



GENDER-BASED ROLES AND PERFORMANCE ON IRISH POTATO (*SOLANUM TUBEROSUM* L.) PRODUCTION IN CENTRAL AGRICULTURAL ZONE OF PLATEAU STATE, NIGERIA

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ABSTRACT

The study examined gender-based roles and performance of Irish potato (*Solanum tuberosum* L.) production in the Central Agricultural Zone of Plateau State, Nigeria. A multistage sampling technique was used in selecting 100 respondents for the study. Data were collected using a structured questionnaire and analyzed using descriptive statistics and a t-test. The findings revealed that all of the Irish potato production activities were performed by both sexes, but their level of involvement varied it showed that most (99.1%) of the male respondents were involved in land preparation while 98.9% of the females were involved in land preparation. It implies that male Irish potato farmers slightly performed more tasks than female in terms of land preparation in the study area. In ridging, results showed that 96.3% of the male farmers participated while 82.6% of female engaged in ridging activities. Emanating from the findings it can be concluded that male dominated most farming activities and had more access to production resources like land, capital and labour compared to their female counterparts. The study concluded that male Irish potato farmers dominated farming activities such land preparation, ridging, weeding, planting, fertilizer application and harvesting among others and had more access to production resources compared to women in the study area. The study recommends that government and non-governmental organizations should provide training and credit facilities to female farmers to boost their productivity and reduce the gender gap in performance.

Keywords: Gender, Roles, Irish, Potato, Production

INTRODUCTION

In Nigeria, the major potato producing areas under rain-fed and dry season conditions in Nigeria are Jos Plateau, Obudu highland, Biu and Mambilla Plateau. The eleven northern states of Bauchi, Borno, Kaduna, Kano, Sokoto, Kebbi, Taraba, Adamawa, Jigawa and Yobe also have potentials to produce potato during the harmattan months of November to February under irrigation facilities (PADP, 2021). Plateau State produces about three quarters of the country's Irish potatoes according to FAOSTAT (2020). Plateau state has comparative advantage in potato production in Nigeria with 95% of the total country production done in the state. Potato is grown in nine (9) Local Government Areas (Bokkos, Mangu, Barkin Ladi, Riyom, Jos South, Jos East, Jos North, Bassa and Pankshin) of the 17 Local Government Areas of the state (Plateau Agricultural Development Programme, PADP, 2021). Gender analysis is a systematic methodology for examining the differences in roles and norms for women and men, the different levels of power they hold; their differing needs, constraints and opportunities and the impact of these differences in their lives in the society, culture, economy and politics (United States Agency for International Development, USAID, 2015). Gender issues are becoming increasingly indispensable in Nigeria's agriculture owing to overwhelming evidence of significant contribution of both men and women to agriculture, stability and food security amidst formidable economic adversity (Badmus *et al.*, 2015). Generally, in the Nigerian society, male and female have different responsibilities, needs, interests, opportunities and constraints in agricultural production (Food and Agriculture Organization-FAO, 2018). They have different levels of access to ownership and control of resources and benefits in households, which vary widely and are in many instances determined by culture, tradition and social status. In addition, male and female have unequal decision-making abilities in resource management (Tafida *et al.*, 2019). Over the years, it is believed that some crops are designated as "women crop" for planting and



processing. These include vegetables, groundnuts and cassava while yams and tree crops such as cocoa and palm produce are said to be men's crop (FAO, 2018).

Male and Female involvement and differences in production have not been studied in depth for the purpose of channeling development incentives, particularly support in terms of finances, access to land, technologies and agricultural extension packages among other production resources. In spite of the overwhelming evidence of women's roles and involvement in Irish potato production, it is most unfortunate that most government policies and interventions seem to by-pass most women farmers in Plateau State. Agricultural production incentives appear to be distributed to the male at the expense of the female farmers (World Bank, 2010). By and large the research work is intended to contribute to the existing knowledge-literature on agricultural gender-based roles in Irish potato production in Central Agricultural zone of Plateau state and as well serve as a reference material for further studies.

The broad objective of the study is to examine the gender-based roles and performance on Irish potato production in Central Agricultural zone of Plateau state, Nigeria. The specific objectives are to:

- i. examine the farming activities engaged by male and female respondents
- ii. assess the level of performance of male and female respondents in the study area;
- iii. identify the constraints to optimum Irish potato production by male and female farmers

METHODOLOGY

The Study Area

This study was carried out in the Central Agricultural Zone of Plateau State, Nigeria. Plateau state which is located in the middle belt region of Nigeria was created in 1976. Northern Agricultural Zone of Plateau State lies between longitudes 8°40' and 9°50' E and latitudes 9° and 10°45' N (National Roots and Cereal Research Institute (NRCRI, 2020). The state has a total land area of 53,385 square km (Plateau Agricultural Development Programme, 2019). The state also has a total population of 3,178,712 people with the breakdown of female population of 1,586,679 at a growing rate of 2.7% per annum while the male gender has a population of 1,593,033 (National Population Commission, 2006). Plateau State shares boundary with Bauchi to the North, Kaduna State to the west, Benue state to the South and Nasarawa and Taraba State to the East Plateau State has seventeen local government areas with Jos as its capital. Plateau state is divided into 3 agricultural zones according to Plateau Agricultural Development Programme (PADP) which include: Central Zone with headquarters at Mangu, Southern Zone with headquarters at Yelwa, and Northern Zone with headquarters at Jos South. Although the state is best known for its mining production, agriculture is the major occupation of the people. Irish Potato is one of the major crops; millets, yams, sorghum, corn (maize), sweet potatoes, cowpeas, rice, fruits, and vegetables are the staple crops. (Plateau State Government of Nigeria, 2020). The study area comprises of four LGAs which are; Bokokos, Pankshin, Mangu and Kanke LGAs.



Figure 1: Map of Plateau State highlighting the study Local Government Areas

Source: Federal Information Service Centre, Jos (2020)

Sampling Technique and Sample Size

The population for this study comprises Irish potato farmers in the study area. A multi-stage sampling technique was used in selecting the respondents for this study. Because most Irish potato farmers belong to one cooperative society or the other, list of farmers were obtained through the farmers multipurpose cooperative societies. The list for these societies was obtained from the Central zonal office of PADP located at Mangu LGA, Plateau State. A total of 18 (9 for men and 9 for women) cooperatives were obtained as shown in table 1 below. In the first stage, 3 LGAs out of 4 in the Central Agricultural Zone were purposively selected making sure that only those LGAs popular in Irish Potato production were selected. They are: Bokkos, Mangu and Pankshin. In the second stage 3 Irish Potato producing communities were purposively selected from each of the 3 selected LGAs making a total of 9 communities. The communities selected was based on the presence of Irish potato cooperative societies. A list of members of those cooperative societies formed the sampling frame for this study. In the third stage from the sampling frame, a proportionate selection of 40% of male and female was randomly carried out in each community to give a total of 201 Sample size for the study. See Table 1.

Table 1: The Sampling Frame and Sample Size of Male and Female Irish Potato Farmers in the Study Area

LGAs	Villages	Sampling frame (Registered farmers from cooperatives)		Sample size (20% of registered farmers)	
		Male	Female	Male	Female
Bokkos	Tangur	35	25	14	10
	Buturagida	32	27	13	11
	Mbar	28	23	11	9
Mangu	AmpangWest	31	25	12	10
	Kerang	30	27	12	11
	Pushit	30	24	12	10
Pankshin	Mile8, Fier	28	28	11	11
	Tambes	29	23	12	9
	Nungwus	30	28	12	11
Total	9	273	230	109	92

Source: Preliminary Survey data (December, 2021)



Methods Data Collection

Primary data was used in this study. The primary data were obtained by the use of structured questionnaire. The questions covered all the objectives of the study including the socioeconomic characteristics of the respondents; their level of access to production inputs and services; level of adoption of improved Irish potato production technologies; the costs and returns of Irish potato production and the constraints to optimum Irish potato production by the respondents.

Data Analysis

Data was subjected to descriptive statistical analyses. The descriptive statistics such as frequency, percentage, mean scores and ranking was used to achieve objectives i, ii and iii.

RESULTS AND DISCUSSION

Farming Activities Performed by Male and Female Respondents

The results in Table 2 show the farming activities performed by male and female respondents. The farming activities performed by male and female respondents showed that 99.1% of the male respondents were involved in land preparation while 98.9% of the females were involved in land preparation. It implies that male Irish potato farmers slightly performed more tasks than female in terms of land preparation in the study area. In ridging, results showed that 96.3% of the male farmers participated while 82.6% of female engaged in ridging activities. The result implies that male potato farmers performed more tasks than female in terms of ridging in the study area. Also, in weeding 95.4% of the male performed the operation while, 91.3% of female Irish potato farmers participated in the operation. It implies that male potato farmers performed more tasks than female in terms of weeding in the study area. In planting 95.4% was carried out by male farmers in the study area and 93.5% of the female potato farmers participated in planting operations. It implies that male potato farmers performed the operation than the female in terms of planting in the study area. In fertilizer application 99.1% of the male respondents participated while 95.7% female participated in fertilizer application. The result implies that male potato farmers performed the tasks more than the female in terms of fertilizer application in the study area. Majority (96.3%) of the male potato farmers performed the harvesting in the study area whereas 89.1% of females were involved in harvesting. It implies that male potato farmers involved in harvesting than the female in terms of harvesting in the study area. However, in processing activity, the female Irish potato farmers had higher participation of 37.0% as against 12.8% performed by the male Irish potato in the study area. In transportation, the male farmers dominated the activity with 94.5%, while 75.0% women were involved. This implies that male potato farmers performed the tasks of transportation than their female counterparts in the study area. More male Irish potato farmers (74.3%) performed the storage operations compared to the 62.0% performed by female Irish potato farmers in the study area. Also, in sorting, male involved in the activity were 66.1% while 85.9% of the female were involved. This implies that female potato farmers performed more than the male Irish potato farmers in terms of sorting in the study area. Also, in packaging, male involved in the activity were only 47.7% while 43.5% of the female were involved. This implies that male potato farmers performed this task more than the female respondents in the study area. In selling of Irish potato, male constituted 84.5% and female constituted 94.8% of the selling activities. It implies that female Irish potato farmers performed this operation than the female Irish potato farmers in terms of selling Irish potato in the study area. In herbicides application, male involvement in the activity was 98.2% while only 34.7% of the female were involved. It implies that male potato farmers performed this task than female in terms of herbicides application in the study area. The final operation which was application of fungicides activity, male respondents was 94.5% while 83.7% of the female respondents performed the activities. Male Irish potato farmers dominated in almost all of the farming activities performed except in processing, sorting and selling where female farmers dominated. The result implies that men had a superiority of labour contribution compared with the women in the study area. Also, men are more likely to participate more in most of the farm activities thereby reducing their cost of production, particularly labour. Women's low participation could be attributed to the tedious nature of Irish potato farming and female farmers' restricted access to production inputs; particularly land ownership due to cultural barriers. This

finding agrees with the findings of Ogheneruemu and Dominic (2020) revealed that the result of their finding showed that Irish potato farming is dominated by male farmers (71.43%).

Table 2: Distribution of Respondents Based on Farming Activities Performed

Activities performed	Male respondents		Female respondents	
	Frequency	Percentage	Frequency	Percentage
Tilling/Land preparation	108*	99.1	91	98.9
Ridging	105	96.3	76	82.6
Weeding	104	95.4	84	91.3
Planting	104	95.4	86	93.5
Fertilizer application	108	99.1	88	95.7
Harvesting	105	96.3	82	89.1
Processing	14	12.8	34	37.0
Transportation	103	94.5	69	75.0
Storage	81	74.3	57	62.0
Sorting	72	66.1	79	85.7
Packaging	52	47.7	40	43.5
Selling	78	84.5	103	94.8
Herbicides application	107	98.2	32	34.7
Fungicides application	103	94.5	77	83.7

Source: Field survey, 2022 *multiple response

Level of Access to Production Resources by Male and Female Irish Potato Farmers

The results from Table 3 revealed that male Irish potato farmers had greater access to land (85.3%) compared to female farmers (35.9%), a situation explained by cultural land tenure systems that favor men. This finding agrees with Nwosu *et al.* (2021), who observed that land inheritance practices in northern Nigeria continue to marginalize women farmers, thereby limiting their capacity to expand production. Similarly, Gebre *et al.* (2020) reported in Ethiopia that women were less likely to access farmland due to patriarchal land allocation systems, which restrict their role in commercial crop farming. The finding also shows that majority (87.2%) of male farmers had access compared to 75.0% of females. This supports the findings of Adesugba and Mavrotas (2019), who found that men often mobilize more household and hired labour for farm operations because of larger farm sizes and higher decision-making power in rural households. Interestingly, women farmers had greater access to tractor services (19.6%) compared to men (13.8%), although overall access was low. This aligns with Ojo *et al.* (2022), who reported that female cooperative groups in Plateau State accessed mechanization services through pooled resources, enabling more women to benefit from tractor hire schemes, though large-scale farming was still constrained by affordability.

The result further indicates that women also had higher access to storage facilities (19.6%) compared to men (24.8%). This result corroborates Ezech *et al.* (2020), who noted that women engaged in postharvest handling and small-scale processing often prioritize storage facilities to minimize losses, while men focus more on farm production. While fertilizers and improved seeds, men were slightly advantaged (fertilizer: 58.7%-52.2%; seeds: 61.5%-53.3%). This finding is consistent with the work of Oladejo and Adetunji (2021), who found that women farmers face constraints in accessing subsidized inputs because distribution networks are male-dominated and women have weaker connections with extension officers. The findings on agrochemicals (fungicides, rodenticide, herbicides, pesticides, and insecticides) further show male dominance, with access rates ranging between 91.7%-68.5%, 65.1%-53.3%, 92.7%-87%, 77.1%-66.3% and 67.9%-65.2%, compared to female respectively. This agrees with Kassa *et al.* (2021), who reported that women farmers often lack technical training in the safe handling of agrochemicals, limiting their utilization despite availability.

On the other hand, women dominated in credit access (16.3%-10.1%) and marketing facilities (66.3%-4.6%). This aligns with Ogunleye and Kehinde (2019), who observed that female farmers are more active in cooperative groups and rotating savings associations, which enhance access to microcredit. Similarly, Auta and Yusuf (2023) emphasized that women are more engaged in



agricultural marketing because it allows them to combine household responsibilities with income-generating activities. Extension services, men had significantly higher access (66.1%) compared to women (32.6%). This supports the findings of Ibrahim *et al.* (2022), who reported that women often face mobility and cultural restrictions that prevent them from attending training sessions, resulting in their lower exposure to extension information. Finally, both male and female farmers had very low access to processing facilities (3.7%-1.1%) and farm insurance (1.8%-1.1%), a finding consistent with Adeoye *et al.* (2022), who highlighted that infrastructural limitations and lack of awareness have hindered smallholder farmers in Nigeria from accessing farm insurance and postharvest technologies.

Table 3: Distribution of Respondents Based on Access to Production Resources

Activities performed	Male respondents		Female respondents	
	*Frequency	Percentage (%)	*Frequency	Percentage (%)
Land	93	85.3	33	35.9
Labour	95	87.2	69	75.0
Tractor service	15	13.8	18	19.6
Storage facilities	27	24.8	18	19.6
Fertilizer	64	58.7	48	52.2
Improved Irish potato seeds	67	61.5	49	53.3
Fungicides	89	91.7	63	68.5
Rodenticides	71	65.1	49	53.3
Herbicides	90	92.7	80	87.0
Pesticides	84	77.1	61	66.3
Insecticides	74	67.9	60	65.2
Credit facilities	11	10.1	15	16.3
Processing facilities	4	3.7	1	1.1
Extension Service	72	66.1	30	32.6
Marketing facilities	5	4.6	61	66.3
Farm Insurance	2	1.8	1	1.1

Source: Field survey, 2022 *Multiple response

CONCLUSION AND RECOMMENDATION

Based on the findings from the study it is concluded that male Irish potato farmers dominated farming activities such land preparation, ridging, weeding, planting, fertilizer application and harvesting among others and had more access to production resources compared to women in the study area. In addition, both male and female respondents faced with constraints such as inadequate capital, lack of credit facilities, lack of a secure land tenure system, high cost of farm inputs and poor marketing facilities among others.

Based on the findings the following recommendations were made;

- Government and NGOs involved in agricultural inputs should make production resources available at ease of access to Irish potato farmers.
- Government should initiate financial assistance scheme for Irish potato farmers to encourage and sustain Irish potato production in the State
- Farmers should form cooperatives and participate actively in pulling resources to increase their access to production inputs
- Government should recruit and equip qualified extension services in the study area

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