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*Allanblackia floribunda*

# Tree domestication spares forests and increases farmer income

by Zac Tchoundjeu<sup>1</sup> and Bertin Takoutsing<sup>2</sup>

**Domestication of valuable wild fruit and nut trees, has resulted in significant improvements in incomes, diets and in rural business development in the Congo Basin. The World Agroforestry Centre (ICRAF) has set up rural resource centres managed by local communities which train farmers in how to propagate and manage trees and which facilitate them in many ways.**

<sup>1</sup> Principal Scientist Tree Improvement, ICRAF Regional Coordinator for West and Central Africa.

<sup>2</sup> Landscape Agroecologist, ICRAF West and Central Africa Regional program.

The Congo Basin forests are inhabited by 30-70 million people, many of whom are dependent upon forests for a range of ecosystem products and environmental services (wood, medicines, fruits and spices). The rural populations that reside in the area are characterised by widespread poverty, low agricultural productivity partly associated with degrading the natural resource base, poor access to markets, and limited formal access to the forest and its derived products which tend to be controlled by the state for central government benefits.

Agricultural land is difficult to define in the area, where local people have practised shifting cultivation for many centuries. The traditional smallholder agriculture is based on shifting cultivation, primarily of root crops such as cassava, yams, and cocoyam, trees of banana (plantain), and occasionally groundnuts (*Arachis hypogaea*). Traditionally, farmers cleared an area of forest, cultivated this during 2 years, allowed a fallow period of 5-20 years, depending on soil conditions, land availability, and various other factors, and returned to clearing and cultivating again. In the meantime these farmers may have cleared and cultivated other areas of forest, moving on from one spot to another.

**SECONDARY FOREST** Secondary forest is often dominated by regrowth of species such as *Musanga cecropiodes* (morphologically similar to the *Cecropia* pioneer trees of the Amazon Basin); shifting cultivation often targets these secondary forests because they are easier to clear than mature forest. More recently, an increasing population size and development have encouraged more sedentary settlements and necessarily shorter fallow periods, without full restoration of soil fertility.

Forest clearing for agriculture does not only include slash-and-burn shifting cultivation, which has been recognised as the key driver of deforestation in the Congo Basin, but also for cash crops such as cocoa (*Theobroma cacao*). With the current trend in the global market, most governments in central Africa have encouraged the increase of cocoa production, however this has been achieved at the expense of forest clearance.



Zac Tchoundjeu



Bertin Takoutsing

In spite of the recognised importance of forest products, tree cultivation is constrained by the limited knowledge of farmers of tree propagation techniques and incompatibility with other land uses. In addition, farmers cannot reap full benefits, because of marketing constraints such as seasonality of products, weak infrastructure, limited market knowledge, lack of networks and associations and inadequate processing and storage methods. Agroforestry practices such as tree domestication have the potential to ensure rural livelihoods, reducing pressure on the forest resources and encouraging farmers to integrate more trees in landscapes, while maintaining forest cover and biodiversity. In order to overcome these constraints, the World Agroforestry Centre (ICRAF) has been implementing a participatory tree domestication programme in Central Africa that is built on three pillars: (1) development of vegetative propagation techniques, (2) increasing economic

## ICRAF

The World Agroforestry Centre (ICRAF) is a CGIAR Consortium Research Centre. ICRAF's headquarters are in Nairobi, Kenya, with six regional offices located in Cameroon, China, India, Indonesia, Kenya and Peru. ICRAF generates science-based knowledge about the diverse benefits – both direct and indirect – of agroforestry, or trees in farming systems and agricultural landscapes, and disseminates this knowledge to develop policy options and promote practices that improve livelihoods and benefit the environment.

Source: [www.worldagroforestry.org](http://www.worldagroforestry.org)



Farmers during the practical training session on vegetative multiplication techniques. PHOTO ICRAF

and ecological productivity of agroforests and (3) improving marketing knowledge and skills for tree products.

**SELECTION** Studies have shown that farmers in central Africa preferred to plant indigenous fruit trees, but that little scientific information was available for improving planting material of these species. Addressing this constraint went hand in hand more generally with capacity development in agroforestry production. An important component of the participatory tree domestication in the Congo Basin is the selection of valuable fruit trees that can produce high yields and with required traits. Much of this selection is done through a participatory process known as priority setting, where researchers work with communities to select varieties and adapt them for local use. Tree cultivation is often done

through vegetative reproduction, using techniques such as air layering (marcotting), cuttings, and grafting, which allow greater selection of desirable traits than simple seed planting. Required traits for agroforestry species include not just size and taste, but also fast growth and fruiting and uniform fruit size. The selection process identified priority species that were included in the tree domestication programme. The main species were: African mango (*Irvingia gabonensis*), safou or butterfruit (*Dacryodes edulis*), Kola nut or Cola (*Cola spp*), bitter kola (*Garcinia kola*), mangosteen (*Garcinia mangostana*), Njangsa (*Ricinodendron heudelotii*), *Pausinystalia johimbe* and bark of the African cherry (*Prunus africana*), with latter a product with major medicinal value and unsaturated markets.

It is believed that hundreds more species in the Congo

## As human populations continue to grow and the demand for resources increases, tree domestication to provide food, fodder, medicines and other products is an important approach to meet demand.

Basin have great potential for domestication and use in agroforestry systems. The approach is extended through the development of rural resource centres managed by local communities which: train farmers in how to propagate and manage trees; hold stock-plants for vegetative propagation; link with smaller nurseries to provide germ plasm more widely; provide fruit processing facilities and business training; and act as venues for farmers to meet and form associations that allow them to market their products and obtain services more effectively .

**MARKET ECONOMICS** Experience has shown that tree domestication and cultivation is only one component of successful agroforestry; market economics are also crucial. Capacity building programmes and microcredit assist landowners to obtain storage facilities in order to be able to provide more constant product supply throughout the year as well as more efficient technology to process fruits and nuts. Adoption of the participatory domestication method, particularly in the humid forest margins of Central Africa, where indigenous fruits and nuts are highly valued in the local economy, has resulted in significant improvements in incomes, diets and in rural business development, supporting diversified, more resilient and more productive farms and improving the social well-being of the communities involved. A multi-faceted approach by which agroforestry supports food and nutritional security, and provides other tree products (nuts, fuel wood, timber, medicinal plants) and environmental services (soil fertility improvement, water purification) involves 1) the support for soil fertility replenishment technologies to improve overall farm productivity and increase staple crop self-reliance; 2) participatory tree domestication of more nutritious fruit and nut trees; and, 3) entrepreneurship and value-addition. The domestication of high-value trees species in agricultural landscapes is increasingly recognised for its important contribution to rural livelihoods, now that the natural forests which provide tree products and services are reduced in size in the face of demand for agricultural land. As human populations continue to grow

and the demand for resources increases, tree domestication to provide food, fodder, medicines and other products is an important approach to meet demand. These tree products have to be grown in the right niches (hedgerows, gardens, contour strips, etc.) to complement other agricultural production options.

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