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Journal of Agricultural Economics, Extension and Rural Development
Abbreviated Key Title: J. Agric. Econs. Extens. Rural Dev.
ISSN-2360-798X (Print) & Open Access
Vol 13: (8): Pp.: 107-115,2025

Impact of Women-in-Agriculture and Youth Empowerment (Waye) Programme on Irish Potato Income among Women Farmers in Plateau State

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Accepted 16/6/2025 Published [13]/6/2025

Abstract

This study examined the impact of the Women-in-Agriculture and Youth Empowerment (WAYE) programme on income among Irish potato women farmers in Plateau State. Nigeria. A multi-stage sampling method was employed to select 512 respondents. Primary data were collected through the use of questionnaires and were subjected to both descriptive and inferential statistics. The mean farming experience was 10 years for WAYE participants and 16 years for non-WAYE participants, while the mean farm size for participants, non-WAYE participants, and non-participants was 1.4 ha and 0.5 ha. Determinants of Irish potato income of programme participants show that farm size (1.184, P<0.01), age (0.410, P<0.05), education (0.050, P<0.01), farm input (0.293, P<0.10), farm experience (0.046, P<0.01), and extension contact (0.362, P<0.01) are determinants. F-chow statistics show that the WAYE programme had a positive impact on the income of programme participants. It was recommended that the WAYE Programme organisation should increase the amount of loan disbursement to N250,000 so as to increase participation, extend the repayment period, lower interest rates, and extend the programme to other farming communities in Plateau State, thereby improving the standard of living of women farmers in the state.

Keywords: Impact, WAYE Programme, Irish potato, output, Standard of living, Women farmers.

Journal of Agricultural Economics, Extension and Rural Development : ISSN-2360-798X Vol 13: (5):

INTRODUCTION

The Irish potato (*Solanum tuberosum*) belongs to the Solanaceae family. The potato (*Solanum tuberosum*) is a native of the Western Hemisphere and is believed to have originated somewhere between Mexico and Chile, possibly in the Andes highlands of Bolivia and Peru. The Irish potato was introduced into Nigeria in the later part of the 19th century and early 20th century by Europeans, notably the tin miners in the Jos Plateau (Mado, 2013). It has a high nutritive value, and it is grown for food purposes as well as livestock feed (Burton, 2000). The Irish potato is, therefore, an important crop not only as a food crop but also for its social, economic, and environmental relationships with the people who grow, sell, and consume it (Alimba and Mgbada, 2003).

The Women-in-Agriculture and Youth Empowerment (WAYE) programme aims at encouraging Irish potato production through participation of the target group as a strategy to combat rural poverty. The WAYE programme is among the recognised non-governmental organisations in the state; it was established in 2007 to promote sustainable social and economic development for the target group. The major objective of the WAYE programme is to ensure complete involvement of both women and youths in agriculture with the aim of improving the living conditions of households in Plateau State.

A number of studies have been carried out by different scholars (Shittu, 2012; Kotter and Petras, 2012; Mado, 2013; Shittu and Panan, 2014) to assess the Women-In-

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Agriculture and Youth Empowerment (WAYE) programme. Their main focus, however, was on women and men, and only a few local government areas were covered, thus limiting the scope of WAYE programme objectives. Similarly, the agricultural component and other aspects of the programme were greatly ignored. What is almost lacking in these studies, however, is any direct involvement of youth in the programme and assessment of the impact of the programme on the livelihood of the participating farmers. Therefore, their studies have left a knowledge gap on the impact of the Women-In-Agriculture and Youth Empowerment programme objectives. It is based on this that the study, therefore, intended to provide empirical analysis on women and youth that will be useful for reassessment and reorientation of the programme's objectives and focus. And thus, the main objective of the study was to determine the impact of the Women-in-Agriculture and Youth Empowerment (WAYE) programme on crop output and income among women farmers in Plateau State, Nigeria. The specific objectives were to describe the socioeconomic characteristics of participants and non-participants in the WAYE programme, determine the income of programme participants, and identify the constraints encountered among women participants in accessing the WAYE programme in the study area.

The hypotheses of the study are stated: The WAYE programme has no significant impact on the income of programme participants in the study area.

METHODOLOGY

This study was conducted in Plateau State, Nigeria. The state was created in 1976 from the defunct Benue-Plateau State. It has highlands rising from 1,200 meters above sea level at the lowlands to a peak of 1,829 meters above sea level. It is located in Nigeria's middle belt and lies between the latitude and longitude of the Greenwich Meridian. (Plateau Agricultural Development Programme, 2000). The state has a landmass covering nearly 53,585 square kilometres with a population of 3,577,669 people as per the 2006 census (NPC, 2006).

A multi-stage sampling procedure was used to select participating farmers for the study. There are nine (9) Irish potato-producing LGAs in Plateau State, and they are given priority consideration for the programme. In the first stage, all these nine local government areas were used for the study. This was because of their high level of production of potatoes in the state. In the second stage, two villages were randomly selected in each Local Government Area, and this was based on the level of participation in the programme as well as in potato production. This gave a total of eighteen (18) villages. During a reconnaissance survey of the study area in 2018, the list of WAYE potato farmers in the chosen villages was compiled with the help of the programme coordinating officers in each LGA, and the total number obtained was seven hundred and eleven (711) farmers. Therefore, a total number of two hundred and fifty-six (256) Irish potato farmers were selected randomly using the random number table method.

Primary data were obtained by the use of a well-structured questionnaire and administered to the participating farmers and non-participating farmers by the researcher, who was assisted by well-trained enumerators from the Plateau State Agricultural Development Project (PADPs). The secondary information was obtained as baseline information from the WAYE head office and the coordinating liaison offices. Also, information from other related studies was used to support the discussion of results of the findings. Data collected were subjected to both descriptive and inferential statistics. Descriptive statistics, such as percentages, tables, frequency counts, and means, were used to achieve the objective. i. The logit regression model and ordinary least squares (OLS) regression were used to achieve objectives ii and iii. The Chow test was used to test the hypothesis.

RESULTS AND DISCUSSION

Socio-economic Characteristics of Participating and Non-Participating Farmers

The result in Table 1 shows that the mean age of the participating farmers was 38 years while that of the non-participating farmers was 43 years. This means that the participating farmers were younger in age than the non-participating farmers. This is in line with the major objective of WAYE programme to engage both young men and women in agricultural activities with the aim of improving the living conditions of households in the study

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area. Age has been found to be an important variable in agricultural productivity; hence both categories of the farmers were within the agricultural productive age range of 30-50 years quoted by Food and Agriculture Organization (FAO, 2000; 2008). About 65% and 60% of the participating farmers were married and single while (66%) and (17%) of the non-participating farmers were also married and single respectively. The significance of marital status on agricultural production can be best explained in terms of the supply of family labour (Adewale, 2005). Michael and Adamu, 2021

The result of the study shows, that (67%) and (33%) of the participating farmers were males and females while (77%) and (33%) of the non-participating farmers were males and females respectively. This agrees with the findings of Ayandiji and Adeniyi (2011) who reported that males have dominance potato production activities unlike their female's counterparts because agricultural activities are regarded as labour intensive. The result in Table 1 indicated that majority (63%) of the participating farmers cultivated between 1-1.5ha for Irish potato production while (75%) of non-participating farmers used less than 1ha.This mean farm size cultivated by both categories of farmers was 1.4 ha and 0.5ha respectively. According to Adamu (2019), Adamu et al,2020, Adamu and Michael 2023; classification of farm size of 0.1 - 5.9 hectares as small farms implies in this study that all the farmers were small scale farmers. This may be due to the inheritance system of land ownership practiced in the study area which results in land fragmentation among farmers, leading to small farm holdings. The implication of small farm size affects the quantities of Irish potato output produced which in turn affect both the income and food security status of the farmers. The result agrees with the finding of (Nwosu, 2007) who reported that majority (82%) of the farmers acquired the farmland through renting with farm sizes ranging from 0.5-4 hetares. Farming experience in Irish potato, the result in Table 1 indicated that, (67%) and (54%) of both the participating farmers and non-participating farmers had Irish potato farming experience between 1-10 years and 11-20years respectively. Abonge (2012) opined that farming experience is an important factor in determining both the productivity and the production level in farming. The result in Table 1 reveals that (55%) and (47%) of the participating farmers and non-participating farmers had secondary school education, which constituted the largest number of educational qualification attained in the study area. Adewale(2005) had identified literacy among other factors as a variable that positively influenced the use of improved agricultural inputs by farmers. According to the distribution of respondents in Table 5.1. The result shows that majority (77%) and (73%) of the participating and non-participating farmers have a family size of 1-10 members respectively. This finding agrees with that of Ifenkwe (2012) reported that the average family size in Africa is between 8 and 9 people in a household. The implication of 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.

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Table 1: Distribution of respondents according to age, marital status, Gender, farm size, farm experience, educational level and household size

	Participating farmers		Non – participating farmers	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Age(Yrs)				
20 – 30	17	6.64	8	3.13
31 – 40	173	67.57	96	37.50
41 – 50	56	21.88	118	46.09
51 – 60	8	3.13	23	8.98
61 – 70	2	0.78	11	4.30
Total	**256**	**100**	**256**	**100**
Mean	38		43	
Marital status				
Single	60	23.44	43	16.80
Married	166	64.84	169	67.58
Divorced	8	3.13	11	4.30
Widow	22	8.59	33	12.89
Total	**256**		**256**	**100**
Gender				
Male	171	66.80	196	76.56
Female	85	33.20	60	23.44
Total	**256**	**100**	**256**	**100**
Farm size(ha)				
Less than 1	36	14.06	192	75.2
1 – 1.5	162	63.28	35	13.68
1.6 – 2.5	47	18.36	21	8.20
2.6 – 3.5	8	3.13	7	2.73
3.6 and above	3	1.17	1	0.37
Total	**256**	**100**	**256**	**100**
Mean	1.4		0.5	
Farming exp(yrs)				
1 – 10	172	67.19	72	28.13
11 – 20	64	25.00	138	53.91
21 – 30	14	5.46	26	10.16
31 – 40	5	1.95	14	5.46
41 – 50	1	0.40	6	2.34
Total	**256**	**100**	**256**	**100**
Mean	10		16	
Educational level				
No education	10	3.91	6	2.34
Qur'anic/adult.	7	2.73	11	4.30
Primary	71	27.73	88	34.38
Secondary	141	55.08	120	46.88
Tertiary	27	10.55	31	12.10
Total	**256**	**100**	**256**	**100**
Household size				
1 – 10	198	77.34	187	73.05
11 – 20	55	21.48	64	25.00
21 – 30	3	1.18	5	1.95
Total	**256**	**100**	**256**	**100**
Mean	**8**		**8**	

Source: Field Survey, 2020

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Impact of DEC microcredit programme on income and standard of living among DEC participants and non-participants

Determinants of farm income among programme participants and non-participants

The result of the OLS regression estimates determine the factors affecting farm income among programme participants is presented in Table 2. The adjusted R square of 0.536 implies that 54% in the variability of the farm income among the programme participants is explained by the explanatory variables specified in the model. The factors that had significant influence on farm income of programme participants in the study area were age (0.410), farm size (1.184), farm experience (0.046), farm input (0.293), education (0,050) and extension contact (0.363). The coefficient of age was found to be positive and significantly related farm income at 5% level of probability. The estimated coefficient of 0.410 implies that the farm income of a programme participant will increases by a magnitude of 0.410 as her age increase by a unit. This means that older farmers would tend to stick to farming, reflecting their age old farm occupation and would work hard to improve on their farm income. The life-cycle hypothesis postulates that the young are more likely to participate or borrow from microfinance institutions because of their ambition to invest and accumulate wealth during their working age. The old on the other hand are less likely to participate in saving or borrowing activities. This finding corroborate that of Amine (2016), Asserted that, younger households particularly in their middle age tend to engage in different productive activities (crop production, rearing of livestock and petty business) to increase their income and saving and gradually accumulate wealth to ensure higher future consumption. The coefficient of farm size was found to be positive and significantly (P<0.05) related with the farm income of programme participants. The estimated coefficient of 1.184implies that the farm income of programme a participant will increase by a magnitude of 1.184percent as her farm size increases by one unit. This is obvious because *ceteris paribus*, the expectation is that an increase in farm size should result in a corresponding increase in farm income. The coefficient of farming experience was found to be positive and significantly (P<0.05) related to farm income. The estimated coefficient of 0.046implies that the farm income of programme participants will increase by a magnitude of 0.046, with a unit increase in farming experience. This finding is in tandem with the earlier findings of Folorunso(2016) who noted that farming experience was a significant determinant of Fadama II net farm income of root and tuber crop respondents

The coefficient of farm inputs (0.293) had the expected positive relationship with farm income of programme participants and is significant at 10% level of probability. The estimated coefficient of farm inputs implies that the farm income of programme participants will increase by the magnitude of 0.293 as farm inputs increase by one unit. This is in consistent with the findings of Shehu *et al* (2015) who observed that the estimated coefficient of farm input was positive as expected and significant at (P<0.10) level which implies that the more farm inputs is applied in their agricultural production the better the farm income of the programme participants. The coefficient of access to market was found to be positive but not significantly related to farm income. Education holds the key to development. This may be the reason Okwu *et al*. (2008) and Folurunso, (2016) recommended that education, whether formal or informal, should be provided to women farmers at all levels. Thus education coefficient was found to have a direct relationship with the farm income of programme participants and is statistically significant at (P< 0.10) level of probability. The estimated coefficient of 0.050implies that the farm income of programme participants will increase by a magnitude of 0.050 as the number of years spent in school increases by one unit. Extension contact was significant at (P< 0.10) level of probability. The estimated coefficient of 0.363 implies that the farm income of programme participants will increase by a magnitude of 0.363as extension contact increases by one unit. This finding is in agreement with the findings of Folorunso(2016) who stated that Extension contact was a significant determinant of Fadama II net farm income of root and tuber crop respondents.

The regression coefficient of labour was also found to be positive and significantly related with farm income at (P< 0.10) level of probability. The estimated coefficient of 0.247 implies that the farm income of the participants will increase by a magnitude of 0.247 as labour increases by one unit. Access to market has a positive coefficient (0.504) and insignificant in determining the farm income of the programme participants. This finding disagrees with

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the findings of Nwalieji *et al* (2015) who stated that there was significant change (χ2= 40.14, P≤ .05) in the proportion of PPFs before and after the commencement of the project. This implies that there is significant changes in ease of marketing rice produce by the PPFs.Credit assists the farm households in the purchase of farm inputs such as fertilizers, herbicides, improved seeds and investment demand, which ultimately increase their productivity. However, credit had positive coefficient (0.295) and was not significant, perhaps due to the small amount of credit received by programme participants. This findings corroborate Nwalieji *et al* (2015)who stated that there was no significant change (χ2= 6.00, P > .05) in the proportion of PPFs that had access to credit, before and after the commencement of the project. This implies that there is no significant increase in access to credit by the farmers. Degree of accessibility to credit implies farmers' ability to acquire or access loan facility or other credit facilities from the agency. However, access to credit is seen as a great enabler for primary producers' especially small-scale farmers in enhancing adoption of technologies and better production methods to improve farm output, income and standard of living.

Table 2: Regression estimates of farm income and socio-economic factors of programme participants and non-participants

	Participants			**Non- participants**		
Variables	**Coefficients**	**SE**	**t-stat**	**Coefficients**	**SE**	**t-stat**
(Constant)	-7.003***	2.636	-2.656	-1.376	1.294	-1.063
Farm size	1.184***	0.117	10.117	0.342***	0.039	8.769
Labour	-0.132	0.176	-.747	0.247*	0.139	1.776
Age	0.410**	0.187	2.192	0.068	0.131	0.519
Farm Experience	0.046***	0.016	2.875	0.013	0.0162	0.802
Farm Input	0.293*	0.169	1.734	-0.050	0.082	-0.609
Credit	0.295	0.186	1.589	-0.045	0.093	-0.483
Access to market	0.046	0.073	0.629	0.028	0.049	0.571
Education	0.050***	0.017	2.941	0.051***	0.015	3.40
ExtensionContact	0.363***	0.133	2.729	0.023	0.087	0.264
R^2=0.55						

Source: Field Survey, 2015
*** P< 0.01, ** P<0.05 and * P<0.10. Adjusted R^2 =0.55(participants) and Adjusted R^2 0.45 (Non-participants**)**

Test of hypothesis of impact of DEC microcredit programme on participants' farm income

The result in Table 3 shows that, F-chow calculated value was 232.378 while F-tabulated value was 1.90 at 5 percent level of probability for eight degrees of freedom and the population (N) was 420. The analysis shows that F*chow calculated is greater than F-tabulated. This implies that DEC microcredit had impact on farm income of programme participants. This is in agreement with the findings of Simonyan (2010), Adamu et al, 2020 on impact analysis of Fadama II who found that they had impact project on income, productivity and standard of living of the beneficiaries in Kaduna State.

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Table 3: Chow test distribution of DEC microcredit programme impact on the participants' farm Income

Group sample	R^2	RSS	N	K	F-cal	F-tab
Pooled	0.536	232.432	420	9	232.3787	1.90
Participants	0.519	79.309	210			
Non-participants	0.422	12.656	210			

R^2 = regression coefficient, N = numbers of observation and K = numbers of parameters

Constraints Encountered by Participants in Accessing WAYE) programme

The results in Table 6 show three major constraints were perceived to be a serious constraint in accessing credit. These were low volume of loan disbursed (X = 2.36) followed by short repayment period (X = 2.23) and high interest rate charged (X = 2.15). This is in line with the finding of Olujide (2014), Adamu and Michael, 2021, who identified limited funds, short period of repayment and high rate of loan default as the major constraints facing COWAN in Ondo State, Nigeria.

Table 6: Mean distribution of respondents according to perceived constraints encounter in accessing WAYE) programme

S/N	Constraints	Mean score	Percent	Ranking	Decision
1	Low volume of loan disbursed	2.36	79	1st	S
2	Short duration of loan	2.23	74	2nd	S
3	High interest rate on loan	2.15	72	3rd	S
4	Inadequate finance	1.98	66	4th	Ns
5	Lack of government support	1.80	60	5th	Ns
6	Transport problem	1.86	62	6th	Ns
7	Non-involvement in project supervision	1.80	60	7th	Ns
8	Non-involvement in decision making	1.60	53	8th	Ns
9	Communication gap	1.45	48	9th	Ns
10	Religious discrimination	1.32	44	10th	Ns

Source: Field survey, 2020 S= Serious constraints. Ns = Not serious constraints.

Conclusion and Recommendation

Based on the findings, this study concludes, that age, education, farm size, farm input,and extension contact had significant and direct relationship with income of the participants. The F-chow calculated shows that WAYE programme had impact on the income of programme participants. The major constraints encountered in accessing WAYE programme by participants was low volume of loan disbursed, short repayment period and high interest rates charged. It was recommended that, WAYE programme organization should increase the amount of loan disbursement from current 50,000 - 200,000, so as to increase participation or patronage; extend the repayment period (but without jeopardizing the interest of the organization), interest rates should be lowered to allow for greater participation and WAYE programme should be extended to others Local Government Areas of Kaduna State.

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