RUFORUM Working Document Series (ISSN 1607-9345) No. 14 (1): 519-523.
Available from http://repository.ruforum.org

Research Application Summary

Utilisation of indigenous fruit trees in the Lake Victoria basin districts of Rwanda and Uganda

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Abstract

Ecosystems in Rwanda and Uganda have a diversity of wild tree species many of which are indigenous fruit trees (IFTs) which provide a number of benefits to communities. This study was conducted to assess the utilization of IFTs in the Lake Victoria Basin. Specifically, it was conducted in the districts of Bugesera, Kirehe and Nyamagabe in Rwanda and Buikwe, Busia, Kamuli, Masaka and Namutumba in Uganda to document and prioritise the available edible indigenous fruit trees, document the determinants for preferences and assess local uses of the keystone IFTs. Data were obtained using various tools including survey, focus group discussion with farmers and key informant interviews. The survey covered 700 households. The study revealed that *Garcinia buchananii* and *Carissa edulis* were two commonly prioritized species in both countries. Determinants such as high food potential, medicine, sweetness etc. motivated farming communities to prioritise IFTs. The study revealed that fruits from prioritized species are eaten as food. Cough was the mostly reported illness treated by almost all the species. *Tamarindus indica, S. comorensis* and *G. buchananii* were reported to treat many illnesses compared to other species. Fruits of *M. holstii, C. schweinfurthii* and *S. comorensis* are sold in local markets to generate income. Besides, the species provide products such as timber, charcoal, firewood, etc. From community knowledge, prioritized IFTs are multipurpose and thus significant in sustaining households. Community knowledge on uses of IFTs could be therefore enhanced and integrated for sustainable conservation of such species in both countries.

Key words: Communities, food security, health benefits, indigenous fruit trees, income

Résumé

Les écosystèmes au Rwanda et en Ouganda ont une diversité d'espèces d'arbres sauvages dont beaucoup sont des arbres fruitiers indigènes (AFIs) qui fournissent un certain nombre d'avantages pour les collectivités. Cette étude a été réalisée afin d'évaluer l'utilisation des AFIs dans le bassin du lac Victoria. Plus précisément, elle a été menée dans les districts de Bugesera, Kirehe, et Nyamagabe au Rwanda et Buikwe, Busia, Kamuli, Masaka, et Namutumba en Ouganda pour documenter et prioriser les arbres fruitiers comestibles indigènes disponibles, documenter les déterminants des préférences et évaluer les usages locaux des AFIs fondamentaux. Les données ont été obtenues à l'aide de divers outils, y compris l'enquête, la discussion en groupes de discussion avec les agriculteurs, et les entrevues avec des informateurs clés. L'enquête a porté sur 700 ménages. L'étude a révélé que *Garcinia buchananii* et *Carissa edulis* étaient les deux espèces couramment prioritaires dans les deux pays. Les déterminants tels que le potentiel élevé d'être comestible, la médecine, la douceur, etc. motivaient les communautés agricoles à donner la priorité aux AFIs. L'étude a révélé que les fruits des espèces prioritaires sont consommés comme nourriture. La toux est la maladie la plus déclarée comme étant traitée par presque toutes les espèces. *Tamarindus indica, S. comorensis* et *G. buchananii* ont été signalés comme médicaments contre de nombreuses maladies par rapport à d'autres espèces. Les fruits de *M. holstii, C. schweinfurthii* et *S. comorensis* sont vendus sur les marchés locaux pour générer des revenus. En outre, les espèces fournissent des produits tels que le bois, le charbon de bois, le bois de chauffage, etc. De par la connaissance de la communauté, les AFIs prioritaires sont polyvalents et donc importants dans le maintien de ménages. La connaissance de la Communauté sur les utilisations des AFIs pourrait donc être renforcée et intégrée pour la conservation durable de ces espèces dans les deux pays.

Mots clés: les communautés, la sécurité alimentaire, les avantages sanitaires, des arbres fruitiers indigènes, le revenu

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Background and literature summary

Indigenous fruit trees (IFTs) play a vital role in the livelihoods of many rural communities in Africa (Mithofer and Waibel, 2003). They contribute tremendously to household food security, nutritional health and income especially during harsh times (Simitu, 2005). IFTs provide rural communities with products such as oil, medicine, nuts and fodder (Ambé *et al.,* 2001). Besides their socio-economic importance, some IFTs are protected by local communities for ecological reasons such windbreaks (Kalaba *et al.*, 2007).

IFTs also play an important agroforestry role and are viewed to a larger context as multipurpose, hence their integration into agroforestry systems (Akinnifesi *et al.,* 2007). Despite their significance, a few IFTs are exploited (Fukushima *et al.,* 2010) within and outside Lake Victoria Basin (LVB) districts of Rwanda and Uganda. Local knowledge related to benefits of IFTs can help in planning and directing research and extension programs by providing useful information for policy formulation (Sinclair and Walker, 1999; Soto-Pinto *et al.,* 2007). As utilization of IFTs depends on indigenous knowledge, there is a need to

collate information from local communities that can help up scaling domestication of IFTs in the LVB. Therefore, the objectives of this study were to document community preferences of IFTs and assess local uses of preferred IFTs in Rwanda and Uganda

Study description

The study was conducted in the LVB districts of Bugesera, Kirehe and Nyamagabe in Rwanda and Busia, Buikwe, Kamuli, Masaka and Namutumba in Uganda. Reconnaissance visits and background data collection were done at the onset. A household survey was then conducted using a semi-structured questionnaire. A total of 700 households were interviewed. The final stage of the study was focus group discussion (FGD) with farmers.

Household survey data were analysed using SPSS (V 20). Descriptive statistics on individual ranking of IFTs, reasons for preference, general uses of IFTs and level of interest of IFTs as food and medicine were generated. Regression analysis was used to identify determinants of communities' preference of IFTs. Differences in level of interest of IFTs as medicine were investigated using Chi square contingency tests for categorical variables. Information obtained from FGDs was grouped into categories to generate themes and subjected to thorough content analysis.

Results

The most preferred IFTs in Rwanda were *Garcinia buchananii, Carisa edulis, Parinari curatellifolia, Pappea capensis* while in Uganda they were *Tamarindus indica, Saba comorensis, Canarium schweinfurthii, Garcinia buchananii, Vangueria apiculata* in Uganda. Highly reported determinants of preference of IFTs were high food potential, environmental benefits, taste, medicinal value, market potential, abundance and high productivity, and sweetness. Food, medicine, firewood and timber were reported as general uses of IFTs in both countries. Other reported uses of IFTs were fodder, charcoal, timber, shade and poles. Regarding food uses, results indicated that IFTs provide fruits that are eaten as food. In addition, fruits of *G. buchananii, P. curatellifolia, X. caffra, S. comorensis, T. indica* and *C. edulis* can be processed into juice. The interest in the species

Table 1. Household allocation of IFT to the four use category

Species	N	Food	Medicine	Firewood	Timber
C. schweinfurthii	149	87.9	5.4	2.7	3.4
G. buchananii	177	80.2	19.8	-	-
S. comorensis	107	60.7	19.6	18.7	0.9
T. indica	359	52.9	28.4	12.0	6.7
V. apiculata	61	91.8	8.2	-	-
C. edulis	109	82.6	12.8	3.7	0.9
M. holstii	99	83.8	12.1	4.0	-
P. curatellifolia	86	80.2	16.3	3.5	-
P. capensis	86	80.2	19.8	-	-

as food was high for *G. buchananii* in Rwanda (38.5%) and *S. comorensis* (93.9%) in Uganda. Digestive disorders, cough, blood pressure and intestinal worms were the mostly reported illnesses treated by IFTs. *Garcinia buchananii, T. indica*, *S. comorensis* and *C. schweifurthii* were reported to treat most illnesses. Additionally, fruits of *C. schweinfurthii, S. comorensis* and *M. holstii* are highly marketable, and thus a source of household income.

Discussion and conclusion

Reasons for preference of specific IFTs are associated with their importance. Rural communities prefer species that significantly contribute to their diet (Agea *et al*., 2007). Rural communities are far knowledgeable about the contribution of IFTs to their livelihood. Though IFTs are multipurpose tree species, food and medicine were their highly reported uses. Given their richness in vitamins, proteins and minerals, their medicinal properties, and other important uses, there is a strong need to popularise IFTs. There is also need of a clear policy on raising communities' awareness on on-farm domestication and management of IFTs.

Acknowledgement

We thank the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) for giving us an opportunity to share our findings. This paper is a contribution to the 2016 Fifth African Higher Education Week and RUFORUM Biennial Conference.

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