

Full Length Research Paper

Impact of Agricultural Cooperatives on Food Production among Fadama User Groups in Ugwunagbo Local Government Area, Abia State, Nigeria

Okoro, C. N.,* Amaechi, E. C. C., Chijioke-Okoro, C. G., and Eze, C. G.

Department of Cooperative Economics & Management, Imo State Polytechnic Umuagwo, Imo State, Nigeria.

*Corresponding Author E-mail: cnokoro2016@gmail.com

Received 8 September 2021; Accepted 30 October 2021; Published 12 November 2021

ABSTRACT: This study assessed the impact of Agricultural Cooperatives on food production. The study was necessitated by the increasing consumption and demand for food products in a subsistent agriculture dominated setting. As such, the effect of the socio-economic characteristics of members of Agricultural Cooperatives on food production in the study area was determined while the determinants of food production were statistically estimated. Descriptive and inferential statistics were used to determine and estimate the objectives on socio-economic characteristics of the members of Cooperatives, and determinants of food production in the study area respectively. Multiple regression analysis was used to test the responses of 216 Agricultural Cooperators randomly selected. From the study, it was discovered that food production activity is a female dominated activity with

the least of formal education in the study area. The farmers were mostly in the active age bracket with a relatively good farm sizes, leading to a good income profile of the members. Among the determinants of food production in the area, gender; education; farming experience; farm size and input cost were significant ($p < 0.05$). The study recommended that extension services be made available in the study area with particular reference to the female gender; government intervention with favourable land reforms and the mounting of development programme that would make grants available to Cooperative Farmers.

Keywords: Agricultural cooperatives, food production, farm income, Fadama

INTRODUCTION

The growing consumption of food products in today's economy is an issue concerning every household consumer (Okoro, 2009). Food forms a basic necessity of man; every effort should be geared towards its production and effective distribution. The production of food products does not on its own solve the basic need of food but the effective distribution to the ultimate consumers (Alegieno, 1985). The standard of living in Nigeria with regards to nutrition would be understood from recent times that the presentation of standard meals on the table has been a battle of life. This has mishandled especially the poor masses aggravating their poverty conditions. This could be viewed from the nature and extent of food cultivation in Nigeria. Over 80% of Nigerian farmers do so at subsistence level. Only little, portions are cultivated solely

for public consumption, using mostly manual farm tools and sometimes improvised. This has led to the exorbitant prices of the little food available for public consumption. Okoro (2005) stressed that low food production is a product of insufficient inputs supply, lack of financial muscles and lack of farmers' collective bargaining power even when appreciable harvest is recorded, traceable to bad road networks, poor storage facility and technology. Low food production takes its bearing from agricultural production and related activities. Owing to the predominant subsistence agriculture in Nigeria, low food production continues to exacerbate. The need for commercial agriculture has become so pressing that farmers need to integrate into groups for reasonable agricultural venture. To achieve this is the cooperative

system of farming or cooperative agriculture. Onah and Anyanwu (1985) described cooperatives as voluntary association of people who work together on the basis of self-help and mutual reliance to solve their common felt needs through cooperative principles. Cooperation is also done on the basis of such values and principles as openness, honesty, equity, equality and democracy; its basic objectives being anchored in the promotion of the socio-economic and even cultural interests of the members who are simultaneously its owners and customers.

Okoro (2009), however stated that agricultural cooperatives are seen to undertake the activities of production, processing, marketing and distribution of agricultural products. These activities are undertaken with the aim of increasing food supply and agricultural raw materials to support domestic manufacturing activities. This is so encouraged since developing countries of the world have abundant unexploited lands (Berko, 2001). With proper land use and application of appropriate new technologies and the adoption of appropriate institutional framework, Nigeria can feed the entirety of her population. Onwuchekwa (1985), examined that when Nigeria became independent in 1960, the rural standard of living was very low as witnessed by malnutrition, low life expectation, shortage of financial resources, human fatigue due to low technological innovation. These background problems led the government to start economic projects such as Farm Settlement, Community Farming, Cooperatives, National Accelerated Food Production Programme (NAFPP), Operation Feed the Nation (OFN), Green Revolution (GR) etc. It is not vague to affirm that most of these government programmes failed with the exit or death of the governments that introduced them. This study was necessitated by problems of food availability in Nigeria. The standard of living in Nigeria with regards to nutrition is seen to be low. Over 80% of Nigerian farmers do so at subsistence level. Only little portions are cultivated solely for public consumption, using mostly manual farm tools and sometimes improvised. This has led to the exorbitant prices of the little food products available for public consumption.

The objectives of this study were to analyze the socio-economic characteristics of members of agricultural cooperatives in the study area and estimate the determinants of food production among the cooperative members in the area. All efforts made to ensure success in this study were being focused to contribute significantly to the knowledge of the appropriation of the methods, systems and practices of agricultural cooperatives to all producers of food in the agricultural practice and to ensure enhanced food production.

Here, farmers were sensitized on the strategies of group farming activities. They would understand and enforce government contributions having understood their linkages.

Agricultural cooperatives in Nigeria

Cooperatives are business enterprises or organizations owned and controlled by the members (member-patron) with the aim of rendering services for the material benefit of all members (Iheanacho and Ahaotu, 2017). They are supposed to be self-reliant, self-controlling and self-sustaining peoples' organization (Ugwuh, 2006). This business organization could be seen in so many sectors of the economy ranging from production to marketing. But for the agricultural sector, the business of cooperatives must revolve around the basic principles of agricultural economics. Ugwuh (2006) noted that the performance status of any agricultural cooperative society succinctly depends on the knowledge and effective application of the principles of agricultural economics in her operations. Onwuchekwa (1985) went further to describe agricultural cooperatives as groups fundamentally organized to assist member farmers in rural areas to improve their productive and marketing activities (Ahaotu *et al.*, 2016). In line with Onwuchekwa (1985), Ugwuh (2006) observed that the principles of agricultural economics that apply in cooperatives are law of diminishing returns, demand and supply.

Functions and activities of agricultural cooperative societies

When we talk about the function and activities of Agricultural Cooperative Societies, we are really talking about what takes place in the time of production and between delivery time and time of purchase of the produce by the customer. It involves all the activities aimed at presenting the farm produce to the target consumers so as to achieve a satisfactory transaction between the producer and the consumer. Such functions are as observed by Helms (1968) and Igbozurike (1986):

Assembling: this function involves the gathering of the agricultural produce from the different scattered farmlands to a convenient point. The agricultural products are usually found in small quantities on scattered farms. It does not encourage buyers who buy it in larger quantities. The concentration of the produce at a particular point appeals to larger quantity buyers who cannot afford to spend their time moving from one place to another. The gathering of produce together makes it possible for large quantity buyers to use more economic means of evacuating them into the various places of consumption. This is one of the reasons why railway lines are being located along food producing zones in the country for easy gathering and evacuation.

Preparation: another important function of agricultural marketing cooperatives is preparation. Some agricultural produce is not suitable for consumption in the state in which they are produced and sold from the farm. At this

point, preparation function becomes very necessary so as to present the produce to potential consumers in the most appetizing way. It involves clearing the produce and removing the unwanted particles and chaffs.

Sorting: sorting functions involves separating the produce according to certain characteristics such as; size, shapes, colour, degree of ripeness, flavour and other characteristics of the produce.

Grading: grading is a completely marketing function used to classify agricultural produce according to the quality. Grading also is an important function which enables the agricultural marketer to determine the right price of the different classes of agricultural produce. Grading enables the marketer to channel its marketing efforts towards a specific market, since each grade has its own defined consumer market.

Processing: this involves the conversion of the raw state of the produce into different forms derived by the target consumers. The conversion of the raw farm produces into different forms according to the consumers' tastes and preferences offers form utility. Through processing functions, fresh apples are converted into canned or frozen juice, wheat into bread etc. Processing also extends the life span of most agricultural produce and enables the marketer to reach distant markets where it can be sold without deterioration in quality.

Packaging: packaging means enclosing the produce in a container to protect it from environmental effects which may lead to physical deterioration of the produce. Apart from protective, theft and adulteration of the produce, packaging not only makes the produce attractive, it also promotes sales as well as differentiates and identifies the produce.

Storage: the storage function makes an agricultural produce available by the time consumers want to buy them. It adds an extra utility to the produce called time utility. This is because of the fact that consumers' demand for fair produce regularly throughout the year irrespective of its seasonal nature of production. Therefore, storage becomes very important so as to keep the extra produce to meet the demand during the off-season.

Transportation: the transportation function is required to make the farm produce available where consumers want them. This function offers place utility. The transportation cost tends to increase the price of the agricultural produce especially where the roads are not accessible. Because of the deplorable state of most roads, both consumers' and producers' prices are affected.

Financing: financing function entails producing the necessary capital to carry out the various marketing functions. The provision of finance by marketing organization facilitates movement of agricultural produce from the point of production to the point of consumption.

Risk Bearing: the marketing organization bears the risk that is involved in evacuating the produce from one point to another. The farmers are usually paid a fixed price

before the produce leaves the farm yard. The buyer bears the risk of financing the customer who is prepared to pay a sum of money that is quite enough to cover both the purchase price and other cost incurred.

Information Dissemination: information function makes marketing intelligence available throughout the system. Efficient agricultural marketing cannot occur in an information vacuum. To make rational decision, both buyers and farmers must be well informed about the standard present and expected future quantities to be produced and consumed.

Selling Functions: the selling function covers all those activities associated with merchandizing, such as: selling price for the produce; displaying the goods; advertising to make customers aware of the produce and its special features.

Background information of the Fadama project

Increasing reduction in production and productivity has continued to characterize Nigerian agricultural sector thereby limiting the ability of the sector to perform its traditional role in economic development. In order to break this cycle and improve the performance of the agricultural sector, the Nigerian government over the years introduced and implemented several policies and programme aimed at revamping the sector (Ajibefun and Aderinola, 2004). A recent effort towards boosting production and enhancing farmers' welfare was the introduction of Second National Fadama Development Project. Fadama II is a follow - up to Fadama I (phase I of the National Fadama Development project), which was implemented during the period 1993-1999. Fadama I focused mainly on crop production and largely neglected support of post-production activities such as commodity processing, storage and marketing (downstream agricultural sector). The emphasis was on providing boreholes and pumps to crop farmers through simple credit arrangements aimed at boosting aggregate crop output (Nkonya *et al*, 2008).

Fadama is the Hausa name for irrigable land are flood plains and low-lying area underlined by shallow aquifers and found along Nigeria river systems (Ingawa *et al*, 2004). Fadama also refers to a seasonally flooded area used for farming during the dry season. It is defined as alluvial, lowland formed by erosional and depositional actions of the rivers and streams (Qureshi, 1989). They encompass land and water resources that could easily be developed for irrigation agriculture (World bank, 1994). Fadama are typically waterlogged during the rainy season but retain moisture during the dry season. The areas are considered to have high potential for economic development through appropriate investments in infrastructure, household assets and technical assistance. When Fadama spread out over a large area, they are often called 'Wetlands' (Nkonya *et al*, 2008;

Blench and Ingawa, 2004). Wetlands are recognized by the RAMSAR convention (Ramsar is a place in Iran where the convention was signed) and it is of worldwide significance because of the biodiversity they support. Nigeria is a signatory to this convention. The Ramsar convention of 1971 defined wetlands as areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. In addition, there are human made wetlands such as fish and shrimp ponds, farm ponds, irrigated agricultural lands, salt pans, reservoirs, gravel pits, sewage farms and canals (Anon, 2004). Land currently used in crop production in the developing countries (excluding China) amounts to some 760 million ha of arid and hyper arid land made production through irrigation (FAO, 1995).

Second National Fadama development project in Nigeria

The Second National Fadama Development Project was borne out of the need to ensure all year round agricultural production using available Fadama resources in Nigeria and also a follow – up to Fadama 1 that was adjudged successful. Its approach was Community Driven Development (CDD) with emphasis on social inclusiveness and empowerment of the rural people to take charge of their development agenda (World Bank, 1994). The Project focused on increasing sustainably the incomes of Fadama Users through empowerment in terms of capacity building, advisory services, acquisition of productive assets and rural infrastructure development. As at mid – term, beneficiaries have increased their income by about 25%. So far, an estimated 2.3 million Fadama households have benefited from the expansion in incomes and wealth (asset) derived from the previously unavailable services provided by the project. The project had created about 126, 000 permanent jobs and an additional savings of more than \$40.8 million have been realized by the majority of the participating states (World Bank, 2003).

METHODOLOGY

A descriptive survey design was adopted to aid the collation of data from respondents in this study. All the Agricultural Cooperatives in the study area involved in FADAMA programme and engaged in the production of food crops qualified possible respondents. The Cooperatives are known as FUGs. A sample size of 216 was determined from a membership of 468 members using Taro Yameni's 1973 statistical formula for determining sample size of a known population is used.

$$n = \frac{N}{1+N(e)^2}$$

Where: n =sample size
 N = Population size
 1 = Constant
 e = Tolerable error (0.05).
 n = ?
 N = 468
 e = 0.05
 l = k

Therefore, to determine n; is:

$$n = \frac{468}{1 + 468(0.05)^2}$$

$$n = \frac{468}{1 + 468 \times 0.025}$$

$$n = \frac{468}{1 + 1.17}$$

$$\frac{468}{2.17}$$

$$n = 215.67$$

$$n = 216.$$

Data collected were analyzed using both descriptive and inferential statistical tools in realizing the objective on the socio-economic characteristics of the respondents; and estimating the determinants of food production in the study area. For the determinants of food production, multiple regression analyses were used as specified below:

Model specification

The multiple regression models of which its four functional forms were tried and specified in explicit form as follows:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + e \text{ (linear)}$$

$$\ln Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + e \text{ (Exponential)}$$

$$\ln Y = b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + b_9 \ln X_9 + b_{10} \ln X_{10} + e \text{ (Double log)}$$

$$Y = b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + b_9 \ln X_9 + b_{10} \ln X_{10} + e \text{ (Semilog)}$$

Table 1: Distribution of respondents by socio-economic characteristics.

Descriptive Statistics						
	N	Range	Minimum	Maximum	Mean	Std. Deviation
Education	216	16.00	.00	16.00	6.7269	5.20951
Age	216	59.00	22.00	81.00	44.5972	13.91368
F/exp	216	40.00	.00	40.00	7.0880	7.30700
HH/size	216	12.00	.00	12.00	4.4583	2.50174
Farm size	216	4.90	.10	5.00	2.8130	1.64614
Income	212	74999.00	1.00	75000.00	12111.55	17324.07413
Gender	216	1.00	.00	1.00	.4120	.49335
Valid N (listwise)	212					

Source: Computed from field survey, 2009.

RESULTS AND DISCUSSION

To analyze the socio-economic characteristics of members of agricultural cooperatives in the study area; a descriptive statistic is employed as shown in (Table 1). From (Table 1), data on educational attainment posted a mean of 7 years in terms of acquisition of formal education. The least had no formal education while the maximum years of acquisition of education in the area was 16 years. Majority of the work force attended primary school and as such, not too educated. Obasi (1991) opined that higher levels of education attained by the labour force not only increases their productivity but also enhances their ability to understand and utilize new technologies. Age ranged from 22 years to 81 years in the study area with a mean of about 45 years. This implied that the ages of the respondents cluster around middle age and show that they fall within the active age brackets. Generally, active populations have the capacity and potential of providing virility, energy and efficiency required for greater efficiency and productivity (Nwachukwu and Onyenweaku, 2007).

Farming experience acquired posted a mean of 7 years. This implies that at least every farmer in the study area must have spent a minimum of 7 years in farming business, which unequivocally impacts on their farming technique. Higher years of experience have the capacity of enhancing the skills and technical competence of the workers. Household size revealed a mean of 4 persons per household. At that average, it implies that the households in the area are moderately sized and their paucity translates into reasonable cost savings given that less pressure is imposed on the household income. Farm size ranged from 1 hectare to 5 hectares of land with the attendant mean of 2 hectares per household. This implies that there is relatively good ownership of farm lands which is directly related to the extent of production.

Minimum income per annum was ₦1, 000 with an average of ₦12, 111. 55. The income range between the least and the highest earners seem to be wide. By implication, an average worker in the area earns about ₦12, 000 per month as income. This income status is a little higher than government approved minimum income of ₦7, 500 per month. Gender represented by dummy and for 0 and 1 for female and male respectively. A negative mean of 0.4 implies that farming in the study area is a female dominated activity. From the analysis of the socio-economic characteristics of the respondents, it could be inferred that the area is dominated by middle-aged, fairly educated workforce with an appreciable income level, minimal household size, reasonable farming experience, reasonable ownership of farmland and a female dominated workforce in respect of food production activity.

To estimate the determinants of food production among Cooperators, multiple regression analysis was employed and variables of interest were: age, education, farming experience, gender, household size, income, input cost depreciation and extension contact. The result was presented in (Table 2).

From (Table 2), four functional forms of multiple regression analysis were used namely: Linear, Cobb-Douglas, Semilog and Exponential. On the basis of statistical and econometric criteria such as values and magnitudes of the R^2 , f-ratio, the number of signs of the significant variables, the linear function was chosen as the lead equation.

The coefficient of multiple determinations (R^2) was about 73% and this measures the goodness of fit at a relatively high percentage. Also, the F-ratio of 13.317 is significant at 99% confidence level and strengthens the suitability of the data to the regression line.

At various levels of probability, gender, education, farming experience, farm size and input cost were

Table 2: Determinants of food production among cooperators.

Variables	Linear	Cobb-Douglas	Semilog	Exponential
Constant	230.064 (3.7897) ^{xxx}	6.361 (8.113) ^{xxx}	459.490 (2.231) ^{xx}	5.520 (21.388) ^{xxx}
Gender	-13.737 (-2.702) ^{xxx}	0.103 (1.094)	21.220 (-0.854)	-0.021 (-0.258)
Education	5.955 (2.047) ^{xx}	-0.099 (-2.202) ^{xx}	-2.085 (-0.086)	0.003 (0.261)
Age	-0.756 (-0.909)	-0.159 (-1.040)	-57.328 (-2.832) ^{xxx}	-0.032 (-10.667) ^{xxx}
F/Experience	3.750 (2.195) ^{xx}	0.082 (2.563) ^{xxx}	13.014 (0.796)	0.016 (2.536) ^{xxx}
HH/Size	0.880 (0.013)	-0.116 (-1.364)	-11.334 (-0.507)	-0.026 (-1.349)
F/Size	16.829 (2.909) ^{xxx}	-0.094 (-0.973)	-8.777 (-0.347)	-0.057 (-1.540)
Income	0.000 (-0.189)	0.086 (3.307) ^{xxx}	13.986 (2.086) ^{xx}	-5.725 (-1.903) ^x
Input Cost	-0.031 (-31.702) ^{xxx}	-0.096 (-4.173) ^{xxx}	-15.701 (-2.451) ^{xx}	-3.435 (-0.843)
Depreciation	-0.003 (-0.406)	-0.048 (-1.020)	-7.595 (-0.613)	-3.005 (-0.960)
Ext. Contact	-0.215 (1.156)	-0.211 (-2.114) ^{xx}	0.303 (1.600)	0.495 (3.414) ^{xxx}
R ²	0.729	0.625	0.561	0.727
F – ratio	13.317	10.811	9.409	9.293

Source: Computed from field survey, 2009.

Note: xxx, xx, and x represent significance level at 0.01, 0.05, 0.10 probability respectively. Values in parenthesis are t – values.

statistically significant. The coefficient of gender had a negative sign and significant at 1% risk level. This implies that food production in the study area is a female dominated activity. Although it contradicts aprior expectation, the result consolidates the findings of Nwachukwu and Onyenweaku (2007) that had a similar outcome.

In line with aprior expectation, education, farming experience and farm size had positive coefficients. The result indicates that any 1% increase in food production is triggered by 5.96%, 3.75%, 16.83% rise in the values of education, farming experience and farm size respectively. Input cost exhibited a negative coefficient in line with economic theory. Increase in the cost structure of food producers has the tendency of reducing output and profit. The research outcome is consistent with the findings of Jiriko (2008), and Okonkwo et al (2009) who had similar significant variables in their studies. The study was necessitated by the increasing consumption and demand for food products in the developing nations like Nigeria; since food constitutes the basic need of man in life. In the first section, it was the objective of this study to assess the impact of agricultural cooperatives on food production by analyzing the socio-economic characteristics of the members of agricultural cooperatives in Ugwunagbo L.G.A of the state, estimating the determinants of food

production among the cooperative members in the area. The agricultural cooperatives involved in the Fadama project were selected for the study. The Fadama project was borne from the increasing reduction in production and productivity which has continued to characterize the Nigerian agricultural sector thereby, limiting the ability of the sector to perform its traditional role in economic development. It was found from the study that agricultural cooperatives exerted positive impact on farm size, income and output, while, non-cooperators stood a higher position than cooperators in productivity, confirming previous findings of (Ahaotu *et al.*, 2017; Nwachukwu and Ezech 2007).

Conclusion and Recommendations

This study on agricultural cooperatives and food production is a revelation of the instrumentality of agricultural cooperatives on food production. Agricultural cooperatives by this study are found to assume a positive ground for food production only when their operational variables are properly put in place. A strengthening of the ability of cooperatives in accessing production facilitating variables will achieve the objective of a hunger free economy. This means the encouragement of collective

farming as against traditional farming system. This is the focus of Fadama to enable farmers sustainably increase their income. Deductions from the objective of Fadama support the idea of a formalized collective action of farmers for accessing grants for agricultural activities. It is unequivocal that group action leads to achievement of a corporate goal. In the study area, food production activity is a female dominated activity with the least of formal education. The farmers are mostly in the active age bracket with a relatively good farm sizes, leading to a good income profile of the members. Among the determinants of food production in the area, gender; education; farming experience; farm size and input cost were statistically significant. The Researchers thereby recommended that extension services be strengthened in the stud area with concerted effort on women; there should also be government intervention in favourable land reforms with consequent mounting of development programmes that would make grants easily accessible by farmers.

REFERENCES

- Ahaotu EO, Ihenacho RA, Ike A, Ihenacho AC (2017). Socio-economic and management practices of Duck in Imo State. A study of Orlu Local Government Area, Imo State, Nigeria. *Direct Journal of Agriculture and Food Science*. 5 (6): 250-255.
- Ahaotu EO, Anietie EM, Iwunze FC, Ihenacho RA (2016). Marketing of Poultry and Poultry Products in Itu Local Government Area of Akwa Ibom State, Nigeria. *International Journal of Environmental and Agriculture Research (IJOEAR)* 2 (8): 93-95.
- Alegieno J (1985). Cooperative Marketing of Scheduled Commodities. A case study of grains; in Okoro Okereke (1985), *Cooperative and The Nigerian Economy*. Enugu, UNN press Nsukka.
- Ajibefun IA, Aderinola EA (2004). Determinants of Technical Efficiency and Policy Implication in Traditional Agricultural Production: Empirical Study of Nigeria Food Crop Farmers. Final Report Presentation at Bi – annual Research Workshop of African Economic Research Consortium, Nairobi, Kenya.
- Berko SY (2001). "Agricultural Producer Cooperative and Agricultural Development in Nigeria" Okeke E.U (ed): *Nigerian Journal of Cooperative Economics and Management (NJCEM)* voi.1 No 1.
- Blench RM, Ingawa SA (2004). A Practical Guide for National Fadama Development Project II on Conflict and Management. The World Bank PCF/Government of Nigeria PCU Fadama 11.
- FAO (1995). World Bank: Towards 2010. Food and Agriculture Organization of the United Nations, Rome.
- Iheanacho AU, Ahaotu EO (2017). Role of Cooperative Thrift and Credit Societies in Agricultural Financing: A Study of Selected Thrift and Credit Societies in Mbaitolu Local Government Council, Imo State, Nigeria. *Journal of Agricultural, Biological and Environmental Sciences*. 4: 51-55. www.jakraya.com/journal/jabes.
- Ingawa SA, Oredipe AA, Idefor K, Okafor C (2004). Facilitators Project Implementation Manual. Second National Fadama Development Project (Fadama 11). Federal Ministry of Agric and Rural Devt. Abuja, Nigeria.
- Jiriko R (2008). Socio-economic Factors Affecting the Performance of Women in Food Production. Proceedings of the 42nd Annual Conference of Agricultural Society of Nigeria (ASN) held at EBSU, Abakaliki, 19th – 23rd October.
- Nkonya E, Philip D, Mogue T, Pander J, Yahaya MK, Adebowale G, Arokoyo T, Kato E (2008). Impacts of a Pro – Poor Community – Driven Development Project in Nigeria. IFPRI discussion Paper 00756, IFPRI Washington.
- Nwachukwu IN, Ezeh CI (2007). Impact of Selected Rural Development Programmes on Poverty Alleviation in Ikwuano LGA of Abia State. *African Journal of Food, Agriculture, Nutrition and Development*. 7(5).
- Nwachukwu IN, Onyenweaku CE (2007). Economic Efficiency of Fadama Telfarie Production in Imo State, Nigeria: A Translog Profit Function Approach. *Journal of Agricultural Research and Policies*, 1(4).
- Obasi PC (1991). Resource Use Efficiency in Food Crop Production: A Case of the Owerri, Imo State, Nigeria.
- Okonkwo MO, Mbah OI, Bamidele A (2009). Determinants of Yam Output in Rural Agrarian Communities: A Case of Ikwo LGA of Ebonyi State. *International Journal of Agriculture and Rural Development*. 11 (2).
- Okoro CN (2009). Towards Effective Marketing of Agricultural products: The Cooperative Approach. Seminar paper presented to the Department of cooperative Economics and Management, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.
- Okoro CN (2005) Agricultural Cooperatives; A Strategy for High Food Production. A B.Sc Project Submitted to the Department of Cooperative Economics and Management, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.
- Onah JO, Anyanwu J (1985). Measures to Strengthen Cooperative Marketing; in Okoro Okereke eds. *Cooperative and The Nigerian Economy*. Enugu, UNN press Nsukka.
- Onwuchekwa CI (1985). *Agricultural Cooperatives and The Problem of Transition*. Sweden, University of Stockholm.
- Qureshi M (1989). Water Management in Fadama Crops. A Paper presented at the National Workshop on Fadama and Irrigation Development in Nigeria held at Zaranda Hotel, Bauchi, Nigeria, 1989.
- Ugwuh DS (2006). Principles of Agricultural Economics for Cooperatives: in Umehali E. E eds. *Readings in Cooperative Economics and Management*. NAU, Awka, Anambra State, Nigeria.
- World Bank. (1994). Staff Appraisal Report. National Fadama Development Project, Kano, Nigeria.
- World Bank (2003). Nigeria – Second National Fadama Development Project: Project Appraisal Document. Electronic Ms.