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Socio-Economic Factors Influencing Yield of Arable Crop in Osun State, Nigeria

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Abstract: The study determined socio-economic factors influencing yield of arable crops in Osun State. Primary data were collected from 150 arable crop farmers from 5 cells in each of the three agricultural zones in the state using purposive and random sampling methods. The data were analysed with descriptive statistics and regression techniques. Result of the analysis showed that the mean age of arable crops farmers was 52 years, the mean years of formal education was 9 years with household size of about 11 and mean farm size was about 3.5 ha. The yield of arable crops slightly increased in 1998 to 2000. Multiple regression analysis showed that R and R^2 for all the variables investigated was 0.687 and 0.472, respectively. Training and demonstrations attended by farmers with Beta Coefficient of (0.123) was the best factor-influencing yield of arable crop in Osun State. Other factors in descending order are access to agricultural input (0.119); farm size (0.052) and age (0.042) Agricultural policy effort should be directed at increasing agricultural extension activities to farmers and agricultural input should be made available at affordable prices to arable crop farmers to increase their yield.

Key words: Socio-economic, factors, arable crop, yield

INTRODUCTION

The expected role of agriculture in Nigeria economy cannot be overemphasized. It was the backbone of Nigeria economy for many decades before the discovery of petroleum in commercial quantity. Nigeria was one of the leading nations in the 60s and 70s in the production and exportation of crops like cocoa, palm produce, rubber, groundnut and cotton. Nigeria was also noted for her abundant production of food during the period. Even though agriculture is still the leading earner of foreign exchange from non-petroleum exports yet Nigeria is one of the leading nations in importation of food to supplement the domestic production/consumption. CBN (2002) reported that out of the 3.402 billion Naira contributed by the non-oil sector to the GDP, agriculture contributed as much as 1,623.45 billion Naira, which is 47.71% of total non oil production. Food is man's first and most important necessity of life and the problem of providing enough food of the right kind for everybody is one, which Nigerian farmers are yet to solved. The Federal Government Policy of increasing food production and attaching staff sufficiency in the nearest future can only be achieved if the right manpower is available with the right strategy of reaching the farmers. Balogun (2000) reported that 69.9% of alley farmers in Osun State, Nigeria were above 45 years of age. Also Odeyemi (2005) reported that about one third of farmers in southwest of Nigeria were above 60 years of age. The implication of this is that the population contained a disproportionate number of people whose productivity on the farm was likely influenced by their age. The predominance of old age might also restrict social activities and might adversely affect the economic situation of farm families. Studies have shown that older people are less receptive to new ideas and are less inclined to accept agricultural innovations than younger people (Balogun, 2000; Jibowo and Francis, 1989; Laogun, 1991).

The Federal Government of Nigeria has adopted many agricultural strategies that could improve agricultural productions among which are the Integrated Agricultural and Rural Development Programme started in 1972, Agricultural Credit Guarantee Scheme (ACGS) and the Unified Agricultural Extension System (UAES). Agricultural Policy for Nigeria (FGN, 1985) noted that integrated agricultural and rural development programme was introduced so that both agriculture and rural areas are developed together. The strategy used for this was provision of basic infrastructural amenities in the rural areas, which tend to make life better for the rural populace. Also, Agricultural Credit Guarantee Scheme (ACGS) was introduced in 1985 so that adequate credit facilities be made available to farmers at the right time and at such rate that will make return from agriculture more attractive. In addition, Unified Agricultural Extension System (UAES) was introduced so that extension agent could be equipped to disseminate agricultural information in all fields of agriculture to their clienteles. This is made possible through adequate training during the fortnightly trainings (FNT) of the extension agents under the

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Training and Visit Extension System. Many of these programmes failed at the implementation stage. The Unified Agricultural Extension System (UAES) has not solved the problem of food shortage and majority of the farming population still live in poverty. The World Bank report (1996) showed that Nigeria has witnessed increased incidences of poverty due to economic policy reversal and policy incredibility. Corroborating evidence from the Federal Office of Statistics also showed that poverty increased from 42% in 1992 to 69.3% in 1996. Poverty is an indicator that agricultural production does not meet the demand of the teeming population.

Among the problems that are hampering farmers' arable crop yield is non-availability and non-affordability of agricultural inputs such as fertilizer, improved seeds, agrochemicals and tools. Adesoji (2002) found that less than 40% of arable crop farmers could afford to purchase fertilizer even though majority (91.3%) could use fertilizer successfully on their arable farms. Inability to afford the price of some vital inputs may discourage production and hamper productivity of such farmer. Axinn and Thorat (1972) reported that additional input is crucial to convert peasant farmer to scientific business manager and can convert the nation from food deficits to food exporter and bring dignity to farm. Laogun (1991) also revealed that the inputs required for increased agricultural production in Nigeria have not been getting to the farmers on time. He went further that even when they get to the farmers, the quantities are insufficient because of the weakness in the organization and institutional arrangement for input delivery. Without an effective input delivery system, the efforts of the farmers and the government will not yield the desired result in food sufficiency. Onyenwaku and Fabiyi (1991) reported that bulk of food production in Nigeria is in the hands of a multitude of small scale farmers who are scattered all over the country. It was also said that the system of the food production comprise small uneconomic production unit, predominance of primitive techniques, limited use of biological and chemical technology, high dependence on rudimentary storage and marketing facilities, inadequate supply of credit and low capital investment with attendant low productivity and income. Adesoji (2002) reported that majority (95%) of arable crop farmers in Osun State were small scale farmers. This is in support of Alimi (1999) that arable crop farmers cultivates small hectarage of less than 10 ha.

Nigeria needs to move from small to large scale production of her agricultural produce. Despite the large budgetary allocations to agricultural sector every year, Nigeria still depend on importation of food items such as rice, fish, edible oil and many packed food items. Large expanses of land remained fallow and many young school leavers are not taken to agricultural production and many arable crop producers only end up in meeting part of the food need in their families. Although the country has realized the importance of raising arable crop production, this can only be achieved through agricultural revitalization schemes which should incorporate better strategies to reach the subsistent farmers in their rural production areas. To evolve strategies that would reach rural populace and increase their productivity necessitate that socio-economic factors influencing crop yield are determined. With all the highlighted problems, one is therefore enthused to know the socio-economic factors that influence the yield of arable crops in Osun State.

The general objective of this study is to determine the socio-economic factors that influence the yield of arable crops in Osun State, Nigeria. The specific objectives of the study are to:

- Identify the production practices of arable crops in Osun State;
- Determine the production level of arable farmers in Osun State;
- Determine the contributions of each of the factors to production of arable crops in Osun State.

MATERIALS AND METHODS

The study was carried out in Osun State, Nigeria. Nigeria is one of the Anglophone (English speaking) countries in West-Africa of sub-sahara in Africa. Nigeria lies between longitudes 3 and 15° east of Greenwich and between latitude 4°north of the equator. Also Osun State is situated in the Western part of Nigeria and lies on latitude 8°10 to the North and longitude 6°5 to the South. Then it is marked by longitude 4° to the west and longitude 5°4 to the east. Osun State has tropical humid climate. The mean annual temperature for Osun State varies between 21.1 and 31.1°C. Annual rainfall is within the range of 1,000 mm in the derived savannah agro-ecology to 1,200 mm in the rainforest belt (OSSADEP, 1997).

Data was collected from the three agricultural zones in the State. Five blocks were selected randomly from each of the zones, out of which five cells were also randomly selected out of eight using simple random sampling technique. One hundred and fifty arable crop farmers were selected and interviewed using purposive and simple random sampling technique between January and March 2005. Structured interview schedule was used to collect information from the farmers through personal interview. Data analysis involved the use of both descriptive and inferential statistics.

The independent variables are:

X_1 = Age (number of years of existence)
X_2 = Level of education (years of formal education)

X_3 = Religion (type of religion practiced-Binary variable) Has a religion - 1, No religion - 0
X_4 = Size of household (number of people feeding from the same pot)
X_5 = External orientation (extent of travel to other places measured on five points ratio scale)
X_6 = Farm size (number of hectares cultivated)
X_7 = Accessibility, Affordability of input (Binary variable) - accessible - 1; not accessible - 0; affordable - 1; not affordable - 0
X_8 = Access to credit facility (credit/loan got at the right time, quantity and with
no constraints) Binary variable: Got loan - 1 No loan - 0
X_9 = Number of training and demonstration attended by farmers
X_{10} = Availability of agricultural information Binary variable: Information available - 1, Information not available - 0
Y = Dependent variable was yield of arable crops measured in tons

RESULTS AND DISCUSSION

Socio-economic characteristics of arable crop farmers: The mean age of arable crop farmers in Osun State was 51.7 years with 7.58 standard deviation. Data in Table 1 show that about 90% of arable crop farmers in Osun State were above 40 years of age. For farm works that require back bending like heaping, weeding and planting operations, young and active people of between 15 and 40 years would be more appropriate. This is because the use of local farm implements still dominates production practices in the study area. About 57% of arable crop farmers in Osun State were Muslim while the remaining (about 43%) was Christian. Majority (95.4%) were married with only 1.3% single and 3.3% were either separated or widowed. About 63.3% of arable crop farmers in Osun State were literate (able to read and write). The remaining (36.7%) had no formal education. The mean year of formal education was 9.4 years with 0.76 standard deviation. However, about 44% of the literate arable crop farmers had their formal education only in the Primary School and only 2.7% of the literate had formal education in the tertiary institutions. The low level of formal education may not be enough to interpret instructions on agrochemicals when extension agent are not present.

Detailed analysis showed that 91% of the arable crop farmers in Osun State have large household size (8 and above). This large household size may be an advantage if they are used as farm labour. The mean household size was 10.63 with standard deviation of 3.19. This finding support that of Ogunjimi (2001) that majority of farmers in Osun State have large family size. The mean farm size of arable crop farmers was 3.42 ha with standard deviation of 3.7 and the mean distance of farm plot to the market was 5.06 km with 1.63 standard deviation. The distance may not make it convenient for arable crop farmers to transport some farm produce to the market for quick sales in the absence of personal vehicle. If the distance is too far it may even discourage cultivation or production in subsequent seasons. This finding is in support of many other studies that showed that many arable crops farmers are peasant, landless, poor and cultivate on scattered farm holdings (Alimi, 1999; Balogun, 2000).

Table 1: Socio-economic characteristics of arable crop farmers

Variables	Mean	Standard deviation
Age	51.7	7.58
Years of formal education	9.4	0.76
Household Size	10.64	3.19
Farm size (ha)	3.42	3.70

Source: Field Survey, 2005

Production practices: Table 2 show that about 99% of the farmers used manual method in their production. About 90% of arable crop farmers produce cassava and all of them with manual method. This is followed by yam with 73.3% using manual method of production. About 53% produced cowpea and 90% of cowpea farmers made use of their hands in the production. Rice was the least with only about 13% of the farmers producing this arable crop. All (100%) of the rice farmers made use of their hands in the production. The table revealed that all the arable farmers in Osun State harvest their farm produce manually. Only 6.7% of arable crop farmers used mechanical means for land preparation and planting of maize while 10% used mechanical means to prepare land for planting of cowpea. Production practices of arable crop farmers showed that majority of these farmers made use of manual means to produce arable crops. This method of production may not be efficient enough to produce enough for the teeming population of the state.

Yield of arable crops: Table 3 shows that there was an increase in the mean yield of arable crops since 1998 to year 2000. Maize increased from 0.94 tons in 1998 to 1.15 tons in year 2000. Mean yield of cowpea also increased from 0.41 tons to 0.43 tons in 1999 and 0.50 tons in 2000. Data also show an increase in the yield of yam from 3.32 tons in 1998 to 3.75 tons in 2000. The same was noticed for both rice and cassava. The mean yield of rice increased from 0.49 tons in 1998 to 1.10 tons in 2000. Cassava increased from 3.83 tons in 1998 to 4.45 tons in year 2000. Though, there had been an increase in the mean yield of arable crops, the yield were still very low when compared with the population of the state. The low yield experience by arable crop farmers in Osun State may be due to low level of technology adopted by the farmers. In addition, the farmers may not follow strictly the recommendations of

Table 2: Distribution of respondents according to production practices and forms of operation

	Production Practices	Land Preparation		Planting operations		Weeding operations							Fertilizer application N = 135		Harvesting	
	Number									Training						
Crops	Cultivating	Man.	Mec.	Man.	Chem.	Man.	Mec.	Mulching	Staking	of vines	Thinning	Supplying	Man.	Mec.	Man.	Mec.
(Freq.)	148.0	136.0	12.0	138.0	10.0	143.0	5.0	-	-	-	14.0	36.0	133.0	2.0	148	-
Maize %	98.7	91.9	8.1	93.3	6.7	96.6	3.4	-	3.0	-	9.5	24.3	98.5	1.5	100	-
(Freq.)	80.0	72.0	8.0	80.0	-	68.0	12.0	-	3.7	-	-	15.0	0.0	-	80	-
Cowpea %	53.3	90.0	10.0	100.0	-	85.0	15.0	-	110.0	-	-	18.7	0.0	80.0	100	-
(Freq.)	110.0	110.0	-	110.0	-	110.0	-	110	100.0	92.0	-	100.0	5.0	-	110	-
Yam%	73.3	100.0	-	100.0	-	100.0	-	100	-	83.6	-	90.9	4.5	-	100	-
(Freq.)	20.0	20.0	-	20.0	-	20.0	-	-	-	-	2.0	2.0	14.0	-	20	-
Rice %	13.3	100.0	-	100.0	-	100.0	-	-	-	-	10.0	10.0	70.0	-	100	-
(Freq.)	135.0	135.0	-	135.0	-	133.0	2.0	-	-	-	-	130.0	-	-	135	-
Cassava %	90.0	100.0	-	100.0	-	98.5	1.5	-	-	-	-	96.3	-	-	100	-

* Multiple responses, Man - Manual, Chem - Chemical, Mec – Mechanical, Source: Field survey, 2005

Table 3: Distribution of respondents according to yield/crop/season

	Yield (tons)					
	1998		1999		2000	
Crops	Yield	Mean	Yield	Mean	Yield	Mean
Maize	139.3	0.94	153.5	1.00	170.1	1.15
Cowpea	32.9	0.41	34.8	0.43	40.3	0.50
Yam	366.0	3.32	402.7	3.66	412.5	3.75
Rice	9.8	0.49	21.0	1.05	22.0	1.10
Cassava	517.0	3.83	555.0	4.11	601.3	4.45

* The yield include those consumed by the producer

Table 4: Effect of independent variables on yield of farmers

Variable	B	Std error	Beta	T
Age	2.57*	0.070	0.042	0.369
Religion	-1.83	0.825	-0.191	0.008
Education level	-0.649	0.606	-0.104	-1.072
Household size	0.182	0.172	0.123	1.064
Farm size	-6.7*	0.113	-0.052	0.002
External orientation	6.324	0.287	0.021	0.220
Access to input	5.89*	0.042	0.119	0.003
Access to credit	-.620	0.389	-0.143	-0.592
Number of training and demonstrations attended	7.10*	0.058	0.123	0.000
Availability of agricultural information	2.44	0.345	0.007	0.071

Constant = 10.42 *Significant at 0.05

the extension agents. Also the removal of subsidy by the Federal Government on farm inputs particularly fertilizers which make this commodity unaffordable to small scale farmers since 1999. Extension agent may start looking at the recommendations from studies on natural soil fertility improvement techniques. Studies of Nzuma and Murwira (2000) and Wickama and Mowo (2001) have reported that indigenous soil conservation methods are the best alternatives to inorganic fertilizers to sustain increased crop yield.

Relationship between arable crop production (yield) and variables investigated: Detailed analysis of multiple regression showed that the ten variables together exhibits strong relationship (R = 0.687) with the dependent variable (arable crop yield). These variables also account for only 47.2% of the variance of the dependant variable (R^2 = 0.472). The remaining 52.8% may be due to error and other factors not investigated in the study such as soil and climatic factors.

Data in Table 4 show that regression coefficient for variables investigated in the study. Only four of the variables are significant. Farm size is significant with a negative coefficient (B = -6.7). Considering the regression line equation (Y = a+bx). It implies that if farm size could be increased by 1 ha, production would decrease by 6.7 tons per annum. This is possible if the farm size is too large for the farmer to cope with especially when majority of the farmers were using manual methods and obsolete tools in production. If the age of arable crop farmer should increase by 1 year, the production will increase by 2.57 tons per year. The increase in age to increase production could continue to about 52 years (mean age). This might be due to the experiences acquired by the aged over time. If access to farm input could increase by one unit, yield would increase by about 6 tons in a year.

Likewise if the number of demonstrations and training attended by arable crop farmers could increase by one unit, yield of arable crops would increase by 7.10 tons per annum. This shows the importance of training and demonstrations by extension agents. Access to agricultural credit have negative coefficient value and not significant.

Beta coefficient is used to know the relative importance of each independent variable on the dependent variable. With reference to Table 4, considering the significant variables such as number of trainings and demonstrations attended by arable crop farmer (0.123) are the most important variables contributing to production/yield of arable crops in Osun State. Others are arranged in the decending order access to agricultural inputs (0.119); farm size (0.052) and age (0.042).

CONCLUSIONS

The study has been able to show that access to agricultural inputs has significant contribution to the yield or production of arable crops. This finding does not go well with the policy of the Federal Government of total removal of subsidy on agricultural input like fertilizer. The study has also shown that trainings and demonstrations given by the extension agents contribute significantly to the yield of arable crops in Osun State. Also the experience of the aged and farm size could be considered when planning for arable crop production increase in the state.

RECOMMENDATIONS

The following recommendations are made based on the above findings:

- Extension agents should endeavour to train more contact farmers using demonstration of skills and practices so that their efforts could be multiplied among arable crop farmers.
- Farm inputs should be made available and affordable to arable crop farmers at the right time of need
- Extension should teach indigenous methods of soil conservation and soil improvement to arable crop farmers.
- Increase in farm size should be accompanied by the use of farm mechanization. Therefore extension should encourage arable crop farmers to use modern farming mechanism to increase their farm size.

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