



Living in and from the forests of central Africa



In brief

Since time immemorial, non-wood forest products (NWFPs), particularly wild forest foods, have played an important role in the diets and health of people living in and outside forests, in both rural and urban areas. Some of these products, such as wild game, fruit, seeds, roots, nuts and fungi, are still used as a source of food, contributing to both food and nutritional security, while others are used for building materials or medicines, or support ancient customs and traditions. For forest dwellers especially – like the Bantou, Baka/Bandjéli and Bororos peoples in the Congo Basin – the concepts of food, medicine, health and wellbeing are all intertwined. Over time, the trade of NWFPs on local and international markets has grown to play a considerable role in generating income for all those involved in the value chains – not only those who gather them, but also those who process, transport, export or sell them.¹

NWFPs can provide an important complement to agricultural crops by broadening the food base, diversifying diets, and in turn helping to prevent micronutrient deficiencies, particularly for young children.

In the Congo Basin, children are the primary consumers of forest fruits, generally eaten raw. Many of these fruits constitute excellent sources of vitamins (carotene, vitamin C, vitamin B1, vitamin A, vitamin D) and minerals (iron, potassium, zinc, calcium, magnesium), in addition to simple sugars and water.

Research suggests that the long-term value of NWFPs could surpass the short-term benefits obtained from timber (e.g. overharvesting), or from the conversion of natural forests to agriculture or plantations,² particularly in terms of their contribution to food and nutritional security. Nevertheless, there is a tendency to underestimate their role because they are poorly represented in national and international statistics, scientific information about their nutritional composition is only available for some species, and in most cases their use and trade are confined to the informal sector. Growing emphasis on dietary diversity and nutrition-sensitive interventions in agriculture opens a window of opportunity for forests, and NWFPs in particular, to become important allies in the challenge of ensuring long-term food and nutritional security.

¹ This brief was written by Ousseynou Ndoye, Giulia Muir and Florence Tonnoir and is based on *Vivre et se Nourrir de la forêt en Afrique centrale*, available at: <http://www.fao.org/3/a-i6399f.pdf>. Leslie Duncan Wearne supported translation into English. For more information, please contact: Giulia.Muir@fao.org or Ousseynou.Ndoye@fao.org.

² Hall and Bawa, 1993; Peters *et al.*, 1989; Shackleton *et al.*, 2011



From foraging to farming

Before the advent of agriculture some 10 000 years ago, humankind depended on foraging – understood as the practice of gathering resources from the wild – for food and health. For thousands of years thereafter, and in most parts of the world, we have gradually moved from a dependence on wild foods to domesticated plants and animals. Today’s society is highly dependent on agriculture for food and nutrition, with only 12 crops and 14 animal species providing 98 percent of the world’s food needs, making agriculture extremely vulnerable to expected and unforeseen shocks such as climatic change or agricultural pests. This bears stark contrast to the approximately 7 000 plants species and several thousand animal species that have commonly been used for human nutrition and health since the Neolithic.³

During this transition, moreover, traditional forest foods and diets, and associated practices such as foraging, have largely been overlooked in programmes and policies on food and nutritional security. For much too long, NWFPs have been referred to as “minor” and “secondary” products. Complicating matters is that with the exception of a few countries that have managed to produce more food while also increasing forest cover, agricultural productivity and food security have generally been achieved at the expense of forests, and of the important forest foods, products and genetic diversity they possess.⁴



The projects

Background

The forests of central Africa teem with life – wild fruit, flowers and fungi, insects, nuts, leaves, bark, bushmeat, molluscs and algae – and contain an extraordinary wealth. The forests of the Congo Basin are our planet’s second-largest forest zone and constitute one of its richest areas in terms of biodiversity. The region is home to 130 million people, most of whom depend directly on forest resources, particularly NWFPs. Small-scale forest-based enterprises play a key role in the commercialization of many of these products. In efforts to meet demand, however, the NWFP sector has to face real challenges regarding conservation and sustainable management of resources, optimization of products, and organization of the various value chains.

Objectives

FAO has been supporting central African countries to identify and implement policy measures to improve food and nutritional security and alleviate poverty by promoting the sustainable management of NWFPs for more than one decade. The projects⁵ – funded by the German Government through the Federal Ministry of Food, Agriculture and Consumer Protection, the European Union, the African Development Bank and the Congo Basin Forest Fund and implemented by FAO under the supervision of the Central African Forests Commission (COMIFAC) – ran from 2005 to 2016 and involved ten countries (Burundi, Cameroon, the Central African Republic, Chad, the Congo, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, Rwanda, and Sao Tome and Principe). Their main objectives included enhancing food and nutritional security by promoting enabling policy, legislative and institutional frameworks at a local, national and sub-regional level for equitable access of local people to resources and markets to promote NWFPs. At pilot sites, the projects also worked to strengthen NWFP-based small- and medium-scale enterprises to benefit poor, local communities by promoting more added-value processing and marketing, and by building the capacity of producer-support networks.

³ Dounias, E. in FAO. 2014.

⁴ FAO. 2016.

⁵ GCP/RAF/398/GER; CGP/RAF/408/EC; GCP/RAF/441/GER; GCP/RAF/479/AFB



Results

✓ **Improved policy and institutional frameworks that govern the access of local communities to resources and markets for NWFPs.** COMIFAC, with FAO support, developed sub-regional guidelines on the sustainable management of NWFPs of plant origin in central Africa. The legislative framework includes guidelines on the right to use, harvest, process and store NWFPs, taxation, penalties, control of the supply chains, institutional mechanisms, capacity building and data-gathering. An analysis of national and sub-regional legislation on NWFPs, and country-exchanges on differing judicial contexts, preceded these guidelines. National Strategies and Action Plans were also developed to favour a more significant contribution of NWFPs to food security and socio-economic well-being, and at the same time ensure their conservation in central African countries.


✓ **Improved skills on small and medium forest-based enterprises to enable organization, processing, commercialization and marketing of more value added NWFPs.** Local people were trained using FAO's Market Analysis and Development (MA&D) approach which

provides a training framework to enhance small forest enterprises development, through which communities can improve their cash income. FAO introduced the MA&D approach in the Democratic Republic of the Congo (DRC) and Cameroon, for example, training communities dependent upon NWFPs like honey, fruits such as "safou" (*Dacryodes edulis*), edible leaves including "fumbwa" (*Gnetum* spp.) and many others. At one pilot site in the Democratic Republic of the Congo, for instance, training sessions were held to improve strategies for harvesting, fermentation, de-pulping, crushing and packaging for markets. The sessions enabled women to improve food and nutritional security of their households and to reap revenue through sales of Njansang nuts (*Ricinodendron heudelotii*) to traders. A good portion of the nuts gathered were consumed locally by more than half of the indigenous Bantu families and nearly all Baka gatherers.

✓ **Participatory domestication of tree species.** Due to high demand of certain species, "participatory domestication" – a process by which villagers are helped to develop nurseries and taught skills to propagate specific and market-oriented "ideotypes" – was undertaken with



Gnetum africanum, *Irvingia gabonensis* and *Acacia Senegal* with the collaboration of the World Agroforestry Centre (ICRAF) in order to reduce pressure on natural stocks. Local community members were trained in sustainable harvesting techniques, construction and maintenance of propagators and tree nurseries, and marketing of species. This training is now being scaled up by local organizations.

 **Improved understanding of the role forests play in contributing to food and nutritional security.**

The projects contributed to the growing body of evidence highlighting the significant role forests, including NWFPs, play for food, nutrition and income. They also helped increase the understanding of the remarkable know-how of local communities with regards to forest foods, and associated health and medicinal benefits.

Looking ahead

With malnutrition currently affecting one in three people and expected to affect one in two people across the globe by 2030, greater attention is now being placed on dietary diversity (quality) over quantity (energy). Growing emphasis on dietary diversity makes forests, and NWFPs in particular, important partners in the challenge of ensuring long-term food and *nutritional* security, especially for people living in and around forests. As governments and decision makers increasingly recognize the need for inter-sectorial collaboration and multi-stakeholder approaches, they must also acknowledge that producing more food will not inherently contribute to better nutrition, and that forests and NWFPs can be powerful allies in nutrition and food security programmes and policies.



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The projects also identified actions for further improving the contribution of forests and trees to food security and nutrition, including:

- ensuring that local people have secure **access to resources** by **regulating** use rights, particularly for women and children who are important users of forests and forest products;
- **empowering women** to be more involved in the value-addition for NWFPs, as it is well documented that women are key “entry points” for enhancing family welfare; this means that investing in women is positively correlated with an improvement in household well-being;
- **promoting the development of small and medium forest-based enterprises** through access to finance and capacity development;
- **considering forests** in national food and nutritional security, and poverty reduction strategies;
- promoting **better land use planning**.

Nutritional values of NWFPs

- About 500 g of Gnetum leaves, consumed in sauces, covers 100% of the recommended daily allowance (RDA) of calcium for an adult and contains as much calcium as milk.
- Boiled okra leaves (*Abelmoschus esculentus*) have twice as much calcium as milk, and contain as much beta-carotene as tomatoes or pumpkins.
- 100 g (about 6 fruits) of custard-apple (*Annona Senegalensis*) cover half of a child’s RDA of Vitamin A, 15 times the RDA of B1, 4 times of B2, half of niacin (vitamin B3), more than 100 percent of vitamin C and three times the RDA of iron.
- Moringa (*Moringa oleifera*) – known as an energy booster – consumed as dried leaves contains four times more potassium than bananas, 14 times more calcium than milk and nine times more iron than spinach (to equal weight).

Sources: Ndoye, O., 2016; Ndoye & Tonnoir, personal communication 2016



Diversifying “the menu” with NWFPs

Wild meat

In the Congo Basin, wild meat from forests, also called bushmeat, provides an estimated 5 million metric tonnes of dietary protein to rural (and urban) families each year, which helps prevent debilitating micronutrient deficiencies.⁶ Bushmeat, often the primary source of protein for rural communities, can provide as much as 80 percent of protein intake for rural communities. Research has moreover found a correlation between the availability of wildlife and stunting – where wildlife is plentiful, the occurrence of stunting in children is typically very low. One study conducted in Madagascar found that removing access to wildlife would lead to a 29 percent increase in children suffering from anemia, and a three-fold increase of anemia cases among poor children. Although often forgotten in discussions about wild meat, insects, consumed by some two billion people across the globe, are also important sources of high quality protein and nutrients. Because of their high fatty acid content, in certain regions, malnourished children are fed porridge supplemented with caterpillars.⁷

⁶ Fa *et al.*, 2014.; Golden *et al.*, 2011.

⁷ FAO, 2013.



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“Eru”, “Okok”, “Fumbwa” (*Gnetum spp.*)

Commonly referred to as “eru” or “okok” in Cameroon and “fumbwa” in the Democratic Republic of the Congo, *Gnetum spp.*, is made up of two species of climbing plants (*Gnetum africanum* and *Gnetum bucholzianum*) that are found across central and west Africa in secondary and primary forests as well as fallow land. Its leaves are eaten and also used for medicinal purposes. They are known for their rich protein and mineral content and year-round abundance. For this reason, they are very important for food and nutritional security in rural and urban households. In the Democratic Republic of the Congo, 200 tonnes are harvested each year in the provinces of Mbandaka, Équateur and Bandundu, and over 4 000 tonnes are harvested between the central, south-west and coastal regions in Cameroon, with some 500 tonnes exported to Europe. The annual market is estimated at €13.8 million in Cameroon and €1.2 million in the Democratic Republic of the Congo. Interestingly, women dominate harvest activities in Cameroon, carrying out nearly 80 percent of activities, while in the Democratic Republic of the Congo the reverse is true, with men covering an estimated 60 percent of activities.

Wild mango (*Irvingia spp.*)

There are two species of wild mango in Cameroon and the Democratic Republic of the Congo: *Irvingia gabonensis* and *Irvingia wombulu*. The fruits of *Irvingia gabonensis* are succulent, with a distinct scent, and produce a sweet juice. The kernels – which boast 54 percent fat content – are consumed as a condiment and thickening agent, and are often preserved dry or transformed into a type of cake. Its juice can be used as a cooking oil or to make wine. The bark of the tree and seeds are also used for medicinal purposes. *Irvingia wombulu* is a smaller fruit and in south-west Cameroon is highly sought after for export to Nigeria. The wood of *Irvingia* is also highly valued for construction and energy.

African cherry (*Prunus africana*)

Prunus africana, or “Pygeum”, is a tree found in mountain forests. During the last 15 years, Cameroon has been one of the largest exporters of its bark extract, with some 1 700 tonnes travelling to Europe and the United States each year. *Prunus africana* has been used by the international pharmaceutical industry in the treatment of prostatic hyperplasia and other related disorders for the past four



decades. Over 45 traditional uses have been documented in Cameroon (including for anti-inflammatory, gastrointestinal, urogenital problems, allergies, and even malaria) as well as for construction and energy. International demand has increased its value from €0.35/kg to €350/kg.

Njansang (*Ricinodendron heudelotii*)

“Njansang” kernels are sold in countries like Cameroon and in regional and international markets. Njansang nuts contribute to a balanced diet thanks to their high content of protein, lipids, carbohydrates, calcium and iron. Studies have shown that they are richer in lipids, carbohydrates and calcium than tomatoes, bushmeat, fish and beef. They contain 49 to 63 percent oil, which is directly consumed or used in pharmaceuticals, and are also processed into powder or paste and used as a much appreciated cooking ingredient for various fish, meat and vegetable dishes in central African countries.

Honey

Forest beekeeping is widespread in Africa and is an important productive system with its own specialised skills and technology that are different from “traditional” beekeeping methods (e.g. small-holder, urban or large-scale industrial beekeeping).⁷ People harvest honey for nutrition, medicine and general wellbeing. Honey – a combination of sugars (fructose and glucose) – is rich in minerals, vitamins, amino acids and water and has exceptional medicinal properties. In the Democratic Republic of the Congo, apiculture is principally managed by men, while women are typically involved in post-harvest activities.

African plum (*Dacryodes edulis*)

Known locally as “safou”, *Dacryodes edulis* is particularly popular in Gabon, where it is known as “atanga”. Rich in vitamins A, C and E and several minerals, it boasts exceptional fatty acid contents. Safou is known as a remedy for toothaches, and also used in the pharmaceutical industry against prostate problems. It is also known for its anti-inflammatory and analgesic properties, as beneficial for urinary infections, against allergies and for treating malaria. Safou has been deemed one of the priority species for domestication in central Africa by local communities. In recent years safou has also been consumed desiccated and processed into oil.

NWFP-based remedies for common nutritional problems

Problem	Examples of useful NWFPs
Protein/energy deficiency	Nuts, seeds, chana (<i>Geoffroea decorticans</i>), kernels (<i>Ricinodendron rautanenil</i> and <i>Parkia spp.</i>), babassu oil (<i>Attalea speciosa</i>), baobab leaves (<i>Andosonia digitata</i>), wild meat (e.g. game, insects), mushrooms
Vitamin A deficiency	Leafy greens and yellow/orange fruits (e.g. wild mango), gums, unrefined palm oil
Anemia	NWFPs rich in assimilable iron: bushmeat, leafy greens (<i>Leptadenia hastata</i> , <i>Adansonia digitata</i>), mushrooms, beans
Niacin (vitamin B3) deficiency which can cause dementia, diarrhoea, dermatitis (common where maize is the main source of food)	Baobab (<i>Adansonia digitata</i>), <i>Boscia senegalensis</i> and <i>Momordica balsamina</i> fruit, <i>Parkia spp.</i> kernels, wild mango (<i>Irvingia gabonensis</i>) and acacia (<i>Acacia albida</i>)
Riboflavin (vitamin B2) deficiency (common in rice-based diets)	Green leaves (<i>Anacardium spp.</i> in particular), <i>Sesbania grandiflora</i> , <i>Cassia obtusifolia</i> , insects
Vitamin C deficiency	Fruits (baobab and African plum <i>Sclerocarya caffra</i>), <i>Cassia obtusifolia</i> leaves, gum from <i>Sterculia spp.</i> , leafy vegetables
Diarrhoea, hemorrhoids	All leafy vegetables, jujubier (<i>Ziziphus mauritiana</i>) fruits (not yet ripe), seed pods of acacia, tamar flowers
Constipation, stomach ache	Leafy greens, ripe fruits, acacia roots and rind
Parasites	Sugar apple (<i>Annona squamosa</i> L.), rinds (e.g. acacia or <i>Garcinia kola</i>), karite
Asthma, cough, bone aches	Acacia fruit rind, honey

Sources: Herzog et al., 1995; FAO, 1995a; Hagggar, 2009

⁷ Bradbear, N. in FAO. 2016.



FAO & NWFPs

In 1991, the FAO Forestry Department embarked on a programme to promote and develop non-wood forest products (NWFPs). The mission of this programme, requested by FAO's member countries, was to serve as a centre of excellence for information exchange towards improved utilization of NWFPs in support of sustainable forest management, conservation of biological diversity and improved food security. The programme works to accomplish this mission through:

- gathering, analysing and disseminating information on use, production and trade;
- **appraisal** of NWFP socio-economic contributions to rural development;
- **technical assistance** in the field.

What are non-wood forest products (NWFPs)?

Non-wood forest products (NWFPs) are goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests. NWFPs and similar terms such as "minor", "secondary", "non-timber" forest products (NTFPs) and more recently, "wild forest products" have emerged as umbrella expressions for the vast array of both animal and plant products other than wood derived from forests or forest tree species. Unlike the term NWFPs, NTFPs also includes fuelwood and small woods used for domestic tools and equipment. Examples of NWFPs include products used as food and food additives (edible nuts, mushrooms, herbs, spices, condiments, aromatic plants, game), fibres (used in construction, furniture, clothing or utensils), resins, gums and plant and animal products used for medicinal, cosmetic or cultural purposes.

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