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Effect of Farmers Socioeconomic Factors on Production of Staple Food Crops in Oil Polluted and Non-Oil Polluted Areas of Bayelsa State, Nigeria

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ABSTRACT
The study analyzed the effect of farmers socioeconomic factors on production of staple food crops in oil polluted and non-oil polluted areas of Bayelsa State, Nigeria. Multi-stage sampling technique were used to select 150 staple crops farmers for the study. Primary data were used for the study. Data were collected through the use of structured questionnaire and were analyzed using descriptive and inferential statistics. Result indicated that most of the respondents (56%) had secondary education in both oil-polluted and non-oil polluted, majority (74.7% and 78.6%) were married, greater percentage were females (63.0% and 55.0%) in oil-polluted and non-oil polluted respectively. Most of the respondents (61.3% and 62.7%) had labour source from family labour in oil-polluted and non-oil polluted areas respectively. The results of the study showed that there were slight differences in the socioeconomic characteristics of the farmers between the two environments, challenges faced by farmers also showed slight differences in mean scores between the two environments though with high grand mean scores of 3.8 and 3.7. Linear regression result showed positive significant relationship between production output and age, membership of cooperatives, income, marital status and household size at 1%, 5%and 10%. Levels. The study therefore concluded that there are socioeconomic factors affecting production of staple food crops in both oil-polluted area and non-oil polluted area. It is recommended that farmers should be trained on best agronomic practices that will reduce invasion of pest and diseases. Also, companies should provide assistance to the farmers to enable them produce of staple food crops.
Key words: Socioeconomic, Oil polluted, Non-oil polluted, Staple Food Crops and Production

INTRODUCTION

A staple food is a food that is eaten routinely and, in such quantities, that it constitutes a dominant portion of a standard diet in a given population, supplying a large fraction of the needs for energy-rich nutrients as well. The staple food crops produced in Bayelsa State include; yam, cassava, sweet potatoes, cocoyam, maize and vegetables. Production of staple food crops such as yam, cassava, rice, plantain and cocoyam coincide approximately to food security in the State; this is why the United

Nations places emphasis on food security, which implies the availability and access of people to food. Food security exists when all people, at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preference for an active and healthy life (FAO, 2013).

The major environmental degradations that affect production of staple food crops over the years include coastal and river bank erosion, flooding, sedimentation, substance and water hyacinth, oil spillage and gas flaring. These have led to soil fertility loss, delta forest-loss, biodiversity depletion and fisheries decline among others. Unfortunately, over the years, Bayelsa State has witnessed massive oil-based environmental degradation, which is the environmental problems of the Niger Delta (Onwuteaka, 2016). The data gathered by Tawari and Abowei (2014) showed that heavy metals, dioxins, CH_4, SO_2, N_2O, NO_2, H_2S, CO_2, NH_3, PAHs, VOCs, $PM_{2.5}$ and PM_{10} were the major air pollutants in the Niger Delta region. Carcinogenic polycyclic aromatic hydrocarbons (PAHs) concentrations in the region were amongst the highest in the world and the people are already suffering from respiratory disorders (Marais *et al.,* 2014). It is not surprising to see these pollutants in the region where oil and gas activities are going on. They are released from all drilling operations or oil spills in addition to those from gas flaring. A smaller spill at the wrong time or wrong season and in a sensitive environment may prove much more harmful than a larger spill at another time of the year in another or even the same environment (Bautista and Rahman, 2016).

The issue of environmental sustainability cannot be over emphasized in the Bayelsa State as this is fundamental to the overall wellbeing and the development of the area especially the wellbeing of future generations which is an important aspect of environmental economics. According to Owolabi (2014), the Niger-Delta region of which Bayelsa State is part of is dominated by rural communities which are endowed with favourable natural conditions and depend chiefly on farming and fishing. Poor people are vulnerable to environmental dynamics because social, political and economic exclusion indicates they are left with few choices about where they live. Hence, they bear the adverse effects of natural hazards, biodiversity loss and forest depletion, pollution and negative impact of industrialization vis-à-vis oil exploration. Irrespective of the studies by (Emaziye, 2015; Inoni, Omotor, and Adun, 2013); Ojimba, 2013;), there is little information on the effect of farmers socioeconomic factors on production of staple food crops in oil polluted and non-oil polluted areas of Bayelsa State. Therefore, this study seeks to assess the effect of farmers socioeconomic factors on production of staple food crops in oil polluted and non-oil polluted areas of Bayelsa State to know the current situation which may serve as future guide to agricultural development in the study area. The objective of the study was to analyze the effect of farmers socioeconomic factors on production of staple food crops in oil polluted and non-oil polluted areas of Bayelsa State. Specifically, to describe the socioeconomic characteristics of the farmers, determine the effect of socioeconomic factors on staple food crops production and ascertain the challenges faced by the farmers in staple food crops production in the study area.

METHODOLOGY

The study was carried out in Bayelsa State, Nigeria. The State is situated in Niger Delta region located between Latitude 04°15¹N and 05°23¹N and between Longitude 05°22¹E and 06°45¹E. It is one of the six states that make up the south-south geopolitical region of Nigeria and has boundaries with Rivers State in the east, Delta State in the North and Gulf of Guinea in the West and South. It has a total land area of 21,100 sq.km with a population density of 188 persons/km² (Bayelsa State Government, 2010). Multistage sampling technique was adopted in the study. The first stage was purposive selection of five Local Government Areas (LGAs) they are; Yenagoa, Ogbia, Southern Ijaw, Ekeremor and Brass. This is because of the high level of oil production activities in the area and the fact that agricultural production is the major occupation of the people. The second stage involved a random selection of two communities from each LGA making a total of 10 communities. Five of the communities (Akassa, Imiringi, Ekpetiama, Kolama I and Ogolomabiri) that were selected were those that had suffered from oil spillage while the other 5 communities (Otuoke, Amassoma, Onopa, Agrisaba and Sagbama town) that were selected from non-oil spillage. The final stage involved a

random selection of 15 smallholder farmers of staple food crops giving a total sample size of 150 farmers used for the study. List of ADP registered small scale farmers served as sample frame. Primary data were used in data collection. Data obtained for the study were analyzed using both descriptive and inferential statistics such as frequency, percentages, mean score. To ascertain the challenges to staple food crops production in the study area, a five-point likert scale of strongly agree =5, agree =4, undecided =3, disagree =2, strongly disagree= 1, was used. In order to make decisions from result obtained, the mean responses were computed as thus: 5+4+3+2+1 = 15/5 =3.0. Mean score of 3.0 was the bench mark for decision. Any mean less than 3.0 was low challenge while any mean equal to and greater than 3.0 was high challenge to production of staple food crops. The inferential statistics used was linear functional form. Implicitly and explicitly explained thus:

$$Y_I = f(X_1, X_2, X_3, \ldots\ldots\ldots\ldots X_{10}\ X_{11}, e)$$

Y= Output of staple food crop ((kg)
X_1 = Sex (male 1, female = 0)
X_2 = Educational level of farmers (years)
X_3 = Age (years)
X_4 = Membership of community (yes = 1, no = 0)
X_5= Farm Size (hectares)
X_6 = Monthly income (₦)
X_7 = Farming Experience (years)
X_8 = Marital status (married =1, single =0)
X_9 = Household size (number)
X_{10} = Extension agent visit (number)
X_{11}= Labour (man days)
e = error term.

RESULTS AND DISCUSSION

Table 1 shows the socioeconomic characteristics of staple food crops farmers' in the oil polluted and non-oil polluted communities of the study areas. The result reveals that the about 78% of the respondents in the oil polluted communities were between 30-49 years old whereas for the non-oil-polluted communities about 83% of the respondents were between 40-59 years old. This suggests that the respondents are middle age class and that the involvement of youth is minimal perhaps due to risks, drudgery and low profitability (FAO, 2012) the result shows that 63% and 55% of females were involved in staple food crop production in oil polluted and non-oil polluted communities respectively. This indicates the dominance of females in staple food production in study area, there is evidence that women's role in agriculture is growing, with women increasingly involved in production for the market (FAO 2011). With regard to marital status and household size, 74.7% and 78.6% of farmers in oil polluted and non-oil polluted communities were married with 5-8 household size respectively. This result is in consonance with Emaziye (2015) who observed that most rural farming households in Bayelsa State were large in size with mean size of 8 persons. Large family size would have positive effect on farm production if there is significant family labour contribution to the production. Most of the farmers (56%) in oil polluted and non-oil polluted communities respectively had secondary education, indicating that majority of the farmers were educated. This conforms to the work of Kainga (2016) who observed that majority of the farmers in Bayelsa State had one form of formal education or the other. Also, result reveals that majority of respondents 61.3% and 62.7% used family labour from oil-polluted and non-oil-polluted respectively. The result is in consonance with the work of Mitchell (2015) who stated that farm labour is predominantly from the household, and there is widespread specialization and division along gender lines in Niger Delta. The result also showed that 61.3.7% of the respondents have less than one hectare of land in oil polluted communities while 65.3% in non-oil polluted communities have farm size ranges from 1-2ha. This may be due to oil pollution that have rendered the productive land useless in oil polluted areas and high number of farmers migrating from oil polluted to non-polluted thereby increase pressure on fallow lands in non-oil polluted communities, this is in consonance with Nnabuenyi (2013) who observed the negative effects of oil spillage on agriculture and lamented that most of the

farmlands are destroyed and rivers polluted. The result also reveals that majority of the respondents (56%) in oil-polluted areas earned monthly within the range ₦1,000-70,000.

Table: 1 Distribution of Respondents according to Socio-economic Characteristics (n =75, 75)

Variables	Oil-polluted		Non-oil polluted	
	Frequency	Percentages	Frequency	Percentages
Age				
>30	8	10.6	1	1.3
30-39	21	27.9	11	14.5
40-49	37	49.7	39	52.0
50-59	8	10.5	23	30.7
60-69	1	1.3	1	1.3
Sex				
Female	44	58.7	26	34.7
Male	31	41.3	49	65.3
Marital status				
Single	19	25.3	16	21.4
Married	56	74.7	59	78.6
Educational level				
No education	6	8.0	6	8.0
Primary	6	8.0	6	8.0
Secondary	42	56.0	42	56.0
Tertiary	21	28.0	21	28.0
Household size				
1-4	21	28.0	22	29.3
5-8	45	60.0	36	48.0
9-12	6	8.0	15	20.0
Above 12	3	4.0	2	2.7
Labour source				
Exchange	3	4.0	0	0
Hired	26	34.7	28	37.3
Family	46	61.3	47	62.7
Member of cooperative				
Yes	46	61.3	46	61.3
No	29	38.7	29	38.7
Farm size				
<1	46	61.3	21	28.0
1-2	27	36.0	49	65.3
3 and above	2	2.7	5	6.7
Annual income (₦)				
1,000-10,000	18	24.0	0	0.0
11,000-20,000	5	6.7	0	0.0
21,000-30,000	2	2.7	0	0.0
31,000-40,000	4	5.3	0	0.0
41,000-50,000	4	5.3	0	0.0
51,000-60,000	5	6.7	0	0.0
61,000-70,000	4	5.3	1	1.3
71,000-80,000	17	22.7	4	5.3
Farming experience				
1-2	15	20.0	8	10.7
3-6	37	49.3	13	17.3
7-10	10	13.3	40	53.3
11 and above	13	17.3	14	18.7
Extension agent visit				
Yes	51	68.0	57	76.0
No	24	32.0	18	24.0

Source: Field survey, 2016

This result is in line with Emaziye (2015) who stated that the mean income of the rural farming households in Bayelsa was ₦62, 678 ($404) revealing a low annual income of $1 a day which is less than the global poverty line. The result shows that most of the farmers (49.3% and 53.3%) were experienced in farming between 3-6 years in oil spillage and 7-10 years in non-oil spillage communities respectively. This is likely to impact positively on output of staple food crops in the study area. Most of the respondents (68 %) were visited by extension agents in oil-polluted areas while greater percentage of respondents (76%) were visited by extension agents in non-oil polluted areas. The extension agents are very important personnel because they supply information on the mode of application or use of recommended technologies to the farmers (Ekpe and Obeten, 2002).

Table 2 shows the distribution of respondents according to the challenges faced by the farmers in the production of their staple food crops in oil-polluted and non-polluted areas of the state. The problem of pests and diseases was the major challenge to staple food crops farmers with mean scores of 4.7 and 4.5 in oil-polluted and non-oil polluted areas respectively. This may be responsible for pre-harvest and post-harvest losses by staple food crops farmers. This finding is in line with Ekon (2013) who opined that most farmers have little or no access to improved seeds and continues to recycle seeds that have become exhausted after generations of cultivation. High cost of labour was severe with mean scores of 4.2 and 4.3 in oil-polluted and non-oil polluted areas respectively as family labour was predominant in the study area and that was why there was acute shortage of labour. This result agrees with the findings of Shaib, Aliyu and Bakshi (2013), who noted that labour shortage of varying degrees occurs in different regions due to the unequal population distribution in the country and cultural preference. The respondents faced inadequate credit facilities as a challenge with mean scores of 4.2 and 3.9 in oil-polluted and non-polluted areas respectively. This result agrees with findings of Anyanwu (2011) who noted that access to microcredit could have prospect in improving the productivity of farmers and contributing to uplifting the livelihoods of disadvantaged rural farming communities. Lack of storage facilities was also a challenge with mean score of 4.1 in both oil-polluted and non-oil polluted areas respectively. Other challenges faced by the farmers in both oil polluted and non-oil polluted areas were inadequate transportation facilities, lack of improved varieties, flood, lack of land, lack of government support and poor extension contact in varying degrees. The grand mean of oil polluted area and non-oil polluted area showed 3.8 and 3.7 respectively, indicating high level of challenges faced by the farmers in both oil spilled and non-oil spilled areas. According to Oni (2013) identification of the constraints or challenges in the agricultural sector is a necessary step to unlock the factors inhibiting performance of the sector towards promotion and growth of the sector.

Table 2: Distributions of Respondents According to Challenges Faced in Oil Polluted and Non-Oil Polluted Areas (n =75 oil polluted, n = 75 non- oil polluted area)

Variables	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Mean
(Oil-polluted areas)						
Inadequate credit	28(140)	37(148)	4(12)	6(12)	0(0)	4.2*
Lack of improved varieties	9(45)	13(52)	25(75)	26(52)	2(2)	3.0*
Pests and diseases	52(260)	23(92)	0(0)	0(0)	0(0)	4.7*
Flood	15(75)	31(124)	4(12)	19(38)	6(6)	3.4*
Inadequate transport facilities	12(60)	37(148)	15(45)	11(22)	0(0)	3.7*
Inadequate storage facilities	21(105)	47(188)	5(15)	1(2)	1(1)	4.1*
Lack of land	13(65)	26(104)	21(63)	12(24)	2(4)	3.5*
Lack of government support	16(80)	38(152)	18(54)	3(6)	0(0)	3.9*
Poor yield	13(65)	33(132)	15(45)	14(28)	0(0)	3.6*
High cost of labour	35(175)	22(88)	15(45)	3(6)	0(0)	4.2*
Poor extension contact	10(50)	34(136)	31(93)	0(0)	0(0)	3.7*
Grand mean						**3.8***
(Non-oil polluted areas)						
Inadequate credit	26(130)	25(100)	18(54)	6(12)	0(0)	3.9*
Lack of improved varieties	4(20)	13(52)	43(129)	15(30)	0(0)	3.1*
Pests and diseases	40(200)	31(124)	4(12)	0(0)	(0)	4.5*
Flood	19(95)	47(188)	3(9)	5(10)	1(1)	4.0*
Inadequate transport facilities	4(20)	21(84)	41(123)	9(18)	0(0)	3.3*
Inadequate storage facilities	11(55)	58(232)	6(18)	0(0)	0(0)	4.1*
Lack of land	9(45)	9(36)	32(96)	21(42)	4(4)	3.0*
Lack of government support	22(110)	35(140)	14(42)	4(8)	0(0)	4.0*
Poor yield	4(20)	11(44)	31(93)	28(56)	1(1)	2.9
High cost of labour	39(195)	21(84)	14(42)	1(2)	0(0)	4.3*
Poor extension contact	8(40)	40(160)	27(81)	0(0)	0(0)	3.7*
Grand mean						**3.7***

Source: Field Survey, 2016. *High challenge to production ≥ 3.00, Low-challenge ≤ 3.00. Bench mark mean score 3.00

Table 3 shows the linear regression analysis of socioeconomic factors affecting staple food crops production in oil-polluted and non-oil polluted areas of the study area. The results reveals that there is existence of relationship between production and age, member of cooperative, income, marital status and household size. This implies that as more of these variables are employed, there will be increase in production output of staple food crops in study areas as the case may be. R^2 (0.5268) indicating that 52.68% of the variation in output of crops is determined by the independent variables. F-ratio was significant at 1% indicating high good of fit of the model used.

Result in table 3 shows that age was significant at 10% and positive implying that additional increase in age of a farmer leads to increase in output of staple food crops produced in the study area. This could be possible in polluted areas because the more a farmer grows in age, the more experience he has on how to manage pollution in the study area. This agrees with Obasi, *et al.* (2015) that stated productivity of the farmers is often affected by age. Member of a cooperative was significant at 1% level and positive indicating that being a member of a cooperative society approximately leads to increase in output. This agrees with a priori expectation and results of Jones and Kalmi (2015) that have recently provided evidence that higher membership rates are associated with better performance. Income was significant at 1% level and also positive indicating that an increase in farmers' income, increases the output of staple food crops produced. Marital status is significant at 10% and positive, indicating that married farmers were more in the production of staple food crops in the study area. Agwu and Mba, (2010), reported that married families are likely to be involved in production practices because they have more family labour at their disposal. Household size was significant at 5% level and also positive. This result implies that the higher the number of household members, the higher the production of staple food crops. This finding in line with the report of

Torimiro, (2005), who opines that the larger the family size, the more the tendency for labour availability in farming.

Table 3: Linear regression of socioeconomic effect on staple food crops production

Variables	Coefficient	Standard error	t-test
Constant	4.7264	1.6367	2.89***
Sex	-0.145	0.3652	-0.40
Age	0.252	0.1352	1.86*
Education	0.00862	0.2607	0.33
Membership of cooperative	1.4608	0.5156	2.83***
Farm size	0.2211	0.3065	0.72
Annual income	0.1268	0.5284	2.40***
Farming experience	-0.2190	0.2975	-0.74
Marital status	0.8527	0.5094	1.67*
Household size	0.0151	0.0068	2.22**
Extension agent visitation	-0.2978	0.2618	-1.14
Labour source	-0.1692	0.2132	-0.79
R-squared		0.5268	
Adjusted R-Squared		0.3930	
F ratio		5.1487	

Source: Field Survey, 2016. Significant levels *** 1%, **5%, *10%

CONCLUSION AND RECOMMENDATIONS

The study concluded that there were slight differences in the socioeconomic characteristics of the farmers between the two environments, challenges faced by farmers also showed slight difference between the two environments though with high grand mean scores of 3.8 and 3.7 respectively. The socioeconomic factors that were found to influence productivity were age, membership of cooperative, income, marital status and household size in both environments. The study therefore, recommended that farmers should be trained on best agronomic practices that will reduce invasion of pest and diseases. Also, companies and government should provide assistance to the farmers whenever there is oil-pollution to enable the production of staple food crops in the study area.

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