

The Role of Gender in Management and Conservation of Seed Diversity of Crops and Varieties: A Case Study in Bariadi, Tanzania

E. Amri and C. Kimaro

Department of Science and Laboratory Technology,
Dar es Salaam Institute of Technology, P.O. Box 2958 Dar es Salaam, Tanzania

Abstract: Gender roles in seed selection, processing and storage contribute significantly in the human management and conservation of diverse crop species and varieties. This study focuses on gender's roles in management of seed diversity of crops and varieties and reports on the findings of a study in three villages in Bariadi District. Seventy-five people for women and men, respectively were surveyed with questionnaires and subsets interviewed in-depth followed by focus groups conducted for women and men which provided a means of crosschecking responses. Distinct areas of gendered divisions of labour among tasks for seed diversity of crops and varieties were addressed: The results indicated that, while men have more activities and great influence over seed diversity of cash crops, seed diversity management of food crops and varieties is mainly done by women. Women are responsible for a great part of seed selection, processing and storage as well as homegarden crops. Gender's role in seed diversity of crops and varieties are important for cultural, economic, management and conservation of agrobiodiversity.

Key words: Seed diversity • Agrobiodiversity • Conservation • Gender relation

INTRODUCTION

Across the globe and particularly in tropical regions rich in biodiversity, in villages, on farms, in homesteads, forests, common pastures, fields and borders, gender roles is recognized in management of most of the plant resources that are used by humans [1]. This means women as well as men have the greatest local plant knowledge and are mainly responsible for the *in situ* conservation and management of useful plants. Women's role for seed diversity, particularly in rural areas, is often circumscribed by a patriarchal social system, although economic development, urbanization and the rapid expansion of industries employing women are changing their status [2, 3]. The roles of gender in seed management have been largely ignored in studies of agrobiodiversity because it is often invisible occurring within the domestic sphere [4]. Failure to consider this aspect perpetuates a huge gap in our understanding of the conservation of agrobiodiversity. Howard [4] emphasizes that culinary traditions and preferences, generally maintained by women, have a major influence on the knowledge, selection, use and conservation of plant biodiversity.

Both men and women's practical knowledge and skills in seed management is not static but influenced by locally specific social and ecological changes and new sources of information that might be informed by global trends such as the increased availability of improved varieties of seeds. Large population of Tanzanians live in rural areas and are largely dependent on subsistence agriculture, mostly using domestic saved seed diversity of crops and varieties. This study focuses on gender role in management crop seed diversity and variety with objective to increase the visibility of men and women's knowledge of seed management for agro-biodiversity and food security in Tanzania.

MATERIALS AND METHODS

The study was conducted in Shinyanga region is situated in the northern part of Tanzania between 2° and 5° southern latitude and 31° and 35° eastern longitude. Three villages namely Mwamoto and Nyakabindi and Nkololo were selected from Bariadi District in Shinyanga region for their based on their comparatively more rural, remote and agriculturally-based. A total of 75 women and

men respectively, heads of households were selected for interviews using random sampling; some of these respondents took part in in-depth interviews. The surveys were conducted with a closed questionnaire (pre-tested on three different female respondents and appropriately modified). On average, each took between 45 minutes to one hour to complete and was carried out in the home itself or right outside the house; in addition, descriptive field observations were recorded.

In-depth, semi structured interviews were carried out with between five and six respondents in both villages (most of who had also participated in the survey). These interviews focused on selection, processing and storage techniques of crop seed diversity and perceptions of gender roles in seed work. Focus groups, one with women and the other with men, were then conducted in each village, in each case hosted by a key informant. Men and women throughout the village were invited and inclusion was based exclusively on availability and interest. Each focus group was attended by between five and ten people (from sample and non-sample households), ranging in ages from 15 to 50 years and above. Variations in responses were resolved through consensual agreement, a process by which conflicting perceptions of fact were unified into a group answer while letting stand differences of opinion. For the purposes of the questionnaire, activities for seed diversity were divided in order to obtain a higher resolution analysis of gendered domains in seed management and conservation.

For determination of men and women's relative participation in seed activities both in cash and food crops as well as in the home gardens, Individual respondents were asked to measure their own level of participation for each task. 'Always' described work performed solely by the respondent all of the time; 'always female' specified work performed by the respondent with family members (mothers/ daughters-in-law) or work always performed by the women of the household; 'some of the work' listed activities in which the respondent generally helped the men in the family by doing a portion of the seed work.

RESULTS

The study revealed a clear difference between men and women's responsibilities with respect to crops and seeds. Women were more involved in production seeds of subsistence food crops such as beans, peas, potatoes, finger millet and vegetables than men who were concerned with production of seeds for cash crops.

However, both men and women produce maize because of its dual role as a household food and a cash crop. Home gardens were also included in the questionnaire and all of the respondents showed high involvement of women for seeds of home gardens, with the exception of an elderly woman who was no longer able to do so. Home gardens are used to grow fruit trees, annual vegetables and spices for family use and the seasonal surplus is often sold in local markets. Data from both villages indicated that women are involved also in field activities like planting and weeding to varying extents despite the fact that these are mostly performed by men.

Seed Separation: Men and women both separate seeds from the field for saving, but women involvement is higher than male. Women frequently are involved with activities of seed separation at home, preparing nursery beds and gathering seedlings for transplanting. Women are generally solely responsible for post-harvest processing activities such as drying, winnowing/cleaning field crops. Approximately three quarters of the women respondents engaged in seed selection for field crops, alone or with male relatives. An important finding is that fewer seeds were purchased for home gardens and, in all cases, the seeds purchased were not local varieties but exotic varieties from seed shops.

Seed Selection and Management: Seed selection is mainly done by women, while men are responsible for constructing adequate seed storage structures. The study revealed that men take an active role in seed selection for cash crops, while women roles are for food crops. Even when food crops such as maize, groundnut, millet and sorghum are to be used as cash crops, men's role is higher than women. The cycle of information in seed management is an important expression of the transmission of knowledge. Women were generally taught to save seeds by their mothers and mothers-in-law. This might be attributed to women being married and moving away from their natal families at a younger age in villages surveyed. During interviews and focus group discussions, women and men were asked, first, if seed management is women's work and, if so, why. The participants in the men's focus groups in both villages quickly characterized seed management as women's work and attributed this to women's knowledge of matters in the house. Similarly, in interviews and focus groups with women, it was agreed that seed management is women's work in the same way that cleaning is considered a woman's task. Thus, seed management for food crops is

seen as an extension of women's domestic duties. Fascinatingly, while the men's focus group participants said that although men do not save seed they are familiar with the skills, participants in the women's focus groups maintained that men have little knowledge of seed management.

Seed Processing and Drying: Seed processing is the series of procedures by which raw grains are preserved for planting in the following season. Respondents were asked to describe the different phases of seed cleaning and drying for various crops. With technology limited to hand processing, women are more involved in seed processing than men due to their skills in winnowing and using the wind and in sieving/grading and drying at an early age, taught by their mothers, mothers-in-law and other older women of the household. Each crop has its own unique seed processing steps. For example, ash is sometimes applied to vegetable seeds to help remove them from the fruit, to prevent them sticking and as a method of pest control. Some seeds are threshed by hand and others like millet is threshed with bare feet.

Women's tests for checking seed dryness in the two study villages included the following methods; for rice sound of seeds hitting against each other when shuffled in the palm of the hand or throw in the air with the winnower to feel for weight and husk comes off readily. For millet husk comes off easily if seeds are rolled against one another. For vegetables/fruits, open seed to look for well-formed cotyledons or sound of seeds rubbing against each other in the palm of the hand. It was also found that women favour seed diversity of minor crops such as pumpkin, cucumber, sponge gourds and watermelon as they are easily available, not labour-intensive and provide healthy food during staple crop shortages, usually between February and June.

Seed Storage: To most of respondent indicated that seeds can be stored in different seed storage unit which also depends on gender. One of the storage units is a constructed and raised platform made of wooden poles, with a basket weave siding made by men mainly for storage cash crops. The raised platform prevents dampness from the mud floors permeating clay pots. Another seed storage facility is variety of containers: clay pots, metal tins, glass bottles or plastic bags done mainly by women. Each of these must be airtight to protect against light, water, insects, rodents and fungi and to control ventilation. Clay pots are sealed with a cow dung/mud mixture and are of different sizes and types.

The role of gender in seed storage methods vary with the different crops grown. Men take an active role in storage for cash crops and food crops which may become cash crops which include maize, groundnut, millet and sorghum. This differentiation can change depending on external circumstances such as in years of good harvest. Seed quality is dependent upon good storage facilities and maintenance. Families depend more on women's knowledge than men to supply seed for the next year's sowing and, ultimately, the healthy harvests of their staple crops for subsistence.

DISCUSSION

Gender differences in knowledge of seed management still contributes significantly to the maintenance of agro biodiversity, local methods can be as effective as modern techniques. Women and men often have different knowledge about seed diversity and preferences for plants For example; women's criteria for choosing certain food crop seeds may include cooking time, meal quality, taste, resistance to pest and diseases damage and ease of collection, processing, preservation and storage. Men are more likely to consider yield, suitability for a range of soil types and ease of storage [5]. Women role are frequently reported in maintaining household seed banks that store and preserve field and home garden crop varieties, many of which are local varieties [3]. As participants in seed selection, women contribute to the genetic diversity of individual varieties [6]. Through seed processing and storage they determine seed quality, women's exchange networks are vital to maintaining seed supply systems and trading crop genetic diversity.

Women also have a broader set of seed varieties selection criteria than men, since they use plant materials in more diverse ways: for example, rice not only provides food, but also straw for thatching, mat-making, fodder and husks for fuel [7]. Women's responsibility for post-harvest seed processing and family food supplies means that they try to ensure that varieties are in line with culinary traditions, are palatable and nutritious and meet processing and storage requirements [8].

Several studies show that, even when women do not produce crops, men take women's preferences and criteria into account when selecting varieties. However, researchers mostly neglect these criteria based on claim that they are not directly related to agro ecological field conditions [8-11]. Very frequently, women are also responsible for seed storage, preservation and exchange.

Women's predominance in seed management activities is often explained by the close relation that this has with post-harvest and domestic work, since seed selection is often done at the same time that harvestable produce is processed and stored [1].

Studies of farmers' knowledge of seed crop varieties that focus exclusively on men farmers often overlook women farmer's information [2]. Assumptions about the degree of varietal diversity, plant uses, cultivation methods, crop breeding and preservation processes that are not informed by both men's and women's contributions do not adequately trace or conserve local knowledge and can, unknowingly, lead to the marginalization of agrobiodiversity [12]. The seed of each agricultural crop, even individual varieties, is managed uniquely and the techniques used vary across cultures and geographic regions. Seed management should be included within the discussion on agrobiodiversity and the recognition of men and women's distinctive roles [1].

There is limited research on women's roles in seed management contributed by three major factors. The first is a tendency to exclude women from the data collection process on the assumption that their work is restricted to the household, especially reinforced where women are not easily accessible to male researchers. The second is a failure to identify the sex of research participants when working with farmers: while much field research on seed management does actually deal with women farmers, research reports and publications frequently fail to discriminate the basis of gendered divisions of labour. The third factor is a partiality by researchers to label the essential tasks of processing, storage and exchange as domestic rather than agricultural work activities [13, 14]. Nevertheless, there is a growing body of research from around the world on women and seed management. Many studies examine a specific aspect of women's work in seed management, such as selection while others are more comprehensive and take account of processing, storage and exchange as well [15].

Nutrition and health needs are most often women's responsibility. Therefore, it is usually women who are knowledgeable about the diversity of crops and variety that serve these needs, their culinary, nutritional or curative properties and their agronomic and environmental characteristics. Therefore there is a need to promote strategies to strengthen seed supply systems, including on-farm seed production and distribution, which target women's needs and preferences. Empowerment and capacity building are important elements of such a strategy. Understanding gender roles in these contexts

would help better target crops seed diversity management and conservation of agrodiversity for food security.

CONCLUSION

Seed diversity of crops and varieties cannot be addressed at all without considering the gender role in seed biodiversity management and conservation. Further, the significance of gender roles in crop seed biodiversity management not only has implications for agrobiodiversity conservation, but is also crucial to problems such as food security, health, poverty, agriculture, trade and technology development. Positive steps to ensure gender roles particularly women's contributions to agrobiodiversity management and conservation are to be taken into account and that their reliance on plant genetic resources for their livelihoods, status and welfare are recognised through use of diverse crop seed diversity, thus promoting its use and transmission in all appropriate spheres, including formal and informal education, training and extension.

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