

Gender and Productivity Differentials in Maize Production in Afijio Local Government Area of Oyo State

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Abstract: This study broadly examined Gender and Productivity Differentials among maize farmers in Afijio Local Government Area of Oyo State. In its specific objectives, it describes the socio-economic characteristics of the farmers, analyze the factors that affect maize production as well as compare the productivities of the male and female cassava farmers in the study area. A sample survey was carried out to sample a total of 82 smallholder (41 male and female) farmers. The respondents were selected through a multistage sampling technique from four major farming settlements which include: Akinmonrin, Aawe, Paanu and Akunnu. The data collected were analyzed by Descriptive Statistics, Multiple Regression Analysis and Chow F-test to check for the existence of structural stability in the male and female maize farmers' production enterprises. The findings of this research showed that there exist differences in the socio-economic characteristics of the selected male and female farmers in the study area. These gender specific socio-economic characteristics do not however, reflect any differences in the productivity levels of the sampled male and female farmers. The findings revealed that in spite of the identified gender specific socio-economic characteristics in the study area, no serious barrier that can affect agricultural productivity, especially of the women has been established. If the same levels of agricultural incentives were granted the women as their men counterparts, there will be increase in the productivity of the various male and female farmers in the study area.

Key words: Productivity differentials, gender, Cobb Douglas function, Afijio, Oyo State, Nigeria

INTRODUCTION

Nigeria is predominantly an agrarian country with over 70.0% of its population engaged in farming (CBN, 1996). Agriculture provides the bulk of employment, income and food for the populace. Also, it provides raw materials for the agro-allied as well as market for industrial goods. The investigation of gender inequality reveals that it is one of the most pervasive forms of inequality because it is present in most societies and cuts across other forms of inequality. It seems myths about rural women's roles and contribution still persist. In many Nigerian communities, economic roles of rural women continue to be invisible or at best viewed as an extension of their domestic roles until very recently and little definite effects were made to evolve policies that will increase rural women's access to education, training, credit, land resources e.t.c., necessary for incorporating them into the mainstream of rural development (Aishatu, 2002).

The gender yield differential apparently is caused by the difference in the intensity, with which measured inputs of labour, manure, fertilizer are applied on plots

controlled by men and women, rather than by differences in the efficiency with which these inputs are used. In production function estimates for all crops (cereals and vegetable crop in while women specialized); it was found that except in the case of sorghum (among cereals), the coefficient of the gender variable was not significant (Fresco, 1993).

One of the major reasons, for the neglect of women in maize development project in West Africa is the error, yet, the pervasive assumption that the female farmers are less efficient than the male farmers. Thus even in regions of West Africa, where women are the traditional maize growers together with some crops (vegetable) which are considered as women's crops, development projects choose to focus on men and not on women.

According to the World Bank (1989), women in Sub-Saharan Africa, Nigeria inclusive, are responsible for the production of about 70% of the total staple food supply in the region. This contribution is higher than that of the women in other regions of the world. The National Center for Economic Management and Administration (NCEMA, 1990) quoting the Food and Agricultural Organization,

stated that women's contribution was 50-60% in Asia, 46% in the Caribbean, 31% in North Africa and the Middle East and slightly more than 30% in Latin America.

Women engage in both domestic chores and farm tasks. The domestic chores include bearing and rearing children, water and firewood fetching and food preparation, while their farm tasks are land clearing, land tilling, planting, weeding, fertilizer or manure application, harvesting, food processing, threshing, winnowing, milling, transportation and marketing as well as rearing of livestock such as chicken, goats, pigs, ducks and sheep (Adeyeye, 1986).

The gender differential, apparently, is caused by the difference in the yield intensity, with which measured inputs of labour, manure, fertilizer are applied on plots controlled by men and women, rather than by differences in the efficiency with which these inputs are used. In production function estimate, for all crops (sorghum and vegetable crops, in which women specialized), Amaza and Olayemi (1999) found, for example, that except in the case of sorghum, the coefficient of the gender variable was not significant. One of the major reasons, for the neglect of women in maize development projects in West Africa is the erroneous, yet pervasive assumption that female farmers are less efficient than their male counterparts. Thus, even in regions of West Africa, where women are the traditional maize growers together with some other arable crops (cassava, vegetables) which are considered as women's crops, development project choose to focus on men and not women.

MATERIALS AND METHODS

The data required for this study were obtained from smallholder male and female farmers by way of a sample survey. Information on socio-economic and farm specific characteristics was obtained from the farmers. Also collected were information on farm production and input-output levels of the farmers. The data collection was made possible by means of detailed structured questionnaire.

A total of 82 respondents (41 each of male and female farmer types) were chosen through a multistage sampling procedure. The study area consists of 4 major farming settlements namely: Akinmonrin, Aawe, Paanu and Akunnu. These settlements are located within the Afijio Local Government Area of Oyo state Ibadan/Ibarapa zone of the Oyo State Agricultural development programme. Maize is a predominant annual crop grown in the study area. Yam, cassava, vegetables and legumes are however grown in bits alongside maize.

Descriptive statistics were used to describe the pattern of the socio-economic and farm specific variables of the respondents. These variables are expected to

impact on the gender characteristics of the respondents. A Cobb-Douglas production function was also fitted to estimate the coefficients and other parameters that affect the respondent's productivity. The production function is of the following implicit form:

$$Y = f(X_1, \dots, X_n)$$

Where,

Y = Output of maize (kg).

X₁ = Age.

X₂ = Marital status.

X₃ = Mode of land acquisition.

X₄ = Farm size.

X₅ = Quantity of seed.

X₆ = Quantity of maize from previous harvest available for planting.

X₇ = Revenue.

X₈ = Herbicide usage.

X₉ = Transportation cost.

X₁₀ = Source of fund.

X₁₁ = Other crops grown.

The choice of Cobb-Douglas' production function was essential because it is a celebrated example of logarithmic function, which up till now, is one of the most widely used production functions, in empirical studies Olayemi (1998). Additionally, it was adopted in this study because of its ease of linearization and especially for its production function approximating abilities.

RESULTS AND DISCUSSION

Gender Characteristics of Farmers: Nine major characteristics of the sampled farmers were considered and analyzed. These characteristics are expected to be imparting on the productivity levels of the men and women maize farmers. The results of the analysis describing these characteristics are presented in Table 1. The summary statistics are discussed as follows:

Age: Most of the men (56.10%) and women (63.41%) were in the active productive ages (31-40 years) with men dominating. The men and women in this age group were expected to be actively involved in maize production. This implies that high productivity will be associated with men and women in this age group but more with men farmers in the study area.

Marital status: A large majority of the sampled male and female maize farmers (78 and 80.5%) were married. 14.6 and 12.2% of the male and female maize farmers sampled were single while only 7.3% of the male and female maize farmers in the study area were widowed.

Table 1: Descriptive statistics of socio-economic and farm characteristics of the sampled farmers by gender

Age (years)	Men (%)	Women (%)
20-30	12.20	9.76
31-40	56.10	63.41
41-50	12.20	17.07
51-60	9.76	-
61-70	9.76	-
Marital status		
Single	14.6	12.2
Married	78.0	80.5
Widowed	7.3	7.3
Level of formal schooling (years)		
None	-	-
Primary	31.7	24.39
Secondary	48.78	60.98
ND/NCE	19.51	14.63
Headship of household	78.0	7.3
Ownership structure of farm holdings		
Family land (Inheritance)	39.0	34.1
Leased	34.1	31.7
Purchased	14.6	7.3
Gift	12.20	27.0
Use of agricultural inputs		
Improved seeds	65.94	77.30
Pesticides	8.23	31.35
Fertilizer	95.60	97.28
Herbicides	41.5	36.6
Sources of credit		
Personal savings	63.4	39.0
Friends/relatives	22.0	31.7
Cooperative society	14.6	22.0
Farm size (hectares)		
1-5	17.1	14.6
6-10	31.7	39.0
>10	51.2	46.3

Level of formal schooling: Results show that most sampled farmers (31.7% men and 24.39% women) had only primary education. 48.78 and 60.98% of the male and female maize farmers had about 12 years of formal education. 19.51 and 14.63% of the male and female farmers had tertiary education. The results indicate that the productivity level of the sampled farmers is moderately high and hence proper use of resources and extension innovations and practices.

Headship of household: Since most of the sampled men and women farmers are married, it is expected that the women who assumed the headship of farming household would be primarily composed of the widows. That explained why the percentage of women heads is equal to that of the widows (about 7.3%). The responsibility of headship is enormous, this implies that women heads would tend to be more hard working and better engaged in farm activities to meet basic subsistence needs. In as much as we can not provide evidence for the position of some authors e.g., Tinker (1976, 1990), Chancey (1984), Moser (1989), Sayne (1991) and a host of others, "that one-third of the world's households are headed by women", we make bold to submit that women, especially the widows in the study area have actually taken a great challenge to provide for the family even in the face of gender imbalance.

Ownership structure of farm holdings: About 39.0 and 34.1% own their farm holdings by inheritance. 34.1 and 31.7% of the men and the women had lands leased out to them. 14.6 and 7.3% of the male and female farmers purchased their lands. The share of women's land with respect to inheritance has imposed several constraints on the women, the prominent of which is their inability to grow crops of their choice, especially perennial crops. This is because the land size is small and most times are grossly inadequate in nutrients, so, the women are compelled to grow annual crops. The absence of title to land by the women can also deny them sustainable farm income, Jackson (1996), in his remark posited that "the endowing of men with land may adversely affect women's bargaining position within households". This is another poverty indicator which potentially distorts the understanding of gendered deprivation by use of male yardstick.

Farm size: 51.2 and 46.3% of the male and female maize farmers cultivated farm sizes ranging from 1.0-5.0 ha, respectively. About 31.7 and 39.0% of the male and female maize farmers cultivated a farm size of between 6-10 ha. The findings with respect farm size in this study are in congruent with the findings of Olayide (1980) that stated that generally majority of the farmers are into small scale production in Nigeria.

Farm experience: Most of the male (46.34%) and female (51.20%) maize farmers had experience of about 5 years in the study area. About 24.39% of the male and female maize farmers had more than 10 years of farm experience. The results show that the male and female maize farmers are well experienced in maize production in the study areas.

Sources of credit: Most of the male (63.4 and 22%) and female (39 and 31.7%) maize farmers obtained their funding from informal sources like Personal savings and Relatives/Friends while only 14.6 and 22% of the male and female maize farmers financed their maize production through Cooperative. The men also have more access to credit from most sources. Only from cooperatives and friends/relations did the women have better access. Access to credit is also a major determinant of output and in effect increased productivity of farmers. The findings here are not uncommon; for example in a study of gender characteristics of rural financial institutions in Uganda, Fendru and Adipala, found that there is limited access to credit by both men and women, but this affects women the more.

Household size: Most of the male (58.5%) and female (61%) maize farmers in the study area have household size of between 6-10 members, respectively. The rest

Table 2: Cobb-douglas model estimates for men, women and the pooled data

Variable	Men	Women	Pooled
Age (X ₁)	0.503	-0.03562	0.0283
Marital status (X ₂)	-1.343	-0.333	-0.271
Land acquisition (X ₃)	-0.482	-0.210	-0.301
Farm size (X ₄)	-0.771	-3.408*	0.0038
Quantity of seed (X ₅)	0.503***	1.424*	0.278
Qty of maize seed from previous harvest (X ₆)	-0.117	-0.0126	0.04291
Returns (X ₇)	-0.000288	-0.01098	0.00008
Herbicide quantity (X ₈)	2.503**	-0.795	0.899
Transportation cost (X ₉)	0.00018	-0.01303	-0.00012
Sources of fund (X ₁₀)	-0.00562	-0.07612	-0.302
Quantity produced of other crops (X ₁₁)	0.01151	-0.000911**	0.00062*
Constant	10.389	51.943	-0.02731
Adjusted R-square	0.802	0.906	0.828
Standard error	2.2292	1.0645	1.8549
F ratio	13.131	14.942	14.905

*Variable significant at 1%, **Variable significant at 5%, ***Variable significant at 10%

41.5 and 39% of the male and female maize farmers have about 5 members per family, respectively. It is expected that the family members of a farm operator will contribute labour to farm work, thus, the farmers' household in the study area are involved in the planting, weeding and harvesting of maize.

Production function analyses: The estimated Cobb Douglas production functions (regression equations), by methods of least squares for the men, women and the pooled data are presented in Table 2. The coefficient of land, seed and farm implements are all positive. The coefficients of land (for men), seeds (for women) and land, seed and farm implements (for the pooled data) are all significant at 1% level. The coefficient of seeds (for men) and land (for women) are all significant at 5% level. However, the coefficients of fertilizer, pesticides, family and hired labour are all negative and insignificant. Though they are all expected to be positively related to the output (a priori), their negative relationships with the maize output in this study are not unexpected for 2 reasons. One, almost three-quarters of the sampled farmers used improved seeds as planting materials (Table 1), especially hybrid maize. Two, hybrid maize only requires good soil and only a little quantity of chemical fertilizer. The need for intensive labour use may not be necessary from the germination to the maturity stage. In essence, inputs like fertilizer, pesticides, family and hired labour were overused in the context of this study. This means that expected yield (in monetary terms) for both men and women of the sampled farmers could have been lowered by making use of the inputs that have negative signs and are insignificantly related to the output.

To check for the structural stability of the regression equations estimated for both men and women, Chow (1960) test, was conducted to ascertain if the 2 relationships differ significantly. Chow test is essentially an F-test (Koutsoyiannis, 1981; Gujarati, 1995; Oredipe

and Akinwumi, 2000). Since, the F computed (0.2234) was less than the theoretical F (2.51 at 1% and 1.94 at 5%), the null hypothesis that there is no significant difference in the coefficients obtained from the two different functions for men and women was accepted. This in effect, means there was no significant difference in the productivity levels of both men and women.

Previous studies e.g., Jacoby (1992) and Ajetomobi (1995) found that men contributed a greater share to the farm output and by extension income and are more productive at the margin than women. They also found that men are more efficient in their use of basic farm inputs than women. The validity of their findings may have been questioned in so far as women farmers have been brought into limelight through various developmental programmes by several NGOs, research institutions in the developed and developing economies. The present study however, provides an eye-opener to the impact of such development programmes geared towards improving women in their different endeavours. Though this study was not meant to estimate the marginal productivity on the basis of the individual inputs (resources), the multi-factors (total factors) productivity indices showed that the relative difference in the production efficiencies of both the men and women could be insignificant, judging by the result of the Chow -F test. Studies such as those of Odii (1994), Rhaji (1998, 2001) and quite a number of more recent ones have results which support the findings here.

Some of the findings even have results which indicate that women's performances in terms of overall productivity and resource-use efficiencies have surpassed those of their men counterparts (Macours and Swinnen, 2000; Kuponiya, 2003).

CONCLUSION AND RECOMMENDATIONS

The study was meant to highlight and analyze the differences that exist in the basic socio-economic and farm characteristics of male and female maize farmers in the study area. These characteristics were expected to reflect a difference in the productivity levels of the sampled farmers. However, the study shows no difference in the average productivity of the sampled male and female farmers. This means that in spite of identified gender specific characteristics in the study area, no barrier has been established that can affect agricultural productivity especially of the women. The findings here have implications for sustainable agricultural development hence the following recommendations are made:

Women who have farm families are composed mainly of widows, in order to make them improve on their farming activities, more attention should be paid to their needs of basic input with minimal bottlenecks. Majority of the women were also found to be farming on family land inherited by them; a situation which only allows them to

cultivate only small parcels of mainly marginalized lands smaller than those of their male counterparts. An aggregate effect in this regard is the generation of low income (though this may be in relative terms). Institutional and cultural practices that will allow the women farmers to have an unbiased and unrestricted access to farm lands should be readdressed. This is to the extent that rights and privileges to acquire lands (especially for farming purposes) by women are not infringed upon.

On average basis, women had more access to improved seeds, fertilizer and herbicides than their male counterparts. The reason for this may not be far-fetched; there is the tendency of the suppliers of the improved seeds and fertilizers to be "compassionate" on the women's demand for those basic inputs. The many developmental programmes of the present day Nigeria accord such privileges to women especially in the rural areas.

In conclusion, the handling of any form of differentials in the productivity status of the male and female farmers will ultimately lead to a sustainable agricultural and rural development as the needs of the women folk for improved livelihood will be met.

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