

FARMERS' INVOLVEMENT IN COCOA PRODUCTION SHARP PRACTICES IN RURAL COMMUNITIES OF IFE AREA, OSUN STATE, NIGERIA

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ABSTRACT

The study investigated farmers' involvement in cocoa production sharp practices in Ife area, Osun State with a view to mitigating the challenge of farmers' engagement in cocoa production sharp practices. It specifically described the socio-economic characteristics of cocoa farmers, examined their awareness of best practices in cocoa production and their perception about sharp practices. A multi-stage sampling technique was employed to select 110 and 16 respondents subjected to structured interview schedule and key informant interview respectively. Data were analysed using descriptive such as frequency, percentage, mean and standard deviation and inferential statistics such as regression. The study revealed among others that the respondents had 50.35 ± 13.43 mean years of age, male (70.9%) and literate (64.7%). Majority (91.0%) of the respondents had high awareness level, perceived cocoa production sharp practices negatively (mean = 2.93) and involved in cocoa production sharp practices (moderately = 65.5% and highly = 20.9%). Also, significant relationship existed between farmers' age ($\beta=0.013$), years of formal education ($\beta=0.014$), income ($\beta=2.514$) and farmers' involvement in cocoa production sharp practices. It was therefore concluded that although most farmers had high awareness of cocoa production best practices and perceived sharp practices negatively, the vast majority were involved in cocoa production sharp practices. Training and retraining intervention on the health implications of engaging in sharp practices and the need to embrace best practices in cocoa production is of utmost importance.

Keywords: Cocoa production; sharp practices; rural communities; rural farmers; involvement

INTRODUCTION

Cocoa (*Theobroma cacao* L.) represents one of the cash crops and a non-oil sector that contribute significantly to Nigeria's Gross Domestic Product (GDP), as well as about six percent of its cocoa output to the global market (Amao *et al.*, 2025). Its contribution to foreign exchange earnings, economic development, rural development, and household income generation makes it a crucial commodity of high importance. In Nigeria, cocoa production is largely concentrated in the southwestern states namely: Ondo, Ekiti and Osun (International Cocoa Organization [ICCO], 2023). Osun state, ranked second in cocoa production in Nigeria, and account for about 22 percent of the country's total cocoa output (Adesiyani *et al.*, 2023). In Nigeria, cocoa production remains an important contributor to rural farmers' livelihood and income especially in most of the Southwestern states. Recent developments in the global cocoa industry have increased concerns regarding cocoa quality, food safety, traceability and sustainability compliance. International buyers increasingly demand for cocoa beans that satisfy stringent standards relating to pesticide residues, fermentation quality, moisture content and environmental sustainability (Akande *et al.*, 2023;

Aneani and Ofori-Frimpong, 2023; Voora *et al.*, 2023). Consequently, cocoa-exporting countries that fail to comply with these requirements risk reduced market access, price discounts and rejection of export consignments. Reports indicate that excessive pesticide use, poor fermentation procedures, contamination during handling and inadequate traceability systems continue to undermine the competitiveness of cocoa from several producing countries. (FAO, 2023; ICCO, 2024; European Commission, 2024; World Bank, 2024). Cocoa farmers often engage in practices to pursue higher yields and economic gains, all of which could compromise cocoa quality, environmental sustainability and consumer safety. These practices are often referred to as sharp practices in cocoa production. Sharp practices are defined as cunning, deceitful, misdirecting, and trickery engagements that violate the law (Merriam-Webster, 2026; Business Dictionary, 2013). Therefore, sharp practices in cocoa production refer to activities that deviate from approved agricultural standards and ethical production guidelines which include indiscriminate use of agrochemicals, application of unapproved pesticides, failure to observe recommended pre-harvest intervals, improper

fermentation and drying procedures, adulteration of cocoa beans and other actions that negatively affect cocoa product quality and safety. The predictors of these include limited knowledge of recommended production techniques, inadequate extension services, economic pressures, pest and disease outbreaks, and weak regulatory enforcement agencies. Pests and diseases remain the major constraints to cocoa production in Nigeria and other cocoa-producing countries. To mitigate these challenges, farmers frequently depend on pesticides but their misuse has become a significant source of concern (Famuyiwa *et al.*, 2015). Oyekale (2022) revealed that many cocoa farmers do not fully comply with agrochemical safety regulations and recommended application procedures, thereby increasing the risks of pesticide residues in cocoa beans and exposure to health hazards while the adoption and sustained use of approved pesticides remain relatively low despite increasing awareness of food safety concerns (Oyenpemi *et al.*, 2023). The indiscriminate use of pesticides in cocoa farming has implications for human health, environmental sustainability and international trade. Excessive pesticide application can contaminate soil and water resources, reduce biodiversity and lead to the accumulation of chemical residues in cocoa beans beyond permissible limits. Such contamination threatens consumer health and may result in the rejection of cocoa exports in international markets (ICCO, 2024). Adedire *et al.*, (2023) who conducted similar study among cocoa farmers in Southwestern Nigeria further revealed that prolonged exposure to pesticides is associated with adverse health risks including respiratory complications, skin irritation, and other occupational health risks. Therefore, marketing of substandard cocoa beans could undermine Nigeria's reputation in the global cocoa market, reduce the income potentials of farmers, pose enormous risk to farmers' health, cocoa beans consumers and the environment. As global buyers increasingly demand for quality, the need to understand farmers' involvement in practices having negative effect on cocoa quality has become more expedient.

However, empirical information on the extent to which cocoa farmers engage in sharp practices, their awareness of best production practices, and perception about sharp practices remain limited. Understanding these issues is essential for

designing effective extension interventions, policy measures, and capacity-building programmes aimed at promoting best practices in cocoa production to enhance the competitiveness of Nigeria's cocoa industry. It is against this background that this paper seeks to assess farmers' involvement in cocoa production sharp practices in Ife Area of Osun State, Nigeria, through the following specific objectives: describe the personal and socio-economic characteristics of cocoa farmers in Osun State; examine farmers' awareness of cocoa production best practices; examine respondents' perception about sharp practices in cocoa production; and determine the involvement level of respondents in cocoa production sharp practices.

THEORETICAL FRAMEWORK

This paper is situated within the perspectives of planned behaviour and classical economic thought. The Theory of Planned Behavior (TPB) was developed by Icek (1991) as an extension of the Theory of Reasoned Action. It posits that an individual's behaviour is primarily determined by intention, which is influenced by three major factors: attitude toward the behaviour, subjective norms, and perceived behavioural control. The Theory of Planned Behavior is relevant to this study because farmers' involvement in cocoa production sharp practices can be viewed as a behavioural outcome resulting from their attitudes, perceptions, and social environment. Cocoa farmers may develop favourable attitudes towards sharp practices if they perceive such practices as effective in controlling pests, reducing production costs, increasing productivity or maximizing profits or otherwise, develop negative attitude when they recognise the adverse effects of sharp practices on cocoa quality, human health, and environmental sustainability. Furthermore, farmers often operate within social networks where information, experiences and farming practices are shared. Where the different actors condone or encourage sharp practices, individual farmers may feel social pressure to adopt similar behaviours whereas strong influence from extension agents, regulatory agencies and farmer associations may discourage involvement in such practices. Farmers who lack access to extension services, approved pesticides, training programmes or financial resources often perceive compliance with recommended cocoa production practices as difficult (Oyenpemi *et al.*, 2023).

Conversely, farmers with adequate knowledge, technical support and access to production resources may be more capable of adhering to recommended practices. The study also adapted Rational Choice Theory (RCT) which was originated from classical economic thought and extensively developed by Coleman (1990). It has a central assumption that individuals are rational being who make decisions by carefully weighing the costs and benefits associated with alternative courses of action. Individuals are expected to choose actions that maximise personal benefits while minimising costs and risks. The theory recognizes that individuals operate under resource constraints and therefore seek to optimise outcomes based on available information and opportunities. In agriculture, farmers evaluate the costs and benefits associated with different farming practices and adopt those perceived to provide the highest returns. Therefore, farmers may engage in sharp practices when they perceive that the benefits of these practices outweigh the potential costs. Such sharp practices include the excessive use of pesticides, application of banned chemicals, failure to observe recommended harvesting intervals, improper fermentation and drying procedures among others. Challenges such as pest infestations, declining productivity, rising input costs, labour shortages, and market uncertainties may cause the farmers to consciously choose such practices to maximise profit, reduce losses or maintain productivity despite knowing the potential long-term consequences. Thus, Rational Choice Theory provides useful explanation for the economic motivations underlying farmers' involvement in sharp practices.

MATERIALS AND METHODS

Study area and sampling techniques

The study was conducted in Osun State, Nigeria. The state is divided into three Agricultural zones based on Osun State Agricultural Development Programme (OSSADEP) namely Iwo, Osogbo and Ife-Ijesha zones. Multistage sampling procedure was used to select respondents for the study. At the first stage, Ife-Ijesha zone was purposively selected because they represent a major cocoa producing belt in the state. At the second stage, two (2) Local Government Areas (LGAs) were purposively selected namely Ife East and Ife South because of their rurality and high concentration of cocoa farming communities. At

the third stage, 4 major cocoa-producing rural communities (Osi Ara, Olode, Egbejoda and Ifetedo from Ife South and Dugbe, Apa Erefe, Koola and Oku Omoni from Ife East) were identified and selected to make a total of 8 communities. At the last stage, random sampling technique was used to select a total of 110 respondents across the selected communities and interviewed using a structured interview schedule. Additionally, 16 key informants were purposively selected to provide qualitative information about the subject matter.

Cocoa farmers' involvement in sharp practices was conceptualised as the extent to which farmers were involved in sharp practices by asking 18 questions on production sharp practices in order to determine their level of involvement. It was measured on a 4-point scale ranging from 0-3 where Not Involved (NI) = 0; Rarely Involved (RI) = 1; Involved (I) = 2 and Frequently Involved (FI) = 3. The score for each of the 18 cocoa production sharp practices was calculated and this formed the farmers' involvement score. For the level of involvement, the expected obtainable maximum and minimum scores were 54 and 0 respectively. Equal interval approach was used to determine the level of farmers involvement as outlined by Deji *et al.* (2023) and Famakinwa *et al.* (2023). Equal interval approach allows for dividing the range of values into three equally. The calculated range of farmers involvement was 54 and this was divided into three to obtain the width of 18. Values equal to or below 18 were categorised as low, between 19 and 36 were recorded as moderate while scores above 36 were recorded as high level of involvement in cocoa production sharp practices.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The result in Table 1 shows that majority (70.9%) of the respondents were males. This implies that more males were involved in cocoa production than females in the study area. In addition, the respondents' mean age was 50.35 ± 13.43 years. This implies that a larger proportion of the respondents were in their middle age that reflect enhance reasoning and expertise, which is ideal for cocoa production. This result is in line with the findings of Balogun *et al.*, (2019) who opined that majority of cocoa farmers are still in their productive phase who are able to adopt standard

agricultural practices in their cocoa production activities. However, the result revealed low youth involvement which could portend great danger for the future of cocoa production in Nigeria. Furthermore, the mean of years spent in formal education was 6.80 ± 4.12 and most (60.9%) had over 10 years of farming experience which implies that respondents have considerable years of cocoa farming and have over those years gained practical production experiences. This result is in line with the submission of Uwagboe *et al.* (2016) who opined that farmers' years of experience could be beneficial to their involvement in using standard practices as they must have gained experience over these years. Also, cocoa farming was the primary source of income for majority (80.0%) of the

respondents, 61.5 percent were arable crop farmers while 10.7 and 9.3 percent were artisans and produce buyers respectively. This finding revealed that cocoa farmers engaged in diverse money-making activities. Cocoa being a seasonal crop necessitates diversification of income generating activities. The monthly income generated by half (50.0%) of the respondents was N100,000 and above, while 45.5 percent made between N50,001 and N100,000 monthly and very few (4.5%) made below N50,000 on monthly basis. All the respondents belong to different associations and this could provide avenues for them to access information on cocoa production best practices.

Table 1: Personal and Socio-economic characteristics of the Respondents (n=110)

Variables	Frequency	Percentage	Mean $\pm$ SD
Age (years)			
24-45	45	40.9	50.35 $\pm$ 13.43
46-65	50	45.5	
66+	15	13.6	
Sex			
Male	78	70.9	
Female	32	29.1	
Literacy level			
Non-literate	30	35.3	
Literate	80	64.7	
Years of formal education			
≤ 6	45	56.3	6.80 $\pm$ 4.12
7-12	26	32.5	
13+	9	11.3	
Years of farming experience			
≤ 5 years	14	12.7	
6-10	17	15.5	
11-15	67	60.9	
16+	12	10.9	
Primary source of income*			
Cocoa farming	88	80.0	
Arable crop farming	68	61.5	
Artisans	12	10.7	
Produce buying	10	9.3	
Estimated monthly income (₦)			
$\leq 50,000$	5	4.5	
50,001-100,000	50	45.5	
100,001+	55	50.0	
Association membership			
Yes	110	100.0	
No	--	--	

Source: Field Survey, 2023

*Multiple response

Farmers' awareness of cocoa production best practices

Based on a five-point scale, the awareness grand mean scores for each of the ten cocoa production best practices was calculated and ranked in a descending order as shown in Tables 2a & b. The expected individual maximum score was 4.0 while the mid-point score was (2.0).

Five of the ten cocoa production best practices (harvesting and handling procedures, land preparation, planting varieties, soil substrate and

record keeping) were ranked 1st, 2nd, 3rd, 4th and 4th respectively. Further analysis of the results also revealed that transportation and water usage ranked lowest (2.64 and 2.57 respectively). In addition, the grand mean score for the ten best practices was 2.94. Importantly too, all the ten production practices were scored above the mid-point (2.50). These results imply that the farmers were familiar with the practices and could be willing to enhance their cocoa production practices if provided the opportunities to do so.

Table 2a: Farmers' Awareness of Cocoa Production Best Practices (n=110)

Practices	Mean	SD	Rank
Harvesting and handling procedures			
Harvesting only fully ripe pods at 75% ripeness	3.36	0.67	1 st
Avoid damage to cocoa trees	3.18	0.32	2 nd
Avoid contamination of beans after harvest	2.95	0.83	3 rd
Grand mean	3.16		
Land preparation			
Previous usage of land	3.23	0.34	1 st
Selection of appropriate site for crop	3.15	0.56	2 nd
Use of open area	3.13	0.38	3 rd
History before land usage	3.12	0.41	4 th
Planting of permanent and temporary shade tree a year prior to planting of cocoa	3.01	0.36	5 th
Site history and management for new establishment	2.92	0.82	6 th
Grand mean	3.09		
Planting variety			
Use of appropriate crop and variety for intercropping	3.17	0.91	1 st
Selection of non-contaminated input	3.07	1.07	2 nd
Diseases and insect resistance variety	3.05	0.74	3 rd
Accessing information on best input for planting	2.97	0.27	4 th
Keep record of source of input	2.83	0.93	5 th
Grand mean	3.02		
Soil substrate			
Intercrop to prevent erosion and land preparation	2.93	0.77	1 st
Testing and analysing soil for presence of heavy metals	2.77	0.59	2 nd
Grand mean	2.85		
Record keeping			
Planting site, date of planting, harvesting, weight of produce and locations should be kept for productivity improvement and traceability	2.85	0.81	1 st
Grand mean	2.85		
Pest and disease management			
Regular printing to reduce risk of pest and disease infestation especially from cocoa pod borers and black pod diseases	2.94	0.82	1 st
Removal of infected disease pods, branches etc and disposing them in safe places	2.90	0.45	2 nd
Use of integrated pest management (IPM) system	2.88	0.73	3 rd
Old unproductive cocoa trees revitalized with side-grafting or bark-grafting; use of only scions or budwood from registered ones that have resistance or tolerance to major pests and diseases	2.63	0.17	4 th
Grand mean	2.84		

Source: Field Survey, 2023

NA: Not aware; FA: Fairly aware; MA: Moderately aware; A: Aware VA: Very aware.

Table 2b: Farmers' Awareness of Cocoa Production Best Practices (n=110)

Practices	Mean	SD	Rank
Fertilizer application			
Use of waste must be properly composited to destroy organism or pathogen in the process	2.83	0.38	1 st
Workers proper handling of equipment used for fertilizer and additives application	2.83	0.72	2 nd
Record of origin, composition of organic fertilizer, date, frequency and analysis of heavy metals performed	2.81	0.63	3 rd
Grand mean	2.82		
Transportation			
All vehicles used to transport farm implement should be properly checked and cleaned to avoid contamination	2.78	0.78	1 st
Vehicle used to handle soil-animal manure, chemical fertilizers, pesticides must be properly cleaned prior to delivery	2.68	0.25	2 nd
Grand mean	2.73		
Synthetic and bio-pesticides			
Observation of recommended interval between chemical application and harvesting	3.16	0.56	1 st
Recommended chemicals to be acquired from reliable vendors based on local authority and government regulations	3.14	0.82	2 nd
Following instructions on labels of products	3.04	0.41	3 rd
Promotion of IPM to reduce the use of synthetic agrochemicals	3.01	0.36	4 th
Proper storage of unused chemicals for re-usage and container properly disposed	2.97	0.26	5 th
A rotation strategy of chemical application to avoid pest resistance and pest revival	2.91	0.88	6 th
Proper cleaning and storage of equipment used	2.91	0.91	7 th
Workers and owners should be well-trained on pest control purposes	2.90	0.59	8 th
Grand mean	2.64		
Water			
Irrigation workers must be well trained on proper methods	2.67	0.91	1 st
Source of water to be analysed annually to minimize its biological and chemical contamination	2.46	1.03	2 nd
Grand mean	2.57		

Source: Field Survey, 2023

NA: Not aware; FA: Fairly aware; MA: Moderately aware; A: Aware VA: Very aware.

Farmers' level of awareness of best practices

Figure 1 below shows the respondents' overall awareness level of cocoa production best practices. It was calculated from the expected maximum score of 144 and the minimum obtainable score of 0 derived from the maximum obtainable score for the responses to 36 questions on cocoa production best practices. These scores were categorised using equal interval approach. With the range of values being 144, the width was calculated by dividing the score into 3 categories to give low, moderate and high levels. Scores from 48 and below were categorised as low, from 49 to 96 moderate and

scores from 97 and above were categorised as high levels of awareness. The result revealed that the vast majority (91.0%) were in the high category, only 9.0 percent were moderate and none was low. This finding indicated that most farmers had high level of awareness of best practices in cocoa production activities.

Therefore, leveraging farmers' high awareness of cocoa production best practices in any planned intervention programme could cause a reduction in farmers' involvement in sharp practices.

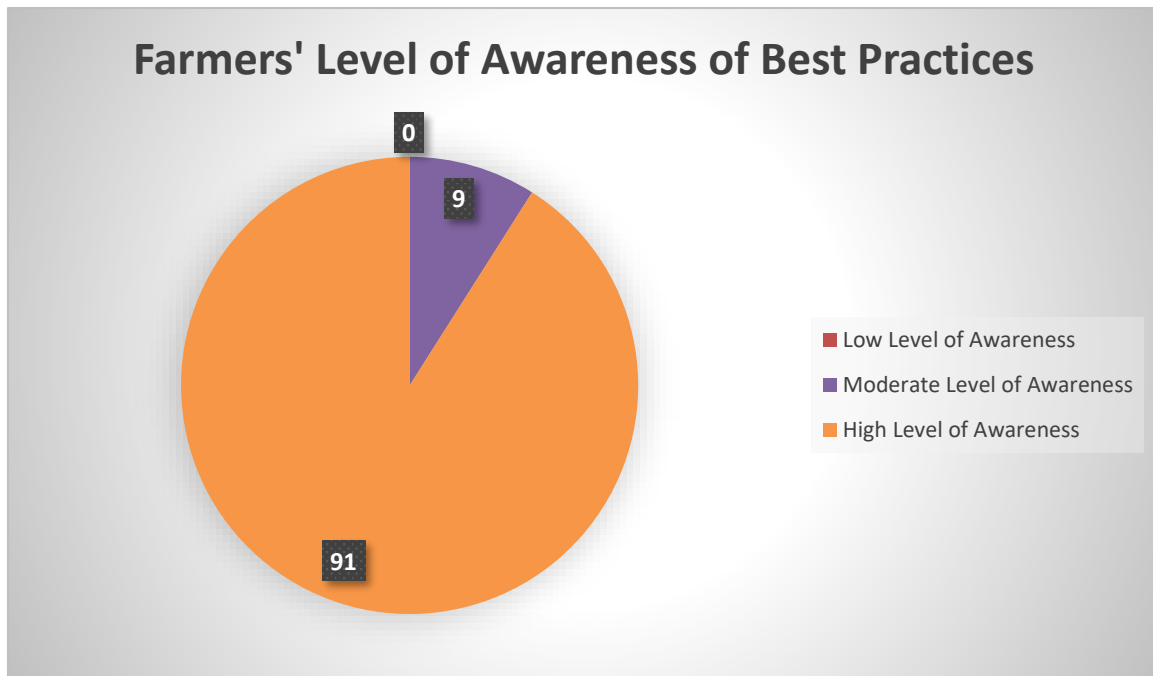


Figure 1: Level of Farmers' Awareness of Cocoa Production Best Practices (n=110)

Farmers' perception about sharp practices in cocoa production activities

The result in Table 3 shows the mean scores of cocoa farmers' responses to 16 perceptual statements, made up of equal numbers of negative and positive statements about farmers' sharp practices in cocoa production activities. The expected individual maximum score was 5.0, minimum was 1 and 2.5 was the mid-point. The three highest ranking negative statements were farmers engaging in sharp practices should be disciplined (mean=3.22), farmers engaged in sharp practices can be controlled (mean=3.21), those engaging in sharp practices are selfish (mean=3.16) and sharp practices in cocoa production is harmful to human health (mean=3.12). Similarly, the three highest mean scores for the positive perceptual statements were sharp practices are inevitable (mean=3.07), lack of regulatory policy promotes sharp practices (mean=3.02) and not all sharp practices are bad (mean=2.86). In summary, 7 out of the 8 negative statements were above the mid-point (2.50) while only one was below. In contrast,

only half (4 of the 8) positive statements were above the mid-point while the remaining 4 were below. This implies that lesser number of farmers were in favour of engaging in cocoa production sharp practices. Furthermore, the grand mean scores were 2.93 and 2.57 for the negative and positive perceptions about sharp practices in cocoa production respectively. These varied farmers' perceptions imply that majority of the farmers perceived their engagement in sharp practices negatively, meaning that they were not ignorant of the consequences of their actions. Thus, the unfavourable disposition to engagement in sharp practices by the farmers could imply their readiness to change if provided with better options. This result agrees with the findings of Famuyiwa et al., (2015) that adoption of good agricultural practices has greater advantage including increased product quality and higher traded cocoa prices. Therefore, leveraging their perception in any planned intervention to limiting farmers' engagement in sharp practices is of utmost importance.

Table 3: Farmers' Perception of Cocoa Production Sharp Practices (n=110)

Variable	SD	D	I	A	SA	Mean
Negative statements						
Farmers engaging in sharp practices should be disciplined	24(21.8)	22(20.0)	4(3.6)	26(23.6)	34(30.9)	3.22
They can be controlled	21(19.1)	24(21.8)	3(2.7)	35(31.8)	27(24.5)	3.21
Those engaging in sharp practices are selfish	20(18.2)	32(29.1)	2(1.8)	22(20.0)	34(30.9)	3.16
Sharp practices in cocoa production are harmful to human health	31(28.2)	24(21.8)	1(0.9)	9(8.2)	45(40.9)	3.12
It is possible for cocoa farmers to be free from practicing them	29(26.4)	24(21.8)	7(6.4)	29(26.4)	21(19.1)	2.90
They have negative effect on cocoa beans produced	21(19.1)	41(37.3)	7(6.4)	19(17.3)	22(20.0)	2.82
They affect the environment negatively	27(24.5)	43(39.1)	3(2.7)	26(23.6)	11(10.0)	2.55
They negatively impact on the nation's reputation	33(30.0)	37(33.6)	9(8.2)	16(14.5)	15(13.6)	2.48
Grand mean score						2.93
Positive statements						
They are inevitable	12(10.9)	43(39.1)	1(0.9)	33(30.0)	21(19.1)	3.07
Lack of regulatory policy promotes sharp practices	30(27.3)	20(18.2)	5(4.5)	28(25.5)	27(24.5)	3.02
Not all the sharp practices are bad	22(20.0)	37(33.6)	2(1.8)	32(29.1)	17(15.5)	2.86
No negative impact on the nation's reputation	35(31.8)	29(26.4)	13(11.8)	19(17.3)	14(12.7)	2.53
They have no negative effects on cocoa beans produced	31(28.2)	44(40.0)	2(1.8)	26(23.6)	7(6.4)	2.40
They do not affect the environment negatively	32(29.1)	48(43.3)	1(0.9)	19(17.3)	10(9.1)	2.33
In the absence of best practices, it is not bad to engage in sharp practices a little	28(25.5)	57(51.8)	1(0.9)	19(17.3)	5(4.5)	2.24
Does not affect humans negatively	47(42.4)	35(31.8)	1(0.9)	19(17.3)	8(7.3)	2.14
Grand mean score						2.57

Source: Field Survey, 2023

SD: Strongly disagree; D: Disagree; I: Indifferent; A: Agree and SA: Strongly agree

Farmers' involvement in cocoa production sharp practices

The list in Table 5 shows the 18 sharp practices covering the different cocoa production activities (land preparation, planting, pest and disease management, harvesting and handling procedures). The analysis of the results revealed that adulteration of fertilizers, pesticides and seeds ranked highest among the sharp practices (mean=1.90), followed by spraying gammalin 20 on drying cocoa beans to prevent moulds and maggots (mean=1.89), mixing of fungicides and insecticides together for use to reduce workload of separate spraying (mean=1.83) and use of outlawed chemical products (mean=1.82). Others were use of overdose of chemicals for intended rapid elimination of pests and insects (mean=1.77) and use of pesticides containers for other purposes

such as carrying of cocoa beans (mean=1.76). Also listed were the use of banned chemical products (glyphosate, chlorpyrifos, endosulfan and feritrothen) (mean=1.68) and intentional wrong use of nozzles (mean=1.68), prolonged fermentation (mean=1.67), intentional use of doses of chemical products (mean=1.64), breaking of cocoa pods without sorting (mean=1.61), production of moisture laden cocoa beans (mean=1.60), use of fixed scale by middlemen (traders) for lower reading than the actual weight to defraud farmers by middlemen (traders) (mean=1.59) and pilferage of cocoa beans by workers and family members (mean=1.59), use of heat fermentation methods without turning (mean=1.58), harvesting of immature cocoa pods (mean=1.44) and diversion of inputs by workers ranking the least (mean=1.38). The summary of

these results revealed that the mean score for each sharp practice in cocoa production was above the mid-point score (1.50) of the expected individual maximum score of 3.0 in 16 of the 18 sharp practices and below in only two. Similarly, the grand mean score (1.66) for the 18 sharp practices was above the mid-point. This result implies that cocoa farmers are involved in production sharp practices in order to maximize profits and minimize their cost. This result is in consonance with the findings of Famuyiwa *et al.*, (2015) who discovered high level of sharp practices among cocoa farmers in 5 geo-political zones in Nigeria.

The findings were further affirmed in an excerpt from the key informant interview conducted across the study area:

"Don't let me deceive you, we all engage in most of the practices mentioned even though we know that many are not

good but we have been using them and they have been working for us"

(A farmer and community leader at Kola, Ife East LGA)

These findings revealed the extent to which the farmers were involved in the various cocoa production sharp practices in the study area. The use of these practices has been found to be associated with the health risks of consumers of cocoa products and the farmers, diminishing the quality of cocoa beans produced, negatively impacting the pricing of cocoa beans and constituting environmental risks (ICCO, 2024; Adedire *et al.*, 2023; Oyekale, 2022). These adverse impacts of farmers widely used cocoa production sharp practices could portends great danger to the future of cocoa production if they remain unchecked.

Table 4: Farmers' Involvement in Cocoa Production Sharp Practices (n=110)

Practices	Mean	SD	Mean
Adulteration of fertilizers, pesticides and seeds	1.90	0.31	1 st
Spraying Gammalin 20 on drying cocoa beans to prevent moulds and maggots developing	1.89	0.22	2 nd
Mixing of fungicides and insecticides together for use to reduce workload of applying differently	1.83	0.17	3 rd
Use of out-lawed chemical products	1.82	0.67	4 th
Use of overdose of chemicals for intended rapid elimination of pests and insects	1.77	0.56	5 th
Use of pesticides containers for other purposes such as carrying of cocoa beans	1.76	0.38	6 th
Use of banned chemical products (Glyphosate, chlorpyrifos, endosulfan and feritrothen)	1.68	0.71	7 th
Intentional wrong use of nozzles	1.68	0.92	8 th
Prolonged fermentation	1.67	0.14	9 th
Intentional wrong use of doses of chemical products	1.64	0.53	10 th
Breaking of cocoa pods without sorting	1.61	0.25	11 th
Production of moisture laden cocoa beans	1.60	0.23	12 th
Use of fixed scale for lower reading than the actual weight to defraud farmers by middlemen (traders)	1.59	0.57	13 th
Pilferage of cocoa beans by workers and family members	1.59	0.66	14 th
Use of heat fermentation method without turning	1.58	0.55	15 th
Displacement of smallholder farmers by land speculators and miners	1.51	0.47	16 th
Harvesting of immature cocoa pods	1.44	0.36	17 th
Diversion of input by workers	1.38	0.76	18 th

Grand mean= 1.66

Source: Field Survey, 2023.

NI= Not Involved (0), RI= Rarely Involved (1), I= Involved (2), FI= Frequently Involved (3)

Level of farmers' involvement in cocoa production sharp practices

Figure 2 show the overall level of farmers' involvement in cocoa production sharp practices. This was categorised into high, moderate and low

levels. Most (65.5%) of the respondents were moderately involved while 20.9 and 13.6 percent had high and low involvement respectively. The result revealed an extensive involvement of cocoa farmers in production sharp practices which calls

for urgent planned intervention programmes to mitigate the challenge of sharp practices in cocoa production and promote best practices. The study showed a moderate to high level of farmers' involvement in sharp practices, therefore, with an 86.4 percent respondents' involvement, the

endpoint might become high involvement if not curtailed or controlled. This result is in line with the findings of Famuyiwa *et al.*, (2015) who discovered high level of sharp practices among cocoa farmers in 5 geo-political zones in Nigeria.

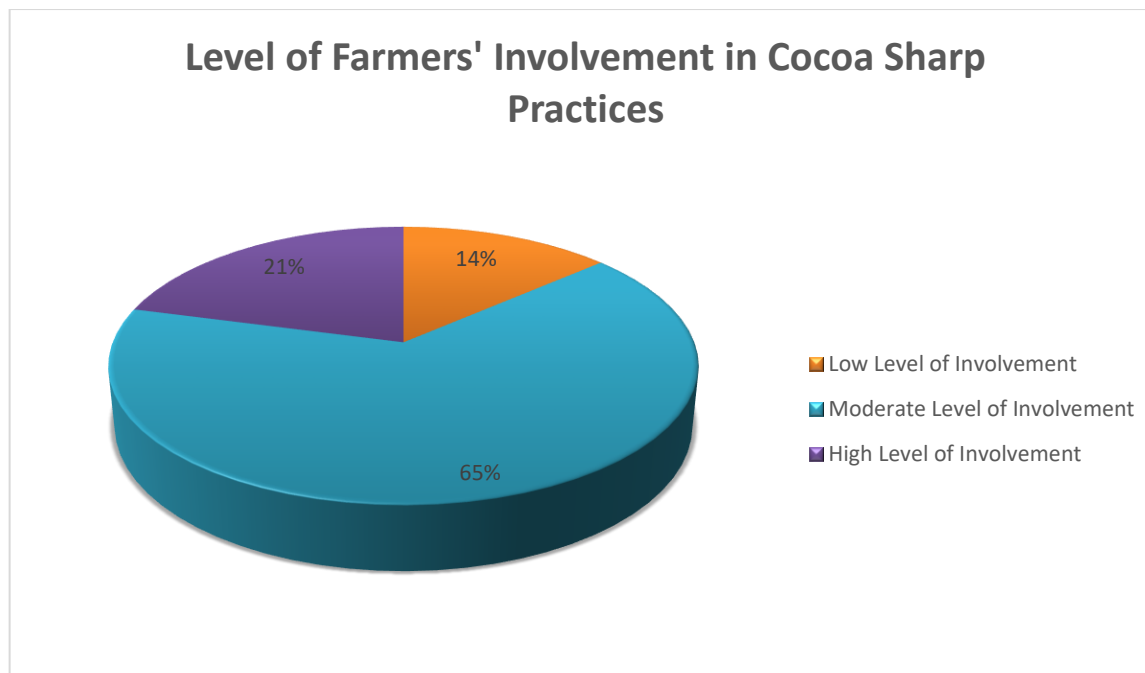


Figure 2: Farmers' Level of Involvement in Cocoa Production Sharp Practices.

Analysis of Regression result

Results of multiple regression analysis in Table 5 show that age ($\beta=0.013$, $p \leq 0.05$), years of formal education ($\beta=0.014$, $p \leq 0.01$) and estimated income from cocoa ($\beta=2.514$, $p \leq 0.01$) were statistically significant predictors of farmers involvement in cocoa production sharp practices in the study area. This result shows that at $p \leq 0.05$, the age of the respondents was significantly related to their involvement in sharp practices and at $p \leq 0.01$, their years of formal education and monthly income from cocoa farming was significantly related to their involvement in sharp practices. This implies that as the age, years of formal education and estimated income from cocoa increases by 1 unit, the farmers involvement in cocoa production sharp practices increases by 0.013, 0.041 and 2.514 respectively. This result implies that as cocoa farmers advance in age, years of formal education and also increase in income, they tend to engage more in sharp practices as they become only interested in making money at all cost despite being aware of the potential danger surrounding those practices. One could have thought that increasing age and years of formal

education of these cocoa farmers would reduce their involvement in sharp practices, rather, the result shows that despite their increasing educational level, there was increase in their involvement which could be as a result of maximizing immediate profit, surviving high production costs, mitigating the impact of low crop yield and coping with the volatile global market prices. This result agrees with the findings of Famuyiwa *et al.*, (2015) who also concluded that farmers engage in sharp practices because of extreme poverty, high production costs, low farm yields, pressure to maximize profit and the quest to withstand volatile global market prices. The multiple correlation coefficient (R) value for the regression was 0.617 indicating that a strong relationship exists between the combination of independent variables and farmers' involvement in cocoa sharp practices, R^2 value was 0.515 which means that the regression model accounted for 51.5 percent variation in farmers' involvement in cocoa production sharp practices. The F-value (55.023) was significant at $p \leq 0.01$ which means that the variables explained by the regression model were not due to chance.

Table 5: Analysis of Farmer's Involvement in Cocoa Production Sharp Practices and some Selected Socio-economic Characteristics (n=110)

Model	B	Std. Error	Beta	t	Sig.
(Constant)	22.495	10.587		2.125	0.036
Age	0.013	0.086	0.420	0.154	0.018
Years of formal education	0.041	0.202	0.701	0.202	0.000
Estimated monthly income from cocoa farming	2.514	1.934	0.612	1.300	0.007
Years of cocoa farming experience	-2.322	1.336	-0.219	01.739	0.085

Multiple R-value = 0.617

R² value = 0.515Adjusted R² = 0.613

F value = 55.023 at P ≤ 0.01

Significant at P ≤ 0.01 level

Significant at P ≤ 0.05 level

Source: Field Survey, 2023

CONCLUSION

The study concluded that cocoa farmers were predominantly male, middle-aged and largely literate. The study also showed that the vast majority of farmers possessed a high awareness level of best practices in cocoa production. Similarly, most respondents perceived sharp practices negatively and acknowledged its potential harmful effects on human health, cocoa quality and the environment. However, despite farmers' high awareness level and generally negative perception about sharp practices in cocoa production, majority of the farmers were moderately involved in cocoa production sharp practices and seconded by a tangible number of those in high level category. Based on the findings of the study, it was recommended that government agencies, extension organisations, cocoa farmers' associations, and other relevant stakeholders should intensify training and retraining programmes focusing on the health, environmental, and economic implications of cocoa production sharp practices. There is also a need to strengthen extension service delivery, improve monitoring and enforcement of regulations guiding agrochemical use and promote the use of sustainable cocoa production practices. Furthermore, incentive-based programmes that reward compliance with quality and safety standards should be introduced to motivate farmers' engagement in best cocoa production practices.

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CONFLICT OF INTEREST

The authors declare no conflict of interest regarding the publication of this paper.

AUTHOR CONTRIBUTIONS

FHBF conceptualised the research, EHO carried out the fieldwork under the supervision of FHBF, SII analysed and interpreted the data, FHBF, AAF and SII wrote the manuscript. FHBF and AAF reviewed the manuscript.

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