PERCEIVED EFFECTS OF QUARRY ACTIVITIES ON COCOA PRODUCTION IN YEWA NORTH LOCAL GOVERNMENT AREA OF OGUN STATE, NIGERIA

Olorode, W. A., Adejuwon, O. T. and Oyesola, O. B.
Department of Agricultural Extension and Rural Development, University of Ibadan, Ibadan, Nigeria
Correspondence contact details: opeyemiadejuwon@gmail.com, tokunbooyesola@gmail.com; 08069039762, 08023250458

ABSTRACT

There had been an increase in the number of quarries in Nigeria in the 19th centuries. The activities of the quarries have detrimental effects on the environment and more importantly on permanent crops; most especially cocoa which is a major commercial crop in the study area. Therefore, this study determined the perceived effects of quarry activities on cocoa production in Yewa north local government area of Ogun State, Nigeria. A multi-stage sampling procedure was used in selecting 120 cocoa farmers in the study area. Data collected were analyzed using descriptive statistical tools like mean, percentage, frequency counts, standard deviation and inferential statistics like Chi-square, PPMC and t-test. All (100%) of the farmers were married, with mean age of 53 ±8.4years. However, 42.5% of the cocoa farmers have a household size of between 5 and 6, while 86.7% of them had formal education with majority finishing secondary school. Environmental problems identified as being severe by respondents were soil erosion, air pollution and massive deforestation, while problems associated with quarry activities were rock blasting, rock powdering and transportation. There is significant difference in the yield of cocoa production before and after the establishment of the cement industry in 2011 in the study area (t=-20.851, p=0.0000). Environmental mitigation measures should be promulgated among communities and quarry industries.

Keywords: Quarry activities, cocoa production, environmental problems

INTRODUCTION

Overcoming hunger remains one of the most daunting challenges facing humanity. The threat of starvation looms most seriously over Africa, where an estimated 33 percent of the population largely children and women suffer from hunger (USAID, 1994). Moreover, per capital food production in Africa has steadily declined by 33 percent over the past 25 years (FAO, 2012). Hunger and famine in some African regions have been particularly debilitating and widespread (Thrupp and Megateli, 1999). Environmental problems have become a key issue globally. The environment and its significance on human life have increasingly come to national and international dimension. Industrial pollution is a major environmental problem in Nigeria. It arises from lack of proper control of pollutant from industries. Increased development of land for industrial use received greater impetus in the post-independence era when national industrial policy revolved around import substitution as a panacea for unfavourable terms of trade that Nigeria faced which featured industries in textile, breweries, leather, tanning, pulp and paper, detergent, steel and quarry activities, all of which have implications for overall quality in the affected areas. Most industries that have the potential of seriously degrading the environment are largely urban-based (Magbagbeola, 2001).

Ideally, the citing of industries should achieve a balance between socio-economic and environmental considerations. Relevant factors are availability and access to raw materials, the proximity of water sources, a market for the products, the cost of effective transportation, and the location of major settlement, labour and infrastructural amenities. In developing countries such as Nigeria, the citing of industries is determined by various criteria, some of which are environmentally unacceptable and thus pose serious threat to public health (UNEP, 1990).

The ministry of Solid Minerals in the country issued licenses for quarry activities in the study area, to exploit approximately 135 million tone tons of limestone deposit in the state (OMICC, 2000). Of these deposits, the Yewa area of the state has more than 80% of the deposit. This necessitated the concentration of many prospecting companies within the region. Coincidentally, this area is regarded as one of the food basket of the state which provides staple such as maize, cassava, yam, vegetables, and tree crops such as cocoa, oil palm, cashew and timber products with prospects for international market.

Cocoa (*Theobroma cacao*) was introduced to West Africa sub region from Brazil and into Nigeria from Fernando Po in the year 1874 (Adegeye, 1996). It was first cultivated in the western region of Nigeria in 1890. Its cultivation gained prominence rapidly in Nigeria such that by 1965, Nigeria became the second largest producer of cocoa in the world (Adegeye, 1996). Cocoa is produced mainly in the rainforest area of the country, known as cocoa belt. The main producing states are Ondo, Ekiti, Oyo, Osun, Ogun, Edo, Delta, Cross Rivers and Akwa Ibom. According to Adegeye (1996), over 50% of the total quantity of cocoa produced for export or utilised locally per annum comes from Ondo State.

The discovery and exploitation of petroleum, the black gold led to decline in the

importance attached to the golden crop cocoa. Nevertheless, cocoa still remains the second largest foreign earner after petroleum (Adegeye, 1996). In Nigeria, cocoa has been the main agricultural stake of the national economy until early 1970s when crude oil was discovered in the country in commercial quantity. However, cocoa has remained a valuable crop and major foreign exchange earner among agricultural commodity exports of the country (Akinbola, 2001; Ogunleye and Oladeji, 2007).

Nigeria's cocoa production output has however declined from over 300,000 to 100,000 tones with average annual rate of 8.3% decline during 1992-1996 to 1.8% during the 1997-2001 and 1.2% during 2002-2006 (Adegeye, 1996). Despite the dwindling production of cocoa in Nigeria, the crop still contributes to nation's economic development. In terms of foreign exchange, no single agricultural export commodity has earned more than cocoa. Apart from providing exchange to the exporting countries, cocoa is a means of conserving foreign exchange. This is achieved by producing cocoa based products, for instance cocoa-butter, cocoa cake, cocoa powder, cocoa wine and so on, locally instead of importing them. In recent years, Nigeria has lost her leading role in exportation of cocoa. This was due to downward trend in cocoa production (Adegeye, 1996). A number of reasons have been given for the decline in cocoa production and inability of cocoa industry to increase output. Some of these reasons include small farm holdings, transportation mode, unavailability of human labour, low capital and variation in climatic factors.

The world is changing rapidly and agriculture has become more complex, more intensive and demanding on the land. However, there are some other sectors of the economy that compete for land with the agricultural sector particularly the industrial sector. The industrial sector does not only compete for land with agricultural sector but also harms agriculture. The modern industrial version of alchemy, which transforms the harmless natural elements into a pervasive toxic burden, harms agriculture. Air, soil and water pollution frequently reduces agricultural yields, lower health status, increase the prices that consumers of agricultural products must pay and alter the returns accruing to owners of agricultural inputs and increase morbidity pattern of the population (Adams and Croker, 1991 and Somorin, 1998)

However, the various quarry activities, such as rock blasting, rock crushing, rock grinding, rock powdering and transportation have adverse effect on the environment and which will have resultant effects on the agricultural production. There is paucity of information on the perceived effect of cement factory activities on agricultural production of erstwhile agrarian communities. Although several environmental related studies have been conducted on industrial pollution, it is necessary that the perception of the people is sought on the environmental pollution that is usually associated with quarry activities and the effect on cocoa production in the study area. Therefore, the study determined the perceived effects of quarry activities on cocoa production in Yewa North Local Government Area of Ogun State.

The specific objectives are to;

a. identify the socio-economic characteristics of cocoa farmers in Yewa North LGA.
b. determine perceived effects of quarry activities on cocoa production in the study area
c. ascertain the perceived environmental problem associated with quarry activities in the study area

Hypothesis of the study stated that there is no significant difference in the level of cocoa production before and after the establishment of quarry factories in the study area

METHODOLOGY

Study area - The study was conducted in Yewa North Local Government area of Ogun State. Yewa North local government is one of the twenty local government areas in Ogun State. It is located to the west of Ogun State bordering the Republic of Benin. Its headquarters is Ayetoro and it has an area of 2,087km2 and a population of 183,844 (NPC, 2006). It shares boundary with Abeokuta North, Yewa South, Imeko-Afon local government and Republic of Benin in the north-east, south, north-west and west respectively. The study area is also blessed with mineral deposits such as limestone, clay and kaolin which remain untapped until recently when attention in being drawn to them (OMICC, 2000). Five of the fourteen major communities in Yewa North Local Government Area have limestone deposits in commercial quality and they are also involved in cocoa production. These communities are Ibese, Komi-Oba, Imasai, Igbogila and Igua.

Sampling procedure and sample size - Five (5) communities that have limestone deposits and are prominent in cocoa production were purposively selected out of the fourteen (14) major communities in the study area. These include Ibese, Imasai, Komi-Oba, Igbogila and Igua. Thereafter, Ibese was purposively selected because Dangote cement factory is located at Ibese. Three of the remaining four (4) communities were randomly selected, which are Igbogila, Imasai, and Komi-Oba. These communities have their cocoa farm

close to where Dangote cement factory activities take place.

Thirty (30) cocoa farmers were selected from each of these four (4) communities using snow ball technique to give one hundred and twenty (120) cocoa farmers.

Measurement of variables

The dependent variable is the level of cocoa production; measured by the yield. Respondents were asked to indicate their cocoa farm annual yields in kilogram from the year 2010 (the period the quarry was established) to 2015 (study period). Student t-test was used to test the significant difference in the cocoa production (yields) before and after the establishment of quarry factories in the study area.

RESULTS AND DISCUSSION

Personal characteristics - Table 1 shows that majority (59.2%) of the farmers were between the ages of 46 and 61 years. The mean age was 52.9 ±8.4years. This implies that many of the farmers were old, while more than half (53.4%) still fell within the active ages. This result corroborates the findings of Onasanya (2007) that farmers are in their active ages when they are within the age range of 20-50 years. The implication of this result is that the youth in the study area are not much involved in cocoa farming. As time goes on, there could be decline in cocoa production in the study area as youths are not interested in cocoa farming. Table 1 also reveals that majority (98.3%) of the cocoa farmers in the study area were male. This implies that men are more dominant in cocoa production; this is because cocoa farming is somehow tedious and very few female can afford to take the task.

Table 1: distribution of cocoa farmers based on socioeconomic characteristics

Variable	Frequency	Percentage	Mean
Age			
38 – 45	26	21.7	
46 – 53	38	31.7	52.9
54 – 61	33	27.5	
62 – 69	22	18.3	
70 – 77	1	0.8	
SD = 8.4			
Sex	118	98.3	
Male			
Female	2	1.7	
Marital status			
Married	120	100.0	
Household size			
3 – 4	15	12.5	
5 – 6	51	42.5	6.3
7 – 8	47	39.2	
9 – 10	7	5.8	
SD = 1.5			
Education Status			
No formal education	16	13.3	
Primary education	41	34.2	
Secondary education	62	51.7	
Tertiary education	1	0.8	
Occupation			
Farming	83	69.2	
Trading	18	15.0	
Artisan	17	14.2	
Clergy	1	0.8	
Civil servant	1	0.8	
Farming experience			
10 – 19	26	21.7	
20 – 29	46	38.3	26.6
30 – 39	23	19.2	
40 – 49	25	20.8	
SD = 9.7			

Variable	Frequency	Percentage	Mean
Farm locations			
1-2	79	65.8	
3-4	29	24.2	2.3
5-6	11	9.2	
7-8	1	2.8	
SD = 1.3			
Farm size			
1-2	30	25.0	
3-4	47	39.2	
5-6	36	30.0	3.9
7-8	6	5.0	
9-10	1	0.8	
SD = 1.7			

Source: Field Survey, 2016

Table 1 also revealed that all the cocoa farmers were married. This result corroborates Onasanya (2007) that reported that 94.6% of the farmers in Ogun State were married and that of Dipelu (2003) that reported that 89.2% of the farmers in Ogun State were married.

Almost half (42.5%) of the cocoa farmers in the study area had between 5-6 members in their households. With the mean score of 6.3 household size, it implies that most of the cocoa farmers in the study area have more than three members to cater for in their households. This corroborates the findings of Oyesola and Oladeji (2002) that 59.59.8% of agro-pastoralists in Ogun State had between 4 and 9 children in their households. The implication of this result is that the more the members in the household, the more readily available are family labour who will assist the farmers on their farms, which could lead to increase in agricultural production. Also, the more the household members, the more the responsibilities on the part of the farmers.

Table 1 also reveals that only 13.3% of the cocoa farmers in the study area do not have formal education. The remaining had one form of formal education or the other. This implies that cocoa farmers in the study area are well educated and this could have assisted them to have knowledge about the effect of environmental pollution on their crop. The result corroborates Akinbile (2007) that reported that only 10.6% of the household heads in Yewa North Local Government Area do not have formal education. Table 1 also shows that majority (69.2%) of the cocoa farmers in the study area are not into any other occupation, that is they are solely engaged in farming. This corroborates the findings of Agbelemoge (2003) that farmers in south-west of Nigeria have no other occupation.

Table 1 further reveals that majority (57.5%) of the cocoa farmers were within 20 – 39 years of farming experience, with mean of 26.6 ±9.7. This implies that they have been in cocoa farming for long, They must have gathered enough experience related to cocoa production so as to be able to attribute whether their level of production now is being affected by the environmental problems associated with quarry activities or not.

Table 1 also shows that majority (65.8%) of the cocoa farmers in the study area have between 1-2 cocoa farm locations. However, the table reveals that majority (69.2%) of the cocoa farmers in the study area had between 3-6 hectares of farm landwith mean of 3.9 ±1.7 hectares. This finding corroborates that of Adegeye (1996) who attributed small holdings as one of the reasons for inability of the cocoa industry to increase output.

Environmental problems associated with quarry activities

Result of analysis on Table 2 shows that air pollution ($\bar{x}$ = 2.96), massive deforestation ($\bar{x}$ = 2.95) and soil erosion ($\bar{x}$= 2.92) were the most severe environmental problems faced by the cocoa farmers in the study area that are associated with quarry activities.

Table 2: Distribution of severity of listed environmental problems of quarry activities

Environmental factors	Highly severe		Moderately severe		Not severe		Mean
	F	%	F	%	F	%	
Land degradation	100	83.3	20	16.7	0	0.0	2.83
Soil erosion	110	91.7	10	8.3	0	0.0	2.92
Water contamination	102	85.0	18	15.0	0	0.0	2.85
Air pollution	116	96.7	4	3.3	0	0.0	2.96
Bush burning	108	90.0	10	10.0	2	1.7	2.88
Massive deforestation	115	95.8	5	4.2	0	0.0	2.95

Environmental factors	Highly severe		Moderately severe		Not severe		Mean
	F	%	F	%	F	%	
Grand mean							**2.90**

Source: Field Survey, 2016

This implies that the heavy vehicles used by the quarry companies had adverse effect on the environment. The finding corroborates that of Onasanya (2007) who reported that air pollution is the most prominent problem in cement production in Ogun State.

Quarry activities

Result of analysis on Table 3 shows that rock blasting ($\bar{x}$ = 2.94), rock powdering ($\bar{x}$ = 2.82) and transportation ($\bar{x}$ = 2.80) were the most dangerous quarry activities affecting the production of the cocoa farmers in the study area. This implies that the dust from the above activities have adverse effect on the cocoa production in the study area.

Table 3: Distribution of severity of listed quarry activities

Environmental factors	Highly severe		Moderately severe		Not severe		Mean
	F	%	F	%	F	%	
Rock blasting	113	94.2	7	5.8	0	0.0	2.94
Rock crushing	100	83.3	12	10.0	8	6.7	2.76
Rock grinding	100	83.3	3	2.5	17	14.2	2.69
Rock powdering	108	90.0	2	1.7	10	8.3	2.82
Transportation	99	82.5	18	15.0	3	2.5	2.80
Grand mean							**2.80**

Source: Field Survey, 2016

Hypothesis testing

Test of difference between cocoa yield before and after the establishment of quarry industries

Table 4 shows that there exists a significant difference between cocoa yield before (t=-20.851, p=0.000) and after the establishment of quarry industries.

Table 4: Result of test of difference between cocoa yield before and after the establishment quarry industries

Variables	Mean	Sd	t value	Df	p value	Decision
Yield 2010	-873.292	458.78974	-20.851	119	0.0000	Significant
Yield 2011-2015						

Source: Field Survey, 2016

This implies that cocoa production was consistent decrease in the production cocoa yield after the establishment of quarry factories. This means that the establishment of quarry industries in the study area has direct negative influence on cocoa production in particular and on farming in general.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that:

- Cocoa farmers in the study area are predominantly educated.
- Majority of the cocoa farmers in the study area are old
- Majority of the cocoa farmers perceived quarry activities in the area as having negative effects on their production?
- There exists a significant difference between the cocoa yield before and cocoa yield after the establishments of quarry industries.

Based on the findings of this study, the following recommendations are proposed in ensuring that cocoa farmers remain productive and maintain a better conserved environment:

- The agricultural development agency in the state and Cocoa Development Unit should encourage the cocoa farmers in the study area to adopt improved technologies in cocoa production. This will go a long way in sustaining cocoa farming and other agricultural activities in the area.
- There should be an avenue through which the communities in the study area can demand a check on the use of resources in their environment.
- Environmental mitigation measures should be promulgated among communities and quarry industries.

REFERENCE

Adegeye, A. J. (1996). Production and Marketing of Cocoa in Nigeria: Problems and Solutions. In: Cocoa Revolution in Nigeria: Proceedings of a National Seminar on Revolutionizing Nigeria's Cocoa Industry, University of Ibadan, Ibadan, Nigeria, 28-30th November, 1995, Adegeye, A.J. and W.O. Ajayi (Eds.). Adaptive Research Group, Ibadan, Nigeria, ISBN-13: 9789783187337, pp: 10-13.

Adams, R. M. and Crocker, T. D. (1991). "The economic impact of air pollution agriculture: an assessment and review". In young M.D. (Ed). (1991): *Towards sustainable agricultural development, published in association with the organization for Economic Cooperation and Development Geneva*.

Agbelemoge, A. (2003). "Socio-cultural Determinants of Cocoyam (*Colocasia and Xanthosoma species*) Utilisation of Household Level in South-Western Nigeria". An unpublished Phd thesis in the Department of Agricultural Extension and Rural Development, University of Agriculture, Abeokuta, Ogun State, Nigeria. pp 95-98.

Akinbile, L. A. (2007). Social Impact Assessment of Limestone Exploitation in Yewa North Local Government Area of Ogun State, Nigeria. *Pakistan journal of social sciences* 4(1): 107-111 2007.

Dipeolu, A. O. (2003). "Technology Use, Employment and Income Distribution in Small-Scale Farming in Ogun State, Nigeria". A PhD post data seminar in the Department of Agricultural Economics, University of Ibadan, Ibadan, pp 26-28.

Food and Agricultural Organization (2012). "Training for agricultural and rural development" Food and Agricultural Organization of United Nations, Rome, Italy. http://Intranet.catie.ac.cr/....manuals/...

Magbagbeola N. O. (2001). "The use of Economic Instruments for Industrial pollution Abatement in Nigeria: Application to the Lagos Lagoon". In Natural Resources Use, the Environmental and Sustaainable Development. Nigeria Economic Society, University of Ibadan, Ibadan, Nigeria pp535-556.

Ogunleye, K. Y. and Oladeji J. O. (2007). Choice of Cocoa Market Channels among Cocoa Farmers in Ila Local Government Area of Osun State, Nigeria. *Middle-East Journal of Scientific Research* 2(1): 14-20.

OMICC (2000). Investment Opportunities in Ogun State. FEMBASS Publicity company Ltd. Abeokuta, Ogun State, pp 9-41.

Onasanya, A. S. (2007). "Effects of Cement Production on Income Generating Activities of Farming Household in Ogun State, Nigeria". Unpublished PhD Thesis in the Department of Agricultural Extension and Rural Development, University of Ibadan, Ibadan 277p.

Oyesola O. B. and Oladeji J. O. (2002). Household food security and environmental management practices within settled Fulani agro-pastoral households in Ogun State. Retrieved from www.google.com on 23/02/2017

Somorin, A. E. (1998). 'A health Index of Rural Farmers in Badagry Local Government Area of Lagos State' Unpublished B.Sc project in the Department of Agricultural Economics, University of Ibadan.

Thrupp L. A. and Megateli N. (1999). Critical Links: Food security and the environment in the Greater Horn of Africa. WRI Project Report. WRI(World Resources Institute), Washington, DC, and ILRI (International Livestock Research Institute), Nairobi.

United Nation Environmental Protection (UNEP) (1990). Human Development Report, Nairobi, Kenya