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POLICY BRIEF

Potential of domesticating indigenous fruit trees for food security and household incomes in Lira district

Jacob G Agea, Joseph Obua, Jaspher Okello and Grace Akullo

Problem statement

Little research has been undertaken on indigenous fruit trees in Uganda. Consequently, there is a dearth of information on indigenous fruit trees that can be incorporated in the farming practices. Under the proposed programmes for improved delivery of agricultural and forest services, each district will be expected to work within the framework of the National Forest Plan (NFP), Plan of Modernization of Agriculture (PMA) and National Agricultural Advisory and Delivery Service (NAADS). In the NFP, districts will be expected to develop and advise on agroforestry technologies (Forest Sector Coordination Secretariat, 2002[#]). The promotion of on-farm tree planting and indigenous fruit tree domestication will be prominent features in the delivery of service to farmers. Information on the fruit trees that can be selected for domestication is therefore important.

The NFP (Ministry of Water, Lands and Environment, 2002[*]) emphasizes the development of efficient and profitable commercial forestry in the country. Forestry in this context encompasses farm forestry. The need to provide information on selected indigenous fruit trees to support the implementation of the NFP, PMA and NAADS in Lira district and the policy implications, provided the impetus to carry out this study.

Objectives of the study

The overall objective of the study was to assess the potential of domesticating indigenous fruit trees for improved food security and household incomes in Lira district. Specifically the study was aimed at:

i) determining fruit tree species diversity in the farming systems.
ii) generating a species priority list, characterizing and documenting the values of indigenous fruit trees as perceived by farmers.
iii) developing criteria for selecting indigenous fruit trees for on-farm cultivation.
iv) assessing the opportunities and constraints to promotion of indigenous fruit tree cultivation under the PMA and NFP programmes.
v) assessing farmers attitudes towards indigenous fruit tree cultivation.

Scope and methodology

In order to have meaningful results and make realistic policy recommendations for incorporation of indigenous fruit tree cultivation in the farming practices in Lira district, the study gathered information from all the parishes in Adwari sub-county. One hundred and twenty semi-structured questionnaires and interviews using Participatory Rural Appraisal (PRA) method was used collect data. The questionnaire covered socio-economic variables of the respondents and opportunities and constraints to on-farm cultivation of indigenous fruit tree. Information on farmers' attitudes towards indigenous fruit tree cultivation as well as uses of indigenous fruit trees by the local communities was also collected.

On-farm walks were conducted to assess the proportion of farmland under indigenous fruit trees. Preference matrix ranking was used to generate a species priority list of indigenous fruit trees preferred by the farmers. SPSS and MINITAB statistical packages were used to analyze the questionnaire responses. Logistic regression analysis was

used to show the influence of socio-economic characteristics on local people's willingness to plant indigenous fruit trees. On-farm diversity of indigenous fruit tree species was analyzed using the Shannon-Wiener's diversity index (H').

Findings

- On-farm diversity of indigenous fruit tree species was relatively high (H´ = 2.164). A total of 16 indigenous fruit tree species was recorded in the 30 farms surveyed. Frequency distribution analysis indicated that six of the indigenous fruit trees (shear butter trees, *Anona senegalensis*, *Vitex doniana*, *Grewia mollis*, *Tamarindus indica* and *Carisa edulis*) occurred at a high density on farms The average proportion of farmland under indigenous fruit trees was however low (23.3% ± 5).

- Majority (85%) of the respondents said that indigenous fruit trees were growing naturally. Only a small proportion (15%) planted indigenous fruit trees. Local people practice very little or no management of indigenous fruit trees. Only a small number (21%) of the respondents said they were carrying out some form of management. Knowledge of propagation was very low among the respondents. It was clear that farmers still regard indigenous fruit trees as wild and God given.

- A wide range of trees has been identified as sources of edible fruits. The ten most preferred species were shear butter trees (Yao), *Vitex doniana* (Owelo), *Anona senegalensis (Obwolo)*, *Tamarindus indica* (Chwao), *Bridelia scleroneura* (Orweco), *Vanueria apiculata* (Amalera), *Ximenia americana* (Olimu), *Carisa edulis* (Achuga), *Diospyros mespiliformis* (Chumu) and *Borassus aethiopum* (Tugu).

- Farmers who either retained or planted indigenous fruit trees in their land had different criteria to choose or retain indigenous fruit trees. Food value and cash values were the most commonly used criteria. More than 60% of the farmers mentioned provision of food as their main selection criteria. Other criteria used for identifying suitable trees for on-farm cultivation included medicinal value, growth habit (does not shade the agricultural crops), early fruiting, ease of management and drought resistance.

- Fruits of shear butter (*Vitellaria paradoxa*) and *Tamarindus indica* were reported to be sold in the local market although their prices are lower than prices of fruits such as *Mangifera indica* (mangoes), *Psidium guajava* (Guava), and *Citrus reticulata* (Tangerine). Lack of a developed market for indigenous fruits was the major hindrance to its commercialization.

- A large number of crops were grown alongside indigenous fruit trees. Sorghum (83%), millet (74%), pigeon peas (57%), sesame (51%), beans (49%), cassava (43%), cotton (43%), sunflower (42%) and yams (42%) were the major ones. Many farmers said they are not willing to invest their labour on growing and managing indigenous fruit trees alone but would prefer to retain or plant fruit trees together with food or cash crops if planting materials were available.

- Peoples' willingness to plant indigenous fruit trees were influenced by their gender ($R = 0.18$, $P = 0.01$), education level ($R = 0.11$, $P = 0.03$), farm size ($R = 0.16$, $P = 0.04$) and occupation status ($R = 0.13$, $P = 0.01$). However, lack of awareness of the need to plant and manage indigenous tree resources; lack of seedlings in local nurseries; unclear markets, food values and poor propagation knowledge were the major challenges to on-farm cultivation of indigenous fruit trees.

- The main threats to indigenous fruit trees are tree cutting for charcoal production (68%) and firewood (55%). Wild fires in the dry season and clearing agricultural land were other important threats. Exploitation of wood for making mortars, timber and house construction, beehives and inability of some trees to sprout once cut down were however considered being less serious threats to the conservation of the indigenous fruit trees.

- Opportunities for domesticating indigenous fruit trees included land availability (70%), interest in and willingness to plant indigenous fruit trees (58%), time availability (49%), increasing support by the NAADS/Extension agents (38%) and willingness of the local people to be trained on indigenous fruit tree propagation techniques for improved fruit yield (17%)

Conclusions and recommendations

In spite of the potential the indigenous fruits have for contributing to the nutrition and cash economy of rural households, little effort has been directed towards ensuring sustainable use of these resources. High local demand for exotic fruit trees is a clear indication of the need to provide fruits throughout the year to supplement food and cash requirements. Indigenous fruit trees could fulfill this role because of their diversity. However, there is a need to:

- Formulate clear policies and by-laws on conservation of indigenous tree resources. Trees are an asset, which contribute to the well-being of the rural community and through their longevity serve as a cultural linkage between generations. Farmers need to be kept informed of the latest advances in domestication and commercialization of fruit trees.

- Address the issue of marketing and pricing of indigenous fruit tree products. There is a need to distinguish fruits with a local or national and a regional or international market. It is also important to analyze the market environment for indigenous tree fruits compared with alternative possibilities such as exotic fruits or agricultural crops. It should also be noted that some markets involve higher risks and distant markets involve higher transport costs. Relating these to product prices and potential benefits to the farmer is crucial.

- Provide material support to encourage identification and selection of species for domestication, improvement and commercialization. Training of extensionists on indigenous tree fruits is needed.

- Establish a community nursery for the collection of native seeds and propagation of native species for distribution to farmers. However, current political situation in some parts of Lira district cannot warrant the setting of such community nursery of indigenous fruit trees.

- Initiate education campaigns among farmers on the food and income potential of indigenous tree resources, germplasm conservation and propagation techniques, the dangers of deforestation and the importance of sustainable use of resources by encouraging on-farm tree-planting culture and agroforestry initiatives.

[#] *Forest Sector Coordination Secretariat (2002). District Forestry Services. Forest Sector Newsletter Issue No. 15. Kampala.*
[*] *Ministry of Water, Lands and Environment (2002). National Forest Plan. Final Version. Kampala, pp. 159.*

ABOUT THE AUTHORS

Jacob G. Agea holds a B.Sc. (Forestry) and M.Sc. (Forestry) from Makerere. He is a Lecturer in the Department of Community Forestry & Extension, Makerere University. He is a prominent professional in the research, training and consulting fields. He is also an honored researcher for Development Initiative & Research Centre and a member Rural Development Forestry Network. His main areas of specialization are; Agroforestry, Applied ethnobotany, Forestry & Food security, and Social Research Processes.

Grace Akullo is a social development worker. She holds a B (SWSA) from Makerere University, a Postgraduate Diploma in Human Resource Management from Uganda Management Institute, a Diploma in Secondary Education and a Certificate in Project Panning Management. She is a Part-time Lecturer in the Department of Community and Extramural Studies, Makerere University. Her main interest is capacity building and conducting field research.

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