# Gendered Difference in Agricultural Output: How Does Access to Land Contribute to the Debate? A Case Study of the Wa Municipality in Ghana

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*Authors' contributions*

*All authors contributed immensely towards this study. Author SM did the estimation and analyses of the Kendall's W and the introduction. Author BA did the analyses on women access to land and agricultural output. Author AABM did the literature review and research methodology. All authors read and approved the final manuscript.*

*Case Report*

## ABSTRACT

In Ghana like many other countries, gender plays a central role in the way in which land rights and production relations are determined. Whilst existing studies have suggested that men are economically productive than their women counterparts, those studies fail to emphasize the extent to which land, the most important input in developing economies' agriculture, contribute to that difference. This study examined the gendered difference in agricultural output and the extent to which access to land contribute to the output difference using the t-test and the Kendall's W. A sample of 100 farmers, 50 males and 50 females. Results show that whilst both men and women have reasonable access to land, men have access to land through multiple sources whilst women get land mostly through their spouses. The research also revealed that men's output is significantly higher than their female counterparts partly due to the difference in farm size and also due to the limited access to farm inputs such as fertilizer and improved seeds.

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## 1. INTRODUCTION

Women the world over own less rights and resources and thus, occupy lower socio-economic status relative to men. Globally, women constitute about 50% of the working population, but earn less income compared to men [1]. Also, existing customary and statutory regulations still restrict women's access to land and other types of properties [1].

African women play major role in agriculture. They comprise approximately 70% of sub-Saharan agricultural workers, and also account for about 80% of food processors. While more women than men are managers of natural resources, they are disadvantaged relative to men in terms of land ownership, access to education, access to extension services, and access to credit [2]. The disparity between women's important role in providing food security, and their poor representation in access to agricultural services indicates that there is scope for improving their contribution to the agricultural sector [2].

Statistics has it that women are dominant in Ghana's agricultural sector, in the form of smallholder farmers who are mostly food crop producers. About 70% of women have food production as their main activity compared to 50% of male farmers [3]. It is therefore imperative to enhance the contribution of women to agriculture since they constitute the majority of the population and are the most disenfranchised living in the rural areas.

In Ghana like many other African countries, gender play a crucial role in determining the distribution of land rights and production relations. Under customary land tenure system, control over productive resources are grounded on clearly demarcated gender segregated patterns based on traditional norms which may function in such a way that women access to land is limited compared to men [2].

Women and men must both be equitably equipped with the requisite inputs to employ their full potentials towards the creation of wealth for the benefit of their household, their community and the economy as a whole. Failure to do so, short-changes wealth creation, creates vulnerabilities and leads to intergenerational transmission of underdevelopment and inability of public policies to yield their commensurate benefits for the purpose of economic growth and development.

[4] contend that access to land and control over its use constitute the major input in the production of food and income generation in rural areas, and more broadly, for household wellbeing. Therefore, access to other productive resources such as irrigation systems, fertilizers and forest products is equally linked to land tenure.

Whilst the above assertions are partly true for some regions, in West Africa and Ghana in particular, access to land as a major constraint to agricultural output is yet to be substantiated by existing literature. Empirical evidence from field surveys in Ghana suggests that existing tenurial systems present no significant obstacle to women's access to agricultural land [5]. Accordingly, land tenure des not directly inhibit agricultural development amongst women, or men generally.

The question then arises as to what extent women have access to land? What effects does access to land have on agricultural production of women? These and some other relevant questions need answers from empirical evidence in support or other wise of the ensuing gap in the literature on the gendered difference in agricultural output. This research is therefore a case study of the Wa Municipality in Ghana.

## 2. LITERATURE

### 2.1 Women and Access to Land

Women's position in sub-Saharan Africa in respect of access to secured land varies significantly. However, most women in Africa have considerable access to land mostly through their relationships with men, as wives or kin [6]. There are a number of channels through which people in Africa have access to land as indicated in Table 1. Formal land markets, in which registered and secured lands are bought and sold or rented on cash basis are relatively rare in Africa, though in south-western Uganda, rental markets for land are reported [7].

**Table 1. Principal forms of land tenure in Africa**

| Form of tenure | Main features | Examples | Prevalence |
|---|---|---|---|
| Freehold | Absolute title to land, including the rights of use, control and disposal, guaranteed and backed by the state. May be held by groups but more often by individuals. Derived from English common law but with equivalent forms of property rights in civil law. | Commercial land holdings under freehold title in South Africa, Namibia and elsewhere; Smallholder land titles created in Kenya, or upgraded from customary rights by land commissions in Niger. | Not prevalent in rural Africa except where created for settlers during the colonial period, or by express allocation of freehold rights or titling programs by independent states. More common in urban areas |
| Leasehold | Long but limited term rental contract (typically 25, 50 or 99 years) on land belonging to the state or private owner; A form of land title backed by the state, and often transactable on the market | Land concessions for commercial purposes in Mozambique; leases issued by government to customary land users in Rwanda; urban plots in Ghana under lease from customary authorities; tobacco estates leased by government in Malawi. | More common in Africa than freeholds, especially where all land belongs to the state which allocates land on a leasehold basis or creates leasehold title as a means of formal registration of customary rights |
| Tenancy | Short-term rental Contracts usually between private individuals. May or may not be regulated by formal law | | |
| Certificates, licenses and permission to occupy | Simplest forms of documentation granting land rights issued by the state or other owner; generally temporary and insecure | Permissions to occupy as yet not upgraded in South African townships | Widespread but with variable forms of documentation from public and especially private / customary land owners in African cities |
| Adverse possession | Secure property rights recognized in law as a result of land occupation over a number of years | One form of legally protected customary rights under Mozambique's 1997 Land law. | Not common |
| Squatting | Unlicensed informal occupation, usually on public land (should be distinguished from occupation permitted by customary owners. undocumented land | | Widespread in African cities; less common in rural areas |
| Customary rights: - Group / communal | Legitimate land rights derived from kinship with or inheritance from | E.g. in Ghana rights are considered to be vested in the traditional land holding | The predominant form of African land holding, but with varying |

| Form of tenure | Main features | Examples | Prevalence |
|---|---|---|---|
| - Family<br>- Individual | members of a land holding group who have established rights historically by clearance or kinship. Customary rules for land access varies widely. Rights held in perpetuity and may be transactable but not on a permanent basis, or not without permission of the group or a customary authority | group, or extended family under a chief. Legal status of individuals' rights may be contested or unclear. In e.g. Uganda and Niger recognized in law and have equal status to freehold. | degrees of freedom to utilize and dispose of land at individual, household or village level according to custom. Where land availability is sufficient, non-farm and unutilized land generally held under Common Property according to customary rules. Customary rights recognized in law in an increasing number of countries but documentary coverage limited. |
| Derived customary rights:<br>-Sharecropping<br>-Tenancy<br>-Gifts and grants<br>- Loans, pledges and mortgages<br>-Seasonal rights | Rights transferred under customary rules to non-rights holders including women and other family members, community members seeking additional lands and to outsiders, notably migrants.<br>Usually but not necessarily temporary and restricted in character. Originally nonmonetary but increasingly monetized. | Various forms of tenancy and sharecropping as in the West African cocoa belt; unregistered customary leases in peri-urban Ghana; seasonal access arrangements between | Very frequent means of land access in customary systems. The predominant form of land access for women, junior family members and migrants. Seasonal land access arrangements common between pastoralists and settled farmers, or sequential use by different pastoral groups. |

*Source [7]*

Land tenure arrangements in Africa vary considerably, transcending ethnic, cultural and national boundaries. In some areas, women have access to traditionally held land and maintain long term rights over it. In other areas, men retain the rights to land and grant women access to it usually through marriage. Therefore, in discussing women's access to land, it is imperative to note the extent to which women have formal and customary rights over the land that are independent of their husbands.

"Just giving women the same access as men to agriculture resources could increase production on women's farms in developing countries by 20 to 30 percent. This could raise total agricultural production in developing countries by 2.5 to 4 percent, which could in turn reduce the number of hungry people in the world by 12 to 17 percent, or 100 to 150 million people. An estimated 925 million people in the world were undernourished in 2010, of which 906 million live in developing countries" [8]. The FAO report states that women in all regions generally have less access to land than men. For those developing countries for which data are available, land holding for women stands between 3 and 20 percent of all landholders [8].

## 2.2 Women and Agricultural Productivity

Women contribute significantly to the labor supply in the agricultural sector. Labor supply of women in agriculture ranges from 20 to 50 percent in developing countries, with an average of about 43 percent; ranging from 20% in Latin America to almost 50% in East and Southeast Asia and sub-Saharan Africa [8]. The share is higher in some countries and varies greatly within countries.

Statistical data for Ghana show that women account for about 50% of the agricultural labor force and produce about 70% of Ghana's food [3]. The World Bank study for Africa contend that women constitute the primary agricultural workers and are responsible for assuring food availability in the family. However, their crucial position in economic activities, arresting food insecurity and meeting the nutritional needs of the family, contrasts with the systematic discrimination they face in access to and control over the basic inputs needed to fully participate in realizing the region's economic growth potential.

Terri Raney, editor of the SOFA Report [9], said that: "Women farmers typically achieve lower yields than men, not because they are less skilled, but because they operate smaller farms and use fewer inputs like fertilizers, improved seeds and tools". [10], have also argued that discussions revolving around agricultural productivity can best be explained through rights over land analysis using a social relation's approach.

## 2.3 Land Tenure Security and Agriculture Productivity

It is argued that ensuring women have independent and secure rights to farmland is an important tool towards eradicating poverty and increasing economic productivity for three important reasons [11]. First, women are often the principal food producers for households, working their household farm plots while their husbands work for collective farms or in industry. Secure tenure of the land women work on provides them with the certainty they require to make the best investment and management decisions with respect to their lands [12]. Farmers who have secure rights of access to land, are more likely to make productivity enhancing investments in their land, irrespective of their gender. Second, women constitute 60 percent of the world's rural population living below the poverty line [13]. Therefore, increasing women's access to productive resources goes directly to relieving the brunt of poverty in the society as a general and the population in general. Third, women are responsible for children's nutrition and primary health care needs; increasing their productivity facilitates a distribution of income to meeting children's basic needs.

## 3. RESEARCH METHODOLOGY

### 3.1 Study Area

The Wa Municipality is one of the nine Districts/Municipal assemblies that make up the Upper West region (UWR) of Ghana. The UWR is located in the North-Western part of Ghana and shares boarders with La Cote D'Ivoire to the North-West, Burkina Faso to the North, the Upper-East Region to the East and the Northern Region to the South.

The Wa Municipal Assembly shares administrative boundaries with; Nadowli District to the North, the Wa East District to the East and

South and the Wa West District to the West and South. It lies within latitude 1°10'N to 2°45'N and longitude 9°32' to 10°20'W.

## 3.2 Sampling and Sample Size

The sample units include women and men in the Wa Municipality, who are farmers, traditional political heads, family and clan heads and opinion leaders in the community.

A sample size of 100 farmers were randomly selected, a little above the sample size determined by the formulae below:

$$\text{Sample size (n)} = \frac{Z^2 \pi (1 - \pi)}{(X - \pi)^2}$$

Where, $(X - \pi)$ = tolerable error of 10%, π is population proportion, =0.5, X is sample proportion and Z = the tabulated value of 95% confidence level = 1.96.

$$n = (1.96)^2 (0.5) (0.5)/ (0.1)^2$$
$$= 96$$

Data collection methods such as interviews and focus group discussions were used in collecting data from the 100 farmers. Data was analyzed using mean, median, t-tests and Kendall's Coefficient of concordance with the aid of Statistical Packages for Social Scientists (SPSS).This enabled the research team get all the necessary information on the access to land by women and how it affects their agricultural production.

## 3.3 Data Analysis Techniques

Descriptive statistical and quantitative methods are used to analyze the data collected. Descriptive statistics such as frequency distribution, mean and mode are used. The t-test was also used to test for the statistical significance of the variables, whilst the Kendall's Coefficient of Concordance (KCC) test was used to rank the challenges faced by the sampled farmers.

## 3.4 Theoretical Model

The challenges that confront farmers in their agricultural businesses were identified and ranked using the Kendall's coefficient of concordance. The coefficient helps to ascertain the level of agreement amongst farmers on the listed challenges.

The weights of various challenges identified as inhibitions to farmers in their attempt to access the input are examined using the Kendall's correlation coefficient ($W$). This is an index that measures the ratio of the observed variance of the sum of the ranks to the maximum possible variance of the ranks. The level of agreement is determined by the sum of the ranks for each challenge such that high sum of the ranks indicates perfect agreement among farmers [14,15].

Following [16], the Kendall's coefficient of concordance ($W$) is given by:

$$W = \frac{12s}{P^2(n^3 - n)} - p^t \tag{1}$$

Where: $W$ is the Kendall's coefficient of concordance; $P$ denotes the number of the farmers, $n$ represents the number of quality perceptions, $t$ denotes the correction factor for tied ranks, and $S$ is the sum of squares statistics over the row sum of ranks $(R_i)$, given as:

$$S = \sum_{i=1}^{n} (R_i - R)^2 \tag{2}$$

Where $R_i$ a row is sum of ranks and $R$ is the mean of $R_i$. Where there is a tied rank, the correction factor for tied ranks (T) is given as:

$$T = \sum_{k=1} (t^3 - t_k) \tag{3}$$

Where $t^3$ is the number of ranks in each of $p$ group of ties is used.

The test of significance of the Kendall's coefficient of concordance is conducted using a chi-square ($\chi^2$) statistics.

The coefficient, $W$, ranges between 0 and 1. If W is 0, there is no overall trend of agreement among the farmers on the perceived challenges hindering their access to the fertilizer. On the other hand if W is 1, there is unanimity among farmers on the challenges confronting them.

# 4. ANALYSES AND PRESENTATION OF RESULTS

## 4.1 Respondents' Characteristics

The results show that male farmers (40%) have high access to extension services compared to female farmers (26%) as indicated in Table 2. Of the 50 male farmers sampled, 30 (representing 60% of the male farmers) use fertilizer on their farms, as against 20 female farmers (representing 40% of the female farmers) who use fertilizer. The results further show that, more male farmers (40%) use improved seeds compared to female farmers (26%).

The results show much difference between men and women in terms of access to basic farm inputs such as fertilizer, extension and improved seed. The difference in access to these output enhancing inputs put women at disadvantaged position in their attempt to improve their output levels.

### Table 2. Respondents' characteristics

|  | Male | Female |
|---|---|---|
| Extension visit | 56% (28) | 30% (15) |
| Fertilizer use | 60%(30) | 40%(20) |
| Improved seed | 40% (20) | 26% (13) |
| Access to credit | 36% (18) | 20% (10) |

*Figures in brackets are frequencies*
*(Source: Field survey, 2011)*

## 4.2 The Extent to Which Women Have Access to Land

### 4.2.1 Access to land

All respondents have access to land irrespective of their gender, though some faced varying challenges that delayed their acquisition. It is worth noting however that whereas only 8% of male indicated that they had difficulty in accessing land, as much as 20% of the women faced various forms of challenges in accessing land as indicated in Table 3.

Contrary to the general belief, women have reasonable access to land. As indicated previously, farming is basically for purposes of consumption. This presupposes that a chunk of the output realized from farms will finally end up in the family pot and hence becomes beneficial to men to support their wives to acquire land. Also, incomes realized by women from proceeds of excess produce will go a long way to support the household economy, especially in the support of their children's needs and wants.

Though the research indicates reasonable access to land by both male and female, the research team wanted to know the extent to which women have access to land. This revealed significant difference in terms of size and security of their access mainly due to the difference in their access routes and the disadvantaged positions of women.

### 4.2.2 Access routes

Land is acquired through various means including family, gift, inheritance, leasing, marriage and others. Fig. 1 shows the access routes to agricultural lands according to gender. The results reveal that 25 (50%) men access land through family allocation as against 10 (20%) women; 18 (36%) men acquire land through inheritance as against 8 (16%) women and 1 (2%) of men as against 26 (52%) of women access land through marriage. It is also worth noting that overall, the dominant access route to land by respondents is through family allocation (35%), followed by marriage (27%), then inheritance (26%) with the remaining access routes together representing 12%. Therefore though both men and women have access to land, it is the access route that differs. Whereas family allocation and inheritance constitute the major access route for men, marriage represents the major route for women. This implies that men, the family heads are advantaged in the allocation of land whilst women would have to depend on their spouses for land.
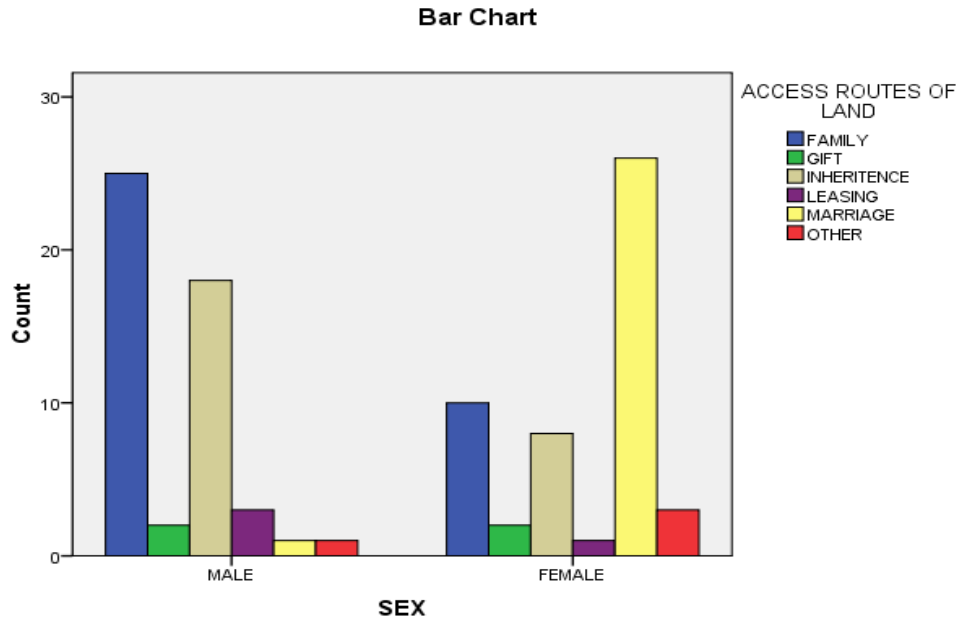
### Table 3. Access to land

| Response | Male | | Female | |
|---|---|---|---|---|
|  | Frequency | Percentage | Frequency | Percentage |
| Yes | 4 | (8%) | 10 | (20%) |
| No | 46 | (92%) | 40 | (80%) |
| **Total** | **50** | **100** | **50** | **100** |

*(Source: Field survey, 2011)*

**Bar Chart**



**Fig. 1. Bar chart on access routes**
*(Source: Field survey, 2011)*

### 4.2.3 Comparing the land size of women to that of men

Though the research indicates that both men and women have access to land, the sizes are different for each group as shown in the Table 3.

Table 4 shows that there is difference in the mean size of land between Men (3.99 acres) and Women (2.002 acres). The table also indicates further the difference between the land size using a rather good measure of Central Tendency-The Median which indicates again that while half of women have their lands above 2.0 acres and other half below it, the men, have half their land above 3.0 acres and the other half below it. Overall, men have larger land size than women.

This difference is further supported using the t-test statistics as in Table 5.

Table 5 indicates the output obtained using the independent t-test to test the difference between the mean size of land for men and women. The Levenes statistic is used to test the assumption of equal variance and suggests that equal variance when the significance value is greater than or equal to 0.10 and that unequal variance is assumed when the significance value is less than 0.10. Since the significance value of the statistic is 0.02, we can assume that the group has unequal variances and hence the second test is used.

The t column displays the observed t statistic for each sample, calculated as the ratio of the difference between sample means divided by the standard error of the difference. The df column displays degrees of freedom. For the independent samples t test, this equals the total number of cases in both samples minus 2. The column labelled Sig. (2-tailed) displays a probability from the t distribution with 98 degrees of freedom. The value listed is the probability of obtaining an absolute value greater than or equal to the observed t statistic, if the difference

**Table 4. Mean and median sizes of land**

| Sex | Mean | Range | Median | Skewness | Std. error of mean | Variance |
|---|---|---|---|---|---|---|
| Male | 3.990 | 19.0 | 3.000 | 3.035 | 0.506 | 12.811 |
| Female | 2.020 | 10.0 | 2.000 | 2.774 | 0.232 | 2.683 |
| **Total** | **3.005** | **20.0** | **2.000** | **3.479** | **0.294** | **8.649** |

*(Source: Field survey, 2011)*

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**Table 5. Independent samples test of mean difference in land size**

| Variable | | 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 |
| Land Size | Equal variances assumed | 5.601 | 0.020 | 3.539 | 98 | 0.001 | 1.97 | 0.557 | 0.865 | 3.075 |
| | Equal variances not assumed | | | 3.539 | 68.663 | 0.001 | 1.97 | 0.557 | 0.859 | 3.081 |

*(Source: Field survey, 2011)*

between the sample means is purely random. The Mean Difference is obtained by subtracting the sample mean for group 2 (Female) from the sample mean for group 1 (Male). The 95% Confidence Interval of the Difference provides an estimate of the boundaries between which the true mean difference lies in 95% of all possible random samples of 100 farmers. Since the significance value of the test is less than 0.05, we can safely conclude that the average difference of 1.97 (acres) of land between men and women is not due to chance alone and thus significant.

Some reasons for this phenomenon include the fact that men are considered bread winners of the family and therefore work harder to ensure food security and provide the basic needs of the family. Accordingly, the men inherit bigger land than the women to enable them meet their acclaimed responsibility (as stated by the [9]. Men usually access land through the family because they are regarded family heads, whiles women usually through marriage as revealed by the research. This limits the size of land acquired by women as they take surplus land of their husbands' family land. Worth noting is also the burden of work put on the shoulders of women in the form of household chores and wellbeing of children that allow them little or no time to

manage bigger farm sizes even if they have the means of doing so.

## 4.3 Effect of Women's Limited Access to Land on Agricultural Production

### 4.3.1 Comparing output of men with that of women

Table 6 shows that there is difference in the mean output between Men (12.5 bags) and Women (5.55 bags). The table also indicates further the difference between the output using a rather good measure of Central Tendency-The Median which indicates again that 50% of men have their output above 9.0 (bags) and the other 50% below that, while 50% of women have output above just 5.0 (bags) and 50%. This shows that, on the average, the output of men is greater than that of women (more than twice).

The claim is further supported by testing the difference in the mean outputs using SPSS as shown in the Table 7.

The Table 7 shows a comparison of means of output between male and female using the t-test. The Levene statistic tests the assumption of equal variance. Since the significance value of

**Table 6. Total output (in Bags)**

| Sex | Mean | N | Std. deviation | Skewness | Median |
|---|---|---|---|---|---|
| Male | 12.5 | 50 | 14.182 | 3.637 | 9.0 |
| Female | 5.55 | 50 | 5.487 | 2.596 | 4.0 |
| **Total** | **9.025** | **100** | **11.254** | **4.307** | **5.0** |

*(Source: Field survey, 2011)*

**Table 7. Independent samples test of mean difference in output**

| Variable | | 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 | |
| Total output (in Bags) | Equal variances assumed | 9.765 | 0.002 | 3.232 | 98 | 0.002 | 6.95 | 2.151 | 2.683 | 11.218 | |
| | Equal variances not assumed | | | 3.232 | 63.347 | 0.002 | 6.95 | 2.151 | 2.653 | 11.247 | |

*(Source: Field survey 2011)*

the statistic is 0.002 which is less than 0.10, we can assume that the groups have unequal variances and hence use the second tests.

The "t" column displays the observed t statistic for each sample, calculated as the ratio of the difference between sample means divided by the standard error of the difference. The df column displays degrees of freedom. For the independent samples t- test, this equals the total number of cases in both samples minus 2. The column labelled Sig. (2-tailed) displays a probability from the t distribution with 98 degrees of freedom. The value listed is the probability of obtaining an absolute value greater than or equal to the observed t statistic, if the difference between the sample means is purely random. The Mean Difference is obtained by subtracting the sample mean for group 2 (Female) from the sample mean for group 1 (Male). The 95% Confidence Interval of the Difference provides an estimate of the boundaries between which the true mean difference lies in 95% of all possible random samples of 100 farmers. Since the significance value of the test is less than 0.05, we can safely conclude that the average difference of 6.95 (Bags) of output between men and women is not due to chance alone, making the variation notable. Therefore, the mean output of men is significantly greater than that of women.

This situation is due again to the fact that economically, women produce lower than men due to historically unfavorable circumstances of women, thereby weakening their capability to

properly invest in their farms to make desirable returns. For instance, it was realized that, 44% of men use inputs such as weedicides as against 30% of women. Women are denied the inheritance of several properties including immobile property such as building that could be used as collateral to raise capital. This experience is shared by FAO that women in Sub-Saharan Africa are considered minors, both with parents and under the roof of a husband and often excluded from most form of inheritance [17]. From the field survey it was realized that 68% of women use fertilizer as against 50% of men. Women generally complained more about the inadequacy of fertilizer than men in the course of the study.

Also, land allocation is in the hands of men in all cases. The best lands are thereby taken by the men and the "unwanted" land made available to women. It is therefore, reasonable to expect that men will have more fertile land than women.

Education is a very important factor in determining the output of farmers. Though the general literacy level is low (18%), women are relatively disadvantaged compared to their male counterparts; whereas 22% of men have access to at least some level of basic education, only 14% of women have had this privilege. A study of 20 low income countries conducted for the world bank which examined the relationship between the level of education and production efficiency found that, other things been equal, farm productivity increases on the average by

6.9% if a farmer had four years of education and likely to be higher in modernizing environments than in traditional environments [18].

### 4.3.2 Ranking of agricultural constraints

It can be deduced from the explanations above that land, though an important resource is neither the only nor the major constraint to agricultural productivity and development at large. The team deemed it fit therefore to rank the agricultural constraints using the Kendall's Coefficient of Concordance (KCC).

The KCC test is a nonparametric alternative to the repeated measures of analysis of variance. It is used in evaluating hypothesis which concerns ordinal outcomes.

The group enumerated some common agricultural constraints and each respondent was made to rank the constraints as they deem fit, this was to enable the team determine the seriousness of land acquisition problems as a major constraint or not to agricultural development and most importantly find out other important limitations to agricultural production.

From Table 8, the respondents tended to rank Inadequate Finance more highly, followed by the famous erratic rainfall, inadequate government support, with land acquisition and poor health taking the lowest ranks. Land acquisition is ranked 13th out of the total of 14 agricultural constraints enumerated. This implies that access to land is considered the least of their challenges. Farmers in the area are challenged more by their inability to finance their agricultural businesses as there are no credit schemes to augment farmers' efforts.

The KCC tests the null hypothesis that the ranks of the variables do not differ from their expected value. Table 9 shows the test statistics for the rank of the challenges confronting farmers. The results show a *Kendall's W[a] of* 0.387, indicating that there is about 39% level of agreement among farmers on the order of importance of the identified challenges they face in their farming enterprises. Even though the level of agreement is weak, the asymptotic significance of 0.0 indicates a rejection of the null hypothesis that there is no agreement between farmers on the challenges confronting them with respect to their access to the input.

**Table 8. Ranking of farmers' constraints**

| Problems | Mean rank | Rank |
|---|---|---|
| Inadequate finance/Credit facilities | 2.96 | 1st |
| Poor soil fertility | 5.09 | 4th |
| Input supply | 4.97 | 3rd |
| Bush fires | 7.25 | 8th |
| Inadequate extension services | 6.57 | 7th |
| Inadequate government's support | 6.47 | 5th |
| Labor cost | 6.48 | 6th |
| Erratic rainfall | 4.40 | 2nd |
| Marketing and storage | 9.64 | 9th |
| Poor health | 10.58 | 14th |
| Land acquisition | 10.56 | 13th |
| Poor road/transportation network | 10.09 | 11th |
| Thieves | 10.22 | 12th |
| Pests and diseases | 9.73 | 10th |

*(Source: Field survey, 2011)*

**Table 9. Test statistics**

| | |
|---|---|
| N | 100 |
| Kendall's W[a] | 0.387 |
| Chi-square | 503.175 |
| Df | 13 |
| Asymp. Sig. | 0.000 |
| a. Kendall's coefficient of concordance | |

*(Source: field survey, 2011)*

## 5. CONCLUSION

The research intended to examine the gendered difference in output using 100 randomly sampled farmers from the Wa municipality to serve as a case study. The study used the t-test and the Kendall's W to examine gendered difference in output and the challenges confronting farmers respectively.

The study revealed that despite the fact that few men faced challenges in accessing land, both women and men have access to land. However, the land size of men is greater than that of women due to the limited channels available to women to access land (mostly through their spouses). Thus, all other things been equal, agricultural output of men is greater than that of women partly due to the differences in the sizes of land acquired and due to the general financial constraints faced by farmers of which women are adversely affected compared to men. This finding confirms the contention of [11] that land tenure security affects productivity of farmers.

## 6. RECOMMENDATIONS

The significance of women in contributing to the overall wellbeing of the Wa Municipality cannot be overemphasized as they constitute 53.3% of the community [19] and play significant roles in household stability. The following measures are thereby suggested to increase the productive capacities of women.

Women should form cooperatives to support each other both financially and otherwise in order to increase their production levels and to share farming experiences.

Measures should be taken to facilitate the right of women to own property in order to increase their independence through active sensitization programs to proof to men that their burden will be reduced, the household economy will be made more stable and most importantly children will have better opportunities to become responsible and productive citizens. Women should also be made to realize that they could and should have better opportunities and be more productive than they are at present.

In order to increase the production capacities of women and farmers at large, there is the need to holistically deal with the high illiteracy level, to enable farmers exploit the numerous opportunities both within and beyond the country. This in no doubt will also help farmers to see their work as more of a business and not a way of life.

There is the need for increased support and commitment by appropriate government agencies, NGOs and donors in addressing the prioritized agricultural constraints such as finance (credit facilities) and inputs among others, to boost agricultural productivity and to alleviate poverty.

Far from suggesting tenurial reforms, it is recommended that the current tenurial systems in the study areas provide sound and dynamic platforms for sustainable development. However, written records and land registration in line with the Land Registry Act 1962 (Act 122) and the Compulsory Land Title Registration Law, 1986, (PNDCL 152) for all land transactions would provide a more secure basis and avoid future litigations that may destabilize the community and facilitate sustainable investment in agribusinesses.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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