



GENDER AND CULTURAL DIMENSIONS OF SORGHUM SEED MANAGEMENT IN NORTH-EAST GHANA

Comfort Kudadjie Freeman¹ and Seth Dankyi Boateng².

¹ College of Agriculture and Consumer Sciences, Agricultural Extension Department, P.O. Box LG 68, University of Ghana, Legon. Ghana.

² College of Agriculture and Consumer Sciences, Agricultural Extension Department, P.O. Box LG 68, University of Ghana, Legon.

Abstract

In Africa most farmers produce their own seed. This paper focuses on gender and cultural dimensions of sorghum seed management by farmers. A stratified multi-stage random sampling procedure was used to select thirty-eight farming communities from North-East Ghana. In total four hundred and forty-eight farm households were surveyed using questionnaires. Data was collected on farmer's sorghum seed sources, seed selection and storage practices and gender roles in seed selection and storage. While a majority (89%) of farmers produced their own seed, selection was done mainly by men (71%) but in some cases (23%) both men and women were involved. Men tended to store seeds in the barns while women stored their seed in pots. It was concluded that while seed selection and storage are mainly male dominated tasks, women are not entirely excluded from them. Ethnicity and religion are explanatory factors for the exclusion or involvement in seed related activities.

Keywords: Gender, sorghum, variety, storage, selection.

Introduction

In northern Ghana, sorghum is an important traditional and multi-purpose cereal crop used and managed primarily by small-scale farmers. The plant has multiple uses: the grain is milled for food and used for the preparation of local beer. The leaves are used for fodder and the stalks supply fuel, fencing and roofing materials. More recently, the brewery industry in Ghana has taken keen interest in the crop as a potential substitute for malt in brewing. Due to the fact that sorghum is largely a traditional crop and its management primarily handled by small farmers, the study of farmer seed systems is important. Seed is an essential input in agriculture and most farmers in Africa produce their own seed for the local crops they cultivate. But until recently farmer seed management has often been neglected in agrobiodiversity research (Oakley and Momsen, 2007) and subsequently the roles of women as well as men in seed management have not been acknowledged.

Seed may be acquired by farmers in several ways and social factors such as wealth, gender and ethnicity may be significant determinants of seed sources and access to seed (Baniya et al., 2000; McGuire, 2005). Seed selection is an important aspect of farming and involves rigorous and careful process to ensure that the farmer has an intact seed for the next season. The time, method and criteria for selection may also vary with the type of crop or its reproductive system. In many situations seed selection and storage show clear gender differentiation and rural women are often found to be the key players in post harvest processing and saving seed (Song and Jiggins, 2003). On the other hand cultural factors may exempt women from seed selection and storage. Thus the way in which farmers manage their seed with regard to the number and type of varieties to grow, how and where to obtain seed, when to select and how to store are influenced by several factors. This eventually leads to variations in the way farmers manage diversity. This study is aimed at understanding how sorghum farmers manage their seed. It seeks to determine the roles of women and men in sorghum seed selection and storage and the socio-cultural factors that influence their involvement in these activities. The socio-cultural factors investigated in this study were religion, ethnicity and location of village (i.e. whether they were inner or border villages to neighbour Togo and Burkina Faso).

Methods

The Bawku Municipality was purposively selected for this study. In the whole of northern Ghana, Bawku is the lead producer of sorghum in terms of yield and the second highest in terms of cropped area (SRID, 2004). The Municipality shares borders with two neighbouring countries – Togo and Burkina Faso.

A stratified multi-stage random sampling procedure was adopted in selecting communities and farmers for the survey. Because of the multi-ethnic nature of the farming communities in the Municipality, and to ensure that each group was adequately represented in the sample, the communities were first stratified by ethnic grouping into Kusasi, Bimoba and a minority group classified as 'mixed', consisting of the Busanga, Mamprusi, Moshi and Yanga tribes. The proportion of the ethnic groups in the Municipality was determined from village listings by predominant ethnicity from the District Assembly and Ministry of Food and Agriculture offices. A quota of 20 Kusasi, 11 Bimoba and 7 mixed farming communities were randomly sampled. From each community 10-20 households were randomly sampled

depending on the number of houses. Ten households were sampled from farming communities with 50 or less houses, 15 households from communities with 75–100 houses and 20 households from communities with over 100 houses. Using information from the District Assembly on the number of houses in a community, randomization was achieved by selecting every fifth house starting from the first house after entering the village.

Questionnaires were used to obtain data on farming households' demographic and socio-cultural characteristics, number and type of sorghum varieties cultivated and farmers' seed sources, seed selection, storage and management practices. In all 448 households were surveyed. Descriptive statistics including frequencies, percentages and chi-square values were calculated using the Statistical Package for Social Sciences v. 12.0. Chi square was used to establish differences between women and men with regard to seed management practices. Data was recalculated to percentages for easy presentation in tables. Depending on the size of the contingency tables generated, the phi() coefficient or Cramer's V was also computed to determine the strength of association between the variables measured for the chi-square statistics.

Results

Demographic and Socio-Economic Factors

Farming was the main occupation for about 98% (n=442) of the respondents interviewed. Adherents belonged to three main religions; Traditional (40.9%), Islam (36.9%) and Christian (22.2%). About 15% (n=78) – of whom 59% were Moslems – had other sources of income apart from farming. These were mainly trading (49%) and small-scale industries (41%) such as pottery, agro-processing, blacksmithing and weaving. The remaining 10% obtained other income through government employment, traditional healing and soothsaying. The mean age of respondents (head of household) was 54 years with a mode of 60 years. The sizes of the households surveyed ranged from 2 to 73, with an average size of 13.8. The average farm size was 2.5 ha. About 54 % of the households (n=241) were found to cultivate two hectares or less. Ninety-two percent of respondents (n=415) used external labour in addition to family labour for their farming activities while the remaining 8% (n=36) depended solely on family labour. External labour was paid for with cash, with food and grain (or seed), or through exchange with labour (reciprocal labour).

Crop Diversity

Farmers grew between two and thirteen different crops. On average, 10.2 (SD=2.5) crops were grown in a season. Farmers who grew between two and seven crops accounted for only 16% (n=68) of the sample while the majority (84%; n=379) grew between 8 and 13 crops. The crops grown by the farmers sampled were mainly cereals, vegetables and legumes. Over 80% of the farmers grew sorghum, millet, maize and rice. The most widely grown cereal was sorghum (99%), followed by early millet (96%), maize (93%) and rice (85%).

Sorghum Diversity at Variety Level

Thirteen (13) sorghum varieties were found to be grown across the district based on farmer's names given for varieties (Figure 1). The highest number of varieties grown by a farmer was six while on the average one farmer cultivated 2.5 (SD=1.2) varieties at a time. In Bawku Municipality Belko peleg (late-maturing type) and Naga red (early-maturing type) were the most popular varieties, planted by 69% and 51% of farmers, respectively. About 39% grew Belko zia (late-maturing) while about 27% grew Naga white and 26% grew Kowerig both of which are early-maturing. All the other late-maturing varieties, and Salibato, an early type, were grown by less than 7% of the farmers.

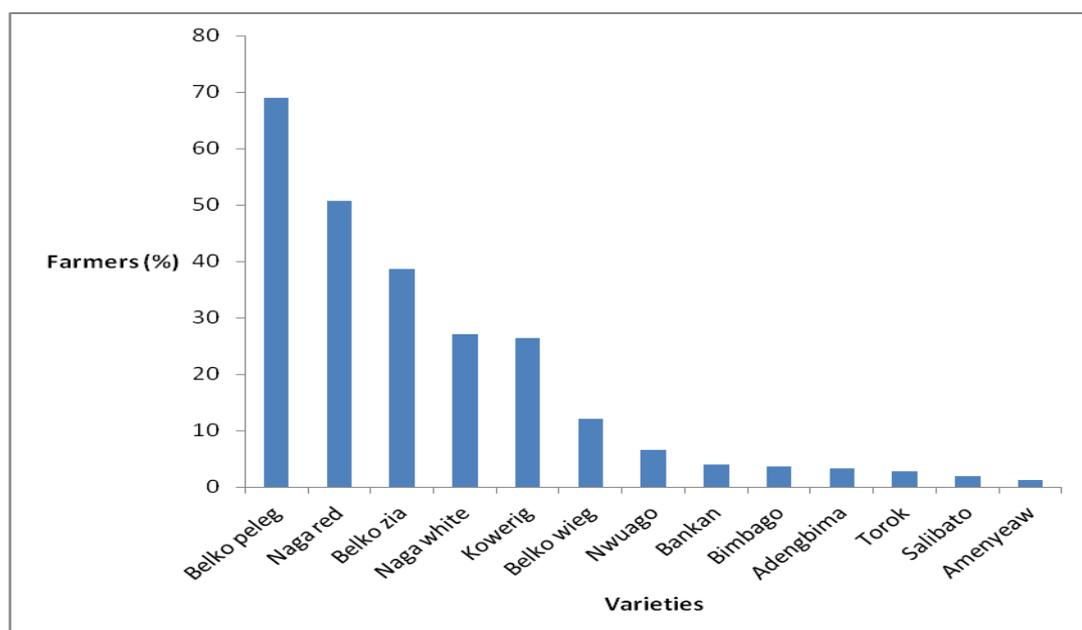


Figure 1. Percentage of farmers growing a particular sorghum variety in Bawku East Municipality.

Seed Sources

Many more farmers tended to use their own seed (89%) or bought seeds from the market (22%), than from other farmers or the Ministry of Food and Agriculture (MOFA) or a non- governmental organisation (Table 1). Seeds obtained from other farmers were either in the form of gifts, or through exchange for seed, grain or labour. However farmers sourced seeds of new varieties mainly from the market (60.3%) and from the Ministry of food and Agriculture offices (32%). Some obtained new sorghum varieties from their friends or relations.

Table 1. Famers' sorghum seed sources in Bawku East Municipality

Source of seed	% ¹ (n =448)
Own seed	89
Market	22
Other farmers	1.5
MoFA/NGO	0.8

¹Figures do not add up to 100 as farmers may use different sources

Seed Selection

Farmers based their selection on both panicle and grain characteristics. Principally these were grain size, grain health, maturity and panicle size. A few farmers mark their sorghum plants for seed selection in the field, but most of the selection takes place during harvesting where the seed is separated from the food grain (Table 2). Hardly any farmer selected seeds just before planting. The usual practice is to cut down all the plants, then, in the process of cutting off the panicles, those selected for seed are separated from the rest of the harvest. In most households (71%) seed selection was done solely by men while in other cases (23%) both men and women selected seed (Table 2). In a few instances (6%) women alone selected seed.

Table 2. Famers' sorghum seed selection practices in Bawku East Municipality

Seed selection practice	% practicing (n =448)	
Time of selection	At or after harvest	94.1
	In field(before harvest)	5.6
	Just before planting	0.2
Who selects	Men	71.4
	Men and women	22.7
	Women	5.8

Source: field survey

Seed Storage

Results showed that in most of the households (76%) surveyed men alone stored sorghum seed. However in some cases (14%) women alone stored the seed. The most common form of storage was to keep the seed on the panicle (82.6%) however some (17.4%) threshed the panicles before storage. When left in the un-threshed form seeds were either stored in mud or grass barns or sometimes hung on trees in the open. A few also hung the panicles in their kitchens above the smoke. But when they were threshed they were either stored in clay pots or sacks in rooms.

Table 3. Sorghum seed storage practices of farmers in Bawku East Municipality

Storage practice	% practicing (n =448)	
Who stores	Men	75.8
	Men and women	14.2
	Women	9.8
Place of storage	Mud barn	63.2
	Grass barn	5.2
	Clay pots	13.2
	Room	10.7
	Open air/trees	4.6
	Sacks	2.4
	Kitchen	1.7

Source: field survey

Socio-Cultural Factors Influencing Men and Women's Involvement in Seed Selection and Storage

The chi-square test indicated a significant difference ($\chi^2 = 15.94$, $df= 4$, $p= 0.011$) between ethnic groupings and the gender of the person who selected seed in a farm household (Table 3). More Kusasi and Bimobas indicated that men alone selected seed whereas more respondents from the mixed group indicated that women alone selected seed. The V coefficient indicated a positive association between seed selection and ethnicity. No significant differences were found between the locations of villages' survey with regard to the gender of the person who selected seed.

With regard to the gender of the person who stored seed in the farm household, the chi-square test statistic showed significant differences ($\chi^2 = 10.25$, $df= 4$, $p= 0.016$) between religious adherents. The V coefficient indicated a weak but

positive association between seed storage and religion. More Moslem households indicated that women were responsible for storing seed while fewer Traditionalists or Christian households indicated that women stored seed (Table 4).

Table 4. Percentage of respondents (n=448) in the categories of religion, ethnicity and village location indicating gender of person who selects sorghum seed.

Farmers' socio-cultural Characteristics	Categories	Who selects seed			χ^2 value	V or ϕ
		Women	Men	Both		
Religion	Traditional	9	67	25	4.95	0.11
	Moslem	6	70	24		
	Christian	4	77	18		
Ethnicity	Kusasi	4	71	25	15.94*	0.19
	Bimoba	6	68	26		
	Mixed	12	78	10		
Location of village	Border	8	70	22	1.14	0.05
	Inner	5	72	23		

(*) significant at the 0.01 level.

Table 5. Percentage of respondents (n=448) in the categories of religion, ethnicity and village location indicating gender of person who stores sorghum seed.

Farmers' socio-cultural Characteristics	Categories	Who selects seed			χ^2 value	V or ϕ
		Women	Men	Both		
Religion	Traditional	10	81	9	10.25*	0.15
	Moslem	19	74	7		
	Christian	14	71	15		
Ethnicity	Kusasi	14	79	7	8.98	0.14
	Bimoba	15	69	16		
	Mixed	13	78	8		
Location of village	Border	16	71	13	2.85	0.08
	Inner	14	78	8		

(*) significant at the 0.01 level.

Discussion

The large household sizes and wide age ranges found are typical of what generally pertains in the region. Like the Tallensi, the Kusasi have their domestic units and reproduction units nested within compound structures and formed around a core of agnatically related men. Groups of sons usually continue to live with their fathers even after they are married. Thus compounds can attain very large sizes and these closely related units often farm together. The labour intensity of agriculture in the West African Savannah has caused a high value to be placed on large households because they provide a large work force.

The generally small landholdings cultivated by the majority of farmers in the area is corroborated by IFAD (2006) which revealed that about 66% of farm families in the Upper East region cultivate landholdings of about 2.0 ha or less. Studies about farming groups in the West African savannah have shown that the main forms of agricultural labour used are family labour, communal labour and wage labour (Saul, 1983; Whitehead, 2002).

Sorghum Diversity at Variety Level

The diversity found in Bawku differs from that found in Ethiopia (a centre of diversity for sorghum) where McGuire (2002) found as many as 17 different varieties mentioned in one district. In this study, Belko peleg, a traditional long-season variety was the most widely cultivated variety, followed by Naga red (an improved short-season variety) by farmers across the district. This suggests that this local/traditional variety has traits considered desirable by the farmers.

Seed Sources and Seed Selection Practices

The studies showed that most of the farmers used their own seed. Similarly Teshome (2001) found that self-sourced seed and the market respectively were the first and second most important sorghum seed sources for farmers in Ethiopia. Almost all households select their sorghum seed at harvest while very few selected seed in the field. Walker and Tripp (1997) also reported that in Ghana less than 4% of maize and cowpea seed selection occurred in the field. But in Zambia about 18-25% of seed selection for sorghum and cowpea was in the field.

Roles in Seed Selection and Storage

The finding that seed selection is mainly done by men contrasts with Jusu's study (1999) on rice in Sierra Leone which revealed differences between three adjacent chiefdoms with regard to the gender of the persons responsible for seed selection. In his study he found that while in one chiefdom seed selection and roguing were done entirely by men, in the other two, women and children were all involved. The finding that more men were involved in seed storage than men is not surprising. This is because among the Kusasi, men (who are head of households) are perceived as not only the provider but also the keepers of staples. In Padmanabhan's (2002) analysis of gender relations of Bawku West district, she suggested however, that this restricted control over staples by men may be changing. She found that women were also beginning to cultivate and store staples.

Gender and Cultural Factors Influencing Seed Selection and Storage

The significant difference between ethnic groupings with regard to the gender of the person who selects seed may be explained by the fact that among the Kusasi, seed selection and storage is more often considered the preserve of men. In this study more Kusasi and Bimoba indicated that men alone, or men with women, selected seed, whereas more respondents from the mixed ethnic groups indicated that women alone selected seed.

Significantly more Moslems indicated that women stored seed while fewer Traditionalists or Christians indicated that women stored seed. Since more Moslems are involved in trade as an off-farm activity and trade is more associated with conversion to Islam than with traditional religion (as found by Last, 2000), then probably more Moslem men are away from home more often than other men of other religions. This may explain why more women would take over their husband's responsibilities (e.g seed storage) among Moslem households.

Conclusions

In north-east Ghana where sorghum is an important traditional cereal crop, farmers, to a large extent use their own seed but may sometimes buy them from the market. Seed selection and storage takes place during harvesting and after harvesting respectively and it is mainly a male dominated task even though women may sometimes be involved. Where women were found to be involved in seed selection and storage, ethnicity and religious affiliation were the main explanatory factors for their inclusion in these seed-related activities. Thus the gendered division of labour in seed management may have some implications for agricultural innovations for sorghum. Men are more likely to be knowledgeable about issues pertaining to sorghum seed management than women. This may suggest that among the Kusasi innovations for improving seed quality may be more successful when men are targeted rather than women.

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