

PARTICIPATORY DOMESTICATION OF INDIGENOUS TREES FOR IMPROVED LIVELIHOODS AND A BETTER ENVIRONMENT

The Problem – Clearing the Forest for Subsistence Agriculture

Throughout the tropics, there has been considerable degradation of tropical moist forests for agriculture. In Cameroon and Nigeria, forest clearance for food production intensified as poor urban people returned to farming during the economic ‘crisis’ of the 1990s. What solutions are available to help farmers improve their livelihoods in an environmentally sustainable manner? From 1999, a DFID-funded research project and an IFAD-funded development project investigated the potential contribution of participatory domestication to achieving more diversified and permanent land use systems in Cameroon, Nigeria, Equatorial Guinea and Gabon.

The Facts: Participatory Domestication Increases Farmers’ Options and Maintains Biodiversity

- Farmers in southern Cameroon incorporate an average of 35 fruit trees per hectare of land, over half of which are indigenous.
- By selecting trees with preferred characteristics over many generations, farmers in Cameroon have increased the fruit size of safou (*Dacryodes edulis*) by 66%. Nigerian farmers have achieved a 44% increase of fruit size in bush mango (*Iringia gabonensis*).
- Variation within a species is as great within communities as between communities, suggesting that this domestication has not reduced intra-specific genetic diversity.
- Participatory domestication programmes at the village-level are building on the success of farmers to achieve further improvements in the productivity and quality of indigenous fruits.
- By producing trees for a wide variety of on-farm niches participatory domestication supports diversified multistrata fruit agroforestry.
- Participatory domestication activities can provide quick economic returns, with marcotted trees fruiting in 2-3 years, and farmers also able to generate incomes from selling their skills, cuttings and improved germplasm.
- The density of fruit trees increases as farm size decreases. This suggests that investing in improvement of fruit trees is particularly beneficial for poor farmers.

The benefits of indigenous fruit trees

Participatory surveys identified farmers’ priorities. Indigenous fruit trees are the primary source of income for 12-15% of households. They provide an essential nutritional input: safou is a staple food for 3-4 months of the year, while bush mango is an essential sauce ingredient. Some fruit trees, particularly safou, provide essential shade for cocoa and coffee, thus supporting commodity crops at the same time as reducing vulnerability by helping to diversify farm livelihoods.



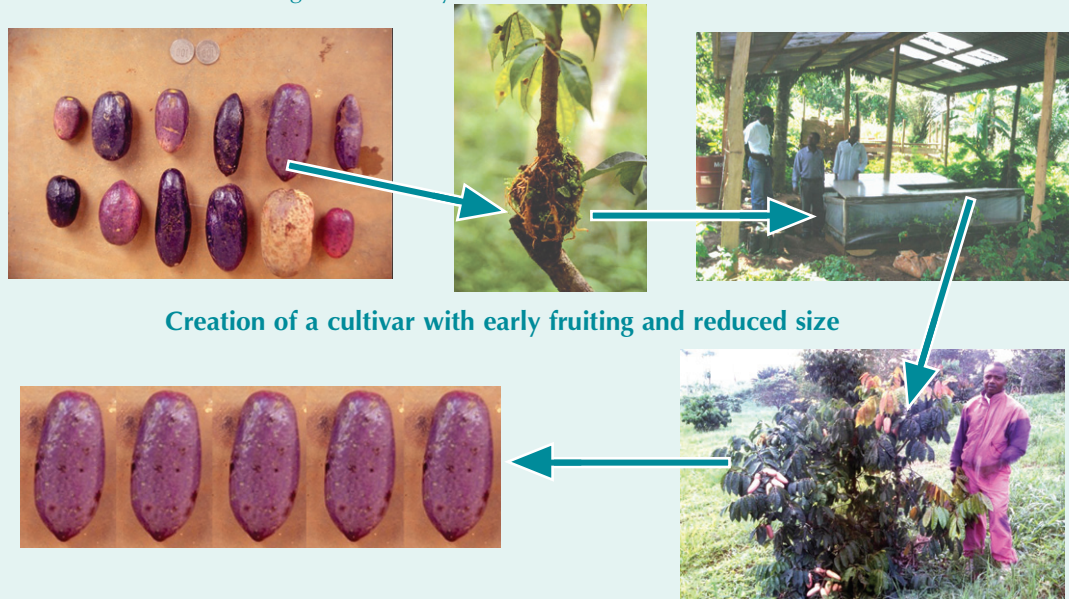
Photo by R. Leakey

Key Constraints: Participatory Domestication Remains an Underutilised Technology

- *Over-regulation.* Regulations concerning the harvest and sale of indigenous tree products from farmers’ own land are a particular constraint to greater development of this resource.
- *Lack of protection for intellectual property rights.* Some farmers have produced high-yielding cultivars that are now being taken up and disseminated by commercial growers. Legislation is needed to ensure that their rights as farmer-breeders are protected.
- *Limited range of species.* There is a need to extend participatory domestication techniques to more species as part of a policy agenda recognising their role in household welfare.
- *Lack of capacity of extension organisations.* Extension organisations are unprepared to support farmers in domestication activities. Their technical expertise is often restricted to a few commercial fruit species and they have limited marketing skills to enable farmers to match supply and demand.

What is participatory domestication?

Participatory domestication enables farmers to capture the genetic traits of superior trees and develop a range of cultivars to suit different farm niches (e.g. fence-lines, cocoa farms, homegardens) and different markets (e.g. fruit, kernels, oils, germplasm). Farmers are trained in vegetative propagation techniques, such as air layering or marcotting, and basic nursery skills. Unlike institutional domestication programmes, participatory domestication empowers local communities, and maintains their rights to indigenous knowledge and germplasm, as proposed by the Convention on Biological Diversity.



The Solution: Scaling up Participatory Domestication

Improving the policy and legislative context for participatory domestication:

- Governments should publicise the important contribution of indigenous fruit trees to livelihoods and promote the adoption of agroforests as a more diversified, sustainable and environmentally friendly livelihood option than monocultures;
- Governments should ensure that legislation related to the exploitation, transport and import/export of indigenous fruit crops treats them like agricultural produce, rather than as non-timber forest products in need of conservation;
- Governments should protect the Intellectual Property Rights of communities involved in participatory domestication from both internal and external exploitation by joining UPOV (International Union for the Protection of New Plant Varieties) or by adopting the Organization of African Unity's New African Model Legislation for the 'Protection of the rights of local communities, farmers and breeders and the regulation of access to biological resources'.

Extending the benefits of participatory domestication:

- Governments should encourage extension organisations to expand training programmes to help farmers use simple vegetative propagation techniques to develop a range of tree cultivars to fit a variety of on-farm niches;
- Governments should promote participatory research with farmers to develop vegetative propagation techniques for preferred species;
- Domestication activities should be focused on the capture and use of intra-specific variation existing within wild/semi-domesticated populations;
- Extension agents need to be trained to promote the local-level processing and marketing of indigenous fruits, nuts and other tree products in parallel with domestication.

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