



Socio-Economic Factors and Cocoa Rehabilitation Techniques among Farmers in Boki, Cross River State, Nigeria

A. O. Akinpelu¹, J. O. Lawal¹, O. S. Ibiremo² and Q. A. Ogunwolu^{1*}

¹*Economics and Extension Department, Cocoa Research Institute of Nigeria (CRIN), Idi Ayunre, PMB-5244, Ibadan, Oyo State, Nigeria.*

²*Soil and Plant Nutrition Department, Cocoa Research Institute of Nigeria (CRIN), Idi Ayunre, PMB-5244, Ibadan, Oyo State, Nigeria.*

Authors' contributions

This work was carried out in collaboration among all authors. Author AOA designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors JOL and OSI collected and processed the raw data used for the research. Author QAO was involved in the statistical analysis and he managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJRCS/2021/v6i430121

Editor(s):

(1) Prof. Bojan Stipesevic, University of J.J. Strossmayer of Osijek, Croatia.

Reviewers:

(1) Nathaniel Gyimah, University of Education, Ghana.

(2) Bernard Naledzani Rasila, South Africa.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/70057>

Original Research Article

Received 17 April 2021
Accepted 23 June 2021
Published 30 June 2021

ABSTRACT

Aims: The study was aimed at; profile the socio economic characteristics of the farmers in the study area, ascertaining types of cocoa rehabilitation techniques prevalent in the study area and ascertaining farmers' knowledge of cocoa rehabilitation.

Place and Duration of the Study: Boki local government area of cross river state, Nigeria.

Methodology: Data obtained was analyzed using simple descriptive statistics such as frequencies, percentages, means, and standard deviation. The study employed a multistage random sampling technique to select cocoa farmers. The first stage was a purposive selection of the local government area. A total of eighty seven (87) cocoa farmers were randomly selected in the local government area. Well-structured questionnaire was used to elicit information from the farmers.

Results: About 77.0% and 96.6% of the farmers were male and married. Mean age, household size, farming experience, age of cocoa farms were 46years±10, 12±7, 24 years ±9 and 18 years±10,

respectively. Cocoa rehabilitation techniques considered in the study were coppicing, complete replanting, side grafting, top grafting, phased farm replanting, fertilizer application and planting under cocoa trees.

Conclusion: It was recommended that cocoa farmers in the study area should be encouraged to stay on the farms through provision of infrastructure to reduce rural-urban migration. Cocoa research institute of Nigeria and other stakeholders in cocoa production should ensure that farmers are encouraged to adopt and practice other cocoa rehabilitation techniques.

Keywords: Socio-economic factors; cocoa rehabilitation techniques; cocoa farmers.

1. INTRODUCTION

Nigeria is the World's fourth largest cocoa producer after Ivory Coast, Ghana and Indonesia, producing about 12 percent of the total world production and Nigeria is the third producer in Africa [1] Cocoa is the most prominent export crop in Nigeria in terms of production and export capacities [2]. According to Adebile and Amusan [3] cocoa contributes about 15 percent to the total Nigerian export in 1970 and also contributes \$900 million to Nigeria's economy in 2012 [4]. Nigeria's cocoa production in 2011/12 was put at 300,000 MT, up from 280,000 MT in 2011. The projected increase is based on a favourable weather outlook and significantly higher grower prices, which encouraged farmers to increase the cultivated area [5]. Nigeria's cocoa production continued to increase both in absolute quantity and as a proportion of total world production. Export of cocoa products from Nigeria was \$822.8 million in 2010. This represents about 35 percent of the \$2.32 billion earnings from non-oil exports in 2010 for Nigeria [6]. However, the fortune of cocoa turned upside down with the discovery of oil in large quantity in the 70's and this brought a downward trend in Nigerian cocoa production and position in the world market [7]. The effect of this is still being felt till date as the country has been struggling to reach the levels of cocoa production it once attained in the 60's and 70's when it was the second largest producer in the world [2]. It was reported that Nigerian cocoa output declined from 399, 200 tonnes in 2010 to about 298, 029 tonnes in 2016 with a growth rate declining from 16.2% to about 12..2% during the period [8]. Rehabilitation as a word has been used in many different ways and contexts. It has long not had a merging conceptual framework. Traditionally, the word has been used to describe a range of responses to incapability. Rehabilitation in this context is to enable cocoa farms with weaknesses to attain and maintain their maximum potentials during their life cycle.

Over the years, some of these cocoa trees are seen to be diminishing in productivity due to old

age and lack of adequate knowledge of rehabilitation of the old farms among the farmers. Hence, to address these issues, Cocoa Research Institute of Nigeria (CRIN) developed various Cocoa Rehabilitation Techniques (CRTs). This was done to regenerate old cocoa trees on cocoa farms and improve the income and livelihood of the farmers. In addition, it was observed that farmers are usually unwilling to destroy an old farm.

According to Opeke [9], rehabilitation is in two ways, the first is putting a cocoa field back into good condition, while the second way is clearing the old cocoa trees and replanting with young seedlings. It should be noted that the former way is seen to be more preferable to the farmers. This is because, it is cost effective, it enhances early maturity of cocoa trees and it generates quick returns to the farmers than the later. Rehabilitation techniques developed by CRIN include coppicing, complete replanting, side grafting, top grafting, phased farm replanting, fertilizer application and planting under cocoa trees. Empirical studies have been carried out by some authors on the number of years the productivity of cocoa tree is observed to be diminishing. The highest cocoa yield is achieved between 15 and 25 years and a profitable life span may be 50 years. In addition, yield declines gradually and production cost rises steadily from the 26th year of planting [10]. In a bid to sustain and perhaps improve Nigeria's position on global scale in cocoa production, CRIN has developed and disseminated different improved production packages on cocoa to farmers in Nigeria. These efforts have achieved some of its objectives. Productivity among farmers has been greatly enhanced and income increased. The study addressed the question of socio economic characteristics of farmers, type of techniques, and farmers' knowledge of cocoa rehabilitation techniques.

1.1 Objectives

The specific objectives of the study were to:

- a. Profile the socio economic characteristics of the farmers in the study area
- b. As certain types of cocoa rehabilitation techniques prevalent in the study area
- c. Ascertain farmers' knowledge of cocoa rehabilitation

2. METHODOLOGY

The study was carried out in Boki Local Government Area (LGA) of Cross River State, Nigeria in 2016. It is located at longitude $6^{\circ}16'26''$ N and latitude $9^{\circ}00'36''$ of the equator. Boki LGA has a population of about one hundred and eighty six thousand six hundred and eleven people (186,611). It has a density of about 67.3 persons per square kilometer [11]. It is bounded in the West by Ikom and Ogoja, North by Obudu and Obanliku, South by Etung LGAs and to the East by the Republic of Cameroon, respectively. The study area is an agrarian and landlocked LGA (<http://crossriverwatch.com/2013/11>, Accessed on 12.03.2021). Major crops grown include cocoa, coffee, timber and palm products. There are cocoa estates in the LGA. These include Integrated cocoa estates, Iso-Bendeghe cocoa estate, Boje cocoa estate, Integrated cocoa estate, Wula, Integrated cocoa estate, Banba and Integrated cocoa estate, Benyia Uman (Kekerete.tripod.com).

The study employed a multistage sampling technique to select cocoa farmers. The first stage was a purposive selection of the LGA. This is because of the volume of cocoa production in the LGA. The second stage was a random selection of two villages (Ochor and Orimekpa) from the eleven (11) wards in the LGA. The third stage was a random selection of eighty seven (87) cocoa farmers in the LGA. Primary and secondary data were used for the study. Well structured questionnaire was used for the primary data. Secondary data was by the use of literatures. Data were collected on age of the farm, age of the farmers, marital status, household size, farming experience, educational level, membership of farmers' association, farm distance, tenure type, knowledge on cocoa rehabilitation, and type of cocoa rehabilitation techniques (CRTs). CRTs considered in the study were coppicing, complete replanting, side grafting, top grafting, phased farm replanting, fertilizer application and planting under cocoa trees. Data was analyzed using simple descriptive statistics means, frequencies, percentages and standard deviation.

3. RESULTS AND DISCUSSION

3.1 Socioeconomic Characteristics of Cocoa Farmers in Boki Local Government Area (Lga) of Cross River State

Table 1 shows the socio-economic characteristics of cocoa farmers in Boki Local Government Area (LGA) of Cross River State. The table reveals that majority (77.01%) of the farmers were male. The implication of this is that cocoa farming in the study area is largely dominated by male gender and thus may be able to withstand the tasks of CRTs. Similarly, Girei et al [12] reported that in Africa, men are more in a crop that is perceived to have commercial value. In addition, the result conforms to the findings by Taiwo et al [13] who reported that about 68.70% of farmers that practiced CRTs in Southwest and South-South agro-ecological zones of Nigeria are male. In addition, the table reveals that majority (96.60%) of the farmers were married. Moreover, the mean age of the farmers is 46 years. The implication of this is that cocoa farmers in the LGA are still in their productive years and thus cocoa production in the study area is expected to be on the increase. However, this is not in consonance with the findings by Adeogun et al [14] and Adebisi and Okunlola [15] who reported that cocoa farmers in selected states of Nigeria were old and that most of the cocoa farmers in Oyo State have passed their productive age. Similarly, the table reveals that highest proportion (56.30%) of the farmers had access to secondary education. The implication of this is that the farmers may perhaps have access to information on good agricultural practices (GAP) with respect to cocoa production and farm rehabilitation. Furthermore, the table reveals an average household size of 12 persons with a Standard Deviation (SD) of ± 7 . This implies that the farmers may perhaps utilize members of the household as labour for some operations relating to cocoa production and farm rehabilitation. This may reduce some production costs that may be incurred on the crop. Mean age of cocoa farms in the study area was about 18 years. This means that the cocoa farms are in their productive years. This is contrary to findings by Adeogun et al [14] that cocoa farmers in selected states of Nigeria had aged trees that are older than thirty (30) years and it is expected that diminishing return on production will set in. Furthermore, the table shows that about 55.20% of the cocoa farmers had above 20 years farming experience.

Table 1. Socio economic characteristics of cocoa farmers in boki local government area, cross river state

Variables	Frequency	Percentage (%)	Mean	Std. Deviation
Sex				
Male	67	77.01		
Female	20	22.99		
Age (Years)				
29- 38	28	32.18		
39- 48	19	21.84		
49 -58	34	39.08		
Above 58	6	6.90	46	10
Marital Status				
Married	84	96.55		
Separated	1	1.15		
Widowed	2	2.30		
Educational Level				
Primary	27	31.04		
Secondary	49	56.32		
Tertiary	11	12.64		
Membership of Farmers' Group				
Yes	85	97.70		
No	2	2.30		
Household Size				
1-10	41	47.13		
11-20	35	40.23		
Above 20	11	12.64	12	7
Age of cocoa farm (Years)				
Below 11	12	13.79		
11-30	67	77.01		
Above 30	8	9.20	18	8
Farming Experience (Years)				
1-10	7	8.00		
11-20	32	36.80		
Above 20	48	55.20	24	9
Farm Distant				
Homestead Farm	15	17.24		
Distant Farm	72	82.76		
Knowledge of cocoa Rehabilitation				
Yes	83	95.40		
No	4	4.60		
Side Grafting				
Yes	61	70.12		
No	27	31.03		

Source: Field Survey, 2016 Std. Dev: Standard Deviation

Table 2. Types and knowledge of cocoa rehabilitation techniques (CRTs) among farmers in boki local government area, cross river state

Types of CRTs	Knowledge of CRTs (%)	
	Yes	No
Coppicing	41.4	58.6
Complete replanting	41.4	58.6
Side grafting	70.1	29.9
Top grafting	63.2	36.8
Phased farm replanting	59.8	40.2
Fertilizer application	39.1	60.9

Source: Field Survey, 2016

In addition, majority (95.40%) of the farmers rehabilitation and 70.1 percent of the reported that they have knowledge of cocoa respondents practiced side grafting as the most

prevalent CRTs. This perhaps may be due to the awareness and trainings conducted by CRIN and other stakeholders in cocoa production. This is in conformity with the findings by Taiwo et al [13].

3.2 Types and Knowledge of Cocoa Rehabilitation Techniques (Crts) among Farmers in Boki Local Government Area, Cross River State

Table 2 below revealed that all the farmers have knowledge of CRTs. This is expected based on the awareness and series of trainings on these techniques carried out by CRIN. In addition, the results are confirmation of the positive impacts the Ajassor sub-station of the Institute is making on cocoa farmers. The sub-station is located in the State. However, largest proportion (70.10%) of the farmers has knowledge of coppicing while 39.10% has knowledge of fertilizer application. The implication of this is that the farmers may perhaps develop more knowledge of coppicing because it is easily done when a cocoa tree is diseased and old. Hence, farmers see this as a technique that may result into little or no loss to them as the new shoots will derive nutrients from the old and mother tree. Moreover, the result on fertilizer application is expected because fertilizer is not always available and affordable. Hence, cocoa farmers may not be willing to practice this technique.

4. CONCLUSION AND RECOMMENDATIONS

It was revealed that age of farmers, gender, marital status, household size, age of the farms, farming experience and educational level of farmers were identified socio-economic factors among cocoa farmers in the study area. It was also observed that side grafting was the most available type of CRTs while majority of the farmers have knowledge of coppicing in the study area. Therefore, it is thus recommended that cocoa farmers in the study area should be encouraged to stay on the farms through provision of infrastructure since majority of the farmers are in their productive years. This will reduce rural-urban migration. Moreover, they should be encouraged to take active roles in the association by participating in all activities directed to CRTs in order to get up to date information on the advantages inherent in cocoa farms rejuvenation. Furthermore, CRIN and other stakeholders in cocoa production should endeavour to develop new CRTs that are gender

friendly. This will ensure that cocoa farmers are encouraged to adopt and practice other CRTs irrespective of gender. Moreover, fertilizer should be made available and affordable to cocoa farmers to encourage the practice of this technique. Further studies should be carried out to ascertain the adoption of these techniques and the most preferable CRTs among cocoa farmers in the study area based on the results of high knowledge level.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

ACKNOWLEDGEMENT

I wish to appreciate Dr. Justina Oluwayemisi LAWAL, Head, Department of Economics and Extension, Cocoa Research Institute of Nigeria (CRIN), Idi-Ayunre, Ibadan, Oyo State, Nigeria. She provided the raw data used for this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. World Cocoa Foundation (WCF). Cocoa Market Update. 2014;1-11.
2. Nwachukwu IN, Ezech CI, Emerole CO. Effect of climate change on cocoa productivity in Nigeria. *African Crop Science Journal*. 2012;20,(2): 487-491.
3. Adebile OA, Amusan AS. The non-oil sector and the nigeria economy: A case study of cocoa export since 1960. *International Journal of Asian Social Science*. 2011;9(1):142-151.
4. The Sun Newspaper 2013. Cocoa Contributes \$900 million to Nigeria's economy in 2012. www.sunnewsonline.com Downloaded on 17/11/2013.
5. David M, Nzeka U. Global agricultural information network (GAIN) report. GAIN report No: NI 11018. 2011;1-7.
6. Mejabi D. The Nigerian cocoa value chain: vertical coordination for improved productivity. Cocoa Round Table Workshop held in Akure;2012.

7. Ayoola BF, Badaru K, Aikpokpodion P. Development of the Nigerian Cocoa Industry. Current issues and challenges for research and production. In: Proceedings of 13th International Cocoa Research Conference. Sabah, Malaysia. 2000;1367-1373.
8. FAO (Food and Agriculture Organisation). FAOSTAT data. Food and agriculture organization, Rome;2019.
9. Opeke LK. Increasing Cocoa Production Rehabilitation techniques among cocoa farmers in Nigeria during the third millennium in occasional publications No. 2 cocoa association of Nigeria. Opeke LK. Tropical Commodity Tree Crops. Spectrum Book Ltd. Ibadan. 2005;86.
10. Olaiya AO. Cocoa rehabilitation: in manuscript of training programme on national export products in Nigeria. Lagos, Nigeria. Cocoa Rehabilitation in Nigeria;2001.
11. National Population Commission. 2006 PHC Priority Tables; 2006. Population.gov.ng. Retrieved 12 March 2021.
12. Girei AA, Daura Y, Dire B. An economic analysis of groundnut (*Arachis hypogea*) production in hong local government area of Adamawa State, Nigeria. Journal of Agricultural and Crops Research. 2013;1(6):84-89.
13. Taiwo O, Ogunlade MO, Ayegboyin KO, Famaye AO, Adeniyi DO, Oyedokun VA, Adeosun S, Adejobi KB. Factors affecting the practice of cocoa rehabilitation techniques in Nigeria: A case of South-west and South-south geo-ecological zone. International Journal of Advanced Agricultural Research IJAAR. 2015;3:25-30.
14. Adeogun SO, Olawoye JE, Akinbile IA. Information source to cacao farmers on cacao rehabilitation techniques (CRTs) in selected States of Nigeria. J. Media and Commun. Stud. 2010;2:009-015.
15. Adebisi S, Okunlola JO. Factors Affecting Adoption of Cocoa Farm Rehabilitation Techniques in Oyo State of Nigeria. World Journal of Agricultural Sciences. 2013;9(3):258-265.

© 2021 Akinpelu et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/70057>