean = 2.37), while fellow farmers ranked 4th (mean = 2.23). Oftentimes, in order to make life better, research institutes carry out studies on the latest agricultural developments and afterwards relay their findings to farmers and various stakeholders. Olaitan [14] found communication among families, relatives and friends as important means of passing across information in rural areas.

Table 1. Distribution of respondents by personal characteristics

Variables	Frequency	Percentage
Age		
23-35	12	10.9
36-45	54	49.1
46-55	34	30.9
56-65	8	7.3
65 and above	2	1.8
Sex		
Male	69	62.7
Female	41	37.3
Marital status		
Single	27	24.5
Married	65	59.1
Divorced	10	9.1
Widowed	8	7.3
Religion		
Christianity	78	70.9
Islam	28	25.5
Traditional	4	3.6
Educational level		
No Formal Education	2	1.8
Primary	16	14.5
Secondary	16	44.5
Tertiary	43	39.1
Primary occupation		
Farming	55	50.0
Business	33	30.0
Civil Servant	15	13.6
Artisan	7	6.4
Farm size		
1-3	8	7.3
4-6	48	43.6
7-9	21	19.1
≥10	33	30.0
Farm experience		
1-5	30	27.3
5-10	55	50.0
11-15	14	12.7
≥16	11	10.0

Table 2. Distribution of respondents by sources of information on cocoa production-related activities

Sources of information	Mean	Rank
Cocoa Research Institute of Nigeria (CRIN)	2.37	2 nd
Cocoa Farmers Association (CFN)	2.52	1 st
Media (Radio, Television, Newspaper, Journals)	2.22	5 th
Licensed Buying agents	1.83	6 th
Fellow Farmers	2.23	4 th
Friends and Neighbors	2.37	2 nd

3.3 Constraints to Cocoa Production-related Activities

Table 3 shows the constraints faced by the respondents in order severity. Poor access to

credit facilities, poor transportation and unstable government policy were ranked 1st (mean = 2.42), 2nd (mean = 2.35) and 3rd (mean = 2.30) in order of their severity respectively. Credit is quite important in agriculture as farmers need money to procure improved cocoa seeds, agro-chemicals among other things to boost their production. However, Akinbode [13] noted that farmers hardly obtain loans from banks due to high-interest rates charged by commercial banks. When there is poor transportation network, farmers find it difficult to move their products from the farm to where they are needed, partly due to the high cost of transportation.

Table 3. Distribution of respondents by constraints to cocoa production-related activities

Constraints	Mean	Rank
Poor access to credit	2.42	1 st
Inadequate labour	1.96	10 th
Transportation problem	2.35	2 nd
Lack of storage facilities	2.09	6 th
Lack of input	2.12	5 th
Provision of artificial oven	2.03	9 th
Theft	2.09	6 th
Sharp practices of middlemen	2.04	8 th
Unstable government policy	2.30	3 rd
Unpredictable climatic condition	2.16	4 th

3.4 Involvement in Cocoa Production-related Activities

Respondents' involvement in cocoa production activities were measured against different aspects such as pre-planting/planting practices, post-planting practices, store management practices and marketing practices. Findings in Table 4 reveal that planting of cocoa seedlings (mean =2.47) and pest and disease control (mean= 2.31) ranked 1st and 2nd respectively were the pre-planting/planting practices the farmers were more involved in. This indicates that selection of appropriate varieties of cocoa seedlings and adhering to prescribed planting procedures are important, as they go a long way in determining yield. It is also paramount to control pests and diseases because pest and disease infestations are highly responsible for the declining quality of cocoa in the country. Under post-planting practices, the farmers were more involved in the drying of cocoa beans (mean =2.84). Drying, done naturally or artificially, helps to preserve cocoa beans by reducing the moisture content. Proper drying produces high-quality cocoa beans that attract premium market prices. Store sanitation

Table 4. Distribution of respondents by involvement in cocoa production and store management practices

Involvement in cocoa activities	Mean	Rank
Pre-planting/planting practices		
Site selection	2.30	3 rd
Bush burning	1.97	8 th
Lining and pegging	2.15	6 th
Planting of cocoa seedlings	2.47	1 st
Fertiliser application	2.23	5 th
Weed control	2.30	3 rd
Pest and disease control	2.31	2 nd
Irrigation during the dry season	2.09	7 th
Post-planting practices		
Harvesting of ripe pods	2.74	3 rd
Breaking of pods	2.73	4 th
Fermentation of cocoa beans	2.81	2 nd
Drying of beans to a recommended moisture content	2.84	1 st
Sorting of defected beans from good beans	2.65	5 th
Store management practices		
Bagging of cocoa inside jute bag	2.49	5 th
Stocking of cocoa bag on wooden pallets	2.53	3 rd
Proper store sanitation	2.59	1 st
Control of store pest	2.51	4 th
Proper store ventilation	2.59	1 st
Re-drying of cocoa bean during raining season	2.48	6 th
Marketing practices		
Grading	2.17	4 th
Wholesales selling	2.56	1 st
Retail selling	2.27	2 nd
Direct export	2.18	3 rd

Table 5. Chi-square and correlation analyses between respondents' personal characteristics, constraint and involvement in cocoa production and store management practices

Variables	χ^2	Df	r-value	p-value	Remarks
Age	-	-	-0.009	0.926	Not significant
Sex	12.715	2	-	0.002	Significant
Marital status	1.712	3	-	0.634	Not significant
Education	13.157	3	-	0.004	Significant
Primary occupation	15.721	3	-	0.001	Significant

(mean= 2.59) and store ventilation (mean= 2.59) were equally essential store practices to the respondents, as they were both ranked first. Proper management of the store is important to forestall pest and disease attacks when cocoa beans are kept in the store. Wholesale selling (mean= 2.56) and direct export (mean= 2.27) ranked 1st and 2nd respectively under marketing practices. This is explainable from the fact that cocoa is a cash crop that can be sold in bulk or exported out of the country.

3.5 The Relationship between Respondents' Characteristics and their Level of Involvement in Cocoa Production

Table 5 shows that sex ($\chi^2=12.715$, $p=0.002$), education ($\chi^2=13.157$, $p=0.004$) and primary

occupation ($\chi^2=15.721$, $p=0.001$) were significantly related to respondents' involvement in cocoa production and store management practices. This indicates that these variables determine the extent to which a cocoa farmer would be involved in cocoa production-related activities. For instance, with respect to sex, women are known to be more involved in cocoa processing activities such as gathering of ripe pods, breaking of pods, removal of the beans, fermenting and drying of the beans unlike men. An educated cocoa farmer would more likely involve or adhere to processing standards that will enhance the quality of cocoa beans. Also, it is expected that respondents who farming is their primary occupation would be more involved in cocoa production and store management practices than those who farming is not their primary occupation.

4. CONCLUSION AND RECOMMENDATION

The cocoa farmers were mostly young, male, married and small-scale farmers. They were more involved in certain cocoa production-related activities such as planting of seedlings, pest and disease control, drying of cocoa beans, store sanitation and ventilation and bulk sale of the crop. Sex, education and primary occupation of the farmers were predictors of the extent of their involvement in cocoa production-related activities. The study further established that limited access to credit, poor transportation system and unstable policies of government hinder the farmers' involvement in cocoa production-related activities. Due to the strategic importance of cocoa to the economy, it is expected that policymakers commence appropriate development interventions aimed at addressing the identified issues to boost cocoa production and improve the quality of its beans.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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