

Analysis of Gender Differentials in the Acquisition of Productive Assets among Smallholder Rice Farmers in Benue State, Nigeria

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Abstract

This study analyzed gender differentials in the acquisition of productive assets among smallholder rice farmers in Benue State, Nigeria. Utilizing a sample of 269 rice farmers selected through random sampling from six LGAs, data was gathered via structured questionnaires. Descriptive statistics and independent sample t-tests were employed to evaluate the types and values of productive assets acquired by male and female farmers. The findings reveal significant gender disparities in asset acquisition. Male farmers had higher total values in most asset categories, including agricultural credit, improved rice varieties, hired labor, and modern inputs such as NPK and UREA fertilizers. Specifically, males acquired agricultural credit worth ₦139,000,000 compared to ₦48,442,532 for females, and improved rice varieties worth ₦9,645,000 compared to ₦3,743,843 for females. The mean acquisition of productive assets for male farmers (₦9,463,804.59) significantly exceeded that for female farmers (₦1,811,698.27), highlighting substantial gender-based differences. An independent samples t-test confirmed these disparities, with a significant mean difference of ₦7,652,106.32 ($p < .05$). These disparities suggest that male farmers have greater access to and ownership of productive assets, potentially limiting female farmers' productivity and economic empowerment. The study recommended that female farmers in the Benue State should come together to form cooperatives so as to pool their resources together and acquire productive assets hitherto difficult to acquire among them as individual farmers; and policies and programs that promote asset ownership and decision-making by female farmers within the agricultural system should be implemented by the Benue State government.

Key words: Gender Differentials; Acquisition; Productive Assets; Smallholder; Rice Farmers; Benue State; Nigeria

Introduction

Rice (*Oryza sativa*) is among the few critical grains consumed by the growing world population with the current global production reaching 755,473,800 tonnes per year (Ibirogba, 2022). The commodity rice has continued to play significant roles in the economic and socio-cultural lives of Nigerians. In 2019, Sasu (2022) reported that rice accounted for more than 14 percent of the crops cultivated by households in Nigeria. According to Ukpe (2022), Nigeria now accounts for 70% of Africa's milled rice production growth over the past decade and this is expected to increase by 10% in 2025.

The demand for rice in Nigeria has been increasing at much faster rate than other West African Countries since the mid-1970s. However, the country is yet to maximize its potential to meet local demand as well as export (Ibirogba, 2022). Rice as a core staple food among Nigerians has been subjected to a combination of measures in an effort to boost local production and reduce the country's large dependence on imports (Famine Early Warning Systems Network, FEWS NET, 2017). However, this production intensification and higher yields per ha has not been sufficient to fill the gap and meet rice demand in the country.

Several factors have been attributed to the inability of Nigeria to bridge the gap between demand and supply of rice. Important but yet understudied factor responsible for this widen gap between rice supply and demand in the country is gender disparity in production assets acquired among actors in the value chain. According to FAO, 2011; Raney *et al.*, 2011; Awuor *et al.*, 2021 and Onubogu, 2023, the agriculture sector is underperforming in many developing countries and one of the key reasons attributed to this is that women do not have equal access to the resources and opportunities they need to be more productive. Similarly Coker *et al.* (2017) observed that gender imbalance in socioeconomic status, resources use productivity and competitiveness are still recurring issues limiting the attainment of increased rice productivity, competitiveness and food production. They observed that farm productivity and competitiveness in developing economies are still very low compared to the developed economies and differs significantly across gender.

Gender differences arise from the society constructed relationship between men and women. These differences affect the distribution of resources and responsibilities between and women, and are shaped by ideological, religious, ethnic, economic, and cultural determinants. The evidence illustrating gender inequalities in access to land is overwhelming. According to Slavchevska *et al.* (2021), less than 15% of agricultural land owners are women and 85% are men worldwide, while in Africa women own under 1% of the agricultural land (Lusasi and Mwaseba, 2020). Women are less likely to be owners (or operators) of agricultural land, and even when they own or operate agricultural land, they usually have smaller plots.

In a data obtained from Bolivia, Ecuador, Guatemala, Nicaragua, Panama, Bangladesh, Indonesia, Nepal, Pakistan, Tajikistan, Vietnam, Ghana, Madagascar, and Malawi, Anriquez (2010) showed that in all the countries, male-headed households on average operate larger agricultural land holdings than female-headed households. Using ad-hoc farm surveys from nine Latin American countries, Deere and Leon (2003) found that male-headed land holders always tend to own more land on average than do female land owners. Similarly, Deere and Doss (2006) in a study carried out in Benin, Morocco and Zimbabwe, reported that male land holdings are larger than female holdings. In a study conducted in Nigeria, Onubogu (2023) observed mean farm sizes of 1.02ha and 0.8ha for male and female farmers respectively.

The control exercise by women over household livestock holdings varies by culture and context; while men are generally responsible for the keeping and marketing of large animals like cows, horses and camels, women tend to claim control over smaller animals like goats, sheep, pigs and poultry (FAO, 2009). This pattern is confirmed in a number of studies. In a study carried out in Nicaragua, Deere *et al.* (2009) observed that women own about 10 percent of work animals and cattle but between 55-65 percent of pigs and poultry. The report (Deere *et al.*, 2009) also showed that the overall value of male owned livestock was found to be 6½ times that owned by female.

Similarly, in Nigeria, Dillon and Quinones (2009) observed that the estimated value of men's livestock holdings to be about 2 times that of women.

In terms of modern farm inputs, evidence points to remarkable gender differences in access to and adoption of modern technologies and use of purchased inputs. In Ghana, Doss and Morris (2001) reported that female farmers had a much lower adoption rate of modern crop varieties (59 versus 39 percent) and attributed this differences to less access to land, lower availability of family labour, and less access to extension services among female farmers. In a Gambian irrigated rice scheme, Raney *et al.* (2011) reported that less than one percent of women farmers owned a weeder, seeder or multipurpose cultivation implement.

In Nigeria, evidence on gender disparity in resource use among small holder farmers is limited. Available studies (Oyediji *et al.* (2019); Jeiyol *et al.* (2013); Anigbogu *et al.* (2018); Ogundele and Badmus (2020); and Coker *et al.* (2017) focused on providing evidence of the existence of gender gap mainly on agricultural credits. Other productive assets were not captured. Hence, it is against this background that this study was design to analyze gender differentials in the acquisition of productive assets among smallholder rice farmers in Benue State, Nigeria and focusing specifically on the productive assets acquired by male and female smallholder rice farmers, and the differences in the value of these assets acquired. Understanding of this differential in productive assets acquired among smallholder rice farmers in Nigeria is important for policy formulation targeted at closing the demand supply gap for rice in the country.

Methodology

The Study Area

The study was conducted in Benue State, Nigeria. The State is located in the North Central region of Nigeria and lies between Latitudes $6^{\circ}25'$ and $8^{\circ}8'N$ and Longitudes $7^{\circ}47'E$ and $16^{\circ}E$ (Susan and Nirupana, 2015). The State has a total land area of about 33,955 square kilometers with a population of 4,253,641 (National Population Commission (NPC), 2006), with an average population density of 99 persons per square kilometers. The projected population of the State in 2022 was 6,141,300 (Brinkhoff, 2022).

Benue State has areas with low population density such as Guma, Gwer East, Ohimini, Katsina-Ala, Logo and Agatu each with less than seventy persons per Km^2 , while areas like Vandeikya, Okpokwu, Ogbadibo, Obi and Gboko have population densities ranging from 140 persons to 200 persons per Km^2 and Makurdi LGA with over 380 persons per Km^2 (Abdul, 2019)

According to Brinkhoff (2022), males made up 49.8 percent of the total population of the State while females constitute 50.2 percent. Benue is rich in agriculture and grows crops such as rice sweet potatoes, cassava, soya bean, guinea corn, yams sesame, and groundnuts. Also, the rearing of livestock such as pig, cattle, goat, sheep and fish abound in the State.

Population of the Study

The study population comprised 821 registered rice farmers from Kwande, Logo, Makurdi, Guma, Apa, and Oju LGAs of Benue State, Nigeria, obtained in 2018 from the Benue State chapter of Rice Farmers Association of Nigeria (RIFAN).

Sampling Technique and Data Collection

The study adopted random sampling technique to select a sample of 269 rice farmers from six randomly selected LGAs in Benue State. Structured questionnaire was used for the data collection.

Analytical Techniques

The study employed descriptive statistics and independent sample t-test, to analyze the collected data. Descriptive statistics were used to analyze the productive assets acquired by male and female smallholder rice farmers, while the independent sample t-test was used to analyze the differences in the value of these assets acquired.

Results and Discussion

Difference in the value of rice productive assets acquired among male and female smallholder rice farmers

Table 1 presents the examination of descriptive data on rice productive assets among male and female smallholder rice farmers in Benue State. Both genders have access to agricultural credit, but the total value for males (₦139,000,000) significantly exceeds that for females (₦48,442,532), implying a financial disparity that may impact female farmers' investment capacity in rice production. Oladosu *et al.* (2018) who analyzed gender differentials in the accessibility of agricultural production resources among yam farmers in Saki Agricultural Zone of Oyo State, Nigeria found similar result. While both genders acquire improved rice varieties, males invest more significantly in this category (₦9,645,000 compared to ₦3,743,843 for females), highlighting the importance of addressing potential discrepancies in access to modern seed varieties crucial for enhancing yields and ensuring food security. The data indicates that both male and female farmers engage in hired labour and have access to farm land, with males holding higher total values in both categories. This suggests that male farmers may operate more extensive agricultural ventures, potentially contributing to greater overall food security. Ankrah *et al.* (2020) investigated gendered access to productive resources-evidence from smallholder farmers in Awulu Senya West District of Ghana. Regarding technological assets like ICT, extension services, and irrigating machines, distribution between genders is relatively equitable. However, females invest more in tractors, indicating a potential efficiency advantage that could enhance productivity. Addressing any gender-based disparities in access to modern machinery is crucial for overall food security.

Males also acquire higher total values in categories such as NPK and UREA fertilizers and various pesticides (except karate 3EC), suggesting potential differences in the adoption of modern agricultural inputs that can impact crop yields and food production. This finding is in line with that

of Ajuwon *et al.* (2021). While both genders participate in agricultural training, males have a higher total value invested, emphasizing the importance of addressing gender-based differences in access to training for implementing best practices and optimizing productivity. Similarly, males have a higher total value in agricultural information, indicating potential disparities in knowledge and resource access. Bridging these gender gaps is crucial for promoting gender equality, empowering female farmers, and fostering a more resilient and sustainable agricultural sector, ultimately contributing to increased overall productivity and food security in Benue State.

Table 1: Productive Assets Accessible

Variables	Acquired Distribution		Sex who acquired		Sex [Total Value Price (₦)]	
	Acquired	Not acquired	M	F	Male	Female
Agricultural credit	206	63	175	31	139,000,000	48,442,532
Improved rice varieties	243	26	127	116	9,645,000	3,743,843
Hired labour	198	71	126	72	7,990,000	2,410,580
Farm land	228	41	129	99	2,280,000	4,254,360
ICT	96	173	89	7	694,240	89,433
Extension services	49	220	38	11	283,474	105,672
Tractor	121	148	51	97	2,605,000	3,195,000
Agricultural training	106	163	94	12	1,042,500	625,532
Storage facilities	179	90	103	76	1,120,000	473,739
Irrigating machines	97	172	84	13	980,000	264,268
NPK	215	54	182	33	7,410,000	2,463,639
UREA	191	78	112	79	5,220,000	3,635,732
Touchdown forte 500EC	151	118	127	24	1,170,000	895,362
Solito 320EC	176	93	135	41	594,000	472,343
Karate 3EC	188	81	110	78	784,000	842,279
Knapsack sprayer	208	61	141	67	4,880,000	2,425,732
Planter	76	193	59	17	737,331	365,362
Agricultural information	140	129	106	34	633,378	247,227

Source: Field Survey, 2023

Table 2 presents group statistics on the acquisition of productive assets among smallholder rice farmers in Benue State, Nigeria, disaggregated by gender. The mean acquisition of productive assets for male farmers (Group 1) is significantly higher (mean = 9463804.59, SD = 29589782.68) compared to female farmers (Group 2) (mean = 1811698.27, SD = 5261485.05). This stark difference highlights the gender disparities in asset acquisition, with male farmers having substantially greater access to and ownership of productive assets compared to their female

counterparts in the study area. This finding is in line with that of Peterman *et al.* (2010) investigated gender differences in agricultural productivity in Uganda and Nigeria. Such disparities can have profound implications for the economic empowerment and livelihoods of female farmers, potentially limiting their ability to increase productivity and income.

Table 3 presents the results of an independent samples t-test comparing the acquisition of productive assets between male and female smallholder rice farmers in Benue State, Nigeria. The Levene's test for equality of variances indicates that the assumption of equal variances is not violated ($F = 1.827$, $p = .244$), allowing for the interpretation of the t-test results. The t-test reveals a statistically significant difference in mean asset acquisition between male and female farmers, with a t-value of 2.365 and 267 degrees of freedom ($p = .019$) when assuming equal variances. This significance persists even when equal variances are not assumed, with a higher t-value of 3.394 and 206.797 degrees of freedom ($p = .001$). The mean difference in asset acquisition between male and female farmers is 7652106.32, with a 95% confidence interval ranging from 1280932.67 to 14023279.98. These findings suggest that there are significant gender disparities in the acquisition of productive assets among smallholder rice farmers in Benue State. The results imply that male farmers have greater access to and ownership of productive assets compared to female farmers in the study area (Olakojo, 2017). Such disparities can have profound implications for the economic empowerment and livelihoods of female farmers, potentially limiting their ability to increase productivity and income.

Table 2: Group Statistics

	Gender	n	Mean	Std. Deviation	Std. Error Mean
Prdt_Asset_Acq	1.00	184	9463804.5924	29589782.67981	2181387.72025
	2.00	85	1811698.2706	5261485.05143	570688.18051

Table 3: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Prdt_Asset_Acq	Equal variances assumed	1.827	.244	2.365	267	.019	7652106.3218	3235923.8514	1280932.67	14023279.98
	Equal variances not assumed			3.394	206.797	.001	7652106.3218	2254803.1810	3206750	12097454.776

Conclusion and Policy Implications

The study reveals significant gender disparities in the acquisition of productive assets among smallholder rice farmers in Benue State, Nigeria. Male farmers possess considerably higher total values of agricultural credit, improved rice varieties, hired labor, farmland, fertilizers, and various pesticides compared to their female counterparts. This disparity suggests that male farmers have more substantial financial capacity and investment opportunities, which likely enhance their productivity and economic stability.

The analysis shows that while both male and female farmers engage in agricultural activities and have access to resources, the total value of assets acquired by males surpasses that of females in most categories. This is evident from the higher mean acquisition of productive assets by male farmers (₦9,463,804.59) compared to female farmers (₦1,811,698.27), a difference supported by the independent samples t-test results, which indicate a statistically significant gap in asset acquisition between genders. The disparities can adversely affect female farmers' productivity, economic empowerment, and overall contribution to food security.

Based on the findings of the study, the following were recommended:

- Female farmers in the Benue State should come together to form cooperatives so as to pool their resources together and acquire productive assets hitherto difficult to acquire among the individual farmers; and
- Policies and programs that promote asset ownership and decision-making by female farmers within the agricultural system should be implemented by the Benue State government such as subsidy programs for seeds, fertilizers and pesticides designed to benefit female farmers; increasing the number of female extension workers to reach out to more women farmers with extension services; reviewed land tenure policies to ensure women's right to land ownership and use; labour assistance programs to support female farmers in hiring additional help during peak agricultural seasons; and training programs on financial literacy and credit management targeted at women farmers.

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