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Nutrition and Food Security: The Role of Forest Resources in Eastern Zambia

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KEY POINTS

- Forest foods can play a vital role in maintaining balance and variety in people's diets by providing foods of different food groups and supplying diverse foods within a food group.
- A study in Eastern province found that not all food groups are supplied by the forests.
- Food groups provided by the forests in the area are non-starchy vegetables, non-starchy fruits and proteins. There is at least one forest food in each meal in addition to the wild fruits consumed as snacks.
- Forest cover is on the decline and this trend is higher in the more populated open forest areas but is also on the rise in densely forested areas due to high immigration of people especially from the open forest areas
- Effective implementation of the forest management policy remains critical and requires multi-stakeholder participation including local communities

INTRODUCTION: Chronic malnutrition and undernourishment are widespread in Zambia especially among rural households who depend on seasonal agricultural production for most parts of their diets. Currently, 40% of children suffer from stunting due to malnutrition and 48% of the country's population is undernourished or suffer from perpetual hunger (CSO 2014 and FAO/IFAD/WFP 2014). Furthermore, an estimated 78% of the rural smallholder households are poor and their agricultural productivity is low (IAPRI/CSO/MAL 2015). This aspect leaves most rural households, who constitute about 60% of Zambia's population, highly dependent on natural forests, and woodlands for their livelihoods including food provision and income generation.

Zambia has a large forest cover estimated at 60% of the total land (Kalinda et al. 2013; Vinya et al. 2011), placing it among the highly forested countries in Africa. However, the rate that forest cover is being lost has increasingly become worrisome such that if it remains uncontrolled it may lead to complete loss of

biodiversity (Mbindo 2003; Mulenga, Nkonde, and Ngoma 2015). Between 1990 and 2000 about 851,000 hectares of forest was lost (Mbindo 2003).

In many parts of Africa, forest foods form a significant portion of the diets for the rural households especially when agricultural products are in low supply (Grivetti and Ogle 2000). This kind of dietary makeup means that wild foods have potential to significantly contribute to nutritional outcomes of the rural households. However, very little has been documented about this role especially for Zambia.

Focusing on Eastern Province which has one of the highest child stunting levels in the country, a study was carried out to explore the contribution of forest products to rural households' food security and child nutrition. The study addressed two objectives:

1. Assess the availability, accessibility, and utilization of forest foods and non-food products in Eastern Province; and

2. Catalogue nutritional properties and medicinal uses of forest foods available to the local communities

DATA AND METHODS: The study mainly used qualitative methods to address the two objectives. Focus Group Discussions (FGDs) with 175 men and 117 women were conducted in 10 different villages in the province in five districts namely Nyimba, Petauke, Katete, Chipata, and Lundazi. The FGDs were conducted to collect information about diversity, availability, seasonality, and limitations to use and access of forest products in the areas. The discussions also included forest management strategies and their implementation to assess sustainable use of forest products. In addition, the research team conducted field observations to assess the impact of forest resources on rural household food and nutrition security.

RESULTS AND DISCUSSION:

Role of Forest Resources: This study found forest resources to be particularly important for Eastern Province which is characterized by high poverty and malnutrition rates. The communities identified several roles which forests play in the food and nutrition security of the households. These are summarized in Box 1.

Box 1. Importance of Forests to Household Food and Nutrition Security

- Edible and non-edible forest products are an important source of income for the households. Fruits, vegetables, grass, timber, charcoal, and honey were the main products collected for sale.
- Forest products supplement foods produced or purchased at household level as these are usually not adequate in all the five districts.
- Forest foods can play a vital role in maintaining balance and variety in the people’s diets if adequately available. There is at least one forest food in each meal in addition to the wild fruits consumed as snacks. Most forest foods are highly nutritious and contain some of the best nutrients required by the body.

Food Groups and Nutrients Available in the Study Area: Table 1 shows all the food groups required for balanced nutrition. Information gathered indicates that forest foods are concentrated in only a few food groups.

Table 1. Food Groups and Examples

Food Group	Examples
Starchy food	Grains, potatoes, and cassava
Non starchy vegetables	Amaranth, Black Jack
Non starchy fruits	Baobab Fruits, Masuku, Tamarind
Legumes, nuts, and seeds	Beans, Groundnuts
Meat/Insects	Small rodents, Mopane Worm (Caterpillar)
Eggs and Dairy	Eggs, Milk

Source: Authors.

From the discussions with the households, it was established that all the wild food products that are available in sufficient amounts fall under only three of the six food groups:

- Non starchy fruits for example, Baobab fruits, Masuku, Mangos, and Tamarind;
- Non starchy vegetables for example, Amaranth leaves and Black Jack leaves; and
- Meat/insects such as rodents and caterpillars.

Starchy foods such as grains and tubers, dairy, legumes, and nuts are not provided by the forest areas studied. Eggs from different wild birds are also found but are in very low supply and in amounts too small to meet people’s nutritional requirements. Vitamin A, protein, iron, zinc, and folate (vitamin B9) are some of the major nutrients found in the three food groups that are critical for reducing child stunting.

Nutrients from Forest Foods: Non-starchy fruits and vegetables, bush-meat, and insects found in the areas surveyed are rich in several nutrients that contribute to a significant share of critical nourishment that helps address malnutrition. Fruits and vegetables provide fiber, vitamins, antioxidants, minerals, and various micronutrients, while bush meats and

insects supply mainly protein and fats. Typically, forest foods are combined with other agricultural foods, thus this mixture of different foods can create diets that are nutritionally balanced and varied.

Nutrients found in the foods which are critical for reducing the levels of malnutrition in Zambia include vitamin A, vitamin B9 (folate), iron, zinc, and protein (NFNC 2014; UNICEF 1990; WHO 2009).

Vitamin A: A number of foods providing sufficient amounts of vitamin A are widely available in the study areas. Green, yellow, and orange fruits and vegetables all contain beta carotene that is converted by the body into vitamin A. Sources of vitamin A found in the forest areas of the villages visited include guavas, masuku (*uapacakirkiana*), mangoes, and amaranth leaves (*bondwe*).

Folate: Folate is widely present in fruits and vegetables found in forests in the five districts. A wild vegetable known as amaranth, and locally referred to as *bondwe*, is known for its high folate content. This vegetable grows abundantly in the forest and like all other wild food products, the local communities collect it at no cost. Other sources are black jack, guava, and mango.

Iron: Several forest foods consumed by the households in the areas studied contain iron. These foods include fruits such as guavas and mangos, a wide variety of vegetables such as amaranth leaves, jute leaves and the small flowered kenaf. The only limitation is that these foods are seasonal and preservation is limited.

Zinc: Amaranth leaves, mushrooms, and several wild small animals and insects appear to be the main source of zinc. However, similar to iron, not all zinc-rich forest foods are available throughout the year. As shown in Table 4, it is mostly the small animals that are available throughout the year and from the FGDs, these have been declining in most areas.

Protein: According to data collected during FGDs, bush meats appeared to be the predominant source of protein among forest

foods. Flying termites (*inswa*), mopani worm (*vinkubala*), rodents, different wild birds, and wild pigs are some of the sources of protein included in the diets. Among all these, wild rodents and the mopani worm were the favorite, probably due to their abundance. Considering that meat is an expensive commodity far beyond the means of rural households, these bush meats provide the households with affordable sources of protein. Households also get protein from eating eggs from small wild birds and guinea fowl but the level of availability of these is rather low. In addition to these protein sources, a number of fruits and vegetables from the forest supply protein, including amaranth leaves and mushrooms.

Wild Honey: Honey is a top income generating commodity and it allows rural households to obtain important food groups that are lacking among forest foods such as grain foods (and other starchy foods) and legumes. Households are able to use income derived from selling honey to purchase foods belonging to other food groups. This helps them achieve nutritionally complete diets that are necessary for fighting malnutrition.

Limitations to Full Utilization of Forest Foods: Despite the above benefits, several limitations to full utilization of the forest resources were identified as follows:

First, forests in the areas do not provide all the food types needed for a balanced nutrition. Only three out of the six food groups are provided by the forest in sufficient quantities to contribute significantly to child nutrition (see table 1)

Second, forests resources need to be supplemented by the other foods that are purchased or cultivated, but these are largely missing or inadequate. Respondents said they were too poor to afford adequate food to meet the basic nutrition requirements and that their agricultural production was inadequate to last the whole year.

Third, it was observed that forest cover was on the decline. The decline is more pronounced in the highly populated open forest areas than densely forested areas. However, the decline

in forest cover is steadily accelerating in densely forested areas due to high immigration of people especially from the open forest areas. Reduction in forest cover has led to a rapid decrease in the amount of forest food resources available to rural households exacerbating food and nutrition insecurity.

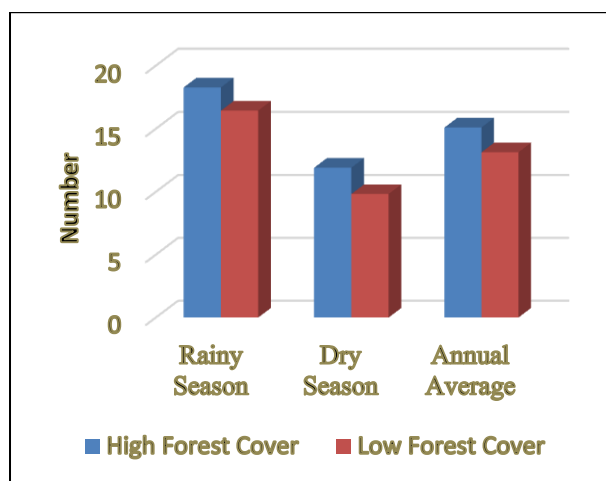
Fourth, some food preparation methods were also found to deplete the nutrients in the forest foods, thereby reducing their full utilization.

Lastly, some forest resources such as bamboo have the potential to increase household income but are not currently being utilized.

Forest Food Availability in High and Low Density Forests: The results show notable differences in forest food supply between the high forest density areas and low forest density areas (Figure 1). Dense forest areas were found to offer slightly more numbers and variety of forest foods than the open forest. However, areas of denser tree cover had a higher influx of settlers than areas with open forests which was posing a threat on the availability of forest resources per capital in those areas.

Also, the soils in areas of denser tree cover were perceived more fertile as most of it was newly cleared lands.

Figure 1. Forest Foods Availability between High and Low Forest Cover Areas



Source: Authors.

CONCLUSION AND RECOMMENDATION: Undoubtedly, forests can play a pivotal role in offsetting starvation among

rural households and serve as safety net for poorer households. Nonetheless, forests still fall short of supplying adequate food and other basic nutrient requirements to solve the malnutrition problem.

In order to improve rural household food and nutritional status as well as sustainable use of forest resources, poverty reduction strategies that focus on increasing agricultural production and increasing incomes must be a matter of priority. Increased household income will enable households to access more diversified diets.

Effective implementation of the forest management policy remains critical and requires multi-stakeholder participation including local communities. Other useful interventions that support and promote sustainable forest resource use include agroforestry, sustainable agriculture, afforestation, and reforestation. In addition, it is important to step-up raising awareness on the importance of forest foods in household food security and child nutrition and the need for sustainable use of forest resources. Lastly, there is need for the deployment of underutilized species such as bamboo for their direct benefits such as cash income.

REFERENCES

- CSO (Central Statistical Office). 2014. Zambia Demographic and Health Survey Data. Lusaka, Zambia: CSO.
- FAO, IFAD, WFP. 2014. The State of Food Insecurity in the World: Strengthening the Enabling Environment for Food Security and Nutrition. Rome: FAO.
- Grivetti, L.E. and B.M. Ogle. 2000. Value of Traditional Foods in Meeting Macro-and Micronutrient Needs: The Wild Plant Connection. *Nutrition Research Reviews* 13.1: 31–46.
- IAPRI/CSO/MAL. 2015. 2015 (RALS) Rural Agricultural Livelihoods Survey Data. Lusaka: IAPRI.

- Kalinda, T., S. Bwalya, J. Munkosha, and A. Siampale. 2013. An Appraisal of Forest Resources in Zambia Using the Integrated Land Use Assessment (ILUA) Survey Data. *Research Journal of Environmental and Earth Sciences* 5.10: 619–630.
- Mbindo, K. 2003. Forest Cover Crisis in the Sub-Tropics: A Case from Zambia. Paper submitted to the XII World Forest Congress, 21-28 September. Quebec City, Canada. Retrieved July, 2015 from <http://www.fao.org/DOCREP/ARTICLE/WFC/XII/1022-B1.HTM>.
- Mulenga, B.P., C. Nkonde, and H. Ngoma. 2015. *Does Customary Land Tenure System Encourage Local Forestry Management in Zambia? A Focus on Wood Fuel*. IAPRI Working Paper No. 95. Lusaka, Zambia: IAPRI.
- NFNC (National Food and Nutrition Commission). 2014. First 1,000 Most Critical Days: Three Year Program 2013-2015. Lusaka, Zambia: NFNC.
- UNICEF (United Nations Children’s Fund). 1990. Strategy for Improved Nutrition of Children and Women in Developing Countries. A UNICEF Policy Review. New York, NY: UNICEF.
- Vinya, R., S. Syampungani, E.C. Kasumu, C. Monde, and R. Kasubika. 2011. Preliminary Study on the Drivers of Deforestation and Potential for REDD+ in Zambia. A Consultancy Report Prepared for Forestry Department and FAO under the National UN-REDD+ Programme Ministry of Lands and Natural Resources. Lusaka, Zambia: UN-REDD+.
- WHO (World Health Organization). 2009. Global Prevalence of Vitamin A Deficiency at Risk 1995-2005. World Global Database on Vitamin A Deficiency. Geneva, Switzerland: WHO. Can be accessed at http://apps.who.int/iris/bitstream/10665/44110/1/9789241598019_eng.pdf.

The full report of this policy brief can be accessed at: <http://www.iapri.org.zm/images/WorkingPapers/wp102.pdf>.

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