

## Comparative Assessment of Adopted Farming Operations of Farmers in Proximate, Intermediate and Remote Cement Producing Precincts of Ogun State

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**Abstract:** The investigation was conducted in cement producing areas (Sagamu and Ewekoro) of Ogun State located in south-western part of Nigeria. The areas were divided into three distinct precincts: proximate (0-5 km<sup>2</sup>), Intermediate (5.1-10 km<sup>2</sup>) and remote (10.1-15 km<sup>2</sup>). From each precinct, 20% of villages were randomly selected. However, from villages not having  $\geq 500$ , 5% farming households were selected, while 10% from villages having  $\geq 500$ . This procedure led to the selection of 1114 farmers with 482 from Proximate CPPs, 259 from Intermediate CPPs and 373 from Remote CPPs. However, 1020 research instruments were found usable for final analysis. Data collected were subjected to analysis of variance. The findings show that farmers engaged in different farming operations in cement producing precincts of Ogun State. The common farming operations in all cement producing precincts include manual clearing (97.7%), harvesting (96.6%), weeding (96.2%), planting (91.9%) and marketing of products (84.4%). Others are ridging (73.9%) and processing of farm products (52.7%). However, the findings shows that in all the cement producing precincts, most farmers are not engaged in mulching, staking, slashing, storage of products, rearing and breeding of animals and zero tillage. Also, the findings shows that significant difference exists in the farming operations of farmers in proximate ( $\bar{x} = 6.67$ ), intermediate ( $\bar{x} = 6.1$ ) and remote ( $\bar{x} = 5.82$ ) cement producing precincts of Ogun State ( $F = 33.77$ ;  $p < 0.05$ ) as revealed by Scheffe's post hoc test. It shows that significant differences exist in the farming operations of farmers in proximate cement producing precinct and intermediate cement producing precinct. Also, significant difference exists in the proximate cement producing precinct and remote cement producing precinct as well as in intermediate cement producing precinct and remote cement producing precinct of Ogun State. It was concluded that farmers engage in different farming operations across cement producing precincts in Ogun State in other to cope with environmental problems. Also, farmers in proximate cement producing precinct engage in more farming operations followed by intermediate precinct and less in remote precinct. Thus, farmers that are relatively close to the cement company are facing more farming problems than farmers that are located far away from the company. Though, it is expected that pollution and other environmental problems would make farming activities less enticing in proximate cement producing precinct, the study shows farmers that are close to the cement industry would have to engage more farming operations to reduce the impact of pollution on their soil and crops than farmers that are far away from the industry to be able to produce sufficient food for their households.

**Key words:** Farmers, farming, farming operations, adoption, cement producing precincts, environmental problems

### INTRODUCTION

In recent years there has been great interest in how farmers are finding ways to diversify small and limited resource farming operations (Onasanya, 2008). Reasons for this interest according to Ellis (2000) and more specifically Owusu (1999) include: small farm crisis and the decline of small and family farms; cash flow problems experienced by many limited resource growers; production of agronomic crops is often not profitable for

small-scale farmers; vegetable and small fruits (including organic produce) can be high value crops and value added agricultural products can greatly enhance farm income. These farmers recognise the importance of maintaining and enhancing their productivity and have shown that they can do so given proper incentives. But the resources are severely undervalued by inappropriate accounting methods, policies and institutional frameworks (Serageldin, 1999). 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 attention. The past few years have witnessed a greater awareness of the destructive effect of centuries of uncontrolled exploitation of the environment without conscious effort at replacement of used resources. Overall, in Africa, in the past half-century, approximately 2 billion ha of land have been degraded, with 300 million affected by extreme degradation (i.e., high levels of soil erosion, nutrient depletion and desertification) (Olujide *et al.*, 2001; Pinstrup-Anderson and Pandya-Lorch, 1995). Other estimates suggest that half of Africa's farmland has degraded soils and fertility loss (Hinchcliffe *et al.*, 1996) (Table 1).

According to a report of the Economic Commission for Africa (Leisinger and Schmitt, 1996) on the outlook of the African continent in 2008, unless dramatic political, economical and social improvements are introduced into the various countries, Africa can expect a nightmare of over-population, land shortages, poverty and famine of unimaginable proportions. The global situation has deteriorated considerably, since 1983 and the Sahelian countries in particular are coming closer to making this catastrophic scenario a reality. The existing situation reveals that there is crisis in the exploitation areas requiring relocation of people. This is because the by-products are becoming hazardous to the health and socioeconomic situation of people. Where, people are not totally free from the resultant effect of the industries, they are exposed to health hazards endangering life and property (Fadulu, 2000). For instance, the activities of cement industry have great consequences on the ecosystem as well. The quarrying of limestone often leads to land degradation. In inland locations, either road or rail infrastructure often have to be constructed. These can cause severe environmental degradation; particularly as culverts and other structures often concentrate floodwater and water is pounded back by embankments. The result can be serious erosion. At the

quarrying site, the original environment is almost always destroyed as a result of quarrying activity (Fadulu, 2000).

Nigerians, in general, are keenly aware of the damage to their environment as a result of environmental degradation and are eager to see sound conservation strategies that would ensure rational utilization of the nation's land resources. In this regard, the governments of the Federation should see conservation as a priority issue and initiate some legislation and policies to set guidelines for overall land use and proper management of land resources. Also, needed at this point are policies, strategies and practices that will attempt to combine natural resource conservation with utilization measures that are socially, politically, economically and ecologically viable and acceptable and can be integrated into the economic development programme.

The resources of rural areas determine the economic activities engaged in by rural folks. In general, the primary economic activity of most rural areas is farming. The objective of farming by the rural folks is not limited to profit maximization, as it is typically the case for most entrepreneurs. Neither is profit maximization the most important objective of rural farmers (Olubanjo *et al.*, 2002). The production objectives includes: maximizing gross margin, satisfying family food requirements, maximizing revenue and minimizing out-of-pocket expenses.

An investment in agricultural lands, away from the urban periphery in form of feeder roads and agricultural inputs is still a subject that requires better consideration to forestall future shortage in food security especially in the wake of transportation problems from the rural areas. In spite, of the land use decree which empowers the government to be land owner, the present policy whereby individuals have more power on land than the government needs to be revised to pave way for improved investment in agriculture by wealthy individuals and corporate organizations.

The above and the absence of empirical research and data necessitate this study to investigate and compare the farming operations of farmers in cement producing precincts of Ogun state. The study tends to identify the socioeconomic and personal characteristics, farming practices of farmers in villages located within proximate (0-5 km), intermediate (5.1-10 km) and remote (10.1-15 km) cement producing precincts of Ogun State.

## MATERIALS AND METHODS

The study was conducted in cement producing areas of Ogun state, Nigeria in the year 2007. The underlying assumption for sampling procedure is that all household in the area under study are farming households. In

Table 1: Land use/degradation indicators in Africa

Type of degradation in Africa	Area (million ha)	Percentage
Land extremely/strongly degraded (1992)	74.00	NA
Land lightly/strongly degraded (1992)	245.00	NA
Desertification/overgrazed lands (1990)	750.00	NA
Degraded soils: Severe/moderate (1990)	321.00	NA
Degraded soil: Light (1990)	174.00	NA
Degraded irrigated land	1.90	18
Degraded rain fed croplands	48.86	61
Degraded range lands	995.08	74
Degraded total agricultural dry lands	1045.84	73

Source: WRI/UNEP/UNDP/World Bank (1998)

essence, it means that the major occupation of the households is farming. Hence, the farmer respondents were selected to represent farming household using multi-stage sampling technique. First, the two local government areas in, which WAPCO is located were purposively selected. Each local government area was then divided into 3 precincts: Those villages within 5 km radius of the factory-Proximate Cement Producing Precincts (PCPP), villages between 5.1 and 10 km radius of the factory-Intermediate Cement Producing Precincts (ICPP) and villages between 10.1 and 15 km radius of the factory-Remote Cement Producing Precincts (RCPP). Second, a simple random sample of 20% of the villages in each precinct was selected. In Ewekoro local government area, there are 24 villages in PCPP, 49 villages in ICPP and 64 villages in RCPP. Thus, selecting 20% from each precinct, 5, 10 and 13 villages, respectively were involved in the sample. In Sagamu Local Government Area, there are 10 villages in PCPP, 24 villages in ICPP and 32 villages in RCPP. Hence, 2, 5 and 6 villages, respectively were selected. Third, from each village not having more than 500 residents, 10% of farming households were systematically selected. From each selected households, 1 farmer was then selected. The same procedure was used to select farmers from villages with more than 500 farming households. However, instead of 10, 5% of the farming households were systematically selected. Note that in this study, 1 household corresponds to a house in the villages selected. This sampling procedure led to a selection of 1114 farmers, 482 in PCPP, 259 in ICPP and 373 in RCPP.

## RESULTS AND DISCUSSION

**Personal characteristics of farmers:** Table 2 shows that majority of the farmers (75.1%) in the cement producing precincts generally are between the ages of 46-65 years with mean age of 53 years. This trend is common to all precincts of West Africa Portland Cement Company (WAPCO) in Ogun state. All the cement-producing precincts (proximate, intermediate and remote) have majority of the farmers (60.5, 67.8 and 55.8%, respectively) in that age category. The mean age of farmers in proximate cement precinct is 55 years and is greater than that of the intermediate cement precinct (54 years) and that of the remote cement precinct (51 years). These average ages are above the mean age of sugar-cane farmers (47 years) in Papalanto area of Ogun State as reported by Olubanjo *et al.* (2002). Also, 21.8% of the farmers in the cement producing precincts generally are in the age category of 56-60 years, while 22.6% of farmers in proximate cement precinct and intermediate cement precinct are in this category and 20.1% of farmers in

remote cement precinct are in this category. Table 2 also reveals that 18.1% of the farmers in the cement producing precincts generally are in the age category of 26-45 years, with more in remote cement precinct (26.4%) than in proximate cement precinct (13.7%) and intermediate cement precinct (12.9%). This is an indication that few of the farmers are in their active years as reported by Iheanacho (1995). However, while Iheanacho (1995) asserted that this category of farmers represent a virile age for active farm operations, Yahaya (2002) said farmers are in their active years, when they are within the age range of 20-50 years.

Marriage is an important institution in any community for it is an important framework within, which social roles and statuses are prescribed (Jibowo, 2000). This assertion was corroborated by the findings in Table 2, which revealed that majority of the farmers (93.4%) are married. This trend is significantly similar in all cement producing precincts as 94.6% of farmers in proximate cement producing precinct, 89.9% in intermediate cement producing precinct and 94.5% in remote cement producing precinct are married. This finding shows that the farmers have very strong family ties among them. This result is corroborated by the assertions of Dipeolu (2003) that reported that 89.2% of farmers in Ogun State are married, while Olujide *et al.* (2001) reported that 70.0% of farmers in the Niger Delta areas of Edo State are married.

The educational attainment of farmers in cement producing precincts of Ogun State is also shown in Table 2. Table 2 shows that 47.7% of the farmers have primary education, while 6.1% have post-secondary education and 27.1% have no formal education in all cement producing precincts.

However, the Table 2 further shows that fewer farmers (22.7%) have post primary education in proximate cement producing precinct, while 21.0 and 31.2% of farmers in intermediate and remote cement producing precinct respectively have post primary education. This shows that the farmers' literacy level is higher in remote cement producing precinct (79.0%) than in proximate cement producing precinct (71.9%) and intermediate cement producing precinct (66.1%) generally.

This result is corroborated by the assertions of Dipeolu (2003) that reported that 27.2% of farmers in Ogun State have no formal education, while the findings of this research is at variance with earlier studies by Akinbile and Omotara (2000) that reported 61.0% of farmers in Osi village in Ekiti State were illiterates and Ewuola (1985), that reported low educational level of farmers in Ondo State, Nigeria.

Table 2 further showed that majority (62.9%) of the farmers in all cement producing precincts of Ogun State have between 5-10 children, while 36.4% have fewer than

Table 2: Distribution of selected personal and socio-economic characteristics of respondents

Selected personal and socio-economic characteristics of respondents	Proximate cement precinct (n = 424)	Intermediate cement precinct (n = 248)	Remote cement precinct (n = 348)	All cement precincts (n = 1020)
<b>Age (mean age)</b>	55 years	54 years	51 years	53 years
Less than 26	2 (0.5)	-	5 (1.4)	07 (0.7)
26-30	-	3 (1.2)	2 (0.6)	05 (0.5)
31-35	4 (0.9)	5 (2.0)	6 (1.7)	15 (1.5)
36-40	16 (3.8)	8 (3.2)	36 (10.3)	60 (5.9)
41-45	38 (9.0)	16 (6.5)	50 (14.4)	104 (10.2)
46-50	90 (21.2)	54 (21.8)	66 (19.0)	210 (20.6)
51-55	71 (16.7)	58 (23.4)	58 (16.7)	187 (18.3)
56-60	96 (22.6)	56 (22.6)	70 (20.1)	222 (21.8)
61-65	75 (17.7)	34 (13.7)	38 (10.9)	147 (14.4)
66-70	16 (3.8)	6 (2.4)	11 (3.2)	33 (3.2)
Above 70	16 (3.8)	8 (3.2)	6 (1.7)	30 (2.9)
<b>Marital status</b>				
Never married	5 (1.2)	2 (0.8)	6 (1.7)	13 (1.3)
Married before	18 (4.2)	23 (9.3)	13 (3.7)	54 (5.3)
Still Married	401 (94.6)	223 (89.9)	329 (94.5)	953 (93.4)
<b>Level of Education</b>				
No formal education	119 (28.1)	84 (33.9)	73 (21.0)	276 (27.1)
Primary education	209 (49.3)	112 (45.2)	166 (47.7)	487 (47.7)
Modem III	41 (9.7)	17 (6.9)	28 (8.0)	86 (8.4)
Secondary education	43 (10.1)	22 (8.9)	45 (12.9)	110 (10.8)
Grade II Technical	-	3 (1.2)	1 (0.3)	04 (0.4)
NCE	7 (1.7)	3 (1.2)	9 (2.6)	19 (1.9)
OND	2 (0.5)	3 (1.2)	15 (4.3)	20 (2.0)
B.Sc.	2 (0.5)	4 (1.6)	6 (1.7)	12 (1.2)
M.Sc.	1 (0.2)	-	5 (1.4)	06 (0.6)
<b>No. of children (average)</b>	5	5	5	5
No child	5 (1.2)	2 (0.8)	6 (1.7)	13 (1.3)
1-2	22 (5.2)	19 (7.7)	46 (13.2)	87 (8.5)
3-4	97 (22.9)	55 (22.2)	119 (34.2)	271 (26.6)
5-6	221 (52.1)	121 (48.8)	136 (39.1)	478 (46.9)
7-8	78 (18.4)	48 (19.4)	36 (10.3)	162 (15.9)
9-10	-	1 (0.4)	-	01 (0.1)
Above 10	1 (0.2)	2 (0.8)	5 (1.4)	08 (0.8)
<b>Occupation</b>				
Agriculture-related occupation	134 (31.6)	120 (48.4)	180 (51.7)	434 (42.5)
Trading	81 (19.1)	25 (10.1)	79 (22.7)	185 (18.1)
Paid employment in public/private service	21 (5.0)	12 (4.8)	15 (4.3)	48 (4.8)
Artisanship/craftsmanship	163 (38.4)	72 (29.0)	63 (18.1)	298 (29.2)
Private business/contractor	14 (3.3)	14 (5.6)	6 (1.7)	34 (3.3)
Others	11 (2.6)	5 (2.0)	5 (1.4)	21 (2.1)
<b>Estimated income (Mean)</b>	\$1465.82	\$1310.87	\$1423.45	\$1413.69
Up to \$416.67	17 (4.0)	22 (8.9)	21 (6.0)	60 (5.9)
\$416.68-\$833.33	33 (7.8)	31 (12.5)	40 (11.5)	104 (10.2)
\$833.34-\$1250.00	127 (30.0)	68 (27.4)	102 (29.3)	297 (29.1)
\$1250.01-\$1666.67	120 (28.3)	70 (28.2)	84 (24.1)	274 (26.9)
\$1666.68-\$2083.33	79 (18.6)	42 (16.9)	58 (16.7)	179 (17.5)
\$2083.34-\$2500.00	17 (4.0)	10 (4.0)	17 (4.9)	44 (4.3)
\$2500.01-\$2916.67	26 (6.1)	5 (2.0)	19 (5.5)	50 (4.9)
\$2916.68-\$3333.33	2 (0.5)	-	6 (1.7)	08 (0.8)
Above \$3333.33	3 (0.7)	-	1 (0.3)	04 (0.4)

Source: Field Survey (2007)

5 children. However, farmers in cement producing precincts of Ogun State have on the average 5 children. Specifically, among farmers in proximate cement producing precinct, 28.1% have fewer than 5 children and 70.5% have between 5 and 10 children, while 29.9% farmers in intermediate cement producing precinct have fewer than 5 children and 68.6% have between 5 and 10 children. Also, 47.4% of farmers in remote cement producing precinct have fewer than 5 children, while 49.4% have between 5 and 10 children. The result is in line

with the submission of Oyesola and Oladeji (2002) that reported that 59.8% of agro-pastoralists in Ogun State have between 4-9 children in their households.

It was also showed in Table 2 that 42.5% of the farmers in all cement producing precincts are not into other occupations, i.e., they are engaged in agriculture-related activities. However, 29.2% are artisans/craftsmen, while 18.1% are traders. In proximate cement producing precinct, more farmers are into artisanship/craftsmanship (38.4%) and agricultur-related activities (31.6%). Also, 48.4

and 29.0% of farmers in intermediate cement producing precinct engage in agriculture-related activities and artisanship/ craftsmanship, respectively. In remote cement producing precinct, 51.7 and 22.7% of farmers engage in agriculture-related activities and trading, respectively. These results show that more farmers are into agriculture-related activities in remote cement producing precinct than intermediate and proximate cement producing precinct in Ogun State. The result is similar to that of Agbelemoge (2003) that reported that 90.0% of the farmers in South-Western Nigeria have no other occupation apart from farming.

Table 2 showed that 29.1% of farmers in all cement producing precincts have between \$833-1250.00 income, while 26.9% have between \$1250.01-1666.67 income and 17.5% have between \$1666.68-2083.33 income. Table 2 also shows that most of the farmers (89.6%) have between \$833.00-\$1250.00 income. The average income of farmers in all cement producing precincts of Ogun State is \$1413.69.

In proximate cement producing precinct, Table 2 shows that 30.0% of farmers have between \$833-1250.00 income, while 28.3% have between \$1250.01-1666.67 income and 18.6% have between \$1666.68-2083.33 income. Also, the Table 2 shows that most of the farmers (88.7%) have between \$416.67-2083.33 income. In intermediate cement producing precinct, Table 2 shows that 27.4% of farmers have between \$833-1250.00 income, while 28.2% have between \$1250.01-1666.67 income and 16.9% have between \$1666.68-2083.33 income. The Table 2 also shows that most of the farmers (93.9%) have between \$416.67-2083.33 income. However, in remote cement producing precinct, Table 2 shows that 29.3% of farmers have between \$833-1250.00 income, while 24.1% have between \$1250.01-1666.67 income and 16.7% have between \$1666.68-2083.33 income. The Table 2 also shows that most of the farmers (87.6%) have between \$416.67-2083.33 income.

The disparity in income generated by farmers in cement producing precincts may be due to the degree of their involvement in both agricultural and non-agricultural activities. However, Olubanjo *et al.* (2002) reported that the average annual farm and non-farm income of sugarcane farmers in Papalanto area of Ogun State is \$493.18. It should be noted that the local currency was converted at the rate of \$1 to N118 (<http://ca.finance.yahoo.com/currency>).

**Types of farming operations adopted by farmers in cement producing precincts of ogun state:** Table 3 shows the distribution of farmers by the types of farming

operations they adopted in cement producing precincts of Ogun State. The Table 3 reveals that the common farming operations adopted by farmers in all cement producing precincts include manual clearing (97.7%), harvesting (96.6%), weeding (96.2%), planting (91.9%) and marketing of products (84.4%). Others are ridging (73.9%) and processing of farm products (52.7%). However, the Table 3 shows that in proximate cement producing precinct, majority of the farmers adopted manual clearing (99.3%), harvesting (98.8%), weeding (97.6%), planting (92.2%), marketing (82.8%), ridging (72.9%) and processing of farm products (48.6%). Also, in intermediate cement producing precinct, majority of the farmers adopted manual clearing (100.0%), harvesting (100.0%), weeding (98.8%), marketing (97.2%), planting (96.8%), ridging (84.7%) and processing of farm products (61.7%). Table 3 further shows that in remote cement producing precinct, majority of farmers adopted manual clearing (94.3%), weeding (92.5%), harvesting (91.4%), planting (87.9%), marketing (77.3%), ridging (67.5%) and processing of farm products (51.4%).

The findings reveal that in all the cement producing precincts, most farmers are not engaged in mulching, staking, slashing, storage of products, rearing and breeding of animals and zero tillage. Also, the results show that the farmers may not have access to good storage facilities and lack good extension support on livestock rearing and tree crop planting. However, these operations could not be used in isolation. It therefore, becomes logical to recommend that farmers use a combination of these operations. As submitted by Oyesola and Oladeji (2002) that bush fallowing, planting of legumes, manuring and crop rotation are important land management operations in areas where land is very scarce and limited; farmers in cement producing precincts should be encouraged to adopt land management operations that can ensure food supply round the year.

**Analysis of variance showing significant differences in farmers farming operations in cements producing precincts of ogun state:** The result of hypothesis that was generated and tested for this study was shown in Table 4. The hypothesis generated in this study states that, there is no significant difference in the farming operations of farmers in proximate, intermediate and remote cement producing precincts of Ogun State. This hypothesis was tested using analysis of variance (F-test).

Table 4 shows that there is a significant difference in the farming operations of farmers in proximate ( $\bar{x} = 6.67$ ),

Table 3: Distribution of respondents by type (s) of farming operations carried out

Type of farming operations	Proximate cement producing precinct (N = 424)	Intermediate cement producing precinct (N = 248)	Remote cement producing precinct (N = 348)	All cement producing precincts (N = 1020)
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
Manual clearing	421 (99.3)	248 (100.0)	328 (94.3)	997 (97.7)
Mechanical clearing	24 (5.7)	7 (2.8)	13 (3.7)	44 (4.3)
Zero tillage	4 (0.9)	3 (1.2)	2 (0.6)	09 (0.9)
Ridging	309 (72.9)	210 (84.7)	235 (67.5)	754 (73.9)
Harrowing	14 (3.3)	6 (2.4)	5 (1.4)	25 (2.5)
Planting	391 (92.2)	240 (96.8)	306 (87.9)	937 (91.9)
Weeding	414 (97.6)	245 (98.8)	322 (92.5)	981 (96.2)
Harvesting	419 (98.8)	248 (100.0)	318 (91.4)	985 (96.6)
Processing	206 (48.6)	153 (61.7)	179 (51.4)	538 (52.7)
Marketing	351 (82.8)	241 (97.2)	269 (77.3)	861 (84.4)
Nursery establishment	13 (3.1)	22 (8.9)	12 (3.4)	47 (4.6)
Transplanting	7 (1.7)	13 (5.2)	5 (1.4)	25 (2.5)
Fertilizer application	12 (2.8)	16 (6.5)	5 (1.4)	33 (3.2)
Rearing and breeding	6 (1.4)	2 (0.8)	22 (6.3)	30 (2.9)
Mulching	-	-	-	-
Staking	-	-	-	-
Slashing	-	-	-	-
Storage of products	1 (0.2)	-	5 (1.4)	06 (0.6)

Source: Field Survey (2007)

Table 4: One-way analysis of variance showing significant differences in farmers' farming operations in cement producing precincts of ogun state

Variable	Source of variation	Sum of squares	df	Mean square	F-value	p-value	Re-mark	Scheffes post hoc test	
								Precincts	Mean values
Farming operations of farmers	Between groups	104.94	2	52.47	33.77	0.00	S	PCPPs	6.67 <sup>a</sup>
	Within groups	1580.41	1017	1.55				ICPPs	6.11 <sup>b</sup>
	Total	1685.35	1019					RCPPs	5.82 <sup>c</sup>

Source: Field Survey (2007); F-test revealed significant differences between the means at  $p \leq 0.05$ ; The critical value of  $F = 3.00$  at  $df 1 = 2$  between groups and  $df 2 = 1017$  within groups; Mean values for the same effect having different superscripts are significantly different at  $p > 0.05$  (Scheffe's post hoc test)

intermediate ( $\bar{x} = 6.1$ ) and remote ( $\bar{x} = 5.82$ ) cement producing precincts of Ogun State ( $F = 33.77$ ;  $p < 0.05$ ). Scheffe's post hoc test shows that significant differences exist in the farming operations of farmers in proximate cement producing precinct and intermediate cement producing precinct. Also, significant difference exists in the proximate cement producing precinct and remote cement producing precinct as well as in intermediate cement producing precinct and remote cement producing precinct of Ogun State. This indicates that farmers engage in different farming operations across cement producing precincts in Ogun State in order to cope with environmental problems. Also, farmers in proximate cement producing precinct engage in more farming operations followed by intermediate precinct and less in remote precinct. Thus, farmers that are relatively close to the cement company are facing more farming problems than farmers that are located far away from the company. Though, it is expected that pollution and other environmental problems would make farming activities less enticing in proximate cement producing precinct, the study shows farmers that are close to the cement industry would have to engage more farming operations to reduce the impact of pollution on their soil

and crops than farmers that are far away from the industry to be able to produce sufficient food for their households.

### CONCLUSION AND RECOMMENDATIONS

The study investigated the farming operations of farmers as they are influenced by cement production activities in Ogun State. Consequent upon empirical evidence in the study, it becomes imperative to say that farmers engage in different farming operations across cement producing precincts of Ogun State in order to cope with environmental problems. Generally, farmers in proximate cement producing precinct engage in more farming operations followed by intermediate precinct and less in remote precinct. Thus, based on the findings of this study, the discussions involved and the conclusions thereafter drawn, the following recommendations are proposed in ensuring that farmers remain healthy, productive and maintain a better-conserved environment:

- The agricultural development agency in the State (OGADEP) should encourage rural households to grow new varieties of high-value crops and under

exploited traditional crops that can thrive in areas that are polluted with industrial wastes especially dust. This will go a long way in sustaining the interest of household heads that are involved in agricultural related income generating activities.

- There is need for improvement of extension services to rural households in polluted areas on livestock production by agencies that are saddled with the responsibility. Also, provision of livestock production inputs at subsidized rates to rural households and provision of credit facilities at low interest rate to boost agricultural production.
- A re-appraisal and follow-up of the implemented programme should be ensured by the concerned parties in the agricultural sector and in the government in Nigeria to ascertain the lapses being encountered and to amend such and therefore improve upon it.

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