

Socio-Economic Evaluation of Cassava Production by Women Farmers in Igbo-Eze North Local Government Area of Enugu State, Nigeria

Okereke, Chukwuma Odii

Department of Agricultural Economics, Management and Extension
Ebonyi State University, Abakaliki, ok_choox08@yahoo.co.uk



Abstract

Received: 5 January 2013,
Reviewed: 28 January 2013,
Revised: 5 February 2013,
Accepted: 22 February 2013

A research was conducted to evaluate cassava production by women farmers in Igbo-Eze North Local Government Area of Enugu State, Nigeria. One hundred and twenty smallholder female cassava farmers were selected using multi-stage sampling. Data were collected from the respondents using questionnaire and interview schedule. Then descriptive statistics (mean, frequency and percentage) were used in analyzing the data obtained. Result showed that 60% of the respondents were in the age range of 30-60 years. Seventy three percent of them had one form of formal education or another. Majority (78%) of them cultivated 0.5-2.5ha of land with cassava per annum indicating that they were mainly small-scale producers. The use of manual implements such as hoes and cutlasses was pronounced in cassava production by the women farmers. Furthermore, the dominant source of finance for cassava production was personal saving (82%) with only 8% of them obtaining micro-credit from banks. Then 94%, 10%, 3% and 1% of the farmers processed their cassava into garri, fufu, chips and starch respectively. Result also revealed a number of constraints militating against cassava production by the women farmers in the study area. These include among others; lack of finance (93%), high cost of fertilizer (88%) and sex discrimination (81%) in relation to access to land and decision making. Climate change was also found to be a significant factor constraining cassava production in the study area. It was suggested that the women farmers should constitute themselves into cooperative societies to enable them access loans from banks for cassava production. [O. C. Odii. **Socio-Economic Evaluation of Cassava Production by Women Farmers in Igbo-Eze North Local Government Area of Enugu State, Nigeria.** *International Journal of Agricultural Science, Research and Technology*, 2012; 2(3):129-136].

Key words: Socio-Economic, Evaluation, Cassava Production, Women Farmers

1. Introduction

Cassava is a very versatile crop having many by products and is one of the most important crops produced in Nigeria. It has different uses in different cultures depending on people's traditions and preferences. For example, the leaves may be consumed as vegetable or used ingredient in soup making. It is also dried and fed to livestock as a feed supplement. The stem is used for plant propagation and grafting while the roots are typically processed for human consumption in form of fufu, garri and flour and for industrial purposes in form of starch, flour and ethanol. Cassava is a major root crop grown throughout Nigeria for cash, food, feed and raw material for agro-allied firms for the production of starch, alcohol, pharmaceuticals and confessionalary (Onwumere, et al. 2006; Francisco, 2004).

Nigerian cassava production is by far the largest in the world; a third more than the production in Brazil and almost double the production in Indonesia and Thailand (FAO, 2004a). The country's total production in 2005 was 38 million tons (FAO, 2006). Comparing the outputs of various crops in

Nigeria, cassava ranks first, followed by yam production at 27 million tons in 2002, sorghum at 7 million tons, millet at 6 million tons and rice at 5 million tons (FAO, 2004b). On a per capita basis, north central is the highest cassava-producing region at 0.72 tons per person in 2002, followed by southeast at 0.56 tons per person (IITA, 2004).

The prominence of cassava on the national agricultural profile of Nigeria could be seen in the fact that it is efficient in the production of energy required by humans and is suitable for the present farming system in Nigeria (Olakulehin and Ajiola, 2005). Also the crop plays a dominant role in the food security of rural households because of its capacity to yield under marginal soil conditions and its tolerance to drought (Ezedinma, et al. 2006). According to (FAO, 2003) cassava is a cheap and reliable source of food for more than 700 million people in the developing world.

About 84% of cassava output in Nigeria is consumed as food while 16% production is utilized for industrial purposes in the proportions of 10% as chips in animal feed, 5% as syrup concentrate for soft

drinks while less than 1% is processed into high quality cassava flour used in biscuits and confectionary, dextrin pre-gelled starch for adhesive, starch and hydrolysates for pharmaceuticals, and seasonings (Kormawa and Akoroda, 2003). In Nigeria, the consumption pattern varies according to ecological zones (FAO, 2004). Gari, a roasted granule is the dominant product which is widely accepted in both rural and urban areas. Fufu and Akpu, a fermented wet paste from cassava is also widely consumed throughout the country especially in the southern zones. FAO (2004c) observed that cassava consumption is finding a new place in the diets of both rural dwellers and up and coming urban elites and that it is a Nigerian staple food with industrial potentials (FAO, 2004c).

Scott et al. (2000) noted that sub-Saharan Africa is expected to experience the most rapid growth in the demand for roots and tubers (including cassava products) ranging from 2.7% per year through the year 2020. Nigeria's production is targeted at 60 million tons by 2020 (IITA, 2002). The enhanced status of cassava is as a result of increased demand for cassava and cassava products outside the peasant families and the rural communities as well as the realization of the attainment of self sufficiency and food security in food production in Nigeria (Mensa, 2002).

Cassava is important not just as a food crop but it also plays a major role as a cash crop which serves as a major source of income for producing households. It has been reported variously that the crop has become a basic raw material for many small scale businesses such as cassava flour mills, bakeries, fast foods firms, restaurants, garri processing firms and is currently an income generating activity (Kormawa, et al; 2002). As a cash crop, it generates substantial cash income in comparison with other staples such as yam, rice and others. It also contributes significantly to poverty reduction among the rural communities in Nigeria.

Today, women constitute a substantial proportion of the people involved in the production, processing, marketing and utilization of cassava and its products in Nigeria. Fresco (1998) noted that about 70% of the agricultural workers, 80% of food producers, 100% of those who process basic foodstuffs and 60% to 90% of rural marketers are women. The technical centre for agriculture and rural cooperation reports that women in Africa make up more than one-third of the world labour force in agricultural production (CTA, 1998). In Nigeria, women produce 60 – 80% of the food in the country (Ogunbameru and Pandey, 1992; Buckland and Haleegoach, 1996). Furthermore, women are responsible for 70% of actual farm work and

constitute up to 60% of the farming population in Nigeria (Mijindaji, 1993). Yahaya (2002) observed that about 76% of women in Oyo and Bauchi states are actively involved either in their own farming activities or in their husband's farms.

However, women in Nigeria face enormous challenges in agricultural production. Some of these challenges are those associated with their socio-economic statuses while some have to do with environmental and institutional factors. For example, Saito and Surling (1993) reported that inadequate information about improved technologies was one of the major constraints to women in agricultural production. In Nigeria, especially in most parts of Igbo land, women rarely own land (Arua, 1978), despite their substantial level of involvement in agricultural production. Women are also constrained in cassava production and processing in terms of lack of access to efficient markets. In most cases, the farming household sells their cassava tubers in unprocessed forms to middle men thereby losing a substantial proportion of the profit margin accruable at the level of processing into garri and other cassava products. This is most often attributed to the poor condition of rural roads which makes transportation of fresh cassava and processed products to urban markets difficult. Generally there are numerous challenges to cassava production which could be grouped under agronomic, institutional/technical and financial constraints (Akinngbe, 2010).

Consequently, the wealth obtainable from cassava production, processing and marketing remains under serious threat if nothing is done to improve the operating environmental and socio-economic conditions of the farmers in terms of asset holding, welfare and credit availability (Onwumere, 2010). In the light of the foregoing, it is necessary to empirically explore various issues as it relates to cassava production by women farmers especially in Igbo-Eze North Local Government area of Enugu State where no study on this subject matter had been done previously. Therefore, the need to fill this perceived gap in knowledge underpins the essence of this study. The study had its specific objectives as to: describe the socio-economic characteristics of the women cassava farmers in the area; analyze the types and sources of inputs used in cassava production in the area and analyze the constraints to cassava production by the respondents.

2. Materials and methods

The Study Area

Igbo-Eze L.G.A is one of the seventeen local government areas in Enugu state, Nigeria. The area is made up of 29 communities with its headquarters at Ogrute (ESMOCM, 2012). According to NPC

(2006) the population of the area is 259,431 comprising 138,006 males and 121,425 females.

The vegetation of the area is of savannah grassland type with two distinct seasons namely; rainy and dry seasons. However, there is usually a period within the dry season characterized by dusty and extremely dry air. The total land area has been estimated at approximately 293km² with the production of crops such as cassava, yam, leafy vegetables, corn, and groundnut and rearing of animal as the major economic activities of the local people.

Sampling and Data Collection

The sampling involved the use of cluster sampling to select 120 women cassava farmers who supplied the data used in the study. The choice of 120 as the sample size was based on the number of women farmers in the study area. The first stage involved the random sampling of 6 communities out of 29 communities that make up the study area. At the second stage, 2 villages were randomly selected from each of the 6 selected communities, making a total of 12 villages. Then ten 10 rural women farmers engaged in cassava production were randomly selected from each of the 12 villages giving a total of 120 respondents. The sampling was based on sampling frame provided by the Enugu State Agricultural Development Programme (ENADEP) office.

The relevant data were collected using mainly questionnaire which was administered as interview schedule in cases where uneducated respondents were involved. The data collection instrument was designed in such a way as to obtain relevant field data that will satisfy each of the specific objectives of the study.

Data Analysis

Data obtained were coded and transferred into computer excel spread sheet from the questionnaire before the actual analysis using SPSS software. The analyses were carried out using mainly descriptive statistics (frequency distribution, mean and percentage).

3. Results and discussion

The findings of the research from the analysis of the field survey data are presented in tables and discussed hereunder in line with the specific objectives of the study.

3.1. Socio-economic Characteristics of Respondents

The result obtained on the socio-economic characteristics of the women cassava farmers are presented in Table 1.

Table 1. Frequency distribution of respondents according to socio-economic characteristics

Variable	frequency	(%)
Age (years)		
20-29	15	12.5
30-39	32	26.7
40-49	27	22.5
50-59	13	10.8
60-69	22	18.3
70-79	11	9.2
Total	120	100
Marital Status		
Married	73	60
Single	9	9.2
Widowed	29	23.3
Divorced	9	7.5
Total	120	100
Educational level		
No formal Education	33	27.5
First School Leaving Certificate	27	22.5
Junior School Certificate	3	2.5
Senior School Certificate	25	20.8
Teacher's Training Certificate	4	3.3
National Certificate in Education	6	5
Ordinary National Diploma	8	6.7
Higher National Diploma	10	8.3
First Degree	4	3.3
Total	120	100
Household size		
1-3	39	32.5
4-6	57	47.5
7-9	23	19.2
10-12	1	0.83
Total	120	100
Farming experience		
1-9	35	29.2
10-19	38	31.7
20-29	22	18.3
30-39	11	9.2
40-49	12	10
> 50	2	1.7
Total	120	100
Farm size		
0 - 1.5	93	77.5
1.6 - 2.0	24	20
2.1 - 2.5	2	1.7
> 2.5	1	0.83
Total	120	100
Annual farm income		
≤ 20,000	25	20.8
20,001-40,000	8	6.7
40,001-60,000	13	10.8
60,001-80,000	10	8.3
80,001-100,000	42	36.7
≥ 100,000	20	16.7
Total	120	100

Source: Field Source, 2010

Result shows that that a greater proportion (60%) of the respondents fell within the age range of the active work force of 30 – 59 years while 28% were 60 years and above, indicating that elderly

women were also engaged in cassava production in the study area. About 60% of the respondents were married while 9 % of them were single. However it was also observed that the percentage of the widows was as high as 23% which is considered to be rather on the high side. This might affect their productive capacity in terms of farm hectarage since these widows may not have as much access to land as women whose husbands are still alive.

In terms of educational attainment, 72% of the respondents had one form of formal education or the other though mostly concentrated at the primary to post primary levels. However, result also showed that 28% of the respondents had no formal education. Of course farmers educational level have been associated in researches with the ability or inability of farmers to access relevant information, adopt new technologies and access credit from financial institutions for agricultural purposes (Masakazu 2002; Knight et al. 2003).

The study also found that the modal class of household size having 4 – 6 family members was 48% of the respondents. This result seems to concur with the earlier finding on the age distribution of the respondents. Those that had household sizes of 7-9 persons and 10-12 persons were 19% and about 1% of the women farmers respectively which could be attributed to the presence of the older farmers of 60 years and above in the sample.

In relation to the length of experience in farming among the respondents, result revealed that 29% of the farmers had been in farming for a period of 1-9 years. Furthermore, those that had been in farming for 10-19 years constituted 32% of the sample while 18% of the respondents had been in farming for 20-29 years. Only about 12% of them had been in farming for over 40 years. Omonona et al (2010) showed that farmers' level of experience in the production of a particular commodity is one of the determinants of their ability to maximize output using available inputs.

One of the parameters for determining the scale of operation of farmers is the size of land they cultivated per annum. Based on this, it was found that the majority of the women cultivated between 0.5-2.5hectares of land per annum. Specifically, 78% of them cultivated 0.5-1.5 hectares while 20% cultivated 1.6-2 hectares of land per annum. Those who cultivated 2.1-2.5 hectares were about 2% of the sample while only about 1% cultivated above 2.5 hectares of land per annum. The implication of the above result is that these female farmers were indeed smallholders since they operated on relatively small hectarage. Oladebo (2004) had observed that agriculture in Nigeria is dominated by smallholder farmers. This of course has some implications on

their capacity to generate adequate income to meet their daily household needs and stay in production. It might as well affect their capacity to access formal credit for agricultural purposes.

Concerning the average annual farm income of the farmers, result shows that 83% of the respondents earned less than ₦100,000 from farming per annum while only 17% of them earned an annual farm income above ₦100,000. This implies that majority of the respondents were likely to be poor and as such may find it difficult to access credit from financial institutions due to lack of required collateral.

3.2. Types and Sources of Inputs used in Cassava Production

There cannot be any meaningful production without the availability of certain limiting and limited economic resources generally known as resources or production inputs. It was therefore necessary to identify and analyze the types and sources of inputs used by the women cassava farmers in the study area. The result obtained is presented in Table 2 and discussed hereunder.

Table 2. Frequency distribution of respondents according to types and sources of inputs

Types/sources of input	f	%
Source of land		
Inheritance	68	56.8
Purchase	31	25.8
Lease	49	40.8
Communal	20	16.7
Total	*168	
Types of labor		
Manual implements	110	91.7
Machine	25	20.8
Total	*135	
Means of conveying produce		
Public transport	80	66.7
Human carriage	30	25
Personal vehicle	31	25.8
Bicycle	12	10
Motocycle	27	22.5
Total	*180	
Source of finance		
Personal savings	98	81.7
Friends and relations	45	37.5
Isusu savings and loans	26	21.7
Cooperative	19	15.8
Bank	10	8.3
Total	*198	

*Multiple responses obtained

Result shows that 57% of the respondents sourced their farm land through inheritance of family lands while 41% obtained theirs through lease. Twenty five (25%) obtained farm land mainly through outright purchase while communal land was a source of land for 17% of the respondents. It is important to note here that the land acquisition arrangements here were mainly made by the household heads which in most cases were males.

In terms of labour, the use of manual implements such as cutlasses and hoes was pronounced in the area as against the use of farm machinery. Specifically, 92% the respondents acknowledged the use of manual labour while 21% used mechanized labour. Furthermore, the major means of transportation for cassava tubers and products was the use of public transport which was 67% of the responses. Other means of transport among the women farmers were: personal cars (26%), human carriage (25%), motorcycle (23%) and bicycle (10%).

On the sources of finance for cassava production by the women, result showed that 82% of the respondents financed their cassava production from personal savings. About 38% of the respondents obtained fund from friends and relatives while 22% obtained their fund through isusu contributions. Only 8% of the respondents sourced their fund from the banks. The general finding here might explain the low level of annual income of these farmers as earlier discussed. This is because informal sources of micro-credit do not extend reasonable sums of money to borrowers in most cases especially in the rural area. As such the productive capacities of the farmers are highly constrained based on available fund.

3.3. Major Types of Cassava Products Obtained

Table 3 shows the frequency distribution of the types of cassava products obtained from cassava tubers by the women farmers in the study area.

Table 3: Frequency distribution of respondents according to types of cassava product produced

Product	Frequency	Percentage (%)
Garri	113	94.2
Fufu	13	10.8
Chips	3	2.5
Starch	1	0.85
Total	*130	

*Multiple Responses Obtained

Ninety four (94) percent of the farmers used their cassava tubers mainly for the production of garri which is a fried granulated cassava product often eaten in a gelatinized form with soup. Fufu, a product

of fermented cassava tubers usually cooked, pounded and eaten with soup was acknowledged by 11% of the respondents as their major cassava product. Then only 3% and about 1% of them produced cassava chips (tapioca) and starch respectively from their cassava tubers. It is obvious from the above result that despite the much orchestrated presidential initiative on cassava, that these farmers were yet to benefit from the much talked about benefits accruable from industrial uses of cassava such as the production of starch and flour. Of course this can only be possible if there is a functional marketing value chain which will ensure the timely evacuation of the produce from the rural areas to the industrial plants where they could be processed into the industrial raw materials such as starch and flour.

3.4. Constraints to Cassava Production by the Respondents

Constraints are factors that tend to limit the level of efficiency of operation in any system such as the small scale cassava production system operated by the women farmers in the study area. A number of constraints which are mainly socio-economic in nature were found to be affecting the farmers as presented in Table 4.

Table 4. Frequency distribution of respondents according to constraints to cassava production

Constraints	f	%
Unavailability of planting material	83	69.2
Inadequate finance	111	92.5
Distance location to market	61	50.8
High cost of fertilizer	106	88.3
Inadequate storage facilities	61	50.8
High cost of labor	72	60
Inadequate transportation	50	41.7
Price instability of cassava product	49	40.8
Seasonality of labor	50	41.7
Lack of market information	60	50
Lack of access to fertile land	60	50
Lack of processing facilities	67	55.8
Sex discrimination in land acquisition	97	80.8
Poor storage facilities	57	47.5
Climate related problems	84	70
Land fragmentation	59	49.2
Low fertility of soil	75	62.5

Result showed that 93% of the respondents identified inadequate finance as a major constraint to cassava production in the area. This is expected considering the fact that these farmers used mainly their personal savings in production. High cost of fertilizer was identified by 88% as a major constraint while another 81% of the respondents identified sex discrimination in land acquisition as a major constraint. Generally, sex discrimination in terms of limited involvement of women in farming decisions

such as land use has been identified as one of the factors affecting women in agricultural production in Nigeria (Yemisi et al. 2009).

Another constraint identified by the respondents was climate related problems such as variability in annual rainfall regime, flooding and drought. This was acknowledged by 70% of the women cassava farmers. The finding here is not surprising since various studies have linked different problems of the agro-ecosystem and agricultural productivity with climate change impacts (Mendelsohn et al. 2000; Olesen and Bindi, 2003; Maracchi, et al. 2005; IFAD 2010; Till, et al. 2010). Specifically, cassava output is negatively affected under a flooded ecology since excess water in the soil encourages the process of rotting of cassava tubers before harvesting. Also, excess heat which could be occasioned in the soil by climate change also has a similar effect on cassava tubers.

Apart from the constraints above, other factors mentioned by the women farmers are; unavailability of planting materials (69%), low fertility status of the soil (63%), high cost of labor (60%), lack of processing facilities (56%) and lack of access to fertile land (51%). In addition, lack of storage facilities and lack of market information were also identified as major constraints by 51% and 50% of the farmers respectively while 49% identified problems associated with land fragmentation as a constraint. Other constraints include distant location of markets (50%), seasonality of labor supply (42%) and inadequate transportation system.

Indeed, most of the constraints identified in the foregoing analysis seem to be recurrent items based on findings of previous researches (IITA 1984; Futa 1992). As such it is evident that the small holder cassava production especially in the tropics is being done under a system that is still fraught with myriad of problems that may require general policy solutions.

4. Conclusion and Recommendations

The study explored a number of socio-economic issues related to cassava production by smallholder women farmers in Igbo-Eze North Local Government Area of Enugu State, Nigeria. Result showed among other things that the farmers were using mainly fund from personal savings for their cassava production due to lack of access to formal agricultural credit. This has considerably reduced their scale of operation thereby affecting their capacity to produce for commercial purposes. Also, a number of constraints were found to be affecting the women farmers in their cassava production venture. Such constraining factors include among others; inadequate finance, high cost of fertilizer, sex discrimination in access to land and climate-related

problems. Based on the findings, it is recommended that the government should institute a micro-credit scheme targeted mainly at the women cassava farmers since it has been severally observed that women are the major producers of this crop. Also, it is suggested that the women should constitute themselves into cooperative societies to enable them access loans from banks for cassava production.

Acknowledgement

I sincerely appreciate the invaluable contributions of my student Urama, Kingsley to the success of this study, especially in the area of data collection.

References

1. Akinagbe, O. M. (2010). Constraints and strategies towards improving cassava production and processing in Enugu North Agricultural Zone of Enugu State, Nigeria. *Bangladesh Journal of Agricultural Research*. 35(3): 387-394.
2. Buckland, L. and Haleegoah, J. (1996). *Gender Analysis in Agricultural Production*, IITA Research Guides 58 Training programme. International Institute of Tropical Agriculture (IITA), Ibadan Nigeria, Pp: 8 – 14.
3. Technical Centre for Agricultural and Rural Cooperation (CTA). (1998). *A Woman's rightful Place*. Spore Bimonthly Bulletin. Technical Centre for Agricultural and Rural Cooperation (CTA), Netherlands No.44.
4. EMOCM. (2012). Enugu State Ministry of Chieftaincy Matters. Retrieved on 07/02/12 from <http://ensmcm.org/Igboeze-North.htm>
5. Ezedinma, C. I., Okafor, C., Asumugha, G. N. and Nweke, F. (2006). Trends in farm labour productivity and implications for cassava industrialization in Nigeria. *Proceeding of the 40th Annual Conference of the Agricultural Society of Nigeria held at NRCRI Umudike, Abia State. October 16th – 20th, 2006. Pp 109 – 115.*
6. Food and Agricultural Organization (FAO). (2003). FAOSTAT, FAO Statistical database Agriculture. Food and Agriculture Organization. Retrieved on 07/02/12 from <http://faostat.Fao.org>.
7. Food and Agricultural Organization (FAO). (2004a). Trends in cassava production. www.fao.org.
8. Food and Agricultural Organization (FAO). (2004b). *Online Statistical Database*. Rome, Italy: Food and Agriculture Organization of the United Nations, website www.Fao.org.
9. Food and Agricultural Organization (FAO). (2004c). *The global cassava development strategy*. International fund for Agricultural development, Food and Agriculture Organization of the United Nations. Rome 2004.

10. Food and Agricultural Organization (FAO). (2006). FAOSTAT. Statistics division of the Food and Collections. Sub set Agriculture. Agricultural Organization. <http://faostat.Fao.org>.
11. Federal Ministry of Agriculture and Rural Development (FAO). (2004). Federal Ministry of Agriculture and Rural Development, Nigeria Annual Report, 2004.
12. Francisco, D. R. V. (2004). The determinants of firms growth: An empirical examination series documents of Trabajo April 2004 draft. P.3.
13. Fresco, L. O. (1998). Nigeria Agricultural Education an Opportunity in Rural Development for Women sustainable Development, Food and Agricultural Organization (FAO), for the United Nations Pp.4.
14. Futa, M. T. (1992). Structural Adjustment Programs and their Implications for Agricultural Development in Africa. Invited paper presented at the at the International Symposium on "Sustainable Food Production in Sub-Saharan African" held at the International Institute of Tropical Agriculture (IITA), Ibadan to mark the 25th Anniversary of the Institute, 7 – 9 December 1992.
15. International Fund for Agricultural Development (IFAD). (2010). IFAD re-iterates negative impacts of climate change on Agriculture. Retrieved on 25/01/2011 from <http://ngrclimaterereports.com>.
16. International Institute for Tropical Agriculture (IITA). (1984). Annual Report, Ibadan, Nigeria.
17. International Institute for Tropical Agriculture (IITA). (2002). Competitiveness workshop. Opportunities for cassava in Nigeria. Bokanga, IITA – Ibadan.
18. International Institute for Tropical Agriculture (IITA). (2004). Nigerian's Cassava Industry: Statistical Handbook.
19. Knight, J., Weir, S and Woldehanna, T. (2003). The role of education in Facilitating risk-taking and innovation in agriculture. Journal of Development Studies 39(6), 1–22. In: Masakazu H (2010) www.econ.niigata-u.ac.jp/~hojo/farmer.pdf.
20. Kormawa, P. M., Kolawole, K. B., Azuogu, I., Okorji, E. C., and Ezedinma, C. I. (2002). Needs Assessment study for market-driven Agricultural Technology Transfer and Commercialization in Abia State Rusep series, pp. 8 – 26.
21. Kormawa, P. and Akoroda, M. O. (2003). Cassava supply Chain arrangements for industrial utilization in Nigeria. Ibadan: IITA.
22. Maracchi, G., Sirotenko, O and Bindi, M. (2005). Impacts of present and future climate variability on agriculture and forestry in the temperate region: Europe Climate Change 70:117-135.
23. Mendelsohn, R., Dinar, A and Dalfelt, A. (2000). Climate change impacts on African agriculture. Preliminary analysis prepared for the World Bank. Washington, D.C. In: Till, B., A. Artner; R. Siebert and S. Sieber (2010) Micro-level practice to adapt to climate change for African small scale farmers. A review of selected literature. Discussion Paper 00953. February, 2010. Environment and Production Technology Division. p.4.
24. Mensa T. A. (2002). Linkage with rural farmer. A processors experience promoting market-led agricultural technology transfer and commercialization in Nigeria Pp: 15 – 16.
25. Mijindadi, N. B. (1993). Agricultural Extension for women: Experience for Nigeria. Paper presented at the 13th World Bank Agricultural Research Management Washington, D.C. pp 6 – 7.
26. Ogunbameru, B. O. and Pandey, I. M. (1992). Nigerian Rural Women Participation in Agriculture as decision making focus on Adamawa and Taraba state. Nigerian Journal of Agricultural Extension, 7: 71 – 76.
27. Oladeebo, J. O. (2004). Resource-use efficiency of small and large farmers in South Western Nigeria: Implication of Food security. International Journal of Food and Agricultural Research 1 (1 & 2): 227.
28. Olakulehin, J. O. and Ajiola, F. S. (2005). Cassava Production: Nigerian's best kept secret Lagos farmer 1, Pp 2 – 4.
29. Olesen, J.E and Bindi, M (2002) Consequences of climate change for European agricultural productivity, land use and policy. European Journal of Agronomy, 16 (4):239-262.
30. Omonona, B. T, Egbetokun, O. A and Akanbi, A. T. (2010). Farmers Resource – Use and Technical Efficiency in Cowpea Production in Nigeria. Economic Analysis & Policy, 40 (1): 87-96.
31. Onwumere, J. (2010). Assets holding size and determinants of welfare of cassava-based investors in Abia State Nigeria. Proceedings of the 44th Annual Conference of Agricultural Society of Nigeria, held in LAUTECH, Ogbomoso Oyo State Nigeria. 18th – 22nd October, 2010, Pp: 131 – 133.
32. Onwumere J., Nwajiuba, C. U and Asumugha, G. N. (2006). Intra-Sectoral Linkapers in cassava based agribusiness in Abia State. Proceedings of Nigeria Association of Agricultural Economics, LAUTECH Ogbomoso, 2006. Oyo State, pp 53 – 61.
33. Saito, K. A. and Surling, D. (1993). Developing Agricultural Extension for Women Farmers. World Bank discussion paper No. 5, pp 20 – 25.

34. Scott, G. J., Rosegrant, M. W and Ringler, C. (2000). Roots and tubers for the 21st Century: Trends, projections, and policy for developing countries. Washing D.C: IFPRI.

35. Till, B., Artner, A., Siebert, R and Sieber, S. (2010). Micro-level practice to adapt to climate change for African small scale farmers. A review of selected literature. Discussion Paper 00953. February, 2010. Environment and Production Technology Division. p.1.

36. Yahaya, M. K. (2002). Gender and Communication variables in Agricultural Information Dissemination in two Agro-ecological zones of Nigeria. Research Monograph, University of Ibadan, pp: 68.

37. Yemisi I. O and Aisha A. M. (2009). Gender Issues in Agriculture and Rural Development in Nigeria: The Role of Women. Humanity & Social Sciences Journal, 4 (1): 19-30