DETERMINANTS OF RURAL YOUTHS PARTICIPATION IN *PITA-HYBRID* PLANTAIN PRODUCTION IN NGOR-OKPALA LGA, IMO STATE, NIGERIA

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Abstract
This study was designed to analyze the determinants of Rural Youths participation in PITA-hybrid plantain production in Ngor-Okpala Local Government Area (LGA) of Imo State, Nigeria. Ninety (90) respondents were involved in the study using a multistage sampling procedure. Descriptive statistics and logit regression were employed in analysis. Majority (72.2%) of the respondents were males, married (60.0%), belong to cooperative society (83.3%), had access to land (83.3%), access to credit (77.8%) and had 1-2 contacts with extension agents (61.1%). Planting had the highest mean score ($\overline{X} = 4.00$), followed by harvesting ($\overline{X} = 3.91$), land preparation ($\overline{X} = 3.41$) and farm decision ($\overline{X} = 3.08$), indicating high level of participation. The major constraints were insufficient *PITA-Hybrid* suckers ($\overline{X} = 3.37$), followed by land acquisition ($\overline{X} = 3.16$), poor attitude to farming ($\overline{X} = 3.00$) and poor market access ($\overline{X} = 2.99$). The coefficients for educational level, and attitude to farming were directly related to probability of participation in *pita-hybrid* plantain production among the youths and significant at 5% level each, as well as labour, and suitable agro-ecological conditions (1% level each), and farming experience (10% level). The coefficients for age and farm size had an indirect relationship with probability of participation in *pita-hybrid* plantain production among the youths and significant at 5% and 1% level respectively. The results therefore call for policies aimed at provision of free and affordable education to enable the youth's access and process information on innovations that will enhance participation and increased production of plantains in the study area. To forestall negative effects of age and farm size might have on participation in PITA-Hybrid plantain production, a public enlightenment on poor attitude to farming in the rural areas will help in positively changing rural youths' perception about farming and its economic implication.

Keywords: Age, farm size, education, agro-ecological conditions, experience, constraints

Introduction
Plantain (*Musa sapientum*) is a herbaceous perennial crop belonging to the family *Musaceae*. Plantains are starchy fruits and are a staple food source. About 70 species of *Musa* are known with a broad variety of uses. *Musa paradisiaca* (plantain) is a member of *Plantagnaceae* and genus *plantaga*. Two groups of plantain are believed to have common origin, the horn plantain and the French plantain (Onyeoziri, 2010). The varieties of plantain include; *lachala*, *saba*, *kitawira*, *mignu* and *kibunga*. All the improved cultivated varieties (cultivars) of edible plantains are hybrids and polyploids of two wild types. Nigeria ranks 2nd highest producer of plantain in West Africa after Ghana, and 5th in Africa and the World after Ghana, DRC, Cameroun, and Uganda and produce about 3.2 million tones per annum (FAO, 2019). In Nigeria, plantain production is mainly grown in the Southern States, and provides direct employment for about 5 million Nigerians in about 17 plantain growing States, especially Bayelsa, Delta, Edo,

Enugu, Anambra, Imo, Ebonyi, Cross-River, Benue, Kogi, Ondo, Oyo, Ogun, Akwa Ibom, Rivers and Southern Kaduna (Adewumi *et al*., 2009). It also provides indirect job opportunities to numerous people involved in processing and marketing of the produce. The common *PITA-Hybrids* include: *PITA 14, PITA 17, PITA 24* and *PITA 16* (ADP, 2018).

The United Nations define youth as individuals in age group ranging from 15 to 24 years (Filmer and Fox, 2017). Rural youths are individuals between the ages of 15 – 40 years who reside in rural areas (Soeze, 2017). Onyeoziri (2010) noted that 61% of the estimated population of Nigerian youths lives in rural areas, while 39% are in the urban centres. Rural youth participation is the involvement of youths in rural areas in taking responsible challenging action that meets genuine needs, with opportunities for planning and or decision making affecting them (Reid, 2010). Ataneh (2012) defines participation as the ability of individuals to have

an input in the decision and planning process, and to play a role in issues concerning them aimed at improving their welfare and quality of their life. Participation of youths in plantain production is crucial in development and improving the welfare of rural youths. Plantain is a major source of food throughout the globe. Plantain is very critical in bridging the gap between the demand and supply of basic energy staple foods. In Nigeria, plantain production is becoming a significant economic activity for income generation for both large scale and small scale farmers, especially for those who produce them within their home gardens.

A hybrid plantain is a result of two different varieties of plantain that are cross-pollinated to create an off-spring or hybrid that contain the best traits of each of the parents. The International Institute of Tropical Agriculture (IITA) in collaboration with Imo State Agricultural Development Programme (ADP) introduced a plantain farming campaign in Imo State in the year 2018. The programme aimed at reaching farmers with improved plantain technologies in order to increase plantain production in the State. The programme promotes *PITA-hybrid* plantain variety which was transferred to farmers. *PITA-hybrid* was produced by crossing the seed fertile medium size; *obinol Ewai* and the wild diploid (2n =2x = 22) banana "*Calcutta 4*" *PITA-Hybrid* plantain because of its resistant to diseases, high yielding and tolerant to water or extreme temperature. *PITA-Hybrid* plantain was disseminated to rural youths in the selected rural communities of Imo State and its production technologies were to improve the farm output and encourage youth participation in agriculture. Despite the existence of tremendous economic importance of plantain and the quick interventions rendered by ADP to encourage youth participation in hybrid plantain production in Ngor Okpala Area, there has been low level of participation of rural youths in hybrid plantain production. This study was conceived to analyze determinants of participation of rural youths in hybrid-plantain production in Ngor Okpala LGA of Imo State, Nigeria.

Methodology
The study was conducted in Ngor Okpala LGA of Imo State, Nigeria. The area is located in rain forest belt within latitude 5°21'N and 5°31'N and longitude 6°59'E of the Greenwich Meridian. It shares common boundaries with Rivers and Abia States in southern part; Aboh Mbaise LGA on the eastern part, Owerri North and Owerri West on the western part of the State. The population for the study consists of all rural youths involved in *PITA-Hybrid* plantain production. Imo State has the population of 3,934,889 persons (NPC, 2006). The current projected population of the state stands at 5,356,223 million persons with the population density which varies from 230 to 1,400 people per kilometer square with a land area of 5,288.0 square kilometer. The temperature ranges from 20°C to 30°C with an average annual relative humidity of 75% (NPC, *ibid*), and agrarian in nature. The major food crops produced are cassava, yam, maize, cocoyam and melon. The cash

crops produced in the area include; oil palm, rubber and forest trees (iroko, malogamy and obeche). The area is endowed with mineral resources, especially petroleum. The area consist of Amala Ntu, Alulu, Obokwe, Eziama, Okpala, Ohekelem, Ihite, Obike, Elelem, Umuohiagu, Imerienwe, Mbato, Upe, Obiangwu and Nguru-Umuaro. The sample frame consists of 500 rural youths registered with Imo State Agricultural Development Programme (ADP, 2018). Primary data were obtained with the aid of a well structured interview schedule from a survey of 90 rural youth participants in PITA-Hybrid plantain production. A multistage sampling technique was used to select the rural youth participants in PITA-Hybrid plantain production in the study area. The first stage was the purposive selection of 9 (nine) communities from the 15 communities that made up the Ngor –Okpala Area in Imo State, Nigeria based on the highest PITA-Hybrid plantain participants in the area (ADP, 2018). The second stage involved purposive selection of one village each from the 9 communities selected. The sample size in each village was based on those with the highest number of registered rural youth PITA-hybrid plantain participants. They are Amala Ntu, Alulu, Obokwe, Obike, Obangwu, Eziama, Ohekelem, Elelem and Imerienwe. The third stage was the random selection of 10 rural youth participants each from the nine villages. In all, ninety (90) rural youth PITA Hybrid plantain farmers were selected. The instrument of validity used a pilot testing conducted with nine copies of the interview schedule administered to rural youths selected outside but near to the study area. A reliability coefficient value of 0.77 was obtained. The justification for the study provided the needed empirical evidence on the production of *PITA-Hybrid* plantain, which will be useful to future researchers. Data obtained were analyzed using descriptive and inferential statistics. A 4-point rating scale of strongly agree (4), agree (3), strongly disagree (2), disagree (1) was used to estimate participation in PITA-Hybrid plantain production. The mean scores were computed by adding weights thus 4+3+2+1 = 10/4 = 2.5. Any mean score greater or equal to 2.5 implies participated and otherwise not participated. The determinants of rural youth participation in *PITA-Hybrid* plantain production was analyzed using Logit regression. The regression model is a unit or multivariable technique which allows for estimating the probability that an event occurs or not by predicting a binary dependent outcome from a set of independent variables. The reasons for choosing logit model is that logit regression ensures production of probability of choice within (0, 1) range. This is an advantage over Probit model and it is easier and more convenient to compute than Probit. In this study, there were two categories: rural youths' participants and non-participants in *PITA-Hybrid* plantain production. The estimation of binary logit was done by normalizing one category, which is referred to as the base or reference category (Czepiel, 2007). The base category in the study was non-participation in *PITA-Hybrid* plantain production, and the coefficients of the logit regression will be used to compare with it. However, the parameter estimates of the binary logit model provide only the direction of the effect of the independent variables on

the dependent (response) variable, as estimates do not represent actual magnitude of change nor probabilities (Gujarati, 1995). Rather, the actual magnitudes of change or probabilities are represented by the marginal effects. The marginal effects are the partial derivatives of the dependent variable with respect to each of the independent variables. The marginal effects or marginal probabilities are functions of the probability itself and measure the expected change in probability of a particular choice being made with respect to a unit change in an independent variable from the mean (Balew, Agwata and Anyango, 2014).

Gujarati and Porter (2009) expressed logit model as:

$$\underset{1-}{\text{Log}} \left[\frac{P_i}{P_1} \right] = \beta_? + \beta_1 X_1 + - - - \beta_n X_n \ \dots\dots (1)$$

Where;
P_i = Probability of rural youths participation in PITA-Hybrid plantain production.
$1 - P$ = Probability of non-participation by the ith respondents.
β = coefficient of the independent variables
βo = Intercept
The explicit logit model is expressed thus

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \dots + \beta_{12} X_{12} + u \ \dots\dots (2)$$

Where,
Y = Dichotomous response variable (1 for rural youths who participated in PITA-Hybrid plantain production or 0 if otherwise)
X_1 = Age of rural youth participants in years
X_2 = Gender (dummy variable; 1 if female, otherwise 0 for male)
X_3 = Formal education of respondents in years
X_4 = Household size in (number of persons)
X_5 = Hired labour (man-days)
X_6 = PITA-Hybrid plantain farming experience (years)
X_7 = Farm size (in hectares)
X_8 = Access to extension contact (dummy variable; 1=yes, no=0)
X_9 = Method of land acquisition (dummy variable; inheritance=1, otherwise=0)
X_{10} = Market access (dummy variable; access = 1, otherwise=0)
X_{11} = Attitude towards farming (dummy variable; suitable=1, otherwise=0)
X_{12} = Agroecological condition (dummy variable; suitable=1, otherwise=0)
$b_1 - b_{12}$ Coefficient of stimulus variable
b_0 = Constant term
U = error term

Results and Discussion
Socio-Economic characteristics of the respondents
The socioeconomic profile of the rural youths in *PITA-Hybrid* plantain production is presented in Table 1.

Table 1: Distribution of Respondents by Socioeconomic Profile of the Rural Youths

Variable	Frequency	Percentage
Gender		
Male	65	72.2
Female	25	27.8
Age		
Less than 25	10	11.1
26 – 30	24	26.7
31 – 35	36	40.0
36 – 40	20	22.2
Marital status		
Single	36	40.0
Married	54	60.0
Educational level		
Non Formal Education	10	11.1
Primary Education	6	6.7
Secondary Education	30	33.3
Tertiary	44	48.9
Farming experience (years)		
1 – 3	5	5.6
4 – 6	42	46.7
7 – 9	23	25.6
> 10	20	22.2
Membership to Cooperative		
No	15	16.7
Yes	75	83.3
Access to Farmland		
Inheritance	75	83.3
Leasehold	10	11.1
Rent	5	5.5
Size of Farm		
< 0.5ha	60	66.7
0.5 – 1ha	18	20.0
> 1.9ha	12	13.3
Farm Involvement		
Full time	25	27.8
Part time	65	72.2
Greater than 200,000		
Access to credit		
Yes	20	22.2
No	70	77.8
Extension Contact		
None	30	33.3
1 – 2 times	55	61.1
> 3 times	5	5.5

Source: Field Survey, 2019

The result shows that majority (72.2%) of the participants were males. This could be because of the tedious nature of plantain production. Majority (83.3%) belong to cooperative societies. This is an advantage because these organizations served as primary source of information through which extension agents pass information about *PITA-Hybrid* plantain technologies to them. This finding strengthened the role of formal organizations in agricultural development and agricultural information dissemination. This is in consonance with Okogun (2015), who stated that most youths in plantain production in Edo State were members of formal organizations. Result also shows that moderate (66.7%) rural youths had less than 0.5 hectares of farmland and majority (83.3%) inherited their farm lands. This is consistent with Angba (2003) who observed that lack of land ownership constitute major constraints, especially to female farmers. The result further indicates that majority (72.2%) participated on part time basis and 66.7% had no access to credit, while 61.1% had 1-2times contact with extension monthly. About 77.8% had no access to credit. This implies low financial capacity to expand their *PITA-Hybrid* production business. This result agrees with Awoke (2003) who observed that inadequate collateral and high interest rate are the major problems of *PITA-Hybrid* plantain production among farmers. Results found that about 89.9% of the respondents had one level of education or the other. This implies that majority of the rural youths were literate.

Level of participation in PITA-Hybrid plantain production

Result in Table 2 shows the level of participation in *PITA-Hybrid* plantain production. Findings indicate that higher proportion of rural youths participated in many the plantain production activities. The mean score of rural youths participation in *PITA-Hybrid* plantain production activities were as follows; planting (4.00), land preparation (3.80), harvesting (3.91), propagation and preparation of suckers (3.41), farm decision (3.08), training/workshop (2.94), farm management practices (2.93), farm planning (2.82) and post planting operations (2.54). The finding indicates that all the variables investigated had mean scores greater than the decision mean score of 2.50. The implication of this finding is that rural youths participated in *PITA-Hybrid*

Table 2: Level of participation in *PITA-Hybrid* plantain production

PITA-Hybrid Plantain Activities	Strongly Agree (4)	Agree (3)	Strongly Disagree (2)	Disagree (1)	Mean score	Decision
Land preparation	78 (86.7)	6 (6.7)	6 (6.7)	0 (0.)	3.80	Participated
Planting	90 (100.0)	0 (0)	0 (0)	0 (0)	4.0	Participated
Training/Workshop	39 (43.3)	12 (13.3)	34 (37.8)	5 (5.6)	2.94	Participated
Planning	33 (36.7)	18 (20.0)	29 (32.2)	10 (11.1)	2.82	Participated
Farm Decision	39 (43.3)	29 (32.2)	12 (13.3)	10 (11.1)	3.08	Participated
Farm Management Practices	44 (48.9)	18 (20.0)	18 (20.0)	16 (17.8)	2.93	Participated
Post Planting Operation	39 (43.3)	5 (5.6)	12 (13.3)	34 (37.8)	2.54	Participated
Propagation Preparation	59 (65.5)	15 (16.7)	10 (11.1)	6 (6.7)	3.41	Participated
Harvesting	87 (96.7)	1 (1.1)	1 (1.1)	1 (1.1)	3.91	Participated

Source: Field Survey, 2019

Determinants of Rural Youths' Participation in PITA-Hybrid Plantain Production

The factors influencing rural youths' participation in PITA-hybrid plantain production are presented in Table 3. The Table shows that the logit regression model had a good fit and explanatory power as evidenced in its highly significant chi-square statistics. The result further show that the probability of rural youths' participation in *PITA-Hybrid* plantain production was significantly affected by age, level of education, hired labour, farming experience, farm size, attitude to farming and agro-ecological conditions.

Age and farm size had negative coefficients and significant at 5% and 1% level respectively, which imply that the probability of youths participating in *PITA-Hybrid* plantain production decreases with increase in age and farm size. An increase in age by one unit decreases the probability of participating in *PITA-Hybrid* plantain production by 0.052 units, while an increase in farm size by one unit decreased the probability of participating in the production by 0.046 units. There are risks inherent in the adoption of new innovations and technology like *PITA-Hybrid* plantain production, and generally, older people are risk averse compared to younger ones. However, majority of the respondents in this study were within the age range of 31-35 years. This is a relatively young age that ought to be very innovative, energetic and productive. Also, farmers with large farm sizes may not have need for increased production as much as farmers with smaller farm sizes. This may have served as a disincentive for the adoption of *PITA-Hybrid* plantain production in the study. This notwithstanding, majority of the farmers had farm sizes of less than 0.5 hectares. The results are in consonance with the findings of Nnadi and Akwiwu (2008) who stated that age and farm size influenced

Table 3: Logit regression estimates of determinants of rural youths' participation in *PITA-Hybrid* Plantain Production

Explanatory Variables	Coefficients	Standard Error	t-Value	Marginal Effects (dy/dx)
Age	- 0.5342	0.2110	- 2.5318**	- 0.0521
Gender	- 0.2111	0.4201	- 0.5025	- 0.0018
Level of education	0.0034	0.0015	2.2666**	0.1032
Household size	- 4.0821	3.0681	- 1.3305	- 0.0744
Hired labour	0.1248	0.0225	5.4667***	0.0211
Farming experience	0.0237	0.0120	1.9750*	0.0152
Farm size	- 1.0065	0.2802	- 3.5921***	- 0.0465
Access to extension contacts	0.0102	0.1033	0.0987	0.0034
Method of land acquisition	- 0.0346	2.0017	- 0.0173	- 1.2003
Access to market	1.0140	0.6005	1.6886	0.0452
Attitude to farming	0.1603	0.0719	2.2295**	0.0078
Agro-ecological condition	0.0087	0.0024	3.625***	0.184
Number of Observations		90		
Wald chi-square (χ2) (33)		132.65		
Prob > χ2		0.0000		
Pseudo R^2		0.1760		
Log pseudo likelihood		301.62002		

*Source: Field Survey, 2019; Key: ***, ** and * is significant at 1%, 5%, and 10% level respectively*

Level of education (5%), hired labour (1%), farming experience (10%), attitude to farming (5%) and agro-ecological conditions (1%) had positive coefficients, implying that the probability of youths' participation in *PITA-Hybrid* plantain production increases with increase in these variables. An increase in level of education by one unit will lead to an increase in the probability of youths participating in *PITA-Hybrid* plantain by 0.103 units, while an increase in the use of hired labour by one unit will increase the probability by 0.02 units. Similarly, a unit increase in farming experience, right attitude to farming and suitable agro-ecological conditions will increase the probability of youths' participation in *PITA-Hybrid* plantain production by 0.015, 0.0078 and 0.184 units respectively. Education is key to technology innovation and adoption as it raises the level of awareness and knowledge on the importance and benefits of such new technology like the *PITA-Hybrid* plantain production. Furthermore, farmers who use hired-labour in their farms relative to household labour are usually market and profit-oriented. Such farmers tend to engage in agronomic practices that will result to higher yields and productivity like the *PITA-Hybrid* plantain. Attitude is a very important non-economic factor of production. Farmers with positive mindset and disposition towards agriculture usually seek for better approach that will enhance their production levels and productivity. Such farmers are willing to explore new innovations, techniques and systems like the *PITA-Hybrid* plantain. Plantains do not grow well in every agro-ecological zone. It requires specific soil, climatic and environmental conditions to optimally grow and produce. Therefore, farmers in agro-ecological zones that are suitable for plantain production will be more predisposed to adopting the *PITA-Hybrid* plantain to increase their yield and productivity.

Constraints militating against Rural Youth Participation in PITA-Hybrid Plantain Production

The result in Table 4 shows the constraints militating against rural youth participation in PITA-Hybrid Plantain production. The result shows that insufficient PITA-Hybrid suckers had the highest mean score of 3.37, followed by poor access to land (3.1.6), poor attitude to farming (3.00), poor market access (2.99) amongst others. Results indicate that all the constraints investigated were important constraints militating against rural youths' participation in PITA-Hybrid Plantain Production in the study area. This study agrees with Onuekwusi (2005) who noted that lack of government support and seasonality of weather are

Table 4: Constraints militating against Rural Youth Participation in *PITA-Hybrid* Plantain Production

Constraints to rural youth participation	Strongly agree (4)	Agree (3)	Strongly Disagree (2)	Disagree (1)	Mean Score
Insufficient *PITA-Hybrid* suckers	50 (55.6)	23 (27.8)	13 (14.4)	2 (2.2)	3.37
Poor Attitude to Farming	30 (33.3)	37 (41.1)	16 (17.8)	7 (7.8)	3.00
Poor Market Access	25 (27.8)	42 (46.7)	20 (22.2)	3 (3.3)	2.99
Poor Credit Access	31 (34.4)	33 (36.7)	17 (18.9)	9 (10.0)	2.96
Insufficient Land Acquisition	23 (25.6)	42 (46.7)	16 (17.8)	35 (38.9)	3.16
Poor Infrastructure	23 (25.6)	42 (46.7)	16 (17.8)	35 (38.9)	2.84
Poor irrigation facilities	1 (1.1)	17 (18.9)	14 (15.6)	7 (7.8)	2.70
Insufficient Fund	33 (36.7)	8 (8.9)	21 (23.3)	28 (31.1)	2.51
Lack of Government Support	31 (34.4)	33 (36.7)	17 (18.9)	9 (10.0)	2.96
Climate change/seasonality	23 (25.6)	42 (46.7)	16 (17.8)	35 (38.9)	2.84

Source: Field Survey, 2019

Conclusion

The study shows that the youths participated in PITA-Hybrid Plantain production at varying levels. The important factors influencing participation in PITA-Hybrid Plantain production include; Age, farm size, level of education, hired labour, farming experience, attitude to farming and agro-ecological conditions. The results therefore call for policies aimed at provision of free and affordable education to enable the youth's access and process information on innovations that will enhance participation and increased production of plantains in the study area. This might also involve the use of demonstration farms and extension packages, which ensure that rural youths work in collaboration with extension agents to participate in PITA-Hybrid plantain farming on their farms. This will also enhance exchange of ideas among participating rural youths. To forestall negative effects of age and farm size might have on participation in PITA-Hybrid plantain production, a public enlightenment on poor attitude to farming in the rural areas will help in positively changing rural youths' perception about farming and its

economic implication.

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