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Full Length Research Paper

Comparative analysis of production practices and utilization of pumpkins (*Cucurbita pepo* and *Cucurbita maxima*) by smallholder farmers in the Lake Victoria Basin, East Africa

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Study was carried out in 2007 in four districts of Lake Victoria Basin: Busia, Gucha, Tarime and Jinja. Rapid participatory appraisal approaches were used to assess the socio-economic, cultural, gender and environmental aspects related to cultivation, storage and utilization of pumpkins by the native communities living in the four selected districts. It was observed that majority of the farmers in the Lake Victoria basin do not consider pumpkins as first priority food crop as much as it is not considered as a viable commercial crop because it was ranked a fifth food crop in Jinja, Gucha and Tarime and sixth food crop in Busia while 96.4, 98.1 and 59.5% of the farmers in Busia, Gucha and Tarime, respectively reported that pumpkins was being planted for domestic consumption. Many of the pumpkin farmers in the districts appreciated the crop's nutritional and medicinal values since they said that pumpkins provided vitamins, minerals, starch and proteins up to 57, 32, 39 and 5%, respectively. It was found that pumpkins were mostly grown by low income members of the community who mainly utilize the leaves as vegetables and occasionally consume the fruit when cooked. Pumpkins were stored in raw form by carefully harvesting them with the stalk still attached. Management of the pumpkin stores was a prerogative of the female in all the areas the research was carried out. Pumpkin farmers stored seeds for future planting. Planting of pumpkins in the Lake Victoria basin was done during the long rains and the crop performed well in loamy soils. In isolated cases the crop thrived in clay and sandy soils an indicator of its resilience in various climatic conditions.

Key words: Pumpkin, ethnobotanic studies, nutritional value, medicinal value, gender, culture, environmental. aspects.

INTRODUCTION

The Lake Victoria Basin sustains the livelihoods of approximately 30 million people and is generally of high agricultural potential. However, most of the inhabitants of the region are subsistence farmers who are among the poorest and most vulnerable to malnutrition and poverty. Over-reliance on a few staple food crops like maize and cassava and to a lesser extent millet, sorghum, potatoes and bananas which lack most of the nutrients required for human health contributes highly to malnutrition. This has often resulted into frequent food insecurity arising from low yields due to poor soil quality mainly caused by soil erosion and repeated cultivation of the same crop at the same areas, escalating costs of fertilizers, reduced land sizes, unreliable rainfall and lack of access to credit

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(World Bank, 1993; Republic of Kenya, 2001). The poor crops harvested also fetch low prices at the markets making farmers to continue being poor.

On the other hand, traditional crops including the pumpkins, which are rich in nutrients, are so far not highly regarded by the smallholder farmers in the region. Nevertheless, cultivation of such high yielding, multi-purpose and nutrient rich food crops are most desirable for the purpose of overcoming the problems of undernourishment and contributing to food poverty.

Opportunities to enhance and support the production and use of pumpkins can greatly contribute to food security of farmers in the region. Apart from their vast potential as food and vegetable for human consumption and as a commercial crop, pumpkin products if promoted will provide incentives to document and support the production, use and development of these genetic resources in the ecosystems of the Lake Victoria Basin. The multiple uses of pumpkins and their great diversity in cultivars and the potential to cultivate them in a wide range of environments indicate an enormously untapped potential for research on pumpkins.

Conservation of plant genetic resources in East African countries has hitherto given priority to cultivated mainstream food crops, but giving less emphasis on underutilized crops like pumpkins. Although pumpkins have been maintained in East Africa for many generations using indigenous knowledge, it is unfortunate that traditional practices and indigenous knowledge required to improve the status of this traditional crop is not well documented. Research done on the crop is inadequate compared to most mainstream and exotic crops (Hamisy et al., 2002). Research and development of the crop in East Africa has been neglected partly because an insignificant proportion of people use it as staple food (Republic of Kenya, 2003; Hamisy et al., 2002). Cultivation of pumpkins is necessary in order to know its productivity, which is one of the most important characters considered by farmers in selecting crop varieties for cultivation. The utilization and improvement of productivity through cultivation of such under-utilized crops including pumpkins would help reduce genetic erosion of the crops (Chweya, 1997). In order to realize the full potential of pumpkins it is therefore necessary to identify and overcome the key constraints to their development in terms of production and utilization. This is despite the existence of favorable ecological conditions necessary for its cultivation and the nutritional and medicinal values that are found in the crop. This study therefore is set to evaluate the production and utilization of pumpkins by smallholder farmers in the districts of Tarime (Tanzania), Gucha and Busia (Kenya) and Jinja (Uganda).

This study was necessitated by the fact that in spite of the vast potential of pumpkin production and utilization in food poverty reduction in the Lake Victoria basin, an insignificant proportion of households in the region cultivate it as a source of food and livelihood. To ensure a sustainable increase in the production and use of pumpkins in the region, it would be necessary to document the cultural attributes of seed selection, conservation and planting, harvesting and storage technology, and utilization of the pumpkins in the region. This information would be useful as a basis for formulating and implementing the necessary intervention programmes.

Specifically, the study addressed the following objectives:

(a). To investigate the cultural, gender, historical and environmental aspects in the cultivation of pumpkins in the Lake Victoria basin.
(b). To identify the storage technologies and practices of harvested pumpkins in the Lake Victoria basin.
(c). To establish the extent to which pumpkins are used by the smallholder farmers and their families in the Lake Victoria basin.

METHODOLOGY

Study Sites

The study was conducted in Gucha and Busia (Kenya), Tarime (Tanzania) and Jinja (Uganda) districts. The districts were randomly selected from among the various districts in the Lake Victoria basin.

In Gucha, data were collected in the following locations: Sameta, Etago, Kenyenya, Nyamanche, Nyacheki and Ogembo. In Jinja, the locations were Namulesa, Nawampanda, Butagaya, Mafubira,, Bugembe, Busende and Budondo. In Busia, the locations covered were Budalangi, Matayos, Butula and Funyula. In Tarime the locations were Tagota, Bomani, Nyabisa, Mogabiri, Nyamwigura, and Nyabisaga Figure 1.

Research design

The diagnostic and descriptive survey research design was applied for the study. This involved the participatory Appraisal Approaches (PRA) specifically utilizing the participating farmer groups (PFG). The design allows the use of both qualitative and quantitative approaches in collecting and analyzing the data. Quantitative approach is structured, predetermined, scientific method of evaluation which yields numbers that can aid data interpretation while qualitative approach is more naturalistic and develops an understanding for a particular social situation, event or interaction (Borg and Gall, 1989. Bogdan and Biklen, 1982). This double-edged design allowed participants to express their feelings more freely which were captured through indepth interviews, observations and gestures that revealed their insights.

Population and sample

The study sites were randomly sampled but first were stratified so as to include the selected districts, villages and various land and farms within the Lake Victoria basin.

The population of the four selected districts was approximately one million-people. For each district, 10% of the farmers cultivating pumpkins which were about 4000 were randomly selected to take part in the study. The lists of farmers from which selection was made were provided by the respective agricultural extension officers in each location or site and total number of farmers interviewed was 340 as shown in Table 1.

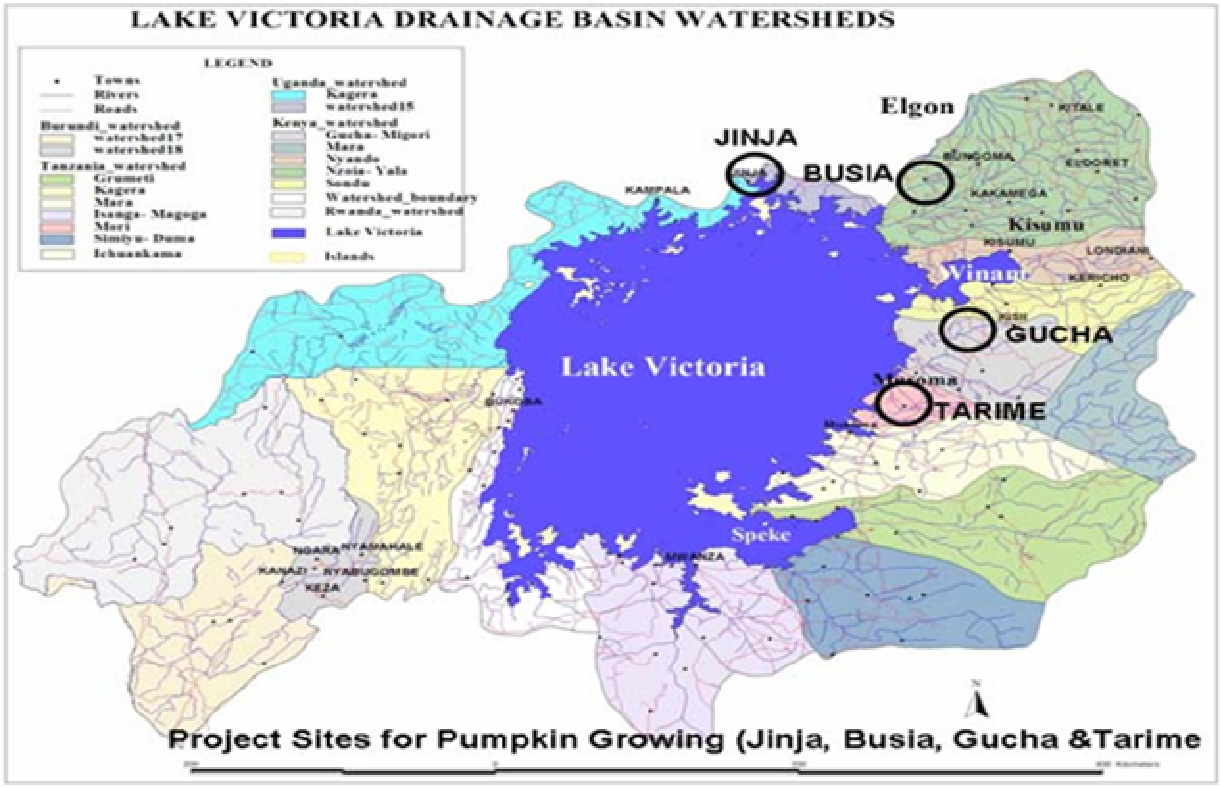

Figure 1. Map showing study sites.

Table 1. Family Sizes of Pumpkin Farmers in the study area.

Family Size	Jinja N=90	Busia N=120	Gucha N=60	Tarime N=70
Small	24	26.2	31.5	28.5
Medium	59	35.2	33.3	31.0
Large	17	38.6	35.2	40.5

Small = 1-2 members, Medium = 3-6 members, Large = above 6 members.

Instruments for data collection

An interview schedule was used for the purpose of collecting data. The schedule was designed to collect qualitative and quantitative data. A questionnaire consisting of structured and semi-structured items was designed based on published literature on the subject and experiences of the authors in the field, it also allowed probing questions. The instrument was used to collect demographic data as well as data on pumpkin production practices, varieties of pumpkins cultivated, uses and value of pumpkins and their storage technologies and practices.

Data collection procedures

Data were collected through a farm survey with participating farmer groups (PFG). In this approach, face-to-face interviews were conducted with farmers and farm workers during farming activities.

Although it was designed in English, it was translated into either Kiswahili or local language by an interpreter. Photographs of the pumpkin specimens were taken using digital cameras.

Data analysis

Data collected was subjected to statistical analysis using SPSS package to compare means, standard deviation, proportions and percentages. Data was presented graphically to indicate the comparisons.

RESULTS

During the survey within the 4 districts in Lake Victoria Basin, the following findings were revealed. In this case 22 different samples of pumpkins were collected (Figure 2). Information and views of pumpkins farmers on pumpkin production practices, processing, storage and preservation are reported as follows:

Pumpkin Production Practices

a) Family Information

Ethnobotanic studies like this one derive their strength from the social organization of the people. It was therefore necessary to collect information on the structure and

Figure 2. Pumpkin varieties of the Lake Victoria Basin

Table 2. Family heads of pumpkin farmers in study area.

Head of Family	Jinja N=90	Busia N=120	Gucha N=60	Tarime N=70
Man	80.2	82.5	83.3	81.0
Woman	18.3	11.8	16.7	4.7
Children	0	5.7	n/a	14.3
Relatives	1.4	0	n/a	n/a

Table 3. Rank of food crops in the study area

Position	Jinja N=90	Busia N=120	Gucha N=60	Tarime N=70
1	Maize	Maize	Maize	Maize
2	Banana	Cassava	Bean	Beans
3	Beans	Beans	Banana	Bananas
4	Cassava	Bananas	Cassava	Cassava
5	Pumpkins	Sorghum	Pumpkin	Pumpkins
6	Groundnuts	Pumpkins	Vegetable	n/a
7	Vegetables	Millet	Fruits	n/a

and organisation of families engaged in pumpkin cultivation.

In Jinja district majority of the families (59%) who practice pumpkin cultivation are medium size while in Busia and Tarime, majority are medium size to large size. In Gucha district, the sizes of families that practice pumpkin cultivation are evenly distributed (Table 1). Majority of the families, which participate in pumpkin cultivation in all the four districts, are headed by men. A significant proportion of families are, however, women-headed with Jinja leading with 18.3%, followed by Gucha (16.7%), Busia (11.8%) and Tarime trailing with 4.7%. More significant still, a number of pumpkin cultivation families in Tarime are children- headed (14.3%) (Table 2).

b) Place of pumpkin as food crop in the study area.

Pumpkin was ranked in relation to other food crops cultivated in the region (Table 3). Pumpkin was not one of the four priority crops cultivated in the study area. The pumpkin is ranked after Maize, Beans, Banana, Cassava, and sorghum.

c) Purpose of planting the pumpkins

The farmers' responses to the purpose for panting pumpkins indicates that in Busia, Gucha and Tarime districts majority of the farmers consider that pumpkins are planted mainly for domestic consumption and only the surplus could be used for commercial purposes (Table 4). In Jinja district, however, majorities consider commercial reasons as the driving factor for planting the pumpkins (Table 4).

On domestic consumption of pumpkins most farmers in the region regarded it as supplementary food. This is an indicator that the pumpkin is not considered as a priority food crop (Table 5).

When further asked to indicate other values of pumpkins, the farmers' views were revealing. They ranged from nutritional to medicinal values.

Nutritional value of pumpkins

Whereas farmers could not accurately ascertain the nutritional value of pumpkins, the majority nevertheless

Table 4. Purpose of planting the pumpkins

Order of Priority	Jinja %	Busia %	Gucha %	Tarime %
Domestic consumption, Commercial use	45.0	96.4	98.1	59.5
Commercial use, Domestic	55.0	3.6	1.9	40.5
Total	100	100	100	100

Table 5. Use of pumpkins at domestic level.

Domestic Use	Jinja %	Busia %	Gucha %	Tarime %
Staple food	2.5	0.5	1.9	1.4
Pudding/dessert	25.5	14.0	5.6	10.6
Supplementary food	72.0	85.5	92.6	88.0
Total	100.0	100.0	100.0	100.0

Table 6. Opinion of farmers on nutritional value of pumpkins.

Nutritional value	Jinja %	Busia %	Gucha %	Tarime %
Minerals	32.1	23.7	7.4	26.2
Proteins	5.2	4.5	0.0	0.0
Starch	28.0	25.1	38.9	19.1
Vitamins	34.7	56.7	51.9	54.7
Don't Know	0.0	0.0	1.9	0.0

mentioned that pumpkins provided important vitamins (Table 6). They also thought pumpkins provided minerals, proteins and starch.

Medicinal value of pumpkins

The opinion of Farmers on Medicinal value of Pumpkins varied from district to district and in some cases from division to division within one district. It was a common opinion in some districts that pumpkin and pumpkin products boost immunity and lead to growth of strong bones if consumed regularly (Table 6).

However, farmers in other Divisions have no idea on medicinal value of pumpkins and pumpkins products while a section of farmers in some divisions had the opinion that pumpkin seeds improve eyesight of people above the age of 30. In Busede Division particularly a section of the farmers believe that pumpkins act as iron supplement in the body.

It was noted that the opinions were largely influenced by health, social or agricultural workers who had visited the various areas in the districts. Some common response was that pumpkins could be used as relaxatives, antiflatulents and anti-diarrhea. Specifically farmers identified the following medicinal values of pumpkins: The fruit stalk treats heartburns; seeds provide vitality (Vitamin E), clean kidneys, treat stomach ulcers, act as de-wormers. Roots was also identified to be medicinal for pregnant women and heal stomach ulcers

Approaches to planting pumpkins

Cultural factors tend to dictate community sivicultural and agricultural practices. With regard to pumpkin cultivation, the practice in the four districts was not markedly different. Majority of the farmers in the region devoted only very small portions of their land (less than an acre) to pumpkin cultivation. This observation confirmed the unproductivity of the crop as staple food.

Majority of farmers in Jinja, Gucha and Tarime Districts inter-crop pumpkins with other crops. However, in Busia District, majority of farmers' mono-crop pumpkins. In Jinja, Gucha and Tarime districts a section of the farmers also plant pumpkins as climbers to other crops (Figure 3). These results indicate that the pumpkin is a versatile crop that can be grown alongside other crops without negative results to other crops and to itself as well.

Environmental conditions for planting pumpkins

The environmental factors are among the most important in determining when pumpkins should be planted. The majority of the farmers in all the four districts indicated that they plant pumpkins during long rains. Farmers in Busia district however, plant pumpkins entirely during

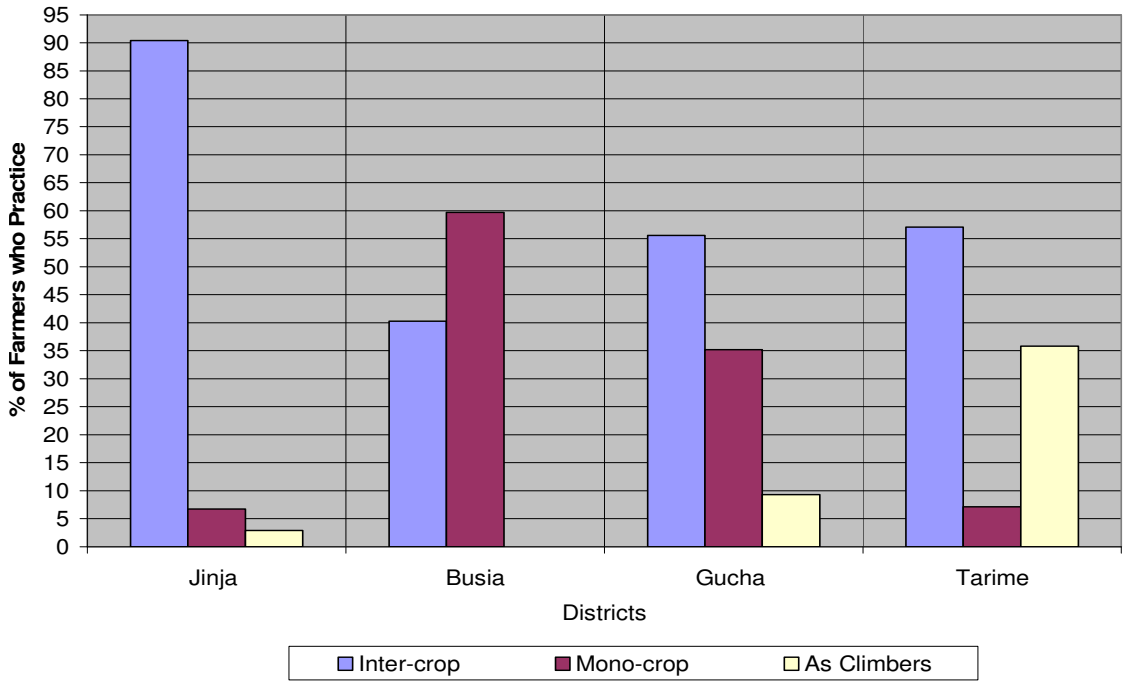

Figure 3. Practices in planting pumpkins

both the long and short rains the latter being necessitated by occasional floods and market forces (Figure 4).

Social cultural values attached to pumpkins

On whether there are socio-cultural values attached to the practice of cultivating pumpkins, several values emerged. These differed from district to district, although some were common to all the four districts.

Farmers in all the four districts had the belief that women should not pluck the leaves of the pumpkins because if they did so, the fruit rots and that touching of premature pumpkins makes them to rot. Similarly, it was noted that young pumpkin fruits should not be pointed at as they rot and that small girls are not allowed to pluck the leaves as the fruits do not develop.

In most districts, it was learned that one should not touch the fruit during development with tobacco-contaminated hands, as this would cause the rotting of the fruit. The other social/cultural values mentioned about pumpkins in the respondents verbatim were: 'Cooking vegetables from pumpkin with ash causes rotting of fruits, Pumpkins are not for sale but given as gifts, If you hit a dog with a rotten pumpkin the remaining fruits grow healthy, Pumpkins do not always germinate when planted, Pumpkins are not stolen- if you do you die, If you eat termites before season for pumpkins planting makes the fruit have a poor taste and easily rots, When rotten fruit is thrown on the road by the sick and people step on it the sick gets healed, Rotten fruit is thrown at a dog's head by the sick to clear disease, They are given to others for free if in plenty in order to harvest more always, Pumpkins should not be offered as wedding gifts since they could be rotten inside, On pointing at the crop; bad people make the fruit to rot before sprouting, Pumpkin fruit is largely for women and children and not for men to eat, Pumpkin is eaten before green maize is ready, and Men hate pumpkin as food which are meant for children.

Problems hampering pumpkin cultivation

Parts of pumpkins harvested include leaves and stalks (1 month), Flowers (1 - 2 months), Young pods (2 months), Seeds (at harvest), Soft fruit coating and roots. Harvesting of pumpkin leaves reduces the yield of the fruit in terms of size and quality.

Some problems affecting pumpkin cultivation were identified as dropping of flowers, lack of ready market, rotting of fruit, swelling of stems, unpredictable rain, weeds, curling of leaves, excess rain (flooding), falling of leaves, Pests (aphids, worms) and land scarcity

Processing, storage and preservation of pumpkins

(a) Maturity Period of Pumpkins.

Most of the pumpkin varieties mature between 3 to 5 months (Figure 4). However, other varieties take longer than 5 months probably due to environmental constraints or type. These types were notable in Gucha and Tarime Districts. It is notable that the maturity period of pumpkins

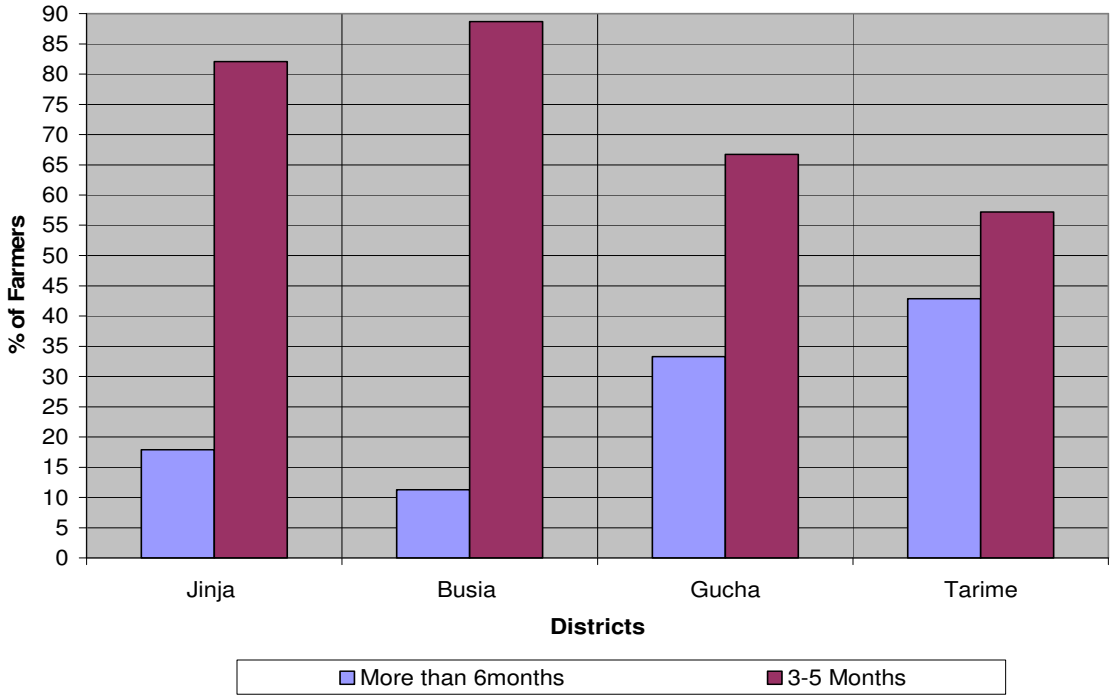

Figure 4. Maturity period of pumpkin.

Table 7. Preservation and storage methods of pumpkins.

Area/Methods	Jinja N=90	Busia N=120	Gucha N=60	Tarime N=70
Traditional methods	64.2	78.1	92.6	100.0
Modern methods	0.0	0.0	1.9	0.0
None	35.8	21.9	5.6	0.0
Total	100.0	100.0	100.0	100.0

grown in Jinja and Busia show clear-cut resemblance as those types grown in Gucha and Tarime. This indicates cross-boarder genetic transfer involving these closely associated districts.

Storage technologies

Table 7 highlights that a significant proportion of the farmers in the studied areas use traditional methods of pumpkin storage. A section of the farmers Jinja (35.8%), Busia (21.9%) and Gucha (5.6%) do not store pumpkins, but dispose off them immediately they are harvested. The traditional method involved the harvesting of the pumpkin with stalks left intact and then keeping the fruits in well lit and aerated environment usually huge baskets made of reeds or granaries/ stores made from locally available materials. These conditions keep the pumpkin physiologically active so that it does not lose its color or turgidity quickly.

In all the studied areas pumpkin stores are mainly managed by women. In Tarime a significant proportion of men participate in management of pumpkin stores that is, 40.5%. Gucha district had the least percentage of men participating in management of pumpkin stores. This observation confirms the findings that women have the responsibility for nurturing the pumpkins and that men are not at ease with the use of pumpkins as food.

Control of pests and diseases

Whereas there are variations in the manner in which the farmers controlled pests in the four districts, it is evident that one traditional method was popular: use of wood ash to keep pests at bay. In various parts in the four districts, other traditional methods are used to control the pests including mulching, weeding and intercropping.

In addition, commercial pesticides commonly used to control pests that affect tomatoes are used by farmers in all the four districts to control pests affecting the pumpkins.

Technologies for pumpkin and pumpkin products processing

In all the seven Divisions of Jinja farmers had no knowledge of technologies for pumpkin and pumpkin products processing. In Butula, Funyula and Matayos Divisions farmers had no knowledge of technologies for pumpkin and pumpkin products processing. Technologies identified for pumpkin and pumpkins products processing in

Budalangi are: After boiling, directly served with pounced groundnut, Fruit stalk: dry, roast, 3 spoonfuls in 250 ml water, Add to partly cooked potato/cassava and cook to taste, Roast seeds to give oil, Dry and ground seeds for medicine (diarrhoea), and Seeds ground and added to infants porridge. In Gucha district farmers had no knowledge of technologies for pumpkin and pumpkin products processing. In Tarime, traditional methods of pumpkin processing were mentioned by a significant proportion of the farmers.

Nurturing and conservation of pumpkins

An overwhelming majority of farmers (on average 80%) from all the four districts indicated that they did not receive any support from any institution or lobby group regarding pumpkin production and use. However, about 20% confirmed that they receive support on pumpkin cultivation from agricultural extension officers, health workers and non governmental organizations.

DISCUSSION

The fairly large families that are engaged in cultivation of pumpkins and other crops in all the four districts indicate the need for provision of adequate food and a balanced diet in the region. This requires an informed and diversified approach to crop production in the region.

The position of pumpkin as a food crop in the study areas indicates that pumpkin is a “woman’s” crop that is not seriously considered as a mainstream crop in the region. Over-reliance on staple food crops like maize and to a lesser extent cassava, beans, bananas and sorghum which have a low bio-availability of nutrients, especially micro-nutrients promotes malnutrition (Republic of Kenya, 2004). Given the high potential of pumpkins in the provision of nearly all nutrients required to maintain human health including vitamins, proteins, oil, minerals and starch (Pamplona- Roger, 2004; Esquinas- Alcazar and Gulik, 1983). It is unfortunate that the crop in the region is not highly regarded by the farmers. This indicates that future efforts in the region should focus on diversification of food crops to include the pumpkins.

The evidence confirms earlier findings that less than 10% of the households cultivate pumpkins as a source of food and livelihood in the Lake Region of East Africa (Republic of Kenya, 2003; Hamisy, 2002).

In Jinja district, majority considers commercial reasons as the driving factor for planting the pumpkins which is a pointer to the fact that Jinja town has a big influence on the activities of the district. The dwellers of the city may not be farmers and that they rely on supplies provided for in the market centers. From these results it is evident that commercialization of pumpkin cultivation in Busia, Tarime and Gucha districts would require more awareness creation than in Jinja district.

Majority of the farmers reported that pumpkins provide important nutrients such as vitamins and has medicinal values. Their responses correspond with scientific documentation which indicate that pumpkins are a rich source of vitamins (A, B1, B2, B12, C, E) proteins, carbohydrates, oil, and minerals (zinc, niacin, iron, mg, phosphorous, potassium, folate, calcium) (Encyclopedia of Foods and their Healing Power, 2004). No other single crop has such potential.

Their responses also show the diverse medicinal value of the pumpkins. Some of these values have been documented such as its use in the treatment of stomach, eye as well as renal disorders (Pamplona-Roger, 2004; Pumpkin-Nook, 2003). Currently, it is a good source of vitamins and minerals in the management of HIV/AIDS. The medicinal potential of the pumpkin cannot be gainsaid, given the diverse value in its fruits, leaves, and seeds.

The observed farming practices for pumpkins confirm that in much of East Africa, pumpkins are mainly cultivated as a marginal crop often on the edges of field crops or scantly scattered between staple crops such as maize or sorghum (Hamisy et al., 2002).

The social cultural values attached to pumpkins tend to safeguard the growth and development of pumpkin fruits. However, they seem to be based on the gender factor. The gender factor has hitherto prompted certain pumpkin production practices such as seed selection and conservation, and the general care of growing pumpkins. On the other hand, it has hindered the overall progress in the cultivation of pumpkins in the region, particularly with respect to the expansion of its production. It was with this in mind that the task force on hunger (Sanchez et al., 2005) recommended that all means be used to increase productivity of food insecure farmers, especially with regard to traditional crops like pumpkins which are nutriationally rich.

Nurturing and conservation of pumpkins is hardly adequate to cause an impact on the role of pumpkins in poverty reduction and food security. If the Farmers in the region are to benefit from the immense potential of the pumpkins, intervention efforts would be greatly needed in terms of production, storage and use.

Although the pumpkin is considered mainly as a crop plant, its potential value goes beyond this limit, and warrants a place under ethnobotanic studies. Ethnobotanic studies are often significant in revealing locally important plant species for providing medicine and medicine-related nutrients. The documentation of traditional knowledge on the medicinal and nutritional use of the pumpkin collected in this study will go a long way in confining the studies on pumpkins in closet of ethnobotany.

In light of fundamental principles of ethnobotany, the results of this study are discussed under three dimensions: pumpkin production practices, utilization and storage technologies. In terms of pumpkin production practices, it is clear from the results that many small-holder farmers in the Lake region have not been sensitized about the immense potential of the crop and the need to pro-

mote its production. This has consigned the pumpkin into the hands of women alone, who have hitherto continued to religiously fall back on to the traditional practices and cultural values to sustain its production. This has slowed the growth in the production of the pumpkins in the region, which continues to be produced at a subsistence level on small plots of land. If the Millennium Development Goals of reducing food insecurity, poverty and malnutrition is to be achieved by 2015, efforts must be directed towards intervention programmes to uplift the production potential of the pumpkin. These include research on pest control and possibility of increasing the land under pumpkin cultivation.

With regard to the utilization of the pumpkin, the results indicate that the crop has very high potential. Given that pumpkins mature in only four months, can grow in any part of East Africa and can be kept for over 8 months after harvesting as long as the fruit retains its stalk, the pumpkin is a good food security crop (Nansubuga, 2007). Healthwise, a pumpkin is a rich source of useful vitamin, proteins, oils and minerals and is therefore used in boosting body immunity and reversing symptoms of malnutrition (Pamplona-Roger, 2004). It is gratifying to note that some farmers are aware of these values. However, it is unfortunate that due to cultural beliefs, many families in the Lake region of East Africa are not benefiting from these important attributes of the pumpkin and continue to slide into food poverty and malnutrition. The onus rests on the agricultural and health workers and the non-governmental organizations to take requisite interventions to popularize the use of pumpkins in the region. As many people learn of its medicinal and nutritional values, the demand for pumpkins will increase by the day and they have the potential of becoming the most profitable venture that could help fight food insecurity, ill health and poverty (Nansubuga, 2007).

The storage of harvested pumpkins has been achieved through traditional technologies. As long as the current level of production continues to be sustained; storage will not be a problem. However, if the production level increases that may be far below the demand for pumpkins this will pose a challenge in the future. An important aspect of storage is the preservation of germplasm. The traditional technologies are still useful, but it will be necessary to look into means and ways of improving the quality of the traditional cultivars. As of now the pumpkin remains the “orphaned crop” because no serious attention is given to it in terms of scientific, technological and cultural research in order to enhance its production, utilization, and value additions that would enable it to effectively contribute to food security and poverty reduction.

Conclusions

Farming is the first priority source of income of the communities in the Lake Victoria basin. This situation is further supported by the fertile soils and favorable climate in the vast part of the Lake Victoria region. Pumpkins are not considered as a priority food crop among the communities in Lake Victoria basin and are not used to generate income by majority of the house-holds living in Lake Victoria basin. Approximately 84.5% of the families conceded that they plant pumpkin as a supplementary. This is a clear indicator that it is unlikely for one to venture into pumpkin cultivation as a commercial crop.

Management of pumpkin stores is a prerogative of women in the Lake Victoria basin. This indicates that the crop is of less significance in relation to other crops, since traditionally, women in this region have always been regarded subordinate to men.

Technologies for processing of pumpkin products are in existence in isolated regions in the Lake Victoria basin though they are not fully harnessed and developed. There is need to invest in value addition of pumpkins in order to encourage people to venture into their cultivation given their immense nutritional and medicinal values. This means that a lot of intervention is needed to venture rigorously into this activity.

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