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ANALYSIS OF CROP ENTERPRISE COMBINATION AMONG SMALL HOLDER FARMERS IN DELTA NORTH AGRICULTURAL ZONE, DELTA STATE, NIGERIA

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Abstract

This study on analysis of crop enterprise combination among small holder farmers was conducted in Delta North Agricultural Zone, Delta State, Nigeria. The study covered fifty farmers randomly selected from two villages randomly selected from five Local Government Areas in the study area. Frequencies, means, percentages and Net Profit Margin analysis was employed in analyzing the data obtained. Net farm income for two years was estimated and discussed. The result gave #277,269.47 and #214,020.30 for the year 2012 and 2013 respectively. The result showed that there was a sharp decline in output and income in the year 2013. The result also showed a drastic decline in both quantity and price of cassava, melon and tomato produced in the year 2013. Okro enterprise on the other hand showed a positive result at the end of 2013 farming year. The decline in output noticed among the various enterprise combinations may be attributed to some uncontrollable variables.

Keywords: Enterprise combination, output, farm size, household, cost and small holder farmer

1. INTRODUCTION

Food is one of the man's basic needs, for this reason and more agricultural food production has taken a central place in economic policies of most developing countries including Nigeria. Adequate food supply at affordable price is the cornerstone of food security policy of all nations of the world. Adewuyi *et al*. (2014) observed that before the discovery of oil in commercial quantities in Nigeria, the agricultural sector was the bedrock of the Nigerian economy, relied upon for subsistence food and fiber supply and foreign exchange. It provides security, individual household income, poverty reduction and a catalyst for investment.

Agricultural production is the foundation of food availability, especially for calories and proteins. Agriculture is very significant in economic growth and development of Nigeria. It is the largest employer of labour and the only sector of the economy that provides the basic necessity of man. The agricultural sector has the onerous challenges of meeting the food and fibre needs of the estimated 140 million people providing employment for over 75 percent of the economically active people (Okumadewa, 1979) a major source of foreign exchange and provision of raw material for burgeoning industrial sector. The importance of the sector can therefore not be over emphasized.

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Prior to the discovery of crude oil, Nigeria produced enough food to sustain her populace and surpluses were exported to earn foreign exchange. For instance, Abolagba *et al.* (2010) reported that Nigeria produced above 15 percent of the world cocoa and was the second largest producer of crop in the world. Similarly, Nigeria ranked high in production of crops such as groundnut, cocoa, beans, palm produce and traded in palm oil. Today, the expected role of agriculture in Nigeria seems to have dropped drastically owing to introduction of petroleum, its product and associated changes in agriculture.

Nigerian's agriculture is characterized by small holder farmers that are mostly found in the rural areas with little or no social amenities. However, small holder farmers in Nigeria are very important component of the economy. These small holder farmers are characterized by small uneconomic and fragmented holdings, use simple farm tools and implements, unimproved planting materials, inadequate use of modern technology, adoption of rudimentary storage and processing facilities. The plight of the small holder farmer is best described as vicious cycle of poverty.

Alabi *et al.* (2004) reported that small holder enterprise production is feasible at the village level where low cost technology available is needed to improve production considerably. Only low investment, small arable land, large dose of labour and low outputs are required, which makes village production environmentally friendly. Over ninety percent of Nigeria's total agricultural production comes from these small holder farmers and they contribute to about forty percent of the Gross Domestic Product (GDP) and about sixty five percent of the nation's labour force.

2. METHODOLOGY

The study was conducted in Delta North Agricultural Zone, Delta State, Nigeria. Delta North Agricultural Zone is one of the three Agricultural Zones in Delta State, Nigeria. It is comprised of nine Local Government Areas, which includes: Aniocha North, Aniocha South, Ika North East, Ika South, Ndokwa East and Ndokwa West. Others are, Oshimili North, Oshimili South and Ukwani Local Government Areas. It has a total population of one million, two hundred and thirty six, eight hundred and forty (1,236,840) (30.07% of the total population of Delta State) which is comprised of six hundred and fourteen thousand, five hundred and thirty four (614,534) males and six hundred and twenty two thousand, three hundred and six (622,306) females out of Delta State's total population of four million, one hundred and twelve thousand, four hundred and forty five (4,112,445) (National Population Commission, 2006). The Zone is endowed with fertile agricultural land suitable for the growth and performance of various crops and animals. This account for why agriculture is the basic activity of the inhabitants. Multi-stage random sampling technique was used to generate data used for this study. Five out of the nine Local Government Areas were randomly selected. They include Aniocha South, Ika South, Ika North East, Ndokwa West and Ukwuani Local Government Areas. The second stage involved the selection of villages. Two villages were selected randomly from each of the five Local Government Areas giving a total of ten villages used for the study. The third stage involved the selection of the respondents. Five farmers were randomly selected from the list of farmers in each of the ten villages. Thus, a total sample size of fifty farmers were interviewed and used for the study. To achieve objectives of the study, descriptive statistics and Net Profit Margin Analysis were employed. Net annual farm income was estimated for the whole enterprises. Net change in farm income was also estimated. Net income is the difference between total income and total expenditure. This is otherwise known as Gross Margin.

3. RESULTS AND DISCUSSION

Socio-economic variables of respondents: The socio –economic characteristics of the respondents studied include: age, gender, educational attainment, and household size, farming experience, farm size, enterprise combination and sources of labour used.

3.1. Age of respondents

Table 1 showed that the mean age of respondents was 47 years. The finding also indicated that ten percent of the respondents were over fifty years of age; thirty percent were within 40-50 years age bracket, forty four percent were within 31-40 years age bracket while the remaining four percent were less than thirty years. The mean age of forty seven showed that the respondents were relatively young. The result is consistent with the mean age of forty seven reported by Chukwuji *et al*. (2007) as the mean age of garri processors in Delta State, Nigeria. It is also consistent with that reported by Esobhawan (2007). It is however less than the 48 years reported by Alabi (2002) as the mean age of cocoa-based Agro-forestry farmers in Oyo State, Nigeria. It is equally less than 52 years reported by Ajani and Olayemi (2002) as the average age of food crop farmers in Oyo North of Oyo State Nigeria. It differs from the mean age of thirty eight years observed by Agbamu (2014) on his study on communication sources used by farmers in handling poultry diseases in Ughelli North Local Government Area, Delta State Nigeria. However, the point of agreement is that the farmers were relatively young. This however negates the report of United Nation (1979) which observed that as a result of oil boom in early seventies, ebullient young men and women immigrated the urban areas in search of greener pasture thus leaving the age and weak with all activities in areas. The implication of the finding of this work on the age of the respondents is that farming activities was not left in the hands of the age and the weak in the study area.

3.2. Gender of respondents

The sex distribution of the respondents indicated that eighty eight percent of the respondents were male while twelve percent were female. The age and sex structure is important in this study as to a great extent it influences individual's decision, ambition, attitude and aspiration.

3.3. Educational level attained

Table 1 also shows that literacy level was high as ninety two percent of respondents had formal education while eight percent of respondents had no formal education. Literacy level of respondents was important in this study as it determines to what extent respondents could imbibe new ideas and/or technologies, methods of doing things and willingness to spread new idea. The level of education attained can also affect the behavioral pattern of individual, remove fear and suspicion. This result is in line with that observed by Kaine *et al.* (2015) and Onubuagu and Nnadozie (2005).

3.4. Household size of the respondents

The mean household size was seven indicating a large household size. The percentage distribution further showed that twenty (40%) of the respondents had family size of between 0-5, sixteen (32%) had family size of 6-10 while fourteen (28%) had a family size of 11 and above. The implication of this result (large household size) is that there will be more pressure on the household income, saving and investment. On the other hand, more persons will be available for farm labour. This result is however not in conformity with the mean age of 4.02 reported by Adewuyi *et al.* (2014) in their study on economics of labour use in selected food crop farming in Ogun state, Nigeria.

3.5. Farming experience of respondents

The analysis of farming experience as indicted in Table 1 showed that respondents were well experienced as fifty percent of respondents had over ten years experience. Although, four percent of respondents could not precisely say the actual year they started farming, those that started farming below ten years were able to say precisely and they constitute forty six percent.

3.6. Farm size

As indicated in Table 1, twelve percent of the respondents cultivated over 5 hectares of land while the remaining eighty eight percent had farm size ranging from 1-4 hectares. The analysis of farm size showed that respondents were small holder farmers. The mean farm size of 3ha was higher than 0.49 to 2.20ha reported by Ajibefun (2002) among small scale Nigeria farmers. Umeh and

Ikejimba (1991) observed that farm size is significant determinant of output. This agrees with a prior expectation that farm size may influence total output. It therefore can be strongly stated that if a farmer has large farm, he or she can look up for a higher output.

Table 1: Socio-economic characteristics of respondents

Characteristics	Frequency (Age of Farmers in years)	Percentage (%)	Mean
Less than 20	2	4	
21-30	6	12	
31-40	22	44	
41-50	19	30	
Above 50	5	110	
Total	50	100	47
Gender			
Male	88	88	
Female	12	12	
Household Size			
0-5	20	40	
6-10	16	32	
11 and above	14	28	7
Educational Level			
No formal education	4	8	
Primary school	14	28	
Vocational/Secondary school	22	44	
OND/NCE	6	12	
HND/B.Sc	4	8	
Total	50	100	11
Farming experience in years			
1-5	6	12	
6-10	17	14	
11-15	12	24	
16-20	8	16	
Above 20	5	10	
Not certain	2	4	
Total	50	100	10
Farm size in hectare			
1-2	22	44	
3-4	22	44	
Above 5	6	12	
Total	50	100	3
Source of labour			
Hired labour	3	6	
Family, relatives and hired labour	42	84	
Co-oporative	-	-	
Age grade labour	5	10	

Source: Survey data, 2013

3.7. Crop enterprise combination

The analysis of crop enterprise combination showed that all the respondents had crop enterprise combination. This is shown by multiple responses as indicated in Table 2. The crop enterprise combination include: food crop, vegetables and tree crop. Table 2 showed that sixty five percent of respondents were into food crop production, nineteen percent of the respondents were involved in

tree crop production while the remaining three percent of respondents were engaged in other farm and/or crop enterprise.

3.8. Source of labor used by respondents

The study on source of labour showed that both paid and unpaid labour services were used. Eighty-four percent (42) of the respondents used family/relatives and hired, labour, ten percent (5) used mainly age grade labour while six percent (2) used hired labour. Labour plays a very central and crucial role in agricultural production especially under small farm holdings. Small holder farmers contribute the largest percentage of total domestic agricultural output in their area. Chianu and Tsuji (2004) however observed that human labour is about the only form of farm labour available to small holder farmers and that this form of labour accounts for up to eighty percent of total farm power. Awoyemi (1981) on the other hand observed that human labour constitute between eighty and ninety percent of the total cost of production in many farming systems.

Table 2: Distribution of respondents according to crop enterprise combination

Crop enterprise combination	Frequency	Percentage
Cassava	43	86
Maize	44	88
Yam	23	46
Melon	29	58
Okra	14	28
Tomato	13	26
Tree crop	18	36
Total	*	*

*Multiple responses were obtained
Source: Field data, 2013

Table 3: Depreciated value of inputs used in production

Inputs	Number	Unit price (₦)	Total value (₦)	Life span (years)	Depreciated value(₦)
Matches	2	475	950	5	190.00
Knives	1	115	115	3	38.00
Planting Hoes	2	400	800	5	160.00
Weeding Hoes	2	200	400	5	80.00

Source: Field data, 2013

Table 4: Estimated value of output, income, expenses and losses

Year 2012	Produce	Output (yield)/Kg Quantity/Kg	Price (N)	Income (N)	Year 2013	Output (Yield) Kg Quantity/Kg	Price (N)	Income (N)	losses Diff. (N)
	Cassava	6189.00	4075	29397.75		4758.40	4.75	22602.40	1430.60
	Maize	854.00	13.90	11870.60		1020.00	13.90	14178.00	166.00
	Yam	3285.00	8.70	285790.50		4374.00	8.70	38053.80	1089.00
	Melon	581.00	27.25	15832.25		328.00	27.25	8938.00	25300
	Tomato	1890.00	35.38	66868.20		897.00	35.38	31735.86	993.00
	Okra	900.00	13.86	12474.00		980.00	13.86	13582.80	80.00
	Livestock	1250.00	100.00	125000.00		976.86	100.00	97686.00	273.14

Total annual income 290,022.30		226,776.86
Variable Cost		
Seeds/Planting Materials	1090.00	
Labour	5672.42	
Fertilizer	2714.71	
Total Variable Cost	9477.13	
Income above Variable Cost	290022.30	
-9477.13		
280545.17		
Fixed Income		
Land	1500.00	
Farm Tool	1307.43	
Depreciation	468.00	
Total Fixed Cost	3275.43	
Total Variable Cost	9477.13	
TVC + TC	12752.56	
Total Expenses	290022.30	226776.86
	-12752.56	-12752.56
Net Annual Income (Profit)	277269.47	214020.30
Net change in Farm Income	243232.90	
-277314.47		
-34081.57		
Net profit for 2012	290,022.30	
- 9477.13		
280,544.87		
Net profit for 2013	226,776.86	
- 9,477.13		
217,299.73		

Source: Computed field survey data, 2013

3.9. Net farm income analysis

Kay (1986) referred to budgeting as a tool used to select the most profitable plan from a number of alternatives and test the profitability of any proposed change in plan. In this study, the profitability (economics) of the various farm enterprise combinations was analyzed by computing the value of the output per hectare of land for a period of two years and the net change in farm income was estimated by computing the net profit. For the purpose of uniformity, ease of comparison and evaluation, the current price was used to determine the Net Farm income. Net farm income and losses were computed by finding the differences in the value of the output for the given period (using the mean value). The value of the fixed cost items were determined using the straight line method of depreciation (Table 3).

To estimate the Net annual Farm Income, the cost items, average annual yield and income were estimated and analyzed using the Net Profit Margin Analysis. Cost items were made up of variable cost and fixed cost. Net annual farm income was computed by estimating the differences between the total income and total expenses. The result in Table 4 gave N277314.47 and N243232.90 for the year 2012 and 2013 respectively. The result showed that an average of 1890.00kg/ha and 897.00kg/ha of tomatoes was produced and sold at the rate of N66868.20 and N3175.86 in 2012 and 2013 respectively; average of 6189.00kg/ha (2012) and N4758.40kg/ha (2013) of cassava was produced and sold at the rate of N29397.75 and N22602.40 (for the respective years). Melon

enterprise showed a decline in both yield and income in 2013. Output (melon) of about 3285.00kg/ha and 4374.00kg/ha was produced and sold at the rate of N2, 8579.50 and N38, 0553.80 in 2012 and 2013 respectively. Okra enterprise showed positive (N13, 582.80) result at the end of 2013 farming year.

From the survey, the total cost of production was N12, 752.56 which constitutes the total variable cost of about N9, 477.13 and total fixed cost of N3275.43. Total Variable cost was computed using the base year. Income above variable cost was N280, 545.17 at the end of 2013 farming year while in 2012 a net profit of N277, and 269.7 was obtained. A net profit of N280, 544.87 and N217, 299.73 was obtained for the year 2012 and 2013 respectively.

4. CONCLUSION

The empirical result established that there was a significant decline in output with a consequent decline in income in the year 2013. The result also established that there was a decline in output in the year 2013, and that most rural dwellers were still involved in farming. It implies that they were motivated to farming not only because of the economic returns but the need to satisfy the food requirement of the teaming population, making provision for household and to ensure food security. The result also established that Okra production was profitable in the study area. The result revealed that farmers in the area were relatively young. This implies that they may be willing to adopt new technological changes. Given the wherewithal and attention, it is hoped that framers will not only increase their productivity but will also maximize their profits.

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