

Explaining Gender Differentials in Agricultural Production in Nigeria

Gbemisola Oseni, Paul Corral, Markus Goldstein and Paul Winters

Summary

Nigeria presents a unique case study on differences in agricultural productivity between men and women. This study, which captures a comprehensive picture of agriculture across the nation, shows that female farmers produce 16 percent less per hectare than their male counterparts, when plot size, farmer characteristics, and inputs are taken into account. This gender gap is driven by the North East and Central zones located in the Northern region of the country, where female farmers are 28 percent less productive than male farmers. In this region, women, particularly those who are older, farm on smaller plots and have lower levels of key inputs, notably fertilizer and labor, which is a well-documented pattern in many African contexts. The Southern region, however, does not fit this established pattern. When controlling for key characteristics and factors of production, in the South no gender gap in productivity is observed, though female farmers would benefit from additional herbicide and female labor. The notably different patterns in these two regions of the same country provide ample space for further study. Thus, in order to decrease the country-wide gender gap in production, we recommend extending access to fertilizer, hired labor, and cash crops to women - particularly those in the North.

INTRODUCTION

Women represent the largest marginalized group in Sub-Saharan Africa. Differences in land tenure, access to inputs, skills, and time use all decrease female productivity, creating a gender gap in production and earnings.

These patterns seem to hold at a national level in Nigeria, where women earn 60 cents for every dollar men earn (WDR 2012). Although they play a key role in agricultural production, women in Nigeria have relatively limited access to agricultural land and less access to inputs and extension services compared with men (Phillip et al. 2009). These constraints work to limit women's productivity in the agriculture sector.

COUNTRY CONTEXT & DATA

As agriculture employs about 60 percent of the working population and contributes roughly 40 percent to GDP (Nigeria National Bureau of Statistics), these gender-specific challenges are particularly relevant in Nigeria. Nigerian agriculture is typically characterized by small-scale, subsistence farming with little commercialization. Agriculture is more common in the more rural North with over 80 percent of households engaged in the sector compared with about 50 percent of households in the more urban, oil-producing South. Although men dominate the sector in Nigeria, 70 percent of female-headed households



are also active across the agriculture value chain, engaging in production, processing, and sales.¹

This policy brief, the second in a series of two, uses data from the General Household Survey-Panel (GHS-Panel) conducted in 2010/11 by the Nigeria National Bureau of Statistics (NBS) in collaboration with the World Bank Living Standard Measurement Study (LSMS) team to capture a comprehensive picture of agriculture across the nation of Nigeria. It is representative at the national, zonal and rural/urban level and includes all six geopolitical zones in Nigeria, three of which are in the North (North East, North West and North Central) and three of which are in the South (South East, South West and

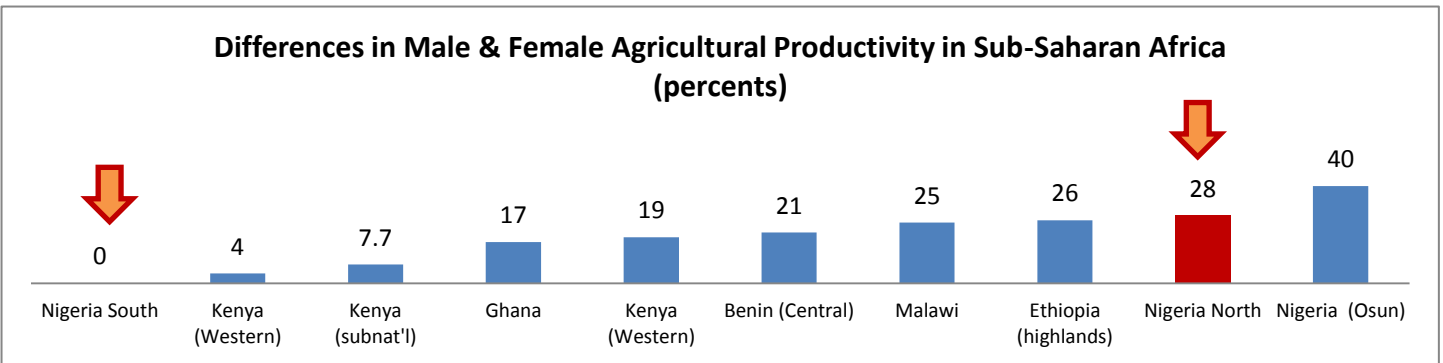
¹ These figures are from the GHS-Panel survey 2010/11 implemented by the NBS

South South). The analysis focuses on 2,431 households farming 4,240 plots over 100 square meters each. The study includes information on the manager of each specific plot farmed rather than defaulting to the household head as the manager, as is common in many surveys. Overall, 15 percent of plot managers in the study are female.

Because of the paucity of female-managed plots in the North West and South West, this analysis excludes the western geopolitical zones of the country. In addition, the analysis shows key distinctions between patterns in the North and South of the country, so the results are presented separately for each region. Henceforth, when referencing the “North” we mean the North East and North Central zones. When referring to the “South” we mean the South East and South South zones. Productivity is measured as the monetary (Naira) value of all crops grown on the plot under the manager’s purview.²

labor from outside the household. Notably, there is no significant difference between male and female farmers in access to extension services in the North.

In the South, some key distinctions emerge. Unlike the sample in the North, after controlling for key factors we observe no significant differences in land size or per hectare use of non-labor inputs when comparing male and female-managed plots. Key differences involve the use of labor, as female-managed plots in the South access significantly fewer days of male family labor, hired male labor, and hired female labor. Moreover, unlike in the North, male managers in the South have more access to extension services than their female peers.



NOT YOUR MOTHER'S FARM

In Nigeria, male and female farmers operate under dramatically different conditions, though these conditions vary by region. In the North, female-managed plots are, on average, 41 percent smaller than male-managed plots. In addition, male managers are more likely than female plot managers to use inputs such as fertilizer, herbicide and pesticide on their plots. Female plot managers use more female household labor per hectare, though there is no significant difference between female and male plot managers in the amount of male household labor used per hectare. However, women are more likely to hire male

A GENDER GAP EMERGES

When accounting for the aforementioned differences including plot size, farmer characteristics, and use of inputs, women in Nigeria as a whole produce on average 16 percent less than men per hectare.

In the North, when controlling for all key factors such as land, access to inputs, and labor we observe a much larger gender gap compared with the country-wide average, with female farmers producing 28 percent less than their male peers.

In the South, where men and women’s plot sizes and use of non-labor inputs are not significantly different, no gender gap in productivity exists. Thus, the patterns of differences between male and female farmers in these two regions of the same country are markedly different. Even after observed factors are controlled for in the North, women are less productive than

² The Naira value of harvest on each plot was calculated by multiplying the quantity of harvest in kilograms for each crop on the plot by the median sales value of the crop in each local government area (LGA) and aggregating to the plot level. In cases where we don't have enough observations in the LGA, we use the value at the next geographical level, zone, state and country as needed. For our main dependent variable, value of harvest per hectare, we divide the value of harvest by the GPS-reported plot size.

men, while in the South they experience similar levels of productivity. Therefore, the national gender gap appears to be driven entirely by productivity differences in the North.

UNDERSTANDING THE GAP: ENDOWMENTS & RETURNS

To get a better understanding of this gender gap, we examine the results of an Oaxaca decomposition, which makes it possible to delve deeper into how different factors contribute to the gender gap. While this technique is often used to explain gender wage differentials, applying it to agricultural productivity is a novel approach that has only been documented sparingly in scholarly literature on Africa.³ We can understand this decomposition as being made up of two portions: endowments (the portion of the gap that is due to differences in levels of observed variables, such as labor, land, and education) and returns (the unexplained portion of the gap which shows the return to each factor of production).

NORTHERN NIGERIA

In the North, both gaps in endowments and returns are significant, though the gender disparities are driven more by the differences in returns than by the observed characteristics of endowments. Gaps in endowments come from factors such as men that are more likely to live in households with a larger household adult labor pool, have higher incidence of fertilizer use, and have more days of hired labor than female managers, all of which widen the gender gap. In addition to these differences, the factor that contributes most to the endowment effect in the North is women's smaller plot sizes⁴, which mask the gender difference by reducing the overall endowment gap.

The returns to factors of productivity are lower for women in the North and seem to be the main driver of gender differences in the region. Female farmers tend to be older and are often widows. In comparison to other groups, these older women

³ The most notable recent example is from Kilic, T., Palacios-Lopez, A., & Goldstein, M. (2013). "Caught in a Productivity Trap: A Distributional Perspective on Gender Differences in Malawian Agriculture". Policy Research Working Paper, 6381, The World Bank.

⁴ If not for the large diseconomies of scale in land size and with men cultivating land about twice the size of women's, the gap between men and women will be much wider.

face a particular disadvantage, the exact nature of which would benefit from further research.

SOUTHERN NIGERIA

In the South, unlike in the North, only the endowment effect between men and women is significant. The differences in amount of herbicide and hired female labor both serve to widen the gap, while similarities in farm size and the number of adult females in the household contributes negatively to the endowment effect, thereby reducing the gap. Men and women in the South appear to obtain similar returns to factors of production and if given similar levels of inputs, the gender gap diminishes.

POLICY CONCLUSIONS

In Northern Nigeria, female farmers produce yields that are significantly lower than those of their male counterparts. This gender gap in productivity is primarily driven by lower returns to factors of production for women, as well as lower levels of key inputs, notably fertilizer and labor. Extending access to fertilizer, hired labor, and promoting cash crops for women in the North would likely have a positive overall impact on Nigerian agricultural growth but may not close the gender gap. Due to the differences in returns, even if women in the North were given the same level of inputs, some differences in productivity may still persist.

In the South, however, when controlling for key characteristics and factors of production, no gender gap in productivity is observed. If women in the South are given the same level of inputs as men, the gender gap diminishes. Thus, in order to increase productivity in the region, women would benefit from provision of additional inputs.

For questions and more information about the Africa Region's gender program, please contact Katherine Manchester at kmanchester@worldbank.org.

The World Bank
1818 H St. NW
Washington, DC 20433 USA