Comparative Analysis of Adoption and Utilization of Women–in–Agriculture Programme Technologies among Farmers in Abia State, Nigeria

Nwaobiala, C. U.
Department of Rural Sociology and Extension
Michael Okpara University of Agriculture Umudike, Abia State, Nigeria
Corresponding Author Email: *cunwaobiala@gmail.com*

Abstract

The study evaluated the adoption and utilization of Women-in-Agriculture (WIA) programme technologies in Abia State, Nigeria. Purposive and multi-stage random sampling techniques were used to select 120 women farmers. Data for the study were collected with a structured questionnaire and analyzed with descriptive statistics and Z – test analysis. Results showed that farmers had mean age of 42.80 years, 69.20% were married while 45.0% acquired secondary education with mean processing experience of 5.7 years. Farm visit/training, small plot adoption techniques (SPATs), management training plots (MTPs) and on - farm adaptive research (OFAR) were methods used by ADP in transferring WIA technologies to farmers. The result showed that farmers adopted ($\bar{x}$=3.3) and utilized ($\bar{x}$=3.2) ADP WIA technologies. Z-test analysis showed that there was no significant difference between adoption and utilization of ADP WIA technologies at P≤ 0.5. Illiteracy (90.0%), domestic activities (85.83%), Non-inclusion of women in leadership (75.00%), no access to land (73.33%), lack of access to resources (72.50%) and lack of dissemination of gender disaggregated data (71.60%) were major problems to adoption and utilization of ADP WIA technologies in the study area. Development of non-gender sensitive extension system, formation of cooperative societies and proper funding of ADP were advocated for utilization of WIA production technologies in the study area.

Keywords: Adoption, ADP, Utilization, Women farmers, Women – in - Agriculture

Introduction

In Nigeria, the involvement of women in agriculture has attracted greater attention in recent years. The need to develop a suitable extension service that is gender specific and tailored to women farmers cannot be overemphasized (Odebode and Adetunji, 2015). Women make essential contributions to the agricultural and rural economies in all developing countries. Their roles vary considerably between and within regions and are changing rapidly in many parts of the world where economic and social forces are transforming the agricultural sector (Nwaobiala *et al*., 2009). Their activities typically include; producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes (National Root Crops Research Institute, 2004; Stephen, 2011).

The contributions of women in agriculture are poorly understood and their specific information needs are ignored in development planning. In spite of that, women have been found to play active roles in Nigeria's agricultural production especially in activities

such as production, processing and marketing of produce (Ogbonna and Nwaobiala, 2015). Asadu *et al*. (2014) stated that the traditional method of processing is dominant in Nigeria. Traditional processing is mostly carried out by women alhough it is considered to be inappropriate for women because it is labour intensive, strenuous and associated with low productivity (Odebode, 2003).

The study proportion of women in agricultural production and post-harvest activities ranges from 20 – 70%; their involvement is increasing in many developing countries particularly with the development of export-oriented irrigated farming, which is associated with a growing demand for female labour including migrant workers (International Assessment of Agricultural Science Technology for Development, 2008). Agricultural extension services in Nigeria have traditionally focused on men and their farm production needs, while neglecting the female farmers that engage in home economics related activities (World Bank, 2003). This had led to low participation of women in the agricultural extension system.

The agricultural extension system in Abia State has the Women-in-Agriculture arm that is supposed to train and empower women in processing technologies (Ugbaja and Ezebuiro, 2017). The Women-in-Agriculture programme of Abia Agricultural Development Programme was introduced with the intention of improving the wellbeing of women farmers. The mandate include; local group formation for effective adoption and utilization of improved agricultural production technologies and management practices. The major technologies disseminated were; dry season vegetable farming, cassava production, cassava processing, soya bean processing, preservation and processing of tomatoes, production and processing of turmeric, storage and processing of melon seeds, cocoyam production and processing and harvesting and storage of paddy rice (ADP, 2000).

Over the years, this programme has recorded much success both in terms of clientele coverage and in adoption rates of disseminated technologies (Amamgbo *et al*., 2006; Okoroafor and Nwaobiala, 2014). The programme encountered problems such as; few WIA extension agents as the ratio of extension staff to farm families is still low making it non-feasible for to extension agents to meet all the women farmers (Odebode, 2008). Women face some challenges that are socio-cultural and institutionally based, which may hinder them from utilizing technologies in the state. These challenges include limited access to extension services, land, funds, inputs and market (Nwaobiala and Anyanwu, 2017).

In view of above, it is not certain whether the programme has fulfilled its mandate of promoting these technologies in the state; hence the study was undertaken to compare adoption and utilization of Women-in-Agriculture technologies among women farmers in the state.

The objectives of the study therefore were to; describe selected socio-economic characteristics of women involved in Women-in-Agriculture programme in the study area; ascertain different methods used by Agricultural Development Programme in disseminating Women-in-Agriculture production technologies in the study area; ascertain levels of adoption and utilization of these technologies by women in the study area; identify the problems faced by respondents in adoption and utilization of WIA programme technologies.

The study tested the null hypothesis (H_0) that: There is no significant difference between adoption and utilization of Women–in–Agriculture production technologies among farmers in the study area.

Materials and Methods

The study was conducted in Abia state which lies between Longitudes $7^{o}23^{1}$ and $8^{o}2^{1}$ East of the Equator and Latitudes $4^{o}47^{1}$ and $6^{o}12^{1}$ North of the Greenwich Meridian. The state is located East of Imo state and shares common boundaries with Anambra, Enugu and Ebonyi States on the North West, North and North East respectively. On the East and South-east it is bounded by Cross River and Akwa Ibom States and by Rivers State to the South. It occupies a land mass of 5833.11 km^2 (Abia State Planning Commission, 2006).

The study population was made up of women farmers involved in Women-in-Agriculture Programme (WIAP) technologies in agricultural zones of Abia State ADP, namely; Aba, Umuahia and Ohafia. Purposively ADP WIA programme contact farmers were chosen for the study because of the training received in processing activities. First, the three agricultural zones that make up Abia state namely; Aba, Ohafia and Umuahia were selected for the study. From each of the three agricultural zones, two blocks each were randomly selected to give a total of six blocks (Aba zone – Aba urban and Okplor Umobo blocks: Ohafia zone - Ohafia West and Bende blocks and Umuahia zone– Ikwuano and Ibeku blocks). Also, two circles each were randomly selected from the selected six blocks which gave a total of 12 circles. Finally, 10 ADP WIA farmers each were randomly selected from each of the selected 12 circles to give a sample size of 120 women farmers. Data for the study were generated from both primary and secondary sources. The primary data was collected using a structured questionnaire, interview schedule and field observation. Descriptive statistics such as frequency counts, percentages and means were utilized. The levels of adoption of ADP WIA technologies among famers in the study area was achieved using adoption scale analysis on a 5-point Likert type scale of; Aware = 1; Interest = 2; Evaluation = 3; Trial = 4; Accept= 5. Farmers with adoption score of 3.0 and above were regarded as having reached mean adoption score of technology and below at any level of adoption.

Decision Rule

1.0 – 1.49 = Awareness stage of the technology.
1.50 – 1.99 = Interest stage of the technology.
2.0 – 2.49 = Evaluation stage of the technology.
2.50 – 2.99 = Trial stage of the technology.
3.0 and above = Adoption of the technology.

The levels of utilization of ADP WIA technologies was captured using a 3-point Likert type scale namely; always=3, occasionally = 2 and never = 1. The bench mark was obtained thus; (3+2+1)/3 to give 2.0.

These categories were used to ascertain the levels of utilization of ADP WIA technologies using the following decision rule:

1.00- 1.50 (low)
1.51- 1.99 (moderate)
2.0 and above (high)

The utilization indices of the respondents were calculated by dividing the total mean utilization score by 3 - point Likert type scale
The adoption and utilization indices of the respondents were calculated in accordance with Nwalieji *et al.* (2014) and stated thus:

a) Computation of the total mean adoption and utilization scores per technology. This was computed by dividing the total adoption and utilization scores by the number of respondents involved.
b) Computation of the grand mean

adoption and utilization scores. This was calculated by adding all the mean adoption and utilization scores and dividing by the number of innovations considered.

Model specification

The "Z"- test was used to test for significant difference between adoption and use WIA recommended production technologies by farmers in the study area.

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$n_1 + n_2 - 2$ degrees of freedom

Where "Z" = "Z" statistic

$\bar{x}_1$ = sample mean for adoption of ADP WIA production technologies

$\bar{x}_2$ = sample mean for utilization of ADP WIA production technologies

σ^2_1 = standard deviation for adoption of ADP WIA production technologies

σ^2_2 = standard deviation for utilization of ADP WIA production technologies

n_1 = sample size for respondents adopting ADP WIA production technologies

n_2 = sample size for respondents utilizing ADP WIA production technologies

Results

Socio-economic characteristics of respondents

Data in Table 1 shows that the mean age of women farmers in the study area was 42.8 years. The results also revealed that high proportions (69.2%) of the women were married and mean household size of 6.4 persons. A moderate proportion (45.00%) of the women acquired secondary education and the population had a mean processing experience of 5.7 years.

Table 1: Distribution of respondents according to socio-economic characteristics **(n = 120)**

Variables	Frequency	Percentage
Age (years)		
20-30	15	12.30
31-40	19	15.80
41-50	45	37.50
51-60	27	22.5
61-70	5	4.16
Mean	42.8	
Marital Status		
Single	10	8.33
Married	83	69.16
Widow	20	16.66
Divorce	7	5.38
Household Size (numbers)		
2-5	54	45.00
6-10	60	50.00
11-15	3	0.25
16-20	3	0.25
Mean	6.4	
Level of Education (years)		
No formal education	20	16.67
Primary education	35	29.17
Secondary education	54	45.00
Tertiary	11	9.16
Processing Experience (years)		
1-5	60	50.00
6-10	24	20.00
11-15	25	20.83
16-20	11	9.16
Mean	5.7	

Source: Field Survey, 2015

Methods adopted by ADP in Women – in – Agriculture production technologies transfer

The result in Figure 1 shows that farm visit/training (100.00%), small plot adoption techniques (93.33%), Management Training Plot (85.83%) and On-Farm Adaptive Research (75.83%) were methods used by the Agricultural Development Programme for transferring WIA technologies to the farmers in the study area.

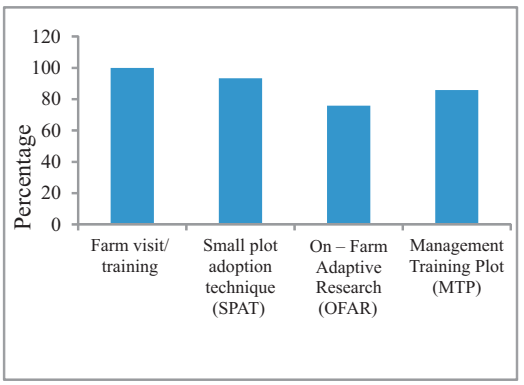

Figure 1: Agricultural Development Programme methods used in transferring Women – in – Agriculture technologies in Abia State

Adoption of Women-in-Agriculture production technologies

Figure 2 reveals that cassava processing into odourless fufu, high quality cassava starch and cassava flour ($\bar{x}$=4.9), dry season vegetable gardening and cassava production ($\bar{x}$=4.4), cocoyam production and processing into cocoyam flour for soup thickening and cocoyam chips ($\bar{x}$=4.4) were WIA technologies adopted by the women in the study area. Processing and storage of melon seeds and soya beans processing into soya milk and soya bean flour had adoption mean ratings of 3.7 respectively. The mean adoption scores for ADP WIA technologies were 3.3, indicating high adoption rate of the technologies since it is greater than 3.0.

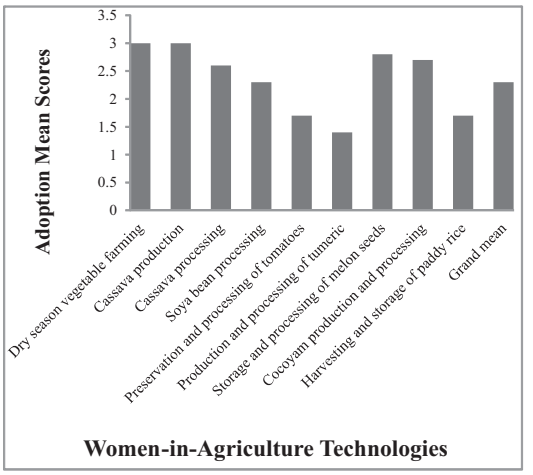

Figure 2: Levels of adoption of Agricultural Development Programme Women – in – Agriculture technologies in Abia State

Utilization of Women-in-Agriculture production technologies

The result in Figure 3 revealed that WIA production technologies that were highly utilized in the study area were dry season vegetable gardening and cassava production both with mean scores of 3.0. Processing and storage of melon seed ($\bar{x}$=2.8) and cocoyam production and processing into cocoyam flour for soup thickening and cocoyam chips ($\bar{x}$= 2.7). Also, WIA technologies such as cassava processing into odourless *fufu*, high quality cassava flour starch and cassava flour ($\bar{x}$=2.5), and Soya beans processing into soya milk and soya bean flour ($\bar{x}$= 2.3) were utilized by the women. Table 2 shows that there was a high level of adoption (30.90) and utilization (29.23) of ADP WIA technologies among the farmers.

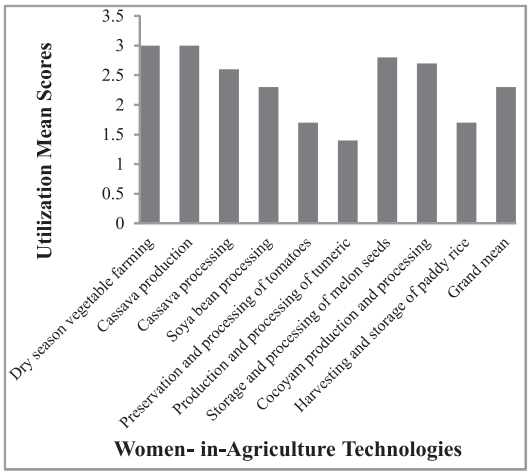

Figure 3: Levels of utilization of Agricultural Development Programme Women – in – Agriculture technologies in Abia State

Table 2: Comparative analysis of levels of adoption and utilization of ADP WIA technologies among women farmers in Abia State

Variables	Mean±SD
Adoption	30.90±5.26
Utilization	29.23±4.25
Combined	45.07±8.30
Z – value	1.27

SD = Standard Deviation *P≤ 0.5
Source: STATA RA output

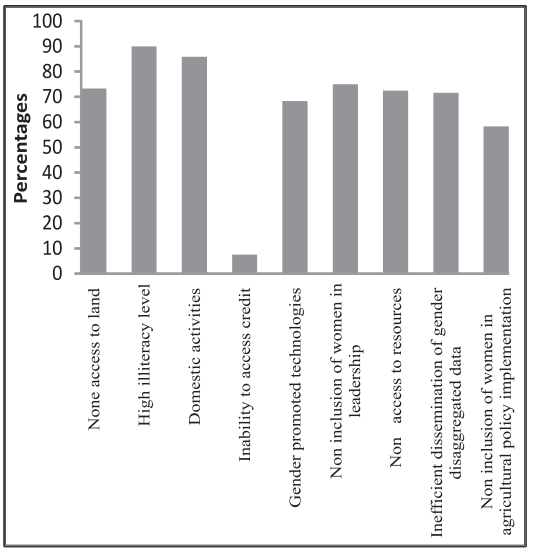

Figure 4: Problems of adoption and utilization of ADP WIA production technologies in Abia State

Challenges associated with adoption and utilization of ADP WIA programme technologies

Figure 4 shows the distribution of respondents according to constraints to adoption and utilization of ADP WIA technologies in the study area. Results revealed that the respondents perceived illiteracy (90.00%), domestic activities (85.83%), non-inclusion of women in leadership (75.00%), none access to land (73.33%), lack of access to resources (72.50%) and lack of dissemination of gender disaggregated data (71.60%) as the major problems faced by women in the utilization of WIA technologies.

Discussion

The average age of respondents' implied that they were productive and capable of handling rigorous cassava processing activities in the study area thus corroborating the findings of Akpa (2007). Married women dominated WIA programme in the study area. This result concurs with findings of Ajah (2013) that married women mostly engaged in WIA programme activities in South-eastern Nigeria. The household size of respondents indicates that more family labour would be readily available since it is an obvious advantage in terms of farm labour and processing activities, where wage rate is relatively costly (Nwaobiala, 2013).

Mbawonku (2001) affirmed that women folk and their household constitute a formidable and significant source of labour in any farming and processing activity. The secondary educational levels infer that the respondents have an advantage of adopting and utilizing technologies transferred since they were literate. Okoroafor and Nwaobiala (2014) in their study found a positive relationship between education and adoption of processing technologies among women in Abia state, Nigeria. Abudu *et al*. (2014) reported that increase in the level of education of farmers positively influenced adoption of improved practices. Years of respondents farming experience implied that they may likely be more responsive to many agricultural extension programmes and policies. Emecheta (2011) found that farmers' processing experience enhances performance of farming and processing of cocoyam and cassava.

The transfer methods adopted by ADP implied that WIA technologies were designed to be implemented within the Training and Visit (T&V) system of the ADP, while the technologies were to be generated and disseminated through farm research and practices into on-going farm operations (Nnadozie *et al*., 2015). Oloche (2013) asserted that a gap 6.5 times greater exist between yields of farmers that use improved technologies, when compared to those that use traditional methods. This gap could be covered through technology transfer which is the sole responsibility of extension in Nigeria (Nwaobiala, 2015). On Farm Adaptive Research (OFAR) and field days have been recognized as one of the vehicles for technology delivery among farmers. Lead or contact farmers are often used with a view that through them technology could trickle down to other farmers Giroh *et al*. (2013). This findings agree with Arokoyo (2003) and Omatayo (2005) that Agricultural Development Programmes (ADPs) in Nigeria adopted these strategies in effective delivery of innovations to famers.

The high level of adoption of WIA programme technologies in the study area may be attributed to the relative comparative advantage and compatibility, as they addressed the felt/latent needs of the farmers. Farmers demand for innovations determines the level of adoption of the technology disseminated. Asadu *et al*. (2013) opined that extension services delivery in Nigeria has strengthened target farmers in adopting and reviewing technologies available to them with the view to taking advantage of the tremendous benefits accruing from them. The finding of this study agree with the findings of Okoye *et al*. (2009) in which women were found to adopt and utilize cocoyam, cassava and other WIA technologies in Abia State, Nigeria.

The result on farmers utilization of WIA programme technologies shows that the farmers had mean utilization score of ADP WIA technologies ($\bar{x}$=2.3) indicating high utilization. This result concurs with Nwaobiala, (2015);

Ogunleye *et al*. (2012) as they obtained a similar result among cassava women farmers and processors in Abia and Oyo states, Nigeria. Comparison between adoption and utilization of ADP WIA programme technologies among women farmers, revealed no significant difference between adoption and utilization of ADP Women-in-Agriculture technologies. The hypothesis that there is no significant difference between adoption and utilization of ADP WIA technologies is hereby accepted. This result is in conformity with Odurukwe *et al*. (2006) who obtained a similar result among ADP WIA farmers in Imo state Nigeria.

The finding implied that women farmers were constrained by socio-cultural factors in their adoption and utilization of WIA technologies in the study area. Nwaobiala *et al*. (2009) and Nwaobiala (2015) obtained similar results among farmers in South-eastern Nigeria.

Conclusion and Recommendations

The Agricultural Development Programme in Abia State effectively used farm visit/training, small plot adoption techniques (SPATs), Management Training Plots (MTPs) and On-Farm Adaptive Research (OFAR) as channels for transferring WIA technologies to women farmers. There was also a high adoption and utilization of ADP WIA technologies by the women farmers. There was no significant difference between the farmers' levels of adoption and utilization of ADP WIA production technologies in the study area. Illiteracy, domestic activities, non - inclusion of women in leadership, non-access to land, non-access to resources and inadequate collection and dissemination of gender disaggregated data were serious constraints affecting utilization of ADP WIA production technologies among the women farmers in Abia State. This underscores the need to develop an efficient extension service that is gender-specific and tailored to women farmers, formation of farmers' groups to facilitate dissemination of agricultural innovations, access to farm inputs and credit and funding of Agricultural Development Programmes in the country were advocated for effective extension delivery in the country.

References

Abia State Agricultural Development Programme (ADP) (2000). Extension Guide. Women – in – agriculture production technologies Vol. 12 No. 4.

Abia State Planning Commission (ABSPC) (2006). Abia State economic empowerment development. strategy report, Pp. 4.

Abudu, S., Haruna, S. K., Idehen, O. E. and Jamilu, A. A. (2014). Adoption of recommended cassava production practices among farmers in Edo State, Nigeria. Proceedings of the 19th Annual National Conference of the Agricultural Extension Society of Nigeria, held at Owerri, Imo State, 27th-30th April, 2014, pp. 23-29.

Amamgbo, L.E.F, Ekwe, K. C. and Aniedu, C. (2006). Consumer acceptance of instant fufu, odourless-fufu and Gari food forms of NR8082. Proceedings of the 36th Annual Conference of Agricultural Society of Nigeria held 3rd – 6th April in Federal University of Technology Owerri Imo state, Nigeria, Pp.110 – 117.

Akpa, E. C. (2007). A Comparative analysis of the impact and technical efficiency of Fadama II and Non Fadama II arable crops farmers in Imo State, Nigeria". *B. Agric. Thesis.* Department of Agricultural Economics and Extension, Abia State University Uturu, pp. 67.

Ajah, J. (2013). Perceptional evaluation of the influence of women-in-agriculture programme on women farmers' access to information on production activities in South-eastern Nigeria.

Proceedings of the 44th Annual Conference of Agricultural Society of Nigeria. LAUTECH 2010 18th – 20th October, Pp. 446-447.

Arokoyo, T. (2003). Information and communication technologies (ICTs) in the transformation of agricultural extension. The case of Nigeria. Paper presented at the 6thconsultative expert meeting of centre for tropical agriculture observatory in ICTs, Wageningen, 23rd – 25th September.

Asadu, A. N., Ogwuike, W.T. and Enwelu, L. A. (2013). Communication technologies used by extension workers in disseminating agriculture innovation in Imo State, Nigeria Proceedings of the 18th Annual National Conference of Agricultural Extension Society of Nigeria (AESON) Held on 5th -19th May Pp. 47 – 54.

Asadu, A. N., Agwu, A. E., Chah, J. M. and Enwelu I. A. (2014). Factors Influencing Adoption of Improved Cassava Processing Technologies by Rural Women in Enugu State, Nigeria *International Journal of Agricultural Science, Research and Technology in Extension and Education Systems (IJASRT in EESs)* 4(4): 205-210.

Emecheta, E. (2011). Processing and storage of agricultural products. Unpublished paper at 2011 pre-planting season training for extension staff of Imo Agricultural Development Programme (ADP), Owerri Imo State, Nigeria.

Giroh, D. Y., Ornan, H. and Nudamatiya, A. B. *(2013).* Enhancing natural rubber (*Hevea brasiliensis*) technology transfer through on-farm adaptive research (OFAR) and farmers field days in the rubber belt of Nigeria. *Nigerian Journal of Rural Extension and Development,* 7(2):46 – 50.

International Assessment of Agricultural Science Technology for Development (IAASTD, (2008). Scientific facts on agriculture and development *http://www.greenfacts.org/en/agriculture-iaastd/1-2/9-women-agriculture.htm* (Accessed 03/05/2012).

Mabawonku, I. (2001). Education women for environment development in Nigeria: The role of information agent and non-governmental organizations (NGOs) Ibadan. *Journal of Communication Studies* 1(1): 23 -28.

Mgbada, J.U. (2000). Production of stable crops by rural women in Enugu and Ebonyi States. Lessons for enhancing poverty alleviation programmes. Proceedings of Agricultural Extension Society of Nigeria, Pp. 104.

National Root Crops Research Institute (NRCRI) (2004). *Annual report on cassava value addition technologies* Vol. 4.

Nnadozie, A. K. O., Nwaobiala, C. U. and Mkpado, M. (2015). An evaluation of research-extension–farmer-input-linkage–system (REFILS) by Agricultural Development Programmes (ADPs) in Nigeria. In Nwachukwu, I., Onumadu, F. N, Ifenkwe, G.E. Agbarevo, M.N.B., Apu, U., Odoemelam, L. E. and Nwaobiala, C.U (Eds.) Contemporary Issues in Extension Systems and Development, Pp. 15-21.

Nwaobiala, C. U., Isiocha, S. C. and Nwachukwu, K. (2009). Adoption of cassava post-harvest technologies by women in Ivo Local Government Area of Ebonyi State, Nigeria, Proceedings of the 43rd Annual Conference of Agricultural Society of Nigeria (ASN) held at Raw Materials Research and Development Centre Abuja, 20th -23rd October, Pp. 670-672.

Nwaobiala, C.U. (2013). Appraisal of farmers' participation in IFAD/FGN/NDDC/ Community-Based natural resource management programme in Abia and Cross River States Nigeria. *A Ph.D Thesis* Department of Agricultural Economics and Extension Abia State University Uturu Pp.61.

Nwaobiala, C.U. (2015). Analysis of cassava value addition technologies used by women processors in Abia State, Nigeria. *Journal of Forestry, Environment and Sustainable Development*, 1(2):112 – 119.

Nwaobiala, C. U. and Anyanwu, C. G. (2017). Socio–Economic Determinants of Farmers' Utilization of Cassava Intercrop Technologies in Imo State, Nigeria. *The Nigerian Journal of Agricultural Extension,* 18(4):34 – 40.

Nwalieji, H. U., Madukwe, M. C., Agwu, A. E. and Umerah, M. I. (2014). Adoption of rice technologies introduced by the United States Agency for International Development in Anambra and Ebonyi States, Nigeria. *Journal of Agricultural Extension*, 8(1): 158 – 169.

Odebode, S. O. (2008). Appropriate technology for cassava processing in Nigeria: User's point of view. *Journal of International Women Studies*, 9(3): 269-283.

Odebode, S. O. and Adetunji, T. A. (2015). Gender differentials of cassava processing Activities among cassava processors in Ogun State, Nigeria. *Nigerian Journal of Rural Extension and Development,* 9 (2):1 – 6.

Odurukwe, S.N., Matthews-Njoku, E. C. and Ejioku-Okereke, N. (2006). Impact of the women-in-agriculture (WIA) extension programme on women's Lives: Implications for subsistence agricultural production of women in Imo State, Nigeria. *Livestock Research for Social Development*, 18(2):22-27.

Ogbonna, M. O. and Nwaobiala, C. U. (2015). Evaluation of participation and poverty Levels of National FADAMA III Development Project Rural Farm Women in Gombe State, Nigeria. *Discourse Journal of Agriculture and Food Sciences* 3(6): 83-90 www.resjournals.org/jafs.

Ogunleye, K. Y., Olaniyi, O.A. and Adedeji, D.I. (2012). Assessment of training needs of cassava processors for increased productivity in Ogbomoso agricultural zone of Oyo State, Nigeria. *International Journal of Agricultural Economics and Rural Development,* 5 (1):10 – 17.

Okoroafor, K. M. and Nwaobiala, C. U. (2014). Effectiveness of cassava women processors in value addition technologies in Abia State, Nigeria. *International Journal of Agricultural Science, Research and Technology in Extension and Education Systems* 4(3): 131 – 135.

Okoye, B. C., Okoye, A. C., Dimelu, M. U., Agbaeze, C. C., Okoroafor, O. N. and Amaefula, A. B. (2009). Adoption scale analysis of improved cocoyam production, processing and storage technologies across gender in Enugu North Agricultural Zone of Enugu State, Nigeria. Proceedings of the 43rd Annual Conference of the Agricultural Society of Nigeria (ASN) Abuja held on 20th - 23rd October, Pp. 619-623.

Omotayo, O. M. (2005). ICTs of agricultural extension. Emerging issues in transferring agricultural technology in developing countries. In: S.F, Adedoyin eds. Agricultural Extension in Nigeria, Agricultural Extension Society of Nigeria, Ilorin Pp.145-158.

Oloche, A. E. (2013). Transforming Nigeria agriculture through agricultural extension. The imperative of extension reform a key note address delivered at the 18th Annual Conference of Agricultural Extension Society of Nigeria (AESON) Held on 15th -19th May Pp. 1-6.

Stephen, Y. (2011). The role of women-in-agriculture in Ghana acknowledged *http://www.ghanabusinessnews.com/2011/04/11/the-role-of-women-in-agriculture-inghana acknowledged/* (Accessed 03/05/2012).

Ugbaja, C. I. and Ezebuiro, N. C. (2017). Technologies available for empowering women in cassava production in Abia state, Nigeria. *Mainstreaming Entrepreneurship in Agricultural Extension Practice*. Proceedings of the Annual Conference of Agricultural Society of Nigeria held at University of Port – Harcourt, Rivers State, Nigeria 23rd – 26th April, Pp. 209 - 216.

World Bank (2003). Nigerian women-in-agriculture, *In:* Sharing experiences—examples of participating approaches. The World Bank group. The World Bank participating sourcebook, Washington, D.C.
http:/www.worldbank.org/wbi/publications.htm.