Documentation of uses and conservation status of edible food plants in the Lake Victoria basin

BY

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LAKE VICTORIA BASIN ECOREGION MASENO

PROGAM: FARM FORESTRY

PROGRESS REPORT MAY 2013

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Introduction

There are more than 30 000 plant species known to man as food (FAO, 1996). The majority of these is harvested locally and is not widely used at the global level. It is estimated that only 30 plant species contribute to 95% of the world plant food intake (FAO, 1996).

At the global level, therefore, the majority of food plants are neglected or underutilized. These neglected food plants are generally wild and grow naturally in the bush and do not have to be planted or tended to before producing edible parts (FAO, 1988). Wild food plants contribute to local household food and livelihood security especially for the economically disadvantaged, the young or the elderly. They are important for local food security because they are free and are easy to access by local communities (FAO, 1988; FAO, 1990, Shackleton et al., 1998). They are especially significant during periods of acute food shortages. Wild food plants also provide nutritional security by adding essential nutrients as well as variety to diets, making staples more appealing to the taste. In addition, they also contribute to household economies (Falconer and Arnold, 1991, Ladio, 2001). Wild relatives of crop plants are important in plant breeding because they can be used to improve existing crop varieties.

Neglecting these important food resources can lead to loss of local plant populations and landraces. When farmers discontinue planting and maintaining particular plants, they can become extinct. This genetic erosion is unfortunate; because once genetic material is lost it forecloses all future options of using these genetic resources to improve crop plants. At the same time this neglect may result in loss of local knowledge concerning the use and management of these plant resources, which is often localized and specialized. Loss of this knowledge can have negative consequences on plant survival and food security as well as nutritional security.

The government of Kenya is desirous to improve the contribution of agriculture to the national economy. In this context, the government has developed a policy on emerging crops (GOK, 2010). There is need to diversify crops so as to spread the risks involved in overreliance on few traditional crops. Some of these crops are indigenous, wild or

domesticated, that have potential for commercialization at regional or local level for food. These plants, whose potential are under-exploited, could contribute to food security, nutrition, health, income generation and environmental service and are good in improving both the quantity and quality of useful products (GOK, 2010).

The conservation and sustainable utilization of neglected food plants require various actions including documenting of existing food plants, in situ conservation of wild crop relatives, and promoting development and commercialization of under-utilized plant species (FAO, 1996). It is in this context that this study proposes to evaluate the conservation status, uses and importance of food plants to the local people.

This interim report covers the results from field work undertaken in Busia County (Port Victoria) and Gwasii hills (Homa Bay County) from 18th to 23rd march 2013.

Broad objective

To document important food plants in woodlands and farmlands so as to support conservation, improve food security and enhance livelihoods

Specific objectives

1. To document existing edible food plants in the region;
2. Determine the extent of use and contribution to food security for the local people;
3. Assess their conservation status.

Research methodology

Study sites

❑ Port Victoria & Gwassi hills

Research Design

❑ Cross sectional

Data collection

❑ Semi-structured interviews with key informants (KIS)

☐ Free listing technique

☐ Literature search

☐ Rapid biophysical assessments

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Data was collected through interviews with key informants. Semi-structured interviews using a checklist of open-ended questions were administered to key informants in a focus group discussion.

Plate 1:   Focus Group discussion

Plate 2: Rapid biophysical assessments in the field

To exhaustively capture important food plants from the respondents, free listing technique was employed. In this technique, the respondents were asked to name any plant food species that come to mind. Normally, people readily remember species, which are important to them (Lykke, 2000).

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…uction

…Forestry Research Institute, Maseno Regional Research Centre attended, …pated and exhibited in the Kisumu A.S.K. Regional Show. Unlike the previous …he centre paid up for its own space and erected a hired tent for displays.

…2007 A.S.K. SHOW THEME:-

…egional Show theme was the same as that of year 2006 thus: - **"Empowering …through growth in Agribusiness".**

…NO REGIONAL RESEARCH EXHIBITIONS

…entre exhibited and displayed the following:-

- The Institutional name and show theme was captured on a large banner that was hoisted on the front/entry side of the display tent.
- Display of seedlings of medicinal trees, timber and pole trees as well as ornamentals, among others were displayed on the sides of the entrance to the tent.
- Posters and information on Natural Forestry Rehabilitation efforts in Kakamega, Wire and Gwassi were displayed.
- KEFRI-Maseno Regional Research Centre Banner showing vision, Mission and contacts was hanging above the posters inside the tent.
- Posters on the efforts on Participatory Forestry Management were displayed.
- Information posters on bamboo propagation, establishment and utilization were displayed.
- Various seeds were displayed and packaged for sale especially Eucalyptus species.
- Collaborators (farmers) were given space to display and sell their tree products which included Moringa leaf powder, Neem powder, Moringa root and bark powder, etc.
- A poster with information on soil fertility replenishment and management was displayed.
- Information and issues regarding soil analysis processes from sampling in the field to actual analysis in the laboratory was shared.
- The librarian displayed all the then available publications by KEFRI with some to give to the visitors at the tent.
- A desk well dressed and with visitors book was set up last on the way out for visitors to sign and/or register comments.

Preliminary Results

Table 1: List of food plants and importance as ranked by key informants

| Site	Name (Botanical)	Local name	Rank
Port Victoria	Tamarindus indica	Omukhuwa	1
	Wild yam	Chihondogo	2
	Ximenia americana	Chinduli	3
	Psidium guajava	Amapera	4
	Carisa edulis	Ojuoga	5
	Morus alba	Omunugu	6
	Mondia whytei	Mugombera	7
	Kigelia africana	Olukindu	8
	Rhus vulgaris	Owayo	9
		Libungwe	11
	Sphaeranthus napierae	Omusali	12
		Omugayu	13
	Dovyalis abbysinica	Osongolo	14
	Goose berries	Namulwa	15
	Wild passion fruit		16
	Rhus natalensis	Osongula	17
Gwasii Hills	Carisa edulis	Ochuoga/Ennyongia	1
		Sare/enthere	2
	Ximenia americana	Olemo/Ensaku	3
	Psidium guajava	Ripera	4
	Kigelia africana	Yago/Omunibe	5
	Morus alba	onunga	6
	Vangueria apiculata	Anyuka	7
	Wild banana	Rabolo/Rithoke	8
		Omange/Omumange	9
	Dovyalis abbysinica	Obunyabuthathi	10
	Rhus natalensis	Sangla/Omusangura	11
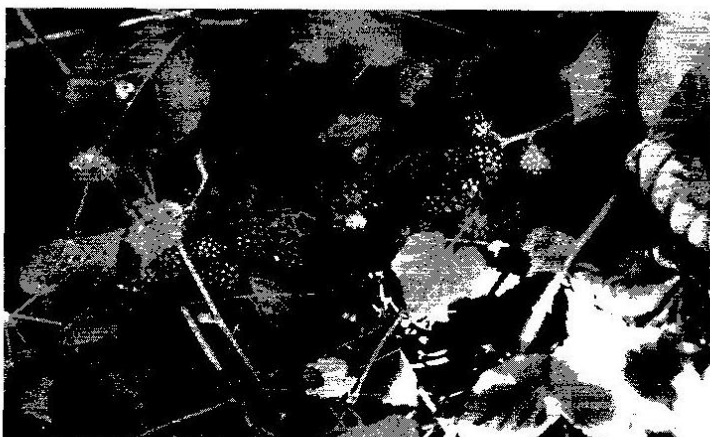
Plate 3: Wild straberries

Plate 4: Wild Guavas

Characteristics of the fruit trees

Most of the food plants are collected in the wild (73 percent) while a few are cultivated (Fig.1.). Ninety three percent of the food plants are indigenous and few are introduced (Fig. 3). In most of them, the fruit part is collected for consumption (Fig.2). Most of the fruit plants are consumed as snacks (Fig.4) and eaten raw (Fig.5). About half of the fruit trees are consumed locally and a few find their way to regional and national markets (Fig.6).
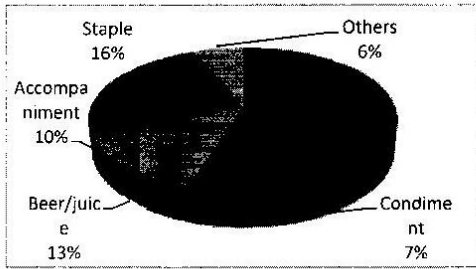
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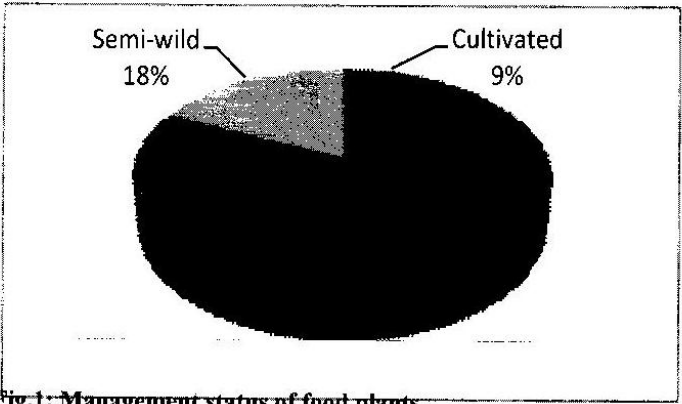
Fig.1: Management status of food plants
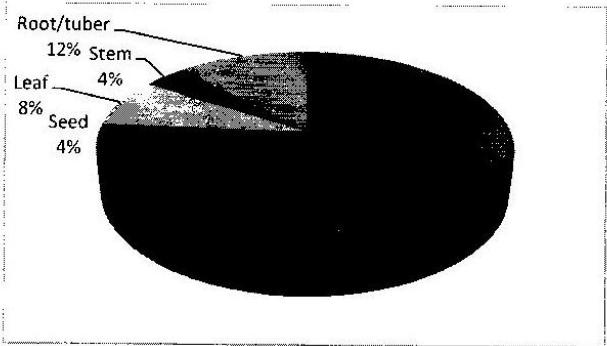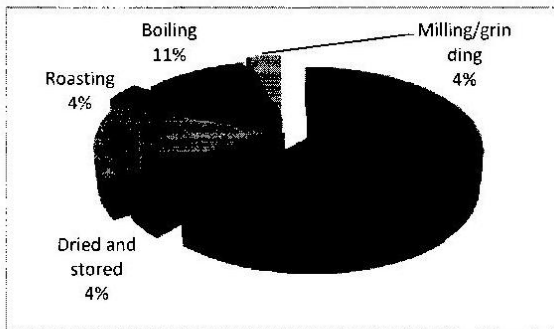

Fig.2: Parts harvested for consumption
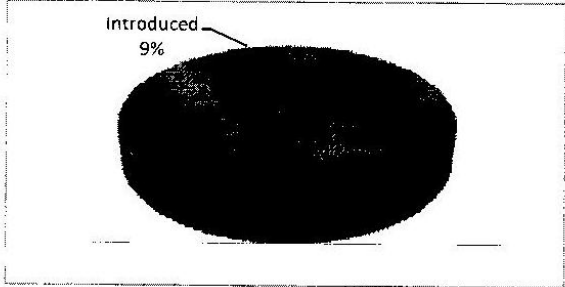
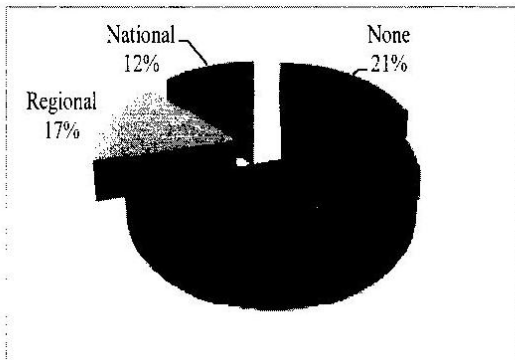Fig.3: Historical status of food plants

Fig.4: Form of consumption

Fig.5: Mode of preparation

Fig.6: Markets of food plants

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Table 2: Alternative uses of food plants

Name	Uses												
	FW	HM	VM	BF	Ju	Dy	Br	Tn	Ch	Tb	Po	Fv	Fd
T.indica	×								×	×	×	×	
X.americana	×	×	×	×				×			×		×
P.guajava	×			×		×							×
M.alba	×			×[1]									×
M.whytei		×										×	
K.africana	×	×	×						×	×			×
Vangueria spp	×									×			
C.edulis		×	×	×		×							×

FW	Firewood,	HM		Human medicine,		VM	Vet medicine						
BF	Bee forage, Dy	Dye,		Br	Beer making,	Tn	Tannin,						
Ch	Charcoal, Tb	Timber, Po		Poles, FV	Food flavor,	Fd	Fodder						

Table 3: Potential value addition for food plants

Species	Potential level			Remarks
	Low	Moderate	High	
1.*Tamarindas indica*			×	Juice, Cake, Jam
2.*Ximenia americana*			×	Juice
3.*Psidium guajava*		×		Juice
4.*Carisa edulis*	×			Juice
5.*Moris alba*			×	
6.*Mondia whytei*			×	Appetizer
7.*Kigelia africana*	×			Fruit pulp/beer
8.*Vangueria apiculata*	×			Juice

[1] The species is good for sericulture
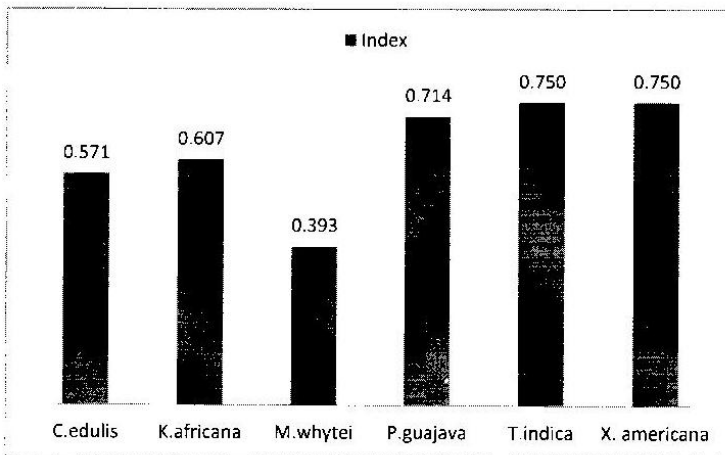
Fig.7: Domestication index for fruit species (Port Victoria)
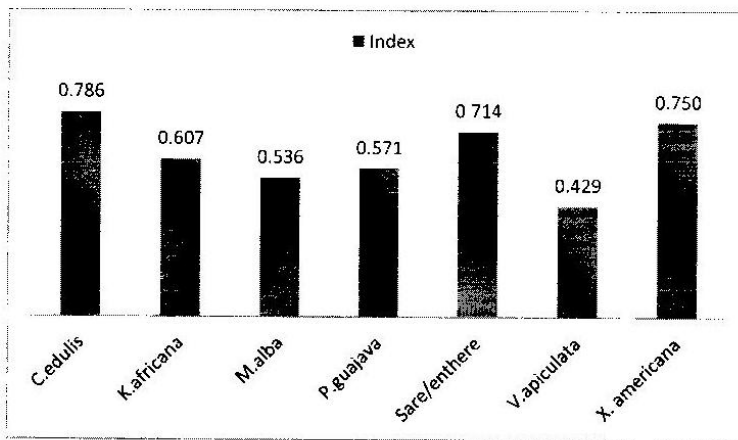
Fig.8: Domestication index for fruit species (Gwasii hills)

Based on the domestication index, the *P.guajava*, *T.indica* and *X.americana* have a good potential for domestication in Busia (port Victoria) while Sare(Luo), *X.americana* and *C.edulis* have a good potential for domestication in Gwasii hills(Fig 7.and 8).

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Threats to conservation of indigenous fruit trees
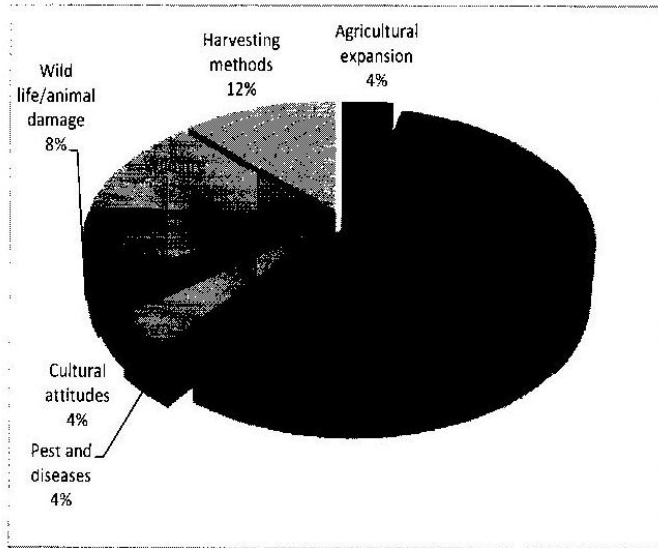
Fig.9: Threats to conservation

The food plants are facing threats due to increasing level of extractive activities for firewood, charcoal, timber and poles (Fig.9). There is great need to promote domestication of these tree species for conservation and livelihoods. This is particularly important because some of the fruit trees have an immense potential to earn revenue to the local people. However, there are knowledge and information gaps which need urgent attention before an elaborate domestication program is implemented.

Future activities

1. Assess the contribution of fruit trees to local livelihoods;
2. Assess abundance, distribution and conservation status of the priority species in the natural environment;
3. Assess the characteristics of the priority tree species
   - ✓ (Phenology, propagation, etc.)
   - ✓ Growth characteristics (Fruiting pattern, fruit size

       ✓ Production potential, post harvest characteristics) etc.
4. Assess capacity of farmers to domesticate the priority species;
5. Undertake value chain study of the selected priority fruit trees (market access (policy, legal and institutional analysis); value addition and feasibility analysis)

References

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