Innovations

Effect of access to healthcare and education interaction on female agricultural productivity in Nigeria

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Abstract
From 4.2 percent in 2002 to 7.2 percent in 2006, the growth rate of the agriculture sector's share of the GDP at constant base prices in 1990 increased. Women make up between 60 and 80 percent of the labor force in African agriculture, according to common estimates. The study's main objective is to compare the employment and productivity levels of men and women on an individual basis using the existing statistical data and to suggest strategies to do so with a lower turnout. In Nigeria (37%), as well as in other developing nations, women's participation in the agricultural sector is significantly lower. The propensity score matching technique was used to evaluate the impact of access to healthcare interacting with education on female agricultural output in order to generate an accurate estimation of the model. The outcome highlights the necessity to increase female employment in Nigeria's economy in order to increase agricultural productivity. As a result, the study recommends that policies supporting female empowerment in other relevant sectors, including agriculture and services, should be encouraged.

Keywords: 1.*Agriculture, 2.Economic growth, 3.Female Farmers, 4.Productivity*

1.0 Introduction

Agriculture provides a living for a large proportion of Nigerian households. It is also a very important sector in the Nigerian economy, contributing significantly to the country's Gross Domestic Product over the years (Udoh et al. 2000). According to a sectoral study of the real GDP in 2006, the agricultural industry contributed about 42% of the GDP, up from 41.2 in 2005. (Ebukiba, 2010). From 4.2 percent in 2002 to 7.2 percent in 2006, the growth rate of the agriculture sector's share of the GDP at constant base prices in 1990 increased. Over 60% of Nigeria's labor force was working in the agriculture industry in 1999. (Adeoti, Cofie, and Oladele 2012). When oil was discovered in Nigeria in the early 1970s, the country became heavily dependent on oil income, which over time had a negative impact on the agricultural sector's performance. Even though Nigeria's agricultural sector experienced growth from an average of around 3% in the 1990s to approximately 7% in the middle of 2000, the country's citizens' level of food security continued to deteriorate (Ajani, Adeoti, and Adenegan 2002). Researchers and the government proposed and launched a number of agricultural schemes and programs to increase agricultural productivity in Nigeria as a result of the agricultural sector's appalling performance in terms of its contribution to Nigeria's yearly total revenue over the past three decades.

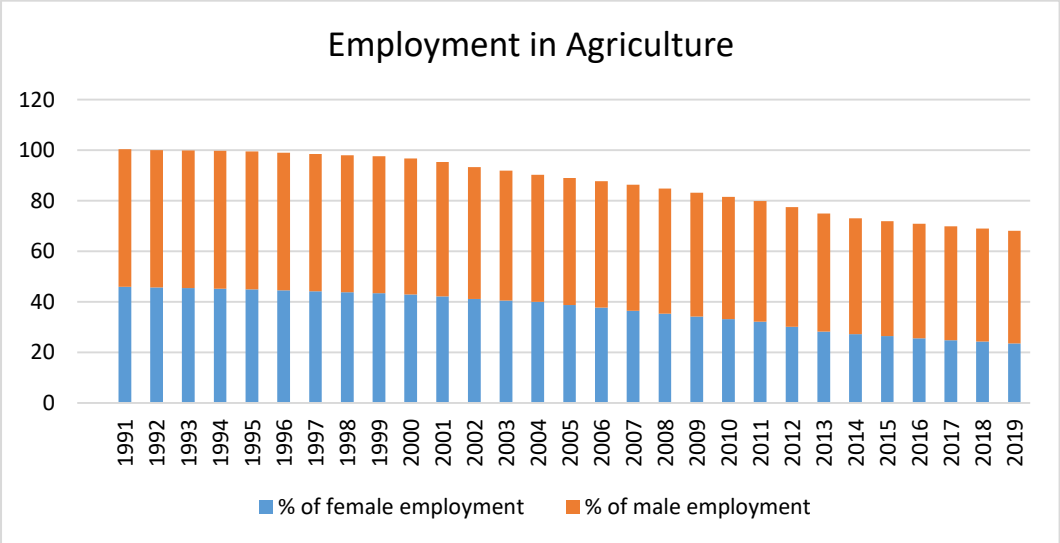
Access to health care can be explained in a variety of ways. It refers to "the timely use of personal health services to achieve the best health outcomes"(Mekonnen et al. 2021). Access to health care services is essential for optimal health, but rural communities encounter a number of hurdles. Residents should ideally be able to obtain services such as primary care, dental care, behavioural health, emergency care, and public health services with ease and confidence.The evidence pertaining to this access issue is compiled, and its supply-side root causes are determined. Considered are broad solutions that have been suggested to address the access issue through adjustments to financial incentives. It is stated that it is necessary to establish and assess specific policy initiatives in addition to identifying overarching plans. We won't discover what increases health care utilization, particularly among the underprivileged in emerging nations, without experimentation and review.

(Odelola 2020; Udoh et al. 2000; Ukwuozo 2006) argued that women do not have equal access to resources and opportunities as their male counterparts have, which is one of the causes for the agricultural sector's observed underperformance in the majority of developing nations.Due to this, they are unable to obtain necessities that will raise the level of their agricultural productivity. Increasing women's agricultural outputs would boost production in underdeveloped nations and end world hunger (Adeoti et al. 2012). Women still confront a number of obstacles that limit their efficacy in agricultural production and related activities, despite the advent of legislation that help recognize them as subjects vital for development. Investigating the type, impact, and degree of women's participation, the reasons behind it, as well as how it affects agricultural output in Nigeria, becomes crucial.

2.0 Some Background Facts

The Figure 2.1 reveals the statistical relationship between the employment of males and females in the agricultural sector over several years. It can be explained that the employment of males has been consistently higher than that of females in the agricultural sector of the Nigerian economy over the years. If the employment of females within this sector can be improved through innovative female-friendly techniques, then the overall output and contributions of the agricultural sector would be greatly improved, also having a positive impact on the general economic level of production.

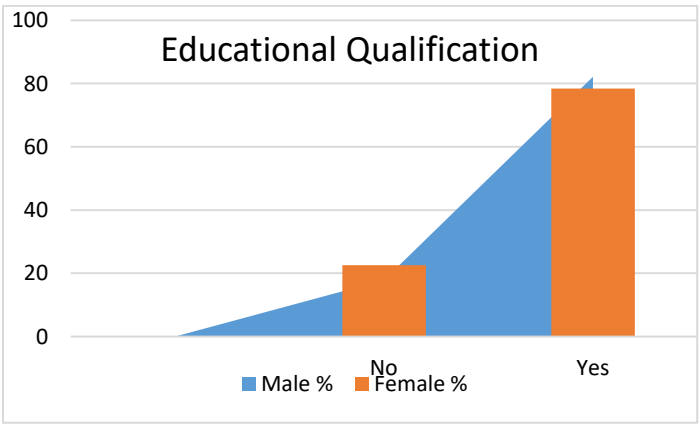
Figure 2.1 Male – Female Employment in Agriculture



Source: Researcher's Computation from World Development Indicators

The Figure 4.2 show the recent gender gap in the agricultural productivity in Nigeria using household statistics for active farmers within the Nigeria economy. This reflects that the level of male agricultural productivity is way beyond the level of female agricultural productivity.

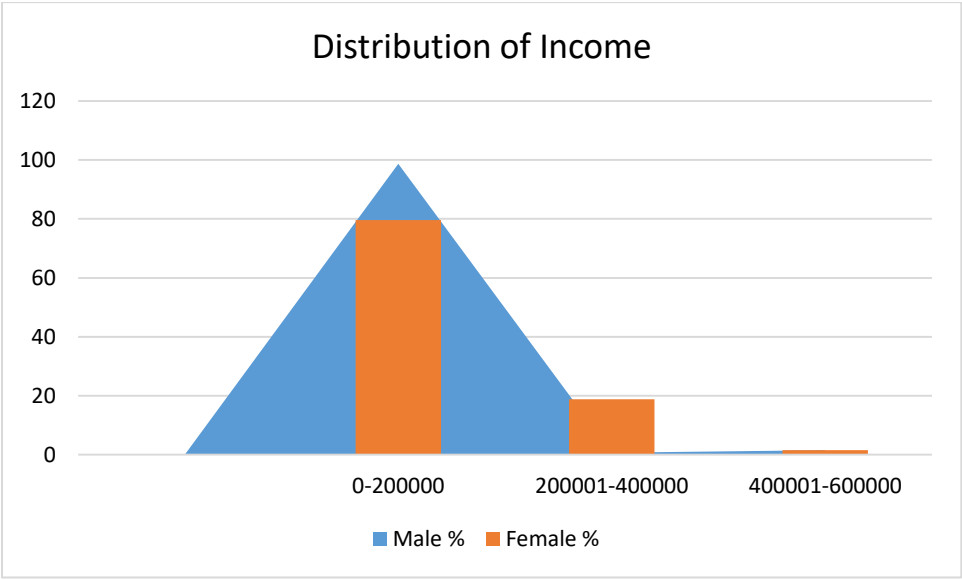
Figure 4.3: Educational Qualification of Farmers sampled



Source: Researcher's Computation from LSMS 2018/2019

The Figure 4.3 shows the distribution of respondents based on receive monetary assistance from abroad. It shows that majority (92.28 percent) of the respondents do not receive monetary assistance from abroad while few (7.72 percent) received monetary assistance from abroad. It revealed that most of the male farmers do not received monetary assistance from abroad. This helps to reflect the capital assistance that each gender gets from abroad to supplement the current domestic capital that they have access to in Nigeria.

Figure 4.4: Distribution of Income



Source: Researcher's Computation from LSMS 2018/2019

Figure 4.4 shows the distribution of respondents based on income. The mean farm income was ₦14872.44. The result revealed that many (98.7%) of the respondents had income between ₦100001 -200000 while few of the male farmers' income is within the range of (₦20001-500000). It revealed that male farm income is still at a normal level of income; it conforms to (Ogunwande and Akinrinola, 2017). More innovations and technologies should be put in place in order to generate higher output invariably create more wealth and income.

3.0 Literature Review

Hannah (2021) investigated the influence of women's empowerment in agriculture on household food security in Ghana. They stated that the more women were actively involved in agriculture, the lesser their household will be disposed to forms of hunger, and there would be a better effect on food security. The empowerment of women in the process of decision-making will also help enhance their level of production and access to land. In the same vein, for tangible agricultural output progress, provided past records of handling land rights situations with rural women(Arthur-Josué, Faustino, and Godfrey 2020; Schmidt, Magigi, and Godfrey 2015). Their findings provided new ways by which women can usefully negotiate their claims in the land, generally owned by the communities at that era. These provisions will help rural women can make an effort to protect land that belongs to them and also create agency for the development of other women as regards land rights. The more women are empowered at current age, the higher the tendencies that other women will be empowered. This will help increase female agricultural production and food security.

Mekonnen et al. (2021); Obayelu and Chime (2020) argued that average males had a greater advantage as compared to the female farmers in terms of educational qualification, ownership of more assets, and higher incomes from agricultural activities by households. The study noted that factor hindering the level of female production include their duties of cooking, care of children, alongside schooling, which may not be achieved at their best capacity, and that reduces their level of productivity in the long run. The study also reaffirms the importance of including women in the development programmes such as asset ownership, involvement in decision-making processes, and innovative programmes in Nigeria.Sekyi, Abu, and Nkegbe (2020); Sekyi, Domanban, and Honya (2019) presented a positive relationship between access to the informal credit system and agricultural production level in rural Ghana. Farmers who have access to informal credit get 48.42kg/ha above that of their less-privileged counterparts. Al-Mujtaba et al. (2020) analysed the creation of employment alongside income generation can be enhanced with little or no support if the benefit is adequately considered. Therefore, the participation of female farmers will experience improvement with the introduction and maintenance of policies that promote credit to them without discrimination.

Alongside the preceding findings, Obayelu and Chime (2020); Schmidt et al. (2015)affirm that introducing programs that will help in encouraging and increasing women's passion and level of agricultural participation despite obvious discouraging factors in order to achieve designed national goals is needful. Thefindings revealed that the level of access to extension women had changed the cropping pattern of the households by continuing to increase the production of the variety of major and minor crops as well as the plot size involved. Hence, they established that there is a significant negative correlation between women's access to extension and adoption of improved variety in the program villages. Obayelu, Ogbe, and Edewor (2019)stated that some of the factors that influence the rate at which women are involved in higher education agricultural programs are based on socio-cultural & gender beliefs. They revealed that the experience of women associated with these programs affects their attitude to higher education agricultural programs.

Methods and strategies that will help encourage more women to participate in the farming programs were suggested to enhance their level of experience and production. Likewise, Fletschner and Kenney (2014)stated that in the measurement of the level of positive impacts gotten from rural development programmes, the access of women in such areas to financial service plays a major role. The establishment and maintenance of useful financial channels that meet women at their micro- commercial levels will strengthen women's position as producers and widen the economic opportunities available to them. The study also explains how initiatives that enhance rural women's access to financial services without the direct influence of their spouses can be more productive and beneficial in increasing women's productive capacity and relative power in their households. This will also result in more efficient resource allocation and better health, nutrition, and education in their families, as women will be empowered to make some independent decisions that will be beneficial.Akter et al. (2020)stated that despite several efforts put in place to increase women's level of participation in agricultural activities, especially within areas where they have been deprived in the past, minimal results have only been achieved on the contributions of women. Their finding, therefore, affirms the existence of a negative relationship between the access women have to agricultural extension and the introduction of improved variety in these areas.

Fletschner and Kenney (2014) confirmed that culture is one major determinant of how agricultural resources are allocated to a different gender. The study affirms that there exists a level of connection between the prevailing culture, gender, and agrarian resources, using the Nupe and Yoruba culture in Nigeria as a case study. Their finding reveals that male farmers have ownership at a level higher compared to women in areas such as access to productive resources. At the same time, it is vice versa in some other regions and cultures with favour to the women in terms of non-mechanized farm equipment. Culture seems to have a more significant impact on the level at which women benefit from. On the other hand, Issahaku, Mahama, and Addy–Morton (2020) examined the effect of credit constraint on agricultural labour production of rural households' consumption in Ghana. They asserted that large households most times experience some form of credit constraints. At the same time, their age or years of experience and compliance with extension advise on how to reduce credit constraints. Hence, policies must be made to improve access to credit and strengthen the output level of labour which will invariably improve the well-being of farm households. In addition, Gershon et al. (2020) noted that because men and women in Africa do not have equal access to finance and land, rural women's fights for land rights have become a serious problem. He added that a few variables contributing to this condition include women's disproportionately limited access to markets, financing, and land.

According to Ulimwengu's (2009) research, output inefficiency rises noticeably as more days are missed due to illness. This shows that boosting the health sector's funding in rural areas will increase both farmers' productivity and income. In order to optimize the impact of health investments on agricultural output and the wider rural economy, policymakers should develop policies. The study confirms the detrimental effects of health limitations on farmers' agricultural productivity, and simulation results indicate that raising farmers' productivity by making investments in their health may not always result in a decrease in poverty. Chiong-Javier (2009) reiterate that thesewomen play a critical role in the underdeveloped counties by providing food to theirhouseholds and societies. However, this responsibility comes with health risks.Findings also point to the need for more recent national statistics on the position of agricultural women in developing cultures that are sexual identity.

The study also suggested the need for filling up numerous gaps in the women's work-and-health paradigm. In Burkina Faso, Adeoti et al. (2012) used an instrumental variables approach to assess how the utilization of health care affected the productivity of rural household agriculture labor. An instrumental variable is the distance a household's farmstead is from the Health and Social Promotion Center (HSPC). In order to

maximize the effect of social services spending on agricultural labor productivity and incomes in African countries, this initiative carries out research in that area. The study also implies that policymakers should concentrate on the availability and quality of HSPC services in rural regions in order to improve agricultural output.

According to Asenso-Okyere, Chiang, and Andam (2011), excellent health should be viewed as an asset for consumption as well as investment because it has compounding returns. On the other hand, health issues may start a cycle of decreased agricultural productivity and bad health. Investments in health at the household level can increase resilience and the capacity to handle catastrophes, including illness. However, making an investment in your health also means having a sufficient income. To increase the production, well-being, and adaptability of farm households, access to suitable inputs (knowledge, land, tools, fertilizer, and seeds) and lucrative marketplaces is required. According to Shadreck, Isaac, and Bruce (2013), family labor employed for farm management and land preparation is extremely susceptible to illness. Only during the farm management stage are households able to replace lost family labor, and the substituted labor does not entirely make up for the lost family labor. Investments in agriculture are negatively impacted as well. According to Emeana and Trenchard (2018), several of the initiatives examined had a connection to agriculture and centered on enhancing farming practices to make them more lucrative.In certain instances, this was primarily achieved by providing farmers with small loans to fund company expenditures such as cattle, new seeds, or technology. These resources aid in their attainment of monetary security and subsequently greater health. Other initiatives under examination used skill development to increase agricultural income generation.

According to Ibietan, Chidozie, and Ujara (2014), there is a negative link between the availability of health care services and agricultural productivity (-0.37), which is statistically significant at the 5% level. It was suggested that the government make sure that rural and urban residents have equal access to medical facilities. Etowa et al. (2015)demonstrated that households' agricultural productivity was adversely influenced by aftermaths of ill-health (funeral expenditures). Initial studies indicated that healthcare was available but insufficient.Ikudayisi, Okoruwa, and Omonona (2019); Aminu and Asogba (2020); and Aminu (2019) all discussed the significance of health care access and utilisation among Nigeria's rural families.The studies recommend that rural development initiatives should support the development of enabling environments to improve participation and equal accessibility in the delivery of modern health care throughout the country's rural areas.The connectivity of women's public and private lives as well as the interaction of class and gender hierarchies in the patterning of women's employment experiences are highlighted by Mumtaz (2003) and Mumtaz and Salway (2009).The study's findings offer suggestions on how the organizational structure of the public health system might be changed to make it easier for female employees to do their jobs.

4.0 Methodology

Following the studies by Ogunniyi et al. (2018)in order to draw a statistical inference, the model for objective one, which is to examine the impact of healthcare on female agricultural productivity, is stated in linear form as:

$$FAP_I = \beta_0 + \beta_i FEDU + \beta_2 FAHEL + \beta_3\, FEDU * FAHEL + \beta_4 \text{ACCPHO} + \beta_5 \text{HHSZE} + e_i \ldots\ldots (3.5)$$

Where $FAP_i$is the female agricultural productivity of household$i$, HEL_i means female access to healthcare of household$i$, X_1, X_2 are other variables considered in the analysis such as household and farm characteristics,

following economic theory. In the model, α_0 is the constant term, β_1, β_2 are the parameter estimates, while e is the stochastic term. The stochastic term captures other variables not included in the model (Gujarati and Porter 2009; Koutsoyiannis 1977)

Where:

FEDU:Female Educational Attainment

FAHEL: Female Access to healthcare

FEDU*FAHEL: Interaction variable

ACCPHO: Access to Phone

HHSZE: Household Size

First stage regression

$X_i = \lambda_0 + \lambda_1 Z_1 + \lambda_2 W + e_i$…… (3.3b)

FEDU = $\lambda_0 + \lambda_1$ (ratio_edu)+ λ_2(accpho, hhsze) + e_i……(3.3b_i)

FAHEL = $\lambda_0 + \lambda_1$ (ratio heal) + λ_2(accpho, hhsze) + e_i……(3.3b_{ii})

Accordingly, the second stage regression; $Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i$

$FAP_I = \beta_0 + \beta_i FEDU + \beta_2 FAHEL + \beta_3 FEDU * FAHEL + e_i$(3.3c)

Where $FAP_i$is the total female agricultural output of household$i$and $FAHEL_i$ means access to healthcare of female individuals within a household, considered in the analysis following the study model. In the model, β_0 is the constant term, β_1, is the parameter estimates, while e is the stochastic term. The stochastic term captures other variables not included in the model. While equation 3.3b explains the first regression model used in the study with X representing each independent variables in 3.3a and Z represents the most significant variable chosen as instrument accordingly (ratio_edu, ratio_heal) and W represents the control variables (include female farmers' access to phone and their household size effect on their agricultural productivity) necessary at the first stage regression analysis(Koutsoyiannis, 1977; Okello et al., 2019)

4.0 Results and Discussion

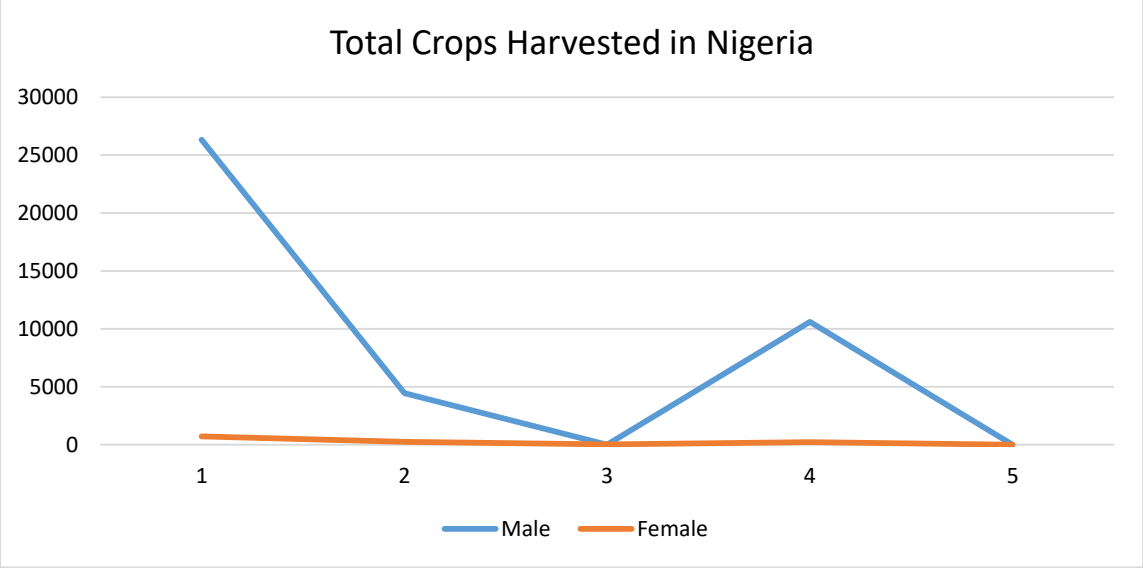
The Table 4.1 show the recent gender gap in the agricultural productivity in Nigeria using household statistics for active farmers within the Nigeria economy. This reflects that the level of male agricultur productivity is way beyond the level of female agricultural productivity.

Table 4.1: Tabulation of Total Harvested in Nigeria

Total harvested (kg/ hectares)	Male	Female
0-50000	2335	708
50001-100000	437	235
100001-150000	7	10
150001-200000	1609	226
200001-250000	1	1
Total	**2760**	**1180**
Mean	53965.65	50687.17
Minimum	200	200
Maximum	214500	214500
Standard Deviation	65363.31	60479.51

Source: Researcher's Computation from LSMS 2018/2019

Figure 4.2: Total Crop Harvested



Source: Researcher's Computation from LSMS 2018/2019

The information in Figure 4.2 showed the variation in gender contribution to agricultural production through their level of total crop harvested in the Nigeria economy. This indicated that more males are involved in agricultural production and it brings about early adopters of innovation invariably leads to higher productivity for male farmers, leaving more female farmers at lower level of agricultural production which could be due to little or no level of educational exposure that will aid their ability to employ innovative methods for higher productivity. Opportunities to learn should be much more open to female farmers in order to improve their agricultural level of production.

4.1 Effects of Access to Healthcare and Educational Attainment Interaction on Female Agricultural Productivity

This sub-section explains the effects of access to healthcare and educational attainment interaction of female farmers on female agricultural productivity. The section helps to provide a holistic view of the effects of educational attainment level and access to healthcare, when interacted on female agricultural productivity. The result specifically shows the relationship between healthcare access and educational attainment interaction in respondents on female agricultural productivity.

First-Stage Regression of Female Education andHealth access Interaction onAgricultural Productivity

This section employs Ordinary Least Square (OLS) regression. The first stage regression shows the strength or relevance of the instrument. Table 4.3 revealed that, with the use of ordinary regression there is a generally positive relationship between the general level of farmers' educational attainment, and their access to healthcare within a specific location and the level of agricultural productivity in that location. As there is also a positive relationship between female heads' level of educational attainment and the level of agricultural productivity, so is there also a positive relationship between female heads' access to healthcare and the level of agricultural productivity. With a more specific emphasis on the performance of relatively healthy female heads and their agricultural output level, result reflects that the level of female farmers' access to healthcare is negatively related to their level of agricultural productivity.

Table 4.2: Female Education and Health access Interaction on Agricultural Productivity

Agri.prod	Coef.	Std. Err.	T	P>/t/
Edu.hel. fem Head	-2.364592	1.200556	-1.97	0.049
Femal_head	6.855227	2.380831	2.88	0.004
ratio_heal	.1393773	.0034274	40.67	0.000
ratio_ed	.0081197	.0002753	29.50	0.000

Source: Researcher's Computation from LSMS 2018/2019

The relationship between the instrument (ratio_edu) and the endogenous variable (education and health access of the female head) is 0.13938 and 0.00812, and they are significant, showing that the ratio of education within the female head's community has a positive effect on the female head being educated and it is positive, reflecting that as more people within the environs of the female head are educated, there is a greater tendency for the individual female head to be educated. The results explain that the higher the level of educational attainment of female heads the lower their level of agricultural productivity as it also applies to female access to healthcare. This can be explain alongside the fact that as female farmers get educated there are more likely to leave or reduce their agricultural practices for much more lucrative job opportunities that

their educational level qualifies them for. As a result, as female farmers' levels of education rise, their previous level of agricultural production declines; the relationship between women's educational success and healthcare availability, and how that affects women's agricultural production. The outcome shows that improvements in female farmers' access to healthcare and educational attainment do not always translate into increases in their level of agricultural output; rather, a negative link is shown.

Table 4.3: Summary Result for First-Stage Regressions

Variabe	Shea partial R^2	partial R^2	F(2,3103)	P-value
Education	0.0021	0.6971	3571.28	0.000
Health	0.0019	0.6444	2812.00	0.000

Source: Researcher's Computation from LSMS 2018/2019

Because the endogenous covariates and the instruments are both observable, the effectiveness of the instruments may be directly evaluated. It is generally accepted that in models with a single endogenous predictor, the F-statistic indicating the instrument's significance in the initial regression should be more than 10. Therefore, it is indicated that the instrument use is relevant for the analysis because the value of the F-statistics is 3571.28, which is more than ten (10).

Instrumental Variables Regression of Access to Healthcare and Educational Attainment Interaction on Female Agricultural Productivity

In observational studies like this, the instrumental variable regression was employed to correct assessment error for a more in-depth result. The use of instrumental variable regression in the section helps allow the possibility of making inferences with observational data in the study. Instrumental variable regression also gives room for both observed and unobserved confounding effects. This section reflects the use of education being instrumented with 'ratio_heal' that is the ratio of female farmers with access to a form of healthcare treatment to the total number of female farmers within the community. The adopted instrument helped to reflect female farmers' access to healthcare with the ratio of healthy female farmers with access to healthcare treatment within a specific area and their combined effects on female agricultural productivity.

Table 4.6: Instrumental Variables Regression of Education, Access to Healthcare and their Interaction on Female Agricultural Productivity

Fem.Agri.Prod. (FAP)	**Coeff.**	**Std. Err.**	**P>/z/**
Female Healthcare (FAHEL)	5.0420	0.0365	0.000
Female Education (FEDU)	2.4866	1.3719	0.010
Female FEdu* FHel (FEDU*FAHEL)	-1.2346	0.6869	0.012
Female access to phone (ACCPHO)	0.0025	2.5832	0.186
Household Size (HHSZE)	0.0087	1.6750	0.334

Summary of second stage regression (over identification test of all instruments)	
Sargan statistic	12.738
Prob > F	0.0000
F(3, 3091)	53066.76
Chi-sq(2) P-val	0.00171

Table 4.6 explains the positive relationship between the general level of female farmers' educational attainment and their access to healthcare with the inclusion of both as an interaction variable and the overall impact on female agricultural productivity. Within a single model, there is also a positive and significant relationship between female farmers' access to healthcare and their level of agricultural productivity. Hence, in relation to female farmers without access to healthcare services, there is a likelihood that female farmers with access to healthcare service will be five (5) times more productivity per hectare of land harvested. Specifically, healthcare services improve the productivity of farmers who have access by at least 5.04 kg/ha per production season. The implication is that, in relation to those without access to healthcare services, for every one hectare harvested, female households with access to healthcare services have the likelihood of experiencing a higher level of productivity of an average of 5.04 kg/ha. Likewise, there is a positive and significant relationship between female farmers' educational attainment level and their level of agricultural productivity, according to the results table, there is a likelihood that female farmers with at least a form of educational attainment will be 2.5 more productivity in relation to female farmers without a form of educational attainment. Hence, educational attainment level improves the productivity of female farmers who have access by at least 2.5kg/ha per production season. The implication is that, in relation to those without educational attainment, for every one hectare harvested, female farmers with educational attainment have the likelihood of experiencing a higher level of productivity of an average of 2.5kg/ha. Within the same single model, the result further reflects that the interaction variable (representing the interaction between the educational attainment and access to healthcare of female farmers) has a significant relationship stating that female farmers with both access to healthcare services and a form of educational attainment, in relation to female farmers on the other side of the category, have a likehood of being 1.2 times more productivity, although at a decreasing rate as indicated by the negative sign of the interaction variable. Hence, there is the need for improved provision and investment that help increase the number of female farmers with both access to healthcare services and at least a form of education.

5.0 Discussion

The outcome of the analysis is the negative outcome of the interaction variable is not a problem, as by interpretation of interaction variable, negative sign reflects a supplementary role rather than a complementary role played by the variable in the model. The negative relationship explains that the combined action of the two variables is smaller than the combination of the single effects of two variables, which reflects an increase at a decreasing rate. This result negates the apriori expectation of the study, as a positive relationship was earlier expected. The result also shows that female agricultural productivity is better influenced by the inclusion of the interaction of the respondents that are educated (exposed to a form of education) and healthy (have access to a form of healthcare treatment) as against those that are only educated, reflecting the supplementary role that the interaction variable plays in the model. Hence, while respondents with educational attainment will produce well, healthy and educated respondents will do much better.

The result explains the importance of human capital investment and development on the level of production, as this helps to improve the capacity of female farmers to produce at a higher rate. According to Doss (2018) agricultural productivity is boosted by an extra year of training and better standards of knowledge. Producers' ineffectiveness has decreased due to an extra year of training. And from the other side, one extra investment of knowledge reduces inefficiency.More specifically, looking at the interaction of access to healthcare and educational attainment and its effect on female agricultural production, the results reflect a positive relationship with the level of female farmers' productivity, revealing also that if more education is given to female farmers in the area of access to healthcare, where they are often found vulnerable, there will be an improvement in their level of productivity. This demands continuous investments in human capital within specific areas of development that will help enhance females' educational level and more especially enhanced health status that will, in turn, increase female farmers' level of productivity. Human capital needs to be continually improved to attend to the needs that will help improve the level of female farmers' agricultural productivity.

6.0 Recommendation

The study gives a new dimension to research works that have been done in the area of factors influencing female agricultural productivity as relevant to the attainment of economic growth. In order to achieve increased agricultural output in the Nigerian economy, it is important that programmes and practices such as provision of educational incentives for female farmers are readily available and accessible to promote female agricultural productivity.More investments are needed to promote female healthcare access to boost female agricultural output. In addition, adequate provisions should be made by the government to ensure effective delivery of laid down plans. Thus, there is the need for the government toimprove the number of available healthcare centres and toilets,distance to nearest healthcare facility, education level of parents especially in regions and localities with preponderant agricultural activities, as this will help ensure that majority of female farmers have quick access to healthcare that will help keep them healthy alongside their children for higher agricultural productivity. The presence of qualified medical staff and equipmentat health facilities will reduce the stress female farmers go through when they travel far in search of medical care. This will help promote the promptness needed for their healthcare access and invariably keep them healthy for a higher and consistent quality level of agricultural productivity, which will positively influence economic growth in the long run. Likewise, it is important that educated farmers have access to healthcare facilities around them and that female farmers that have access to healthcare facilities are enlightened through the media.

Hence, the studyshowsthat poor access to healthcare is a major factor contributing to the low level of female contribution to the agricultural industry. It highlights some of the aspects to be considered and hypothetically explored by future researchers in line with this research's interest in producing scholarly studies. The following are suggestions from this study for further research works:First, this study examined the effect of female farmers' educational attainment level on female agricultural productivity as a singular entity to reveal their direct relationship and effects. Further studies need to consider the direct effects of male educational attainment level on male agricultural productivity in Nigeria, as this can help proffer ways to increase male farmers' productivity. Second, this research looked at the effect of female farmers' access to healthcare on agricultural production as a whole to reveal their direct relationship and effects. Further studies can be done to aid more improvement in female agricultural productivity through other identified factors.

7.0 Conclusion

In order to increase the capacity of human capital to create at a greater rate, the study highlights the significance of human capital development and investment on the level of output. According to Jules and

Fondo (2018), agricultural productivity rises with each extra year of experience and level of education. A producer's level of inefficiency was reduced by one year of experience squared. While an additional unit of education reduces the level of inefficiency. Morespecifically looking at the interaction of health and education and its effect on female agricultural production, the results reflect a positive relationship with the level of female farmers' productivity, revealing also that if more education is given to female farmers in the area of healthcare where they are often found vulnerable, there will be an improvement in their level of agricultural productivity. This demands continuous investments in human capital within specific areas of development that will help enhance female educational level and more especially for enhanced health status that will in turn increase female farmers' level of productivity. Human capital needs to be continually improved to attend to the needs that will help improve the level of female farmers' production.

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