FACTORS INFLUENCING LEVEL OF PARTICIPATION IN WOMEN-IN-AGRICULTUREAND YOUTH EMPOWERMENT (WAYE) PROGAMME BY IRISH POTATO PRODUCTION FARMERS INPLATEAU STATE, NIGERIA

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ABSTRACT
In Nigeria, Irish potato production has enhanced food availability, reduction in rural poverty and unemployment, agro-industrial and socio-economic growth in the country. The increasing demand for Irish potato as food, industrial raw materials, income and employment generation has stimulated the need for increased in its production. This paper examines factors influencing the level of participation in Women-in-Agriculture and Youth Empowerment (WAYE) programme by Irish potato farmers in Plateau State, Nigeria. Multi-stage sampling procedure was used to select 200 registered Irish potato farmers. Data were obtained through a well-structured questionnaire. Descriptive statistics and tobit regression model were employed for data analysis. The results on level of participation revealed that about 31% and 39% (70%) of the participating WAYE farmers had participating index ranging from 0.61 – 0.80 and 0.81 – 1.00 respectively. The mean index value for the participating farmers in these categories was 0.68 and 0.81 respectively while the standard deviation was 0.023 and 0.021 respectively. The results of tobit regression analysis revealed that the coefficients of the variables such as age, household-size, farm size, farming experience, credit amount, cooperative associations and extension contact were found to influence the level of participation in the WAYE programme. High cost of labour, delay in input supply, insecurity of farmers and poor marketing of produce were among the constraints limiting Irish potato production in the area. It was therefore recommended that government agencies should make timely distribution of farm inputs to farmers at affordable prices.

Keywords: Factors, Influencing, Participation, Constraints, Irish Potato Production, Farmers.

1 INTRODUCTION
In Nigeria, Irish potato production has enhanced food availability, reduction in rural poverty and unemployment and agro-industrial and socio-economic growth in the country (Momoh, 2015). Irish potato has been described as being very important and consumed by those who traditionally use them for food and feed, as well as those who use its processed by-products (Horton, 2001). Hence, Irish potato is an important factor in food security and poverty alleviation. Its products are used for food, feed, and industrial use, Food and Agriculture Organization Statistics (FAOSTAT, 2019).

Irish potato is, therefore, an important crop not only as food crop, but also its social, economic and environmental relationships with the people who grow, sell and consume it (Alimba and Mgbada, 2003). It can be processed into chips, flour, and pellet, which can be consumed as food. Recent finding hasalso shown that Irish potato tubers can be peeled, dried and blended into flour and used by confectionery industries (Kudi*et al.,* 2008). The blending of Irish potato flour with wheat flour gives rise to quality bakery but most confectionery managers are ignorant of such potentiality for reduction of importation of the expensive wheat flour (Alabi*et al.,* 2006).

Despite the tremendous roles of Irish potato, the production in Nigeria is still characterised by low yields compared to other Irish potato growing regions in the world such as Bolovia, Peru, Chile and Mexico respectively. This is attributed to planting of low yielding and local varieties as well as cultivation of Irish potato on over used land with very short fallow period with little or none usage of organic or inorganic fertilizer (Mado, 2013). Cultivation of improved varieties could lead to significant increase in agricultural productivity which could transform the subsistence production to a large and industrial production.

Plateau State is endowed with abundant fertile lands suitable for the production of Irish potato in commercial quantities. But the problem limiting the production of Irish potato in commercial quantities in the area is the low level of farmers' participation in innovation programmes (Momoh, 2015). This has resultedto the continuous use of local varieties and traditional methods of Irish potato cultivation by farmers in the area. Consequently, the production of Irish potato in the study area in terms of current yield (1.2 million tons/ha) is relatively low (PADP Annual Report, 2019).Successive governments in Nigeria over the years have initiated and implemented various agricultural programmes for sustainable economic development. To complement government efforts towards improving the livelihood of rural farmers, different non-governmental organizations have emerged with different intervention programmes to empower farmers in order to raise their living conditions through sustainable rural development. Despite all these, the level of participation of farmers in agricultural programmes and production of the crop in the area is relatively low (Shittu, 2012).

Several studies have also been carried out by different scholars (Shittu, 2012; Kotter and Petras, 2012; Mado, 2013; Shittu and Panan, 2014, Dankat, 2015) to assess the Women-In-Agriculture and Youth Empowerment (WAYE) programme. Their main focus, however, was on women and men and only few Local Government Areas were covered, thus limiting the scope on WAYE programme objectives. What is almost lacking in these studies, however, is any direct involvement of youth in the programme and the use of strong (inferential) statistical tools to assess the factors influencing the level of farmers' participation in the WAYE programme.

It is based on the gap of previous studies that this study was conceived with the intent to provide empirical analysis on factors influencing farmers' participation in the programme to provide the information that could be useful for re-assessment and re-orientation of the program's objectives and focus.

2 Methodology

The study was conducted in Plateau State, Nigeria. The area is located in Nigeria's middle belt and lies between latitude 9.10 ^{0}N and longitude 9.45 ^{0}E and of the Greenwich Meridian. The State is situated in the tropical zone, with a higher altitude ranges from 12 meters, about 400 feet to a peak of 1829 meters above sea level (Plateau Agricultural Development Programme, 2019). Plateau State has a boundary with Bauchi State to the north-east and Kaduna State to the north-west. It is also bounded to

the south-east and south-west by Taraba and Nasarawa States, respectively. The State has a landmass covering nearly 53,585 square kilometers with an estimated population of 4,692,206 people as at 2020. Farming is the major occupation of the majority of indigenes because the area is endowed with abundant fertile land suitable for farming activities. The crops cultivated are Irish potato yam, cassava, maize, sorghum, rice, groundnut, beans and vegetables. Beside crop production, the rural communities also rear livestock such as sheep, goat, cattle and poultry birds at subsistence level.

2.1 Sampling Procedure and Data Collection

A multi-stage sampling procedure was adopted to select 200 Irish potato farmers inJos South, BarkiLadi, Mangu, and BassaLocal Government Area of Plateau State (that is 50 farmers from each LGA).Data were collected through the use of structured questionnaires by well-trained enumerators based on the 2018 cropping season.

2.2 Analytical Tools

Data were analyzed using both descriptive and inferential statistics. A 5 point Linkert-type scale of (Very low, Low, Average, High and Very high) was developed to examine the level of participation of farmers in the programme. Tobit regression was used to determine factors influencing Irish potato farmers' level of participation in WAYE programme. Tobit regression was used because it reveals not only the probability of access and level of participation in the programme but also the intensity of participation in the programme. The model for the regression is thus expressed:

$Y^*_i = \beta_0 + \beta_i X_i + U_i$ 1

$Y_i = Y^*_i if \beta_0 + \beta_i X_i + U_i > 0$ 2

$Y_i = 0 \; if \beta_0 + \beta_i X_i + U_i \leq 0$ 3

Where: $Y_i =$ the ratio of level of participation index for $i^{t\square}$ farmer. $Y_i^* =$the latent variable and the solution to problem of intensity or level of participation subjected to a set of constraint per household and conditional on being above limit. $X_i$is the vector of factors affecting the level of participation. $\beta_i$is the vector of unknown parameters and $U_i =$ the error term which is normally distributed with a mean of 0 and a constant variance σ^2. The estimation of the model parameters is done explicitly specifying the Tobit likelihood function.

$Y^*_I = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + U$ 4

$i = 1,2,3, \ldots 10$

Where Y^*_I is the level of participation (using participation score), X_1 is the age (in years), X_2 is the marital status (married = 1, single = 0), X_3 is the sex (male = 1, female = 0), X_4 is the farm size (hectare), X_5 is the years of experience in cocoa production (in years), X_6 is the formal education (in years), X_7 is the household size (in numbers) X_8 is the access to credit (amount of credit in naira), X_9 is the access to extension services (in number of extension visits),X_{10} is the membership of cooperative group (number of years as a member of cooperative), and $X_{11}$is the information Sources (in numbers),U_i is the error term, β_0 is constant, $\beta_1 - \beta_0$ is regression coefficients.

All the explanatory variables were checked for problems of multi-collinearity before the Tobit model is run. This was done using the (i) Variance Inflation Factor (VIF) to check for association among the continuous explanatory variables and (ii) Contingency coefficient for dummy variables. Maddala (1992) adopted by Momoh (2015) define VIF as

$X_i = \frac{1}{1-R_i^2}$ 5

Where, R^2 is the squared multiple correlation coefficient between X_i and other explanatory variables. According to Gujarati (1995), the variable is highly collinear if the value of VIF of a variable is more

than 10, in which case the $R^2{}_i$ value exceeds 0.95. The contingency coefficients for dummy variables were computed thus:

$C = \sqrt{\frac{x^2}{N+x^2}}$ ……6

Where C is the contingency coefficient, x^2 is the chi-square value and N the total sample size. According to Momoh (2015), dummy variables is collinear if the C value is greater than 0.75.

3 Results and Discussion

3.1 Level of Participation of Farmers in the WAYE Programme

Table 1: Level of participation of farmers in WAYE activities

Farmers Category	Participation Index	Frequency	% of farmers	Mean Index	Std. Dev	Coeff of Var
Very Low	0.01-0.20	4	1.95	0.059	0.093	0.81
Low	0.21-0.40	16	7.81	0.128	0.047	6.82
Average	0.41-0.60	39	19.53	0.532	0.029	4.12
High	0.61-0.80	62	31.25	0.687	0.023	2.95
Very High	0.81-1.00	79	39.43	0.812	0.021	2.30
Total		**200**	**100**			

The result revealed that about 31% and 39% of the participating WAYE farmers had participating index ranging from 0.61 – 0.80 and 0.81 – 1.00 respectively. This shows that the farmers were in the participants' categories of high and very high levels of participation. This implies that about 71% of the farmers participated in most of the WAYE activities. The high level of farmers' participation recorded in study may be attributed to common interest, positive experience and benefits of past and similar intervention programmes. The mean index value for the participating farmers in these categories was 0.68 and 0.81 respectively while the standard deviation was 0.023 and 0.021 respectively. The coefficient of variation for participating Irish potato farmers in the participants' categories: average, high and very high level of participation was 4.12%, 2.95% and 2.30% respectively. The values of these coefficients of variation were low, and this showed that the ratio of standard deviation to the mean was low. This implies that the risk-return trade-off which describes the fit in terms of the relative sizes of the squared residual and outcome values is better.

Agwu and Agbada (2010) reported in his study of participation of farmers in the International Institute of Tropical Agriculture (IITA) root and tuber production project, that involvement of participants in project activities was very high on key decisions made by project officials and farmers. Famers' participation is considered necessary to get community support for agricultural development projects (Mado, 2013). Similarly, Dankat (2015) validated this assertion in his study of the impact of government initiative programmes towards poverty reduction in Plateau State. His findings revealed that majority (87%) of farmers that participated in the programme recorded high productivity of large tubers than the non-participating farmers.

The farmers in the average or moderate category of participation were 19% while the remaining10%was for the farmers under low and very low levels of participation respectively. The low level of participation of these categories may be due to some constraints encountered in the programme. This agrees with Mado (2013) who found that the poor level of participation of farmers in WAYE programme was due to insufficient training, bureaucratic procedures and the cost implications. The standard deviation was 0.021 and 0.176 respectively. The coefficient of variation of 7.6%, 18.6%,

4.1%, 0.1% and 4% for participating WAYE farmers in the very low, low, average, high and very high was low.

3.2 Socio-economic characteristics and institutional factors have no significant influence on the level of participation of Irish potato farmers

Table 2: reveals the result of tobit regression model used to determine the level of participation of farmers in the programme.

Table 2: Tobit regression analysis of socio-economic and institutional factors influencing level of participation of farmers in the programme

Variables	**Coefficient**	**Standard Error**	**T-value**
Age (X_1)	-0.0435	0.0905	2.41***
Marital status (X_2)	0.6472	0.1738	4.17***
Sex(X_3)	1.1465	0.5099	0.38
Household Size (X_4)	0.7805	0.0715	10.92***
Farm size (X_5)	0.1742	0.3384	5.51***
Education (X_6)	0.2763	0.1769	0.11
Farming experience (X_7)	0.3474	0.0353	7.12***
Information source (X_8)	-0.7914	0.7003	0.44
Credit amount (X_9)	0.5602	0.0001	3.932***
Cooperatives (X_{10})	0.4329	0.0367	7.13***
Extension contact (X_{11})	0.1578	0.0168	4.34***
Constant	6.00		
No. of Observation	512		
Log likelihood	-480.98		
LR	602.16		
Prob	0.000		
Pseudo R^2	0.759		

Source: Field Survey, 2017 *** P< 0.01, ** P<0.05

Table2 shows that the age of the participating farmers was statistically significant at 1% level of probability. The variable had a negative coefficient (-0.0435) indicating that the higher the age of the farmer, less the probability of a prompt decision to participate in any agricultural programme no matter its benefits. This could because older farmers in the rural communities are traditionally bound therefore; they tend to stick to their old ways of doing things. This finding agrees with that of Mado (2013) which indicated the as the age of the farmer increases, the chance of diversifying animals and crops significantly reduces.

The marital status (0.6472) of the participating farmers was significant at 1% level of probability. The positive coefficient (0.6472) in the farmers' level of participation in the programme, implied that as the marital status of the farmer changes from single to married, it is likely there would be more active participation in the prgramme. This was expected because married persons are usually believed to have higher needs and increased responsibility. This is in agreement with the findings of Alimba and Mgbada (2003) who found that married farmers adopt new varieties of Irish potato and cassava more than farmers that are single.

The household size had a positive coefficient (0.7805) and was statistically significant at 1% level of probability. This implies that farmers with larger household size were more likely to participate in the WAYE programme than farmers with smaller household size. This may be so because increase in number of people in an Irish potato household should guarantee the access of farmers to farm labour required in Irish potato production. The result agrees with Adamu (2019) who reported that large number in a household can be a motivation to the adoption of innovations because members will provide the required family labour for Irish potato production, this will reduce the cost of production.

Farm size positively and significantly influences their level of participation in the WAYE programme at 1% level probability and also had a positive coefficient (0.1742). The implication is that, the larger the farm size, the higher the probability of farmers' level participation in the programme. Findings agree with the studies of Kudi*et al.* (2008) and Alimba and Mgbada (2003) that farm size had positive relationship with level of farmers' involvement in agricultural programmes that would benefit them.

Farming experience of the participating farmers positively and significantly influences their level of participation in the WAYE programme at 1% level probability and also had a positive coefficient (0.3474). The implication is that, the more years a farmer spends in Irish potato farming, the higher the probability of the farmers' level participation in the programme. Therefore, with many experience in Irish potato farming, farmers are less likely to resist participation in intervention programme. The result agrees with the finding of Momoh (2015) who reported that a farmer's experience in farming can help generate more confidence, thus, bringinga positive effect on the farmer's decision to participate and the level of participation respectively.

The amount of credit received by the participating farmers was statistically and significant at 1% level of probability. The positive coefficient (0.5602) of the variable suggested that an increase in the amount of credit received is likely to have positive influence on their decision to participate in the WAYE programme. The result is in agreement with that of Adamu (2019) who reported that the availability and accessibility of credit could largely determine the extent of production capacity of a farmer. This is also in line with Mado (2013) who reported that the performance of an enterprise such as potato farming in Nigeria could be greatly influenced by credit accessibility.

Membership of cooperative association positively and significantly influences their level of participation in the WAYE programme at 1% level probability and also had a positive coefficient (0.4329). Membership of cooperative associations offers members with various benefits such as access to information, access to credit facilities, access to improved production inputs as well as access to better produce market price. The result is in line with Alimba and Mgbada (2003) whose findings revealed that farmers' membership of associations provide both information and credit to the farmers and encouraged participation and adoption of recommended farm practices.

The variable extension contact had a positive coefficient of (0.1578) and was statistically significant at 1% level of probability. This means that the more and frequents the extension contact between the

extension agents and the Irish potato farmers, the positive the farmers' decision to participate and also the higher their level of participation in the programme. The result correspond with that of Ali and Ali (2013) who reported that farmers who had access to extension service and also frequent contact with extension workers are more likely to be aware of new agricultural technologies. Adamu (2019) validated this assertion when he reported majority (87%) of his farmers that had frequent extension visits were aware of the benefits of the agricultural technologies and therefore, participated actively in the community seed out-grower scheme which improved their livelihood.

The Pseudo R-square value 0.759 (75.9%) was also explained by both the socio-economic and institutional variables. The log likelihood function indicated about 48% of their variation in level of participation in the WAYE programme was explained by the socio-economic and institutional variables included in the model.

3.3 Irish potato production constraints

Table 3: Constraints in Irish potato production

Constraints	Frequency	Percentage	Ranking
High cost of labour	46	23	1st
High cost of input	39	19	2nd
Land acquisition	32	16	3rd
Security challenges	28	14	4th
Insufficient capital	23	12	5th
Storage problems	18	09	6th
Poor marketing.	14	07	7th

The result in Table 3 reveals that the major constraints emphasized by the farmers include high cost of labour, high cost of input like Irish potato seeds, fertilizer, herbicides, pesticides, land acquisition, security challenges, insufficient capital, poor storage facilities and poor marketing. It was recommended that there should be a wider awareness creation on the programme and government timely distribution of farm inputs to farmers.

4 CONCLUSION

In this study, factors influencing the level of participation in Women-in-Agriculture and Youth Empowerment programme and constraints to Irish potato production were examined. The result of this study indicates that farmers were faced with constraints but in spite of these, the level of farmers' participation in the programme was high (70%). The study also found that the coefficients of the variables such as age, marital status, and household size, farm size, farming experience, credit amount, cooperative associations and extension contact positively and significantly influenced the level of participation at 1% level of probability. The study identified major constraints in Irish potato production to include high cost of labour and input, insecurity of farmers and poor marketing of produce. It was therefore recommended that government agencies should make timely distribution of farm inputs to farmers at affordable prices.

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