

Enhancing the Contribution of Non-Wood Forest Products to Poverty Alleviation and Food Security in Central African Countries

Gnetum spp. – the edible leaves from the forest

Worldwide, over thirty species of the gender *Gnetum* are known and two of them are consumed as food in the Congo Basin: *Gnetum africanum* and *Gnetum buchholzianum* locally called okok or eru (Cameroon), koko (Congo and Central African Republic), fumbwa (Democratic Republic of Congo) and nkumu or mfumbu (Gabon).



Picture 1: Negotiations between purchasers and collectors of the leaves of *Gnetum spp.* at a collection point in Sa'a, Cameroon (Photo: Ignace Fokou Sakam)

Gnetum spp. is an evergreen climbing liana growing in the forest. The two species found in the Congo Basin are not easy to distinguish as their opposing leaves vary only slightly in color and shape. One needs to examine the reproductive organs to classify the two species.

The leaves of *Gnetum spp.* are a valuable source of proteins and minerals. They are regularly consumed by the rural and urban population living in the Congo Basin. In traditional medicine, the leaves are used against constipation, throat infections, to heal small injuries and to ease delivery.

Destructive or sustainable collection

After their collection in the forest, the leaves of *Gnetum spp.* are traded locally, over country borders within Central Africa and to Europe or the United States of America following the demand of the African diaspora. Collectors use four different techniques to gather the leaves:

- Collect all leaves leaving a blank liana on which new leaves will sprout,
- Cut the upper of the plant leaving the lower part that will restart to grow,
- Uproot the whole plant without any possibility of regrowth,
- Fell the supporting tree to reach all liana leaves (CIFOR).

Exhausted stocks due to a high demand

Natural stocks of *Gnetum spp.* are about to deplete due to high demand, missing regulations for collection and trade and destructive harvesting techniques. This is true for most of the countries in the Congo Basin and was especially observed for the Republic of Congo and the Central African Republic where rural communities living in the main supply zones for Brazzaville, Pointe-Noire and Bangui need to cover several kilometers to find sufficient numbers of the liana in the forest.

In 2010, the Food and Agriculture Organization of the United Nations (FAO) conducted a participatory study in Congo and the Central African Republic confirming that the stocks of *Gnetum spp.* are depleted around villages in the area of Abala in the Plateaux Region and in Madingo-Kayes in the Kouilou Region of Congo as well as in the Lobaye area in the South-west of the Central African Republic.

In order to offer alternatives to the collection of the liana in the forest, in May and June 2011, FAO organized three trainings on *Gnetum spp.* domestication that were facilitated by the Centre for Nursery Development and Eru Propagation (CENDEP) coming from Limbe in Cameroon. CENDEP was founded in 1999 after a seminar on domestication techniques conducted by the Limbe Botanical Garden, Cameroon (www.cendep.org).

History of *Gnetum spp.* domestication

Since the 1990s, the Limbe Botanical Garden developed a conservation technique for *Gnetum spp.* that was named *conservation by cultivation* based on its main principle, plant domestication.



Picture 2: Commercialization of *Gnetum spp.* is an important source of revenue for women (Photo: Ousseyinou Ndoeye)

This technique is based on propagation through cuttage and allows conserving the natural resource base of *Gnetum spp.* outside the forest. The cuttage of seedlings does not require high investments and can be taught to and implemented by local communities. CENDEP observed that propagated plants can produce about 4 kg of leaves annually.

Capacity building for local communities

The project GCP/RAF/441/GER “Enhancing the contribution of non-wood forest products to poverty alleviation and food security in Central African countries” financed by the German government, implemented by FAO in collaboration with the ministries in charge of forests in Gabon, Congo and the Central African Republic organized three trainings with over 80 participants, who were trained on sustainable harvesting techniques, construction, maintenance of propagators and tree nurseries and marketing of *Gnetum* spp. The follow-up of these trainings is done by local organizations that profited from an in-depth training on entrepreneurial development in the frame of *Gnetum* spp. domestication.

Training on domestication

In the beginning of the training, the participants learnt about biological and ecological characteristics of *Gnetum* spp. and its socio-economic aspects. Afterwards, participants were introduced to the techniques of *Gnetum* spp. domestication:

Building the shelter for the propagators

The shelter needs to be oriented with its long sides towards the sun with a door facing the setting sun. All the sides of the shelter should be covered to prevent the sun to heat the building's inside that harbors the propagators.



Picture 3: Covering the shelter's wall and constructing the propagator's rack, pilot site Mbaïki, Central African Republic (Photo: Bruno Bokoto de Semboli)

Setting up the propagator

The rack is preferably constructed using in addition to wood local materials like bamboo or clay bricks. After completely covering the bottom and the sides of the rack with a single plastic sheet, the propagator is carefully filled with layers of different material forming the rooting substrate. While filling the propagator, one needs to be cautious not to damage the plastic foil. In addition, a piece of a tube is put in one corner of the propagator cutting all layers.

The layers are filled from the bottom up in the following order:

- A thin layer of sand at the bottom of the propagator,
- A thick layer of big stones,
- A thick layer of gravel sand filling the openings between the bigger stones,
- A thin layer of sand over the gravel sand (about one barrow or four buckets with a volume of 15 liters

each).

- Add water until the sand and gravel are completely soaked. The level of water reached in the tube cutting all the layers should be marked with the help of a dipstick.
- The last layer has a height of around 10 cm and consists of sand mixed with sawdust (Armand Asseng Zé).

Harvest, preparation and putting of the cuttings

Propagation of *Gnetum* spp. is preferably done with cuttings with two to four leaves because its seeds do germinate only after a very long period. The upper half of the cutting's leaves are cut with scissors before putting the cuttings into the propagator. Keep some centimeters of space between each cutting.



Picture 4: Cuttings in the propagator and in plastic bags, Abala pilot site, Congo (Photo: Félix Koubaouana)

Potting and daily maintenance of the plants

The cuttings stay between six to eight weeks in the propagator to develop their first roots. During this time, daily care is a must, including the following tasks:

- Open the propagator every day before 9 am and control the level of water through the tube. If necessary, add water.
- Sweep away condensed water from the plastic foil at the sides and the top cover.
- If necessary, use a sponge to absorb excess water.
- Control and, if necessary, repair any holes.

If the above described steps are respected, plants will show well developed roots and one can put them in plastic bags. These bags are placed in the next propagator where they stay around four weeks. Afterwards, the young plants are kept in the shadow for about three months before one plants them on the field.

The manual used for these trainings was elaborated and published by the Limbe Botanical Garden and later adopted by CENDEP. It will be revised in order to take into account the various experiences from the field made in different Central African countries and to integrate the new scientific knowledge gained (or accumulated). *The training report will soon be available online.*

Sources: Asseng Zé, A. (2006): Contribution à l'étude de la filière *Gnetum* spp. (Gnetacées). Master thesis at the University I of Yaoundé.

CIFOR (n.d.): Fact sheet *Gnetum* spp. Available online: http://www.cifor.org/publications/pdf_files/factsheet/Gnetum_eng.pdf