The influence of Farmers' Gender on Factors Affecting Maize production among Small Scale Farmers in the Agricultural Reform Era: The Case of Western Region of Kenya

Original Research Articles

ABSTRACT

The introduction of Structural Adjustment Programmes (SAPs) and trade liberalisation resulted in agricultural reforms in Kenya and other developing countries. Hence the Kenya government no longer gives incentives to small scale farmers. Therefore, the small scale farmers, extension service and the government at large have to look for all ways to increase maize production in the country, hence the study. Men and women both make significant contributions in maize-based farming systems and livelihoods, although gender roles in maize cultivation vary greatly across and within regions. .Their contribution to agricultural work varies even more widely, depending on the specific crop and activity. The purpose of the study was to determine the influence of Farmers' Gender on Factors Affecting Maize production among Small Scale Farmers in the Agricultural Reform Era: The Case of Western Region of Kenya. This is because maize is the main staple for most of the Kenyan population and Western Region is the food basket. The study used Ex-post facto research design via cross sectional survey. Busia, Bungoma, Mt. Elgon and Lugari Counties were purposively selected to represent the Western Region of Kenya. Two sub-counties from each of the four Counties were selected by simple random sampling. For uniformity purposes 200 small scale farmers were selected from focal areas through systematic random sampling hence ensuring that they all had been exposed to extension staff. Four key informants were sampled purposefully based on their positions of authority. In addition, 52 extension staffs were sampled through systematic random sampling. The small scale farmers were interviewed with the help of interview schedule containing open and closed ended questions. Data were analyzed using descriptive statistics. The results of the multiple regression illustrated that there was a statistically significant relationship between factors affecting maize production among small scale farmers (adoption of improved agricultural practices, attitude towards maize farming attitude towards farmer organizations and attitude towards opinion leaders) and farmers' gender. The results showed that the adjusted R2=0.090, F=3.830 at $p < 0.01$ and df=8. The study recommended that the Kenya government, extension service and researchers should pay more attention to the women small scale farmers, who form a large percentage of the small scale farmers in the western region, yet produce less bags of maize in order for Kenya to be food secure. There was therefore need for further research to find ways of motivating women small scale farmers to increase maize production in the Western Region of Kenya.

INTRODUCTION

Structural Adjustment Programmes (SAPs) as propagated by the International Monetary Fund (IMF) and the World Bank in the 1980s in Kenya occurred against a background of the country's declining economic performance, which increased poverty levels [9]. The trend has continued to date with agricultural production and especially maize production declining.

Agricultural Sector in Kenya is the backbone of the country's economy and the source of livelihood for majority of the rural population. The sector contributes about 26 percent of the country's GDP, employs about 75 percent of the population and is a major source of food to Kenya's growing population [3] [4]. The small scale farmers are expected to purchase their inputs, source for information on increasing production, store their own produce and seek for the best markets for their produce. One of the main issues in this regard is the lack of and the poor conditions of rural roads linking the farmer´s facilities and the commercialization spots in the country. All challenges are solved differently by the men and women small scale farmers [6]. There is therefore need more researches to be carried out on the factors affecting maize production by gender among small scale farmers in the western region of kenya, which is the main maize producing area In Kenya

PURPOSE OF THE STUDY

The purpose of the study was to determine the influence of Farmers' Gender on Factors Affecting Maize production among Small Scale Farmers in the Agricultural Reform Era: The Case of Western Region of Kenya

METHODOLOGY

Ex-post facto research design was used via a cross sectional survey. The study used naturally occurring treatments on subjects having a self-selected level of the independent variable [7]; [2].

The study was conducted in Western Region which is administratively divided into six counties as shown on Fig. 1 & 2. The region is made up of Busia, Bungoma, Kakamega, Lugari: Vihiga and Mt. Elgon counties. The Region covers an area of 8436 Km^2 out of this 6670 Km^2 has potential for agriculture of which, 3591 Km^2 is cultivated for various crops. Rainfall is bimodal. The long and short rains come in March-May and August-November periods, respectively. Annual rainfall ranges from 900mm in Busia to 2100mm in Bungoma [12].

Fig. 1. Map showing the Western Region of Kenya

Fig. 2. Map showing the Counties in the Western Region of Kenya

The target population was made up of small scale farmers in the Western Region. The accessible population is as shown in Table 1.

Table 1. Showing the Study Accessible Population

District	Accessible population
Lugari County	41,809
Bungoma County	158,370
Mt. Elgon County	19,746
Busia County	136,736

Busia, Bungoma, Mt. Elgon and Lugari counties were selected through purposive sampling because Busia County had the lowest average maize yields (7 bags per acre) in the region while, Lugari County experienced the highest average maize yield (18 bags per acre). Bungoma and Mt. Elgon counties were in-between in terms of maize yield [5]; [10]. The four counties also represented Western Region in terms of all the Agro-ecological zones that exist in the Region and therefore, results obtained could be generalized to the whole Region.

Two sub-counties from each of the four selected counties were selected by simple random sampling. The study sub-counties were Bumula and Webuye in Bungoma County; Kaptama and Kapsokwony in Mt. Elgon County; Funyula and Butula in Busia County and Lugari and Likuyani in Lugari County (figure 2).

For uniformity purposes the small holder farmers were selected from focal areas through systematic random sampling thus ensuring that they all had been exposed to extension staff. At the time of data collection, the extension staff had trained the farmers in one focal area per

division and had moved to the next. The focal area approach which is under the National Agriculture and Livestock Extension Programme (NALEP) aims at improving livelihoods of the poor rural households [11]. In the focal area approach the extension staffs works in one area of approximately 400 farmers per year. The focal area is taken as a demonstration site where farmers from the rest of the division can learn latest technologies [1]. The key informants were purposefully sampled due to their positions of authority.

The sample size was arrived at using the following formula:

$$n = NC^2 \div C^2 + (N-1)e^2$$

(*note:* n=sample size; N=population size; C=Coefficient of variation which is 30%; e=margin of error which is fixed between 2-5%). The study sample was calculated at 25% coefficient of variation and 5% margin of error [13] [5] [7].

For the purpose of generalizing the results to Western Region, twenty five percent coefficient of variation was used to ensure that the sample was wide enough. Five percent margin of error was used because the study was an ex-post facto survey. In ex-post facto survey the independent variables are not be manipulated hence necessitating relatively higher margin of error. The study sample is shown in Table 2.

The small scale farmers and extension staff were selected through systematic random sampling from sampling frames that were obtained from the extension staff offices. Four key informants were interviewed in order to generate additional information and clarify issues on the reform measures that had taken place. The key informants included the Provincial Director of Agriculture and Livestock Extension, the Provincial Crops Officer, an officer in position of authority in Agricultural Finance Corporation and an officer in position of authority at the National Cereals and Produce Board, Western Region. The small scale farmers were interviewed with the help of interview schedules and the extension staff were asked to fill questionnaires

Table 2. Total number of subjects by category from which the sample was drawn

Category	Number of subjects	Sample size
Extension staff in the Region	832	52
Household heads in Busia County	136,736	50
Household heads in Lugari County	41809	50
Household heads in Bungoma County	158370	50
Household heads in Mt. Elgon County	19746	50
Key Informants		4
Total	357,493	256

The study sought to determine the relationship between factors affecting maize production among small scale farmers in the agricultural reform era, by gender, in Western Region.

RESULTS AND DISCUSSIONS

The results of the multiple regression illustrated that there was a statistically significant relationship between factors affecting maize production among small scale farmers (adoption of improved agricultural practices, attitude towards maize farming attitude towards farmer organisations and attitude towards opinion leaders) and farmers' gender. The results showed that the adjusted R^2=0.090, F=3.830 at p <0.01 and df=8. Hence the null hypothesis was rejected.

The study further sought to establish the differences in the factors affecting maize production among small scale farmers between men and women farmers. The differences in maize yield between men and women farmers were also determined. The results revealed that there was a statistically significant difference at 0.05 significant level in maize yield (F=12.038, df=1). However, there was no statistically significant difference between adoption of improved agricultural practices (F=3.582, df=1), attitude towards farmer organisation (F=0.100, df=1), attitude towards maize farming (F=0.305, df=1) and attitude towards opinion leaders (F=2.695, df=1) between men and women small scale farmers.

To facilitate discussion of the gender differences in maize yield, adoption of improved agricultural practices, and farmers' attitude towards maize farming, farmer organisations opinion leaders, cross tabulations were run. The results were as shown in Tables 3-6. The results revealed that more women farmers (71.4 %) achieved maize yield of less than 11 bags per acre as compared to 47.9% of the men farmers who achieved the same yield. On other hand, more men farmers (27.6%) achieved maize yields of over 16 bags per acre compared to the 16.6% women farmers who achieved the same yield as shown in Table 3. The low yields realised by women farmers could be explained in part by the factors shown in Table 4.21-4.23.

Table 3: Percentage Men and Women Farmers Who Achieved Various Maize Yields per Acre

Maize yield	Women farmers (%)	Men farmers (%)
≤ bags per acre	30.8	21.4
6-10 bags per acre	40.6	26.5
11-15 bags per acre	12.0	24.5
16-20 bags per acre	8.3	9.2
21-25 bags per acre	5.3	4.1
Over 25 bags per acre	3.0	14.3
TOTAL	100	100

Table 4 illustrates that more men farmers (60.6%) adopted either three quarters or all the improved agricultural practices taught by the extension staff, as compared to 46.2% women. On the other hand, more women farmers (32.1%) than men farmers (25.3%) either did not adopt or

adopted only one quarter of the improved agricultural practices. This explains in part the reason why women farmers generally achieved lower maize yields than men farmers.

Table 4: Cross Tabulation of Adopted Improved Agricultural Practices by Gender

	Extension packages passed and adopted by farmers				
	None of the Packages Passed	**Quarter of the packages Passed**	**Half of the packages passed**	**Three quarters of the packages passed**	**All of the packages passed**
Men	19.2	6.1	14.1	21.2	39.4
Women	28.4	3.7	21.6	14.9	31.3

Cross tabulations of attitude of farmers towards maize farming, farmer organisations and opinion leaders indicated that relatively more women farmers (55.2%) had either very poor or poor attitude towards maize farming as compared to 47.9% men farmers. On the contrary, more men farmers (52.1%) had average to very good attitude towards maize farming as Compared to 44.8% of women farmers as shown in Table 5.

The results further showed that relatively more women farmers (27.6%) had very poor to poor attitude towards farmer organisations as compared to 24.5% of men farmers with the same attitude towards farmer organisations. On the other hand, more men farmers (75.5%) had average to positive attitude towards farmer organisations as compared to 72.4% of the Women farmers as shown in Table 4. Generally, both men and women farmers had average to very good attitude towards opinion leaders. However, more women (7.5) had very poor to poor attitude towards opinion leaders as compared to 3.1 % of the men farmers. The extension service, the government and other stake holders may have to give more emphasis to problems facing women farmers if food production in Western Region and in the country should improve.

Table 5: Attitude of Farmers towards Maize Farming, Farmer Organisation Opinion Leaders by Gender

	Very poor (%)	Poor (%)	Average (%)	Good (%)	Very good (%)	n
Attitude towards maize farming						
Men	11.2	36.7	48	3.1	1	98
Women	10.4	44.8	33.6	11.2	0	134
Attitude toward farmer organisations						
Men	4.1	20.4	40.8	31.6	3.1	98
Women	10.4	17.2	39.6	27.6	5.2	134
Attitude toward opinion leaders						
Men	0	3.1	52	42.9	2	98
Women	1.5	6	61.9	26.9	3.7	134

Table 6 shows that slightly more women (37.3%) than men (21.1%) had planted maize on land sizes of less than one acre. In addition, more men (45.5%) than women (37.4%) farmers had land sizes of more than four acres. Similarly, more men farmers (52.7%) had acquired secondary school education or above as compared to the women farmers (23.2%). Furthermore, correlation coefficients indicated statistically significant relationships (Pearson correlation of 0.180, at $p < 0.007$) between education level and maize acreage and between education level and maize yield (Pearson correlation of 0.262 at $p < 0.0005$). This implies that men farmers are in a better position to realise higher yields in agricultural production than women farmers. Simplified extension packages should be designed for women farmers.

The high maize acreage, farm acreage and education levels give men an edge over women farmers. This is because the high levels of education possessed by men will help them understand improved agricultural practices passed by extension staff making adoption of these practices easy. Table 6 further shows that more men farmers (32.3%) had some form of employment compared to 27.6% women farmers who had some form of employment. For farmers to be productive they need money to buy farm inputs, indulgence of men farmers in other forms of employment earns them extra income which may enable them to purchase farm inputs, hence as are able to adopt improved agricultural practices.

Table 6: Maize Acreage, Education Level, Farm and Other Occupations Possessed by Men and Women farmers

Maize Acreage	men (%)	women (%)	Education level	Men (%)	Women (%)
No response	1.4	1.0	none	4.3	17.6
<1 acre	19.7	36.3	primary level	43.0	59.2
1-3 acres	62.0	46.1	secondary level	47.3	21.6
4-6 acres	7.0	9.8	college/ university	4.3	1.6
7-9 acres	1.4	1.0		1.1	0.0
≥ 10 acres	8.5	5.9			
Total	**100**	**100**		**100**	**100**
Farm size				**Other occupations**	
<1 acre	7.0	5.1	none	67.7	72.4
1-3 acres	47.5	57.5	self employed	18.2	20.9
4-6 acres	21.2	23.9	church/ community	4.0	1.5
7-9 acres	8.1	6.0	formal employment	8.1	5.2
10-12 acres	5.1	3.0	politician	2.0	0.0
>12 acres	11.1	4.5			
Total	**100**	**100**		**100**	**100**

CONCLUSION

More male small scale farmers achieved more bags of maize yield per acres compared to the women small scale farmers, more men farmers (60.6%) adopted either three quarters or all the improved agricultural practices taught by the extension staff, as compared to 46.2% women. relatively more women farmers (55.2%) had either very poor or poor attitude towards maize maize farming, farmer organizations and opinion leaders as compared to 47.9% men farmers. The study also revealed that most of the small scale farmers who had small farm sizes were women, they also had low education levels, that is below primary level and they were not involved in any other occupations apart from farming.

RECOMMENDATION

In order for Kenya to be food secure. the Kenya government, extension service and researchers should pay more attention to the women small scale farmers, who form a large percentage of the small scale farmers in the western region.

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