

## DETERMINANTS OF PARTICIPATION OF RURAL WOMEN FARMERS IN ABIA STATE IN THE COCOYAM REBIRTH INITIATIVE OF NRCRI UMUDIKE

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### ABSTRACT

*The study was carried out in Abia State Nigeria to investigate the socio-economic determinants and constraint militating against rural women farmers' participation in the cocoyam rebirth initiative of National Root Crops Research Institute Umudike. Multistage random sampling technique was used in the selection of 160 participating farmers for the study. Relevant data were collected with the aid of structured and pre-tested questionnaire and were subjected to descriptive statistics such as percentage, frequency, and means. Probit regression analysis was carried out to resolve the determinants. From the result, the probit regression estimate showed that the coefficients of education (0.76), farm size (0.99), farm income (1.03) and occupation (0.34) had significant influence on rural farm women's participation in the cocoyam rebirth initiative of the National Root Crop Research Institute at varied risk level. All the determinants exerted positive influences. The main constraints to participation in NRCRI cocoyam rebirth initiative among the participating women farmers were scarcity/high cost of improved farm input, inadequate extension visits, and inadequate training and retraining of participating rural farm women. We recommend development and deployment of technologies for very rapid multiplication of cocoyam cormels in order to make planting materials available thereby reducing scarcity. Furthermore, there should be educational programmes organized to train and re-train extension staff who in turn trains and re-trains the rural farm-women*

**Key words:** Participation, Socioeconomic, Cocoyam rebirth, Rural Women, NRCRI Umudike

### INTRODUCTION

Cocoyam, a name used collectively for 2 aroid species (*Colocasia esculenta* and *Xanthosoma sagittifolium*) is a major food crop in Nigeria, especially in the southern parts where it is cultivated extensively mainly for local consumption. *Colocasia* is more popular in the southern areas of Nigeria. Nutritionally, it is high in protein, minerals and vitamins and it is eaten in various forms. Rural women farmers encounter series of problems that limit their participation in cocoyam production. These problems according to Ajah *et al.*, (2010), include low consumption and poor market value of the crop; disparities between men and women's statuses; access to productive resources such as land (major productive factor); control of assets; lack of access to productivity raising services such as credit, cooperatives, agricultural-inputs, extension and training; innovation difficult/complicated to understand and decision making powers. Women's contributions are usually under estimated and not accorded proper recognition because of their mode of production. Indeed, these contributions are usually grouped as "unpaid labour" and not measured in economic terms (Ekumankama and Ekumakama, 1996; Omokore and Omokore, 1996; Bankole and Olowu, 2005).

In recent years, an increasing number of analyses of projects have shown that participation by rural people is one of the critical components of success in

irrigation, livestock water, crops and agriculture (USDA, 2007). Participation that is most appropriate varies with circumstance, including culture, age, gender setting, political conditions, available resources and the participant's goals and participatory learning action (PLA, 2004). FAO (2006), views participation as an active process in which people take initiatives and action that is stimulated by their own thinking and deliberation and which they can effectively influence. Participation with regard to community development include people's involvement in decision making process in implementing programmes, their sharing in the benefit of development programmes and their involvement in the efforts to evaluate such programmes. In essence, participation is all about involving a significant number of rural people (project beneficiaries) in one way or the other in situations or actions which enhance their wellbeing (Oakley, 2002).

Cocoyam rebirth is new holistic approach to the perception, research, production, utilization and marketing of cocoyam in Nigeria (Chukwu and Nwosu, 2008). Cocoyam rebirth is a strategy to recapitulate and re-orientate Nigerians about the roles cocoyam played as a major nutritious, easily available cheap food in the colonial era. It is a reminder of the Igbo tribe of the salvage role cocoyam played to save many of them from dying of starvation during the Nigerian civil war up to early 1970s. The rebirth of

cocoyam creates awareness that the crop is now better positioned to enhance and sustain endogenous development, for socio-economic and cultural upliftment of Nigerians in particular, and sub-Saharan African countries in general. Cocoyam rebirth is therefore, not just a matter of practicing new technologies but it is about adopting a new style of thinking, perceiving and tackling challenges facing cocoyam. In cocoyam rebirth, we learn how to think, learn how to learn and learn how to create new ideas, technologies, terminologies, and to demystify scientific research (Chukwu and Nwosu, 2008). Since cocoyam rebirth was launched in 2008, participation of rural women farmers in the initiative have not been as enthusiastic as was expected considering the status of the cocoyam as a woman crop. This study aims to investigate the socio-economic determinant and constraint militating against rural women farmers' participation on cocoyam rebirth initiative of National Root Crops Research Institute in Abia state Nigeria.

**METHODOLOGY**

Abia State, Nigeria, was selected for this study because of its proximity to NRCRI Umudike. A multi-stage sampling technique was used to obtain 160 respondents used in this study. The first stage was the purposive selection of Umuahia Agricultural Zone because of the presence and notable position of NRCRI in root crop expansion programme in the zone. Four (4) LGAs were randomly selected from the six LGA's that make up the agricultural zone. Two autonomous communities were selected randomly from each of the four selected LGAs, making a total of eight (8) autonomous communities. The assistance of farm extension staff of NRCRI was employed to develop a sample frame of cocoyam women farmers in the communities. From the sampling frame, a random sample of ten (10) participating women farmers of the NRCRI cocoyam rebirth initiative were selected from the eight selected autonomous communities. Ten non-participating women cocoyam farmers were also randomly chosen from the same communities. This gave a grand sample size of one hundred and sixty (160) women cocoyam farmers for the study. Data on socioeconomic characteristics such as age, marital status, household size, educational level, farming experience, farm size, farm income, membership of farm associations, and primary occupation were collected with the aid of structured questionnaire and were subjected to descriptive statistics and Probit regression analysis following the model used by Gujarati (2003) and Ajani and Tijani (2009).

**Model Specification:**

Probit regression model was used to analyze the influence of socio-economic factors on farmers' participation in the programme. It is appropriate when the response takes one of only two possible values

representing participation or no participation. The model was adopted as used by Gujarati (2003) and Ajani and Tijani (2009). The five (5) points on the scale were weighed according to the degree of participation. The following scaling procedure according to Nwaobiala (2013) was adopted: always =5; often =4; occasionally = 3; seldom = 2 and never =1. The values of the five responses was added and further divided by 5 to obtain 3.0, which was regarded as the mean participation level. Rural women cocoyam farmers with mean score of 3.0 and above was regarded as having participated in the cocoyam rebirth programme, while rural women cocoyam farmers with mean score of less than 3.0 did not participate actively.

$$P_i [y_i=1] = [Fz_i]$$

Where,

$$Z_i = \beta_0 + \beta_1 X_{1i} \dots \dots \dots (1)$$

$$y_i = \beta_1 + \beta_2 X_{2i} + \dots \dots + \beta_k X_{ki} \dots \dots \dots (2)$$

$y_i^*$  is unobserved but  $y_i = 0$  if  $y_i^* < 0$ , 1 if  $y_i^* \geq 0$

$$P(y_i = 1) = P(y_i^* \geq 0)$$

$$= P(u_i \geq -\beta_1 + \beta_2 X_{2i} + \dots \dots + \beta_k X_{ki}) \dots \dots (3)$$

$i = 1, 2, \dots, 240$

$Y_i^*$  = an underlying latent variable that indexes the level of farmers participation

$Y_i$  = dummy variable indexing farmers participation per technological package (Participation =1; 0 = no participation)

$X_1$ = gender (dummy; 1=Male; 0=Female)

$X_2$  = Age (Years)

$X_3$  = Marital status (Yes =1 if Married, 0=Otherwise)

$X_4$ = Household size (number of persons)

$X_5$ = Years of formal education (Years)

$X_6$ = occupation (1= farmer, 0=non farmer)

$X_7$ = farm size (hectares)

$X_8$ = farming experience (Years)

$X_9$ = Membership of Cooperative (membership =1, Otherwise = 0)

$e_i$ = error term

Paired treatment test (Paired't' test) was used according to Ezech and Anyiro (2013); Nwachukwu and Ezech (2007) as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \dots \dots \dots (5)$$

$n_1 + n_2 - 2$  degree of freedom.

Where:

$t$  = paired t statistic

$\bar{X}_1$  = Mean parameters of participating women cocoyam farmers

$\bar{X}_2$  = Mean parameters of non participating women cocoyam farmers

$S_1^2$ = sample Variance for participating farmers

$S_2^2$ = sample Variance for participating farmers

$n_1$  = sample size for participating farmers

$n_2$  = sample size for participating farmers

## RESULTS AND DISCUSSION

### Socio- Economic and Institutional Variables of Participating and non- Participating Rural Women Farmers in Cocoyam rebirth Initiative.

The result in **Table 1:** shows majority of participating rural women cocoyam farmers (70.00%) and non-participating rural women cocoyam farmers (62.50%) were between 31-50 years. This showed that both groups of rural women farmers were within the middle-aged groups who are still energetic and productive. The result further showed that 71.25% and 75.00% of participating and non participating rural women cocoyam farmers in the study area were married. This indicates that married rural women cocoyam farmers were more involved in cocoyam

rebirth initiative of NRCRI. 91.25% and 83.75% of participating and non-participating rural women cocoyam farmers were literate. 45.00% and 37.50% of the two groups of respondents had household size that ranged between 5 and 8 members. Household size has major implication in the provision of labour for farm work (Akpa, 2007). The result also shows that majority (58.75% and 60.0%) of participating and non-participating rural women cocoyam farmers were engaged primarily in farming. The predominance of both groups of rural women in farming explained why over 90% of the food produced in the country comes from the rural sector (FAO 2004). 30.00% of both groups of respondents had farm sizes of between 1.0-2.0 hectares.

**Table 1: Socioeconomic Characteristics of Respondents.**

Variables	Participating Farmers		Non-participating Farmers	
	Frequency	Percentages	Frequency	Percentages
<b>Age</b>				
20-30	10	12.5	15	18.75
31-40	25	31.25	27	33.75
41-50	31	38.75	23	28.75
51-60	11	13.75	10	12.5
61 and above	3	3.75	5	6.25
<b>Marital status</b>				
Single	16	20	13	16.25
Married	57	71.25	60	75
Widowed	4	5	4	5
Divorced	3	3.75	3	3.75
<b>Educational status</b>				
No formal education	7	8.75	13	16.25
Primary education	22	27.5	27	33.75
Secondary education	39	48.75	34	42.5
Tertiary education	12	15	6	7.5
<b>Household size</b>				
1-4	18	22.5	21	26.25
5-8	36	45	30	37.5
9-12	15	18.75	20	25
13 and above	11	13.75	9	11.25
<b>Primary occupation</b>				
Farming	47	58.75	48	60
Trading	17	21.25	15	18.75
Civil service	9	11.25	8	10
Artistry	7	8.75	9	11.25
<b>Farm size</b>				
0-1.0	13	16.25	17	21.25
1.1-2.0	24	30	24	30
2.1-3.0	22	27.5	20	25
3.1 and above	21	26.25	19	23.75
<b>Farming experience</b>				
1-5	12	15	14	17.5
6-10	27	33.75	22	27.5
11-15	15	18.75	20	25
16-20	11	13.75	14	17.5
21-25	7	8.75	6	7.5
26 and above	8	10	4	5

Source: Field Survey data, 2017

### Determinant factors affecting rural farm women's participation in the cocoyam rebirth initiative

Probit regression estimates of factors that influenced rural farm women's participation in the cocoyam rebirth initiative of the NRCRI Umudike in Abia State are presented in **Table 2**. The model posted a log likelihood value of -15.30, a pseudo R<sup>2</sup>-value of 0.4480 and a goodness of fit chi-square value of 66.73 which is statistically significant at 1.0% level suggesting that it was an appropriate model for the study. The coefficient (0.76) of educational level was positive and statistically significant at 10.0% probability level implying that the educated rural farm women had high probability of participating in the cocoyam rebirth initiative of the NRCRI Umudike. Ajagbe *et al.* (2007) noted that education can influence participation in Agricultural programmes. The coefficient of farm size (0.99) was positive and highly significant at 99.0% confidence level. This implied that as farm size

increases, the likelihood of participation of farmers in the NRCRI cocoyam rebirth initiative increases. The coefficient of farm income had a positive coefficient (1.03) and was statistically significant at 10.0% probability level. It can be adduced that an increase in farm income increases the probability of participation in cocoyam rebirth initiative. Increase in farm income is expected to boost participation level of agricultural technological initiative because a farmer may not readily involve in an innovation that is too expensive. Also the higher the costs incurred in production, the lower the profit realized which will reduce participation level. Expectedly, the coefficient (0.34) of occupation of the rural farm women was positive and significant at 10.0 % alpha level. The positive coefficient of this variable indicates that being a full time farmer increases the probability of participating in cocoyam rebirth initiative of NRCRI.

**Table2: Binary Probit regression estimates of factors affecting rural farm women's participation in the cocoyam rebirth initiative of the National Root Crop Research Institute**

Variable	Estimated coefficients	Standard errors	Z-ratios	P> z
Constant	-1.633647	2.878709	-0.57	0.570
Age	-0.0424456	0.0620576	-0.68	0.494
Marital status	-0.6823387	0.8825605	-0.77	0.439
Household size	.0523137	0.1441717	0.36	0.717
Educational level	0.7551557*	0.4446364	1.70	0.089
Farming Experience	0.1973097	0.1656863	1.19	0.234
Farm size	0.9909502***	0.1346554	7.36	0.000
Farm income	1.033804*	0.2017399	5.12	0.000
Membership of farmers association	0.4699613	0.6446412	0.73	0.466
Primary Occupation	0.3400759*	0.1908087	1.78	-0.3390
Number of observations at one:	55			
Number of observations at zero:	25			
Pseudo R <sup>2</sup>	0.4480			
Log likelihood:	-15.301674			
Chi <sup>2</sup> (9)	66.73***			

Source: Field Survey data, 2017;

\*\*\* Significant at 1.0% level,

\* Significant at 10.0% level

### Constraints to Effective Participation of Rural Farm Women in NRCRI Cocoyam rebirth initiative

**Table 3** shows constraints to effective participation of rural women farmers in the cocoyam rebirth initiative of NRCRI Umudike. A good proportion (67.67%) of the participating rural farm women ascribe late arrival /high cost of improved farm input as a major problem. This is because majority of the farmers depend solely on sourcing these improved varieties of crops from NRCRI. One of the major challenges of cocoyam production is scarcity and high cost of planting

materials. As a consequence, this challenge limits hectares of land intended to plant and reduces the volume of total production (Chukwu *et al.*, 2009). Fairly good proportion (57.78%) of participating women farmers complained of the problem of inadequate training and re-training of participating farmers by the programme facilitators. Hence, 42.22% of rural participating farm women identified administrative bottlenecks and bureaucracy as constraint militating against their participation in the project. Asiabaka (2007) and Naswen *et al.* (2008) asserted that the bureaucratic system in an extension

outfit had hindered information flow and technology dissemination between extension officers and farmers. Infrequent visits by the programme extension officers (52.22%) were identified also as a problem facing participating of rural farm women in cocoyam rebirth initiative of NRCRI. The result further revealed that 38.89% of participating women farmers complained

of apathy/Low Value Addition to Cocoyam as a constraint to effective participation in cocoyam rebirth initiative of NRCRI. Cocoyam is erroneously perceived as an inferior crop to yam, cassava, rice, sweet potato and potato, meant for the poor and produced by indigent rural women.

**Table 3: Constraints to Effective Participation of Rural Farm Women in NRCRI Cocoyam rebirth initiative**

Category of problems	Frequency*	Percentages
Administrative bottlenecks and bureaucracy	38	42.22
Scarcity /high cost of farm input	61	67.77
Infrequent visit of Extension Officers	47	52.22
Inadequate training and retraining of participating rural farm women	52	57.78
Negative perception of farmers on past programme	29	32.22
Complexity and tediousness of the practice	25	27.78
Labour availability	14	15.56
Apathy/ Low Value Addition to Cocoyam	35	38.89

Source: Field survey data, 2017;

\*multiple responses recorded

## CONCLUSION AND RECOMMENDATION

This study established that education, farm size, farm income and occupation were the major determinants of rural farm women's participation in the cocoyam rebirth initiative of the National Root Crop Research Institute with all the factors exerting positive influences. The major constraints to effective participation were scarcity and high cost of planting materials, inadequate training and retraining of participating women and infrequent visits of extension officers. We recommend development and deployment of technologies for very rapid multiplication of cocoyam cormels in order to make planting materials available. Furthermore, there should be educational programmes organized to train and re-train extension staff who in turn trains and re-trains the rural farm-women

## REFERENCES

Ajagbe, F.A., Adewoye J.O., and Ajetomobi J.O (2007). An Evaluation of Financial Performance of **Community Banks in Ogbomoso Area of Oyo State, Nigeria**. *International Business Management*, 1, (4); 65-69.

Ajah, J., Unamma, R. A. P., & Nwachukwu, I. (2010). Perceptual evaluation of the influence of women-in-agriculture programme on women Nigeria. *Journal of Agricultural Research and Policies*, 5(1): 34-38.

Ajani, O.I.Y. and Tijani O.A. (2009). The Role of Social Capital in Access to Microcredit in Ekiti State, Nigeria. *Pakistan Journal of Social Sciences*. 6(3): 125-132

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. Dept of Agricultural Economics and Extension, Abia State University Uturu.

Asiabaka, C.C. (2007). The challenges of Research Extension Farm Input System (REFILS) in Agricultural Technology Development and Delivery in Southeast agro Ecological Zone. *Paper presented at the 22<sup>nd</sup> annual REFILS Workshop* Awka, Anambra sta Anyiro, C.O., Emerole C.O, Osondu C.K, Udah S.C and Ugorji S.E (2013a). Labour-use Efficiency by Smallholder Yam Farmers in Abia State Nigeria: A Labour-use Requirement Frontier Approach. *International Journal of Food and Agricultural Economics*. 1(1) 151-163

Anyiro C.O, Osondu C.K, Ezech C.I and Akabueze I.C (2013b). Resource-use and Efficiency of Rural Women Smallholder Cocoyam Farmers in Onitsha Agricultural Zone of

- Anambra State, Nigeria. Research WebPub. 1(2): 12-17.
- Bankole, T.O.A. and Olowu, T.A. (2005) "Agricultural Information, Needs of Women Farmers in South-West Nigeria Lessons for Effective Extension Delivery" pp. 32 – 40. *Journal of Agricultural Extension*. Vol. 3 published by AESON
- Chukwu G.O and Nwosu, K.I (2008). Cocoyam rebirth: The renaissance of a giant crop. *Paper presented at the 17th Annual Conference of Nigeria Rural Sociological Association, NRCRI Umudike, 11 pp.*
- Chukwu, G.O., Nwosu K.I., Mbanaso E.N.A., Onwubiko, O., Okoye B. C., Madu, T.U., Ogbonye, H and Nwoko, S.U. (2009) Development of gocken multiplication technology for cocoyam. *Online at <http://mpira.ub.uni-muenchen.de/17441/> MPRA Paper No.17441/ 15:17*
- Ekumankama, I.O. and Ekumankama O.O. (1996). Harnessing the Capabilities of Rural Women towards achieving Rural Development in Nigeria. Pp. 147, 152. In: Proceedings of the 9<sup>th</sup> Annual National Conference of NRSA, UDU, Sokoto, Nigeria 5 – 8<sup>th</sup> March
- Ezeh, C.I and C.O. Anyiro (2013). The impact of Micro Financing on Poverty levels of rural Women Farm Households in Abia State, Nigeria; Implication for Policy Intervention. *Journal of Central European Agriculture*. 14(2):168-180
- Food and Agricultural Organization (FAO) (2006). Plan to Action for Peoples Participation in Rural Development. FAO Forty – One Session. FAO Conference, Rome 9 – 28, November, pp. 47.
- Food and Agriculture Organization FAO. (2004). Sustainable development and management wetlands; Wetland contribution to livelihoods in Zambia. Food and Agricultural Organization (FAO), Rome, Italy
- Gujarati, D.N., (2003). Basic Econometrics. Tata McGraw-Hill Edition, New York.
- Naswem, A.A., Dauda S and Ejembi E.P. (2008). Agricultural extension in Nigeria: Policy imperatives for the 21<sup>st</sup> century. Proceedings of the 13<sup>th</sup> Annual National Conference of Agricultural Extension of Nigeria (AESON). 8<sup>th</sup>-11<sup>th</sup> April. Pp 27-33.
- 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. PhD thesis, department of Agricultural Economics and Extension, Abia State University, Uturu, Nigeria
- Oakley, E.A. (2002). Poverty Reduction in Nigeria, The Way Forward CBN Developments Geneva ILO. Pp. 98 – 112.
- Omokore D.F. and Omokere O.O. (1996). "Activities of Women in Agricultural Production: A Case Study of Soba Local Government Area, Kaduna State". Pp. 159 – 164. Proceedings of the 9<sup>th</sup> Annual Conference of NRSA, UDU, Sokoto, Nigeria 5 – 8<sup>th</sup> March.
- Okoye B.C, Onyenweaku C.E, Asumugha G.N (2007). Allocative efficiency of smallholder cocoyam farmers in Anambra State, Nigeria. *Nig. Agric. J.* 38: 70- 81.
- Participation Learning Action (PLA) Notes (2004). Evaluating Children's Participations and Seeking Areas of Consensus in Children's Participation. Earth Print Ltd. Stevenage Hertfordshire SG 14 TP Orders Department, England
- United States Department of Agriculture (USDA) (2007). Women in Development Aid Programme Evaluation Report. No. 32 Washington D.C. Agency for International Development