THE CONTRIBUTION OF WOMEN IN MAIZE AND SORGHUM CROP PRODUCTION IN BOTSWANA: A CASE OF NGWAKETSE CENTRAL SUB-DISTRICT IN THE SOUTHERN DISTRICT REGION

CHISANGO FUTURE FORTUNE T*

MUNYIMBILI FRANCIS W**

TEMBACHAKO DELIWE*

Abstract

The main focus of the research study was to highlight the contribution of women in the production of staple food crops in the Southern district of Botswana. The major objectives of the study were to establish the number of women and the level of their participation in maize and sorghum production in the country. Parameters of importance included the gender and ages of family members, the size of land in hectares which was planted to maize and sorghum, total physical product (yield) obtained from the two staple food crops and the actual time women spent in various farming activities during the farming season. Out of approximately 16667 subsistence farmers only 0.6 percent of the farming population was sampled for the study. The questionnaire, interviews, and observations were used in data collection. Descriptive data analysis method has been adopted in data analysis, by the use of graphs, pie charts, and tables. An average crop yield of 0.87 and 0.14 tons per hectare of sorghum and maize respectively were recorded, compared to normal district averages of 1.3 to 3.6 and 2.65 tons per hectare for sorghum and maize respectively. This showed that there is great need for an integrated approach in extension and service delivery, if output is expected to increase in the district.

Key words: average crop yield, Descriptive analysis**,** interviewed respondents & subsistence farmers,

* Program Coordinator/Lecturer: Agriculture Economics, Zimbabwe Open University

** Agricultural Extension Officer Southern District Botswana

1.0 Introduction

Farming is a rooted tradition for both men and women in Botswana. There is much evidence to support the claim that in Botswana, both men and women are farmers (Agrinews magazine, 2009). Farmers are typically often perceived as "male" by policy makers, planners and those at the helm of agricultural service delivery systems. For this reason, agricultural services such as technology, extension, training and production capacity, often tend to target male farmers. However, female farmers are the backbone of subsistence farming in Botswana as rural women are responsible of 60% to 80% of food production, yet female farmers are often underestimated and overlooked in agricultural policies and strategies (UNDP 2009). Women are vital and play a pivotal role to the economy of Botswana. Over the years, there has been a gradual realization of the key role of women in agricultural development and their vital contribution in agriculture, food security, horticulture, processing, nutrition, sericulture, and other allied sectors. In Botswana like in other rural African communities, crop farming was deemed a woman job while men involved themselves with what they believed to be male inclined duties such as herding of livestock (FAO 1997).

Among the major grain crops grown in Botswana, maize and sorghum are the most popular ones and women have taken an initiative in the production of these crops. 65% of carbohydrate requirements in Botswana are obtained from maize, 20% from sorghum and the rest is obtained from other cereal crops which comprise wheat and millet (Botswana Arable Agriculture Manual 2001). Much of the grains are grown by women in fields scattered in different ecological zones across the country. Women form the backbone of agriculture in Botswana and constitute the bulk of agricultural labor force.

1.2 Background and context of the study

In Botswana as in many other countries in the region, the agricultural sector is the backbone of the rural economy and livelihoods of the rural population. Data from a rapid assessment of Integrated Support Programme for Arable Agriculture Development, which was aimed at empowering subsistence farmers through the provision of draught power, seeds, and fertilizer, indicated that women are participating and benefiting more than men from this poverty alleviation and economic empowerment programme (Agrinews Magazine 2010). In recent years we have seen even greater numbers of women fully engaged in food production in Botswana. This rapid assessment of 2009, indicated that 89000 arable farmers benefited from this programme and that 58 % of the subsistence land owners were women (Agrinews Magazine 2010). The rapid assessment also indicated that women in Botswana play a dominant role in subsistence food production because the majority of men are mostly pastoral farmers. In all the districts of Botswana, women are the majority in ISPAAD programme, and invest more time and resources to contribute to food production at the household level.

Nationally, the female population of Botswana is slightly higher than male population with a ratio of 96 males in every 100 females; and 50% of the population lives in urban areas (Population Census, 2010). Grain arable farming is the mainstay of the larger Batswana community (World Bank-2010). Only about 0.7 % of total land in Botswana is arable. The principal crops for domestic use are sorghum, corn, and millet. Sorghum and corn production in 2009 was 13,000 tons and 5,000 tons respectively. The sorghum and corn harvests comprise less than 10% of the annual requirement of 250,000 tons. The Cereal yield (kg per hectare) in Botswana was 464.80 kg in 2009 (World Bank 2010**).**

Notably the total area planted by the communal sub-sector is 278,500 hectares which represents 93% of the national communal cultivatable area which stood at 300 000 hectares in 2011/2012 growing season (World Bank, 2010). In 2010, 2160 metric tons of sorghum was produced in the southern district from 3349 hectares of land (Kanye district agriculture office). Botswana recorded a total of 128644 hectares which were ploughed for maize in 2008/2009 growing season yielding a total of 42305.72 metric tons. In the same period, Southern district recorded 6096.15 metric tons of maize from 35225 hectares of land. Women produced 35% of this yield from 19112 hectares (Kanye district agriculture office).

1.3 Statement of the problem

The optimal utilization of available arable land by women farmers in Botswana is constrained by limited access to inputs, such as fertilisers, certified seed, equipment, irrigation infrastructure as well as extension services. The fall in the average yields of staple food crops such as maize and sorghum reflects deficiencies in the use of irrigation resources, and lack of experience as many of the women farmers produce the crops without proper assistance from extension services. In an effort to revive women's participation in the country's agricultural sector, the Botswana government should formulate policies and strategies which incorporate women as main participants in the farming sector. Under such circumstances women would therefore play a pivotal role in the mainstream of the country's economy.

1.4 Research objectives

1 Establish the proportion of women against men engaged in subsistence farming in the Southern district of Botswana.

2 Establish the actual time female farmers spent on farming activities such as land preparation, planting, weeding, harvesting and processing of food crops

3 Establish the numbers of livestock (symbol of wealth) possessed by female farmers in the district.

1.5 Research Methodology

Geographical location of the study area

The research was conducted in Southern district of Botswana which is located in the extreme south-eastern part of the country which borders the Northwest Province of South Africa. It has a population of 186,831 with a total of 15986 subsistence farmers. The whole country has a sub-tropical climate but the Southern district is affected by the southern cold winds which lowers temperatures. The district is divided into five sub-districts namely Goodhope, Ngwaketse Central, Ngwaketse South, Ngwaketse North and Ngwaketse West. Ngwaketse Central sub-district which is the focus of the study has a total of 1423 farmers.

Sampling Procedures

The study area is divided into ten extension areas with a total 2392 subsistence farmers. Through random sampling, four extension areas were selected which are: Lotlakane East, Diabo, Tswidi and Molapowabojang with a total of 766 subsistence farmers. These farmers were then stratified into male and female farmers in each of the four extension areas. Out of 766 farmers, 416 were female and 235 were males. Twenty five female farmers were then selected at random from each extension area for the purpose of the study, to make a total of 100 farmers.

Data Collection Methods

Descriptive/qualitative research design was used in collection and analysis of data. The relevant data gathering techniques employed included the use of questionnaire, observations and interviews. Informal interviews were also conducted with the view of getting deeper underlying background information from relevant authorities.

Data Analysis

Data was analyzed by the use of graphs, pie charts, bar charts and tables. The tools were more effective as they proved to be clear and simple to interpret. According to (Greig and Taylor, 1999), bar Charts make the comparison of the expected and actual degrees of frequency and direction of relationships clearer.

1.6 Presentation of Results

Table 1.1
Actual numbers of women and men who planted maize and sorghum in four extension areas (2011/2012) growing season.

EXTENSION AREA	MALE	FEMALE	TOTAL	% FEMALE
Tswidi	53	62	115	53.9
Diabo	55	49	104	47.1
Lotlhakane	101	309	410	74.1
Molopowabojang	79	58	137	42.3
Total	**288**	**478**	**766**	**62.4**

Source: District agriculture office (2011/2012)

The above table indicates that 62.4% of the subsistence farmers in four extension areas who planted maize and sorghum in 2011/2012 growing season were women and 37.6% were men. The findings confirm documented literature that in most Third World countries, the majority of subsistence farmers are women.

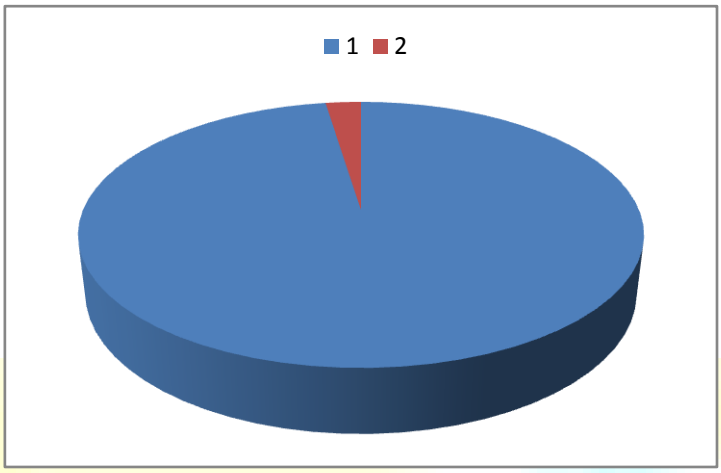
Table 1.2: Ages of interviewed farmer respondents

	Years from	Years from	Years from	Years over
AGE CATEGORIES IN YEARS	1 - 15	16 - 30	31 - 35	35
NUMBER OF FAMILIES (FREQUENCY)	35	56	48	41

Table 1.2 above indicates that 56% and 48% of the interviewed families have their family members aged between 16 to 30 years respectively. Of significance is that this is a youthful age group which has less interest in farming. This could be one of the reasons why it was discovered during farm visits that no single person aged between 16 to 25 years of age was found helping in the field/engaged on farming activities.

Table 1.3: Hectares planted to maize and sorghum by subsistence farmers.

EXTENSION AREA	MAIZE	SORGHUM	TOTAL
Tswidi	644	7.5	651.5
Diabo	287.95	NILL	287.95
Lotlhakane	1611.04	1.3	1612.34
Molapowabojang	387	NILL	387
TOTAL	**2929.99**	**8.8**	**2938.79**



KEY
1 = MAIZE
2 = SORGHUM

Fig.2.1Division of land planted to maize and sorghum.

Source: Extension Officers Report (2011/2012)

Table1.3 and Fig. 2.1 indicate that more farmers planted maize than sorghum in the year 2011 and 2012 growing season. During interviews with farmers, it was discovered that sorghum production requires more labour especially during harvesting. Another important factor for the low hectares of sorghum cropped is that many farmers complained of quelea bird damage which is a nuisance to the crop at soft dough stage. If not scared away, the bird is capable of destroying several hectares of the crop in no time. Despite the risks associated with maize crop production, which include poor rainfall during growing and maturing stages, many farmers opted to grow maize. In any case the number of hectares which were cultivated for the production of the above cereal crops in the area indicates active participation of women in crop farming.

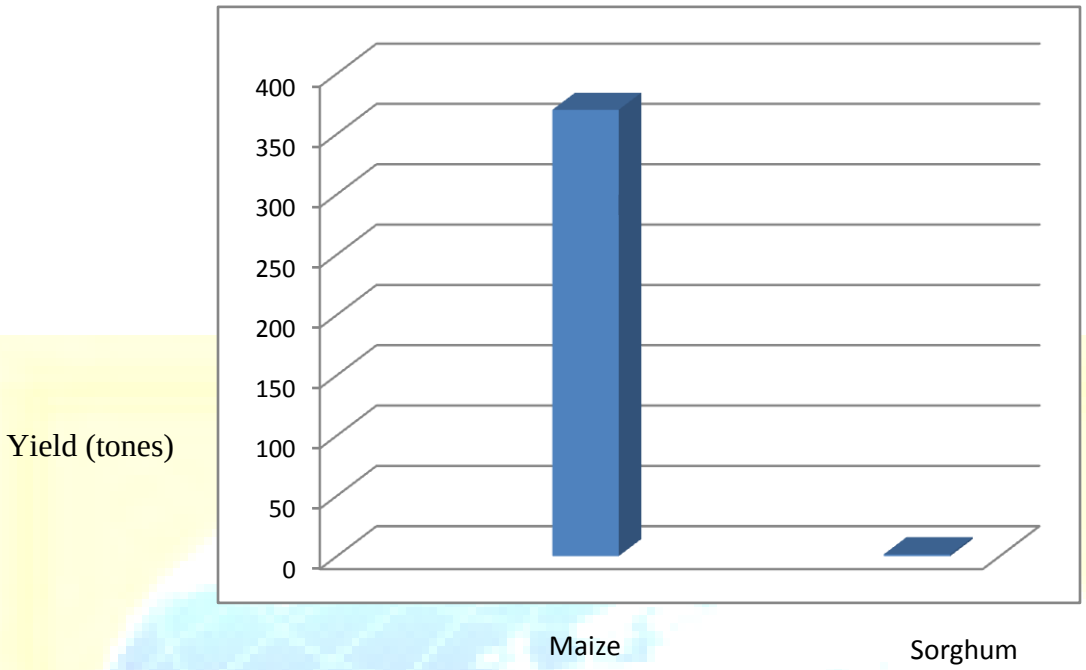
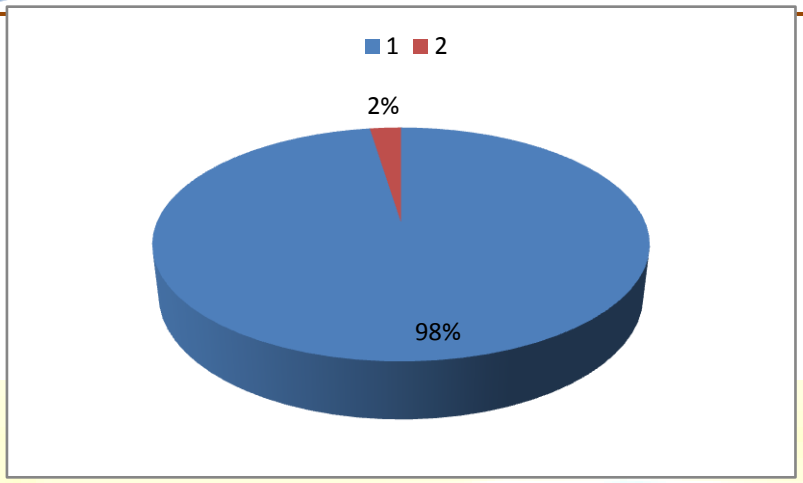


Fig. 2.2: Bar chart representation of Table 1.3 above.

From the interviewed female farmers, only 25% of them planted sorghum. Despite the low hectarage for the crop, it remains one of the favourable crops in the district. During interviews with farmers, it was however, discovered that farmers are not keen to grow sorghum because of the quelea bird which is capable of causing serious damage to the crop if proper measures are not taken.

Table 1.4: Crop yields for maize and sorghum for sampled farmers (2011/2012).

CROP TYPE	Tones
Maize	52.4
Sorghum	1.3



KEY
1 =Maize
2 = Sorghum

2.3: Percentage yield of maize and sorghum by interviewed farmers (from Table 1.4 above)

Research findings indicated that the average yield of sorghum per hectare is 0.87 tonnes, and 0.14 tonnes per hectare for maize. The expected yield for the two crops are 1.3 to 3.6 tonnes per hectare and 2.65 tonnes per hectare for sorghum and maize respectively (Field crops Reference Handbook in Botswana-2001) Despite the low tonnage yield of sorghum, the crop remains one of the favourable crops in the district because of its resistance to frequent draught spells which are often prevalent in the district. Low yield for both crops can be attributed to insufficient land preparation, incorrect plant spacing, incorrect fertilizer application and poor weed management. These poor crop management practices were so apparent during field visits.

Table 1.5: Time in days which farmers spent in performing various farming activities for each crop/ha

FARM ACTIVITY	TYPE OF CROP	
	MAIZE	SORGHUM
	DAYS	DAYS
Land Preparation	1	1
Planting	1	1
Fertilizer application	1	1
Weeding	5	7
Harvesting	7	9
Processing	13	17
Total	**28**	**36**

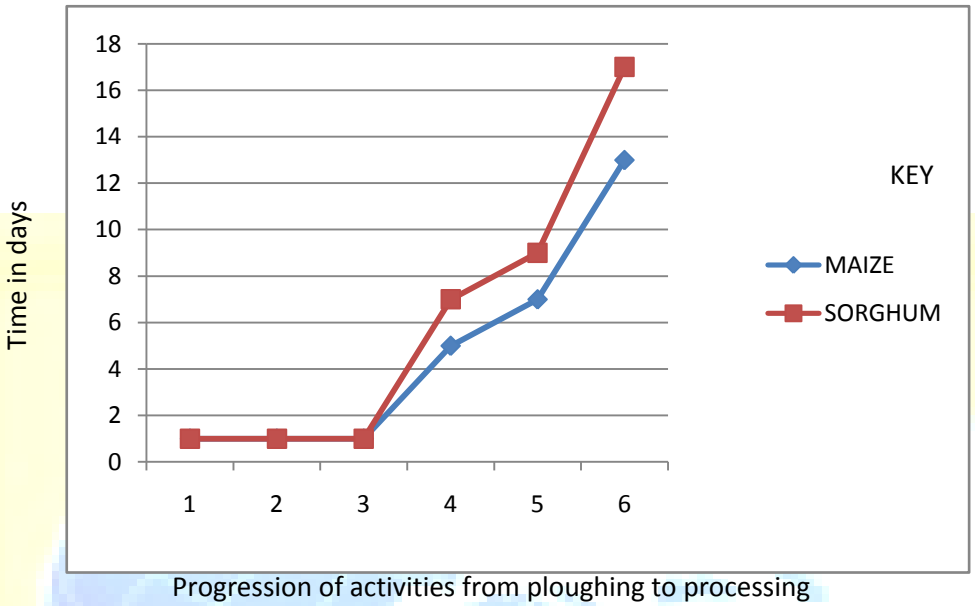


Fig 2.4: Graph representation of Table 1.5 above.

All the interviewed farmers were the beneficiaries of free land preparation, planting, and application of fertilizer and free seeds as per the Integrated Support Programme for Arable Agriculture Development, a government initiative aimed at supporting arable agriculture, both subsistence and commercial farming sectors. Farming activities which include land preparation, planting, and application of fertilizers, were done concurrently in all the districts, and therefore took the same number of days. For an average of one hectare, farmers spent 36 days in the production of sorghum as compared to 28 days for maize. Obviously the farmers would have spent more days for the production of each crop if there was no government assistance. Harvesting and processing took 72.2% for sorghum as compared to 71.4% of the time for similar activities for maize. These results generally indicated that farmers spent more time (days) on sorghum production than maize. This could be one of the reasons for the low number of hectares which were planted to sorghum during the season.

1.7 Conclusion

Basing on the findings of the study and available literature, it is evident, that women in the Southern district of Botswana are actively involved in maize and sorghum production which are the major grain crops in the district, let alone the whole country. The study shows that 62.4 % of the farming population in the study area are women while 37.6 % of the respondents were males. These results confirmed the already available information that the majority of subsistence grain crop farmers in the area are women.

The study also revealed that maize was the favoured crop which was planted by most female farmers in the district as the crop occupied 99.59 % of land which is owned by the respondents and only 0.40 % was planted to sorghum. However, it has been revealed that crop produce for both crops is below average. This can be attributed to a number of factors which include low rainfall in the district during the growing season, poor weed management evidenced during field visits and genera poor agronomic practices by farmers. The study has shown that women spent a great deal of time in growing the two crops. Maize demanded 71.4% of their time during harvesting and processing alone, and sorghum demanded 72.2% of the time for same activities. Total time spent per hectare for maize crop production is less than time women spend on sorghum crop production. This is one of the reasons why the majority of farmers preferred maize production.

1.8 Discussion & recommendations

The study revealed that many women in Ngwaketse Central sub-district are engaged in maize and sorghum crop food production, but yields obtained are below average. Attributed to low and erratic rainfall, poor weed management and poor agronomic practices among other determinants. If possible the Government of Botswana should include chemical weed and pest control package in its arable farming support programme. This would go a long way to increase the output of the two grain crops. Alternatively, the government can include in this package, the hiring and use of casual labour-force to assist in weeding as such assistance can greatly boost production.

There is great need for training of farmers and this has to be the mandate of all stakeholders, as it was deduced that female farmers are not knowledgeable about the new cropping technologies. Hybrid crop varieties which most farmers receive as government grant require timely planting, weeding, application of fertilizers and many relevant crop husbandry practices which are very necessary for attainment of higher yields. This can happen if the farmers are constantly trained by extension staff through conducting demonstrations and experimental plots in farmer's fields where farmers can tap firsthand knowledge on latest farming techniques. Possibly a few pilot farmers should be selected in each extension area, basing on their knowledge and capability of

maize and sorghum crop production, and these should stand as demonstrators to other female farmers. Until such a time when knowledge has infiltrated into the majority of the female community, then full financial support can be released and make meaningful impact on agricultural productivity.

The ministry of agriculture should ensure that sound crop production practices are followed by farmers. This can be assured if there are constant top–down spot checks to make sure that farmers are monitored and assisted by the relevant agriculture technical officers. Adult literacy programs can also be implemented to help farmers in freely accessing farming information from different sources.

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