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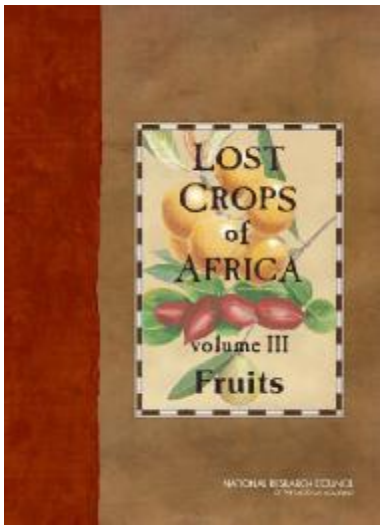

LOST CROPS OF AFRICA
VOLUME III : FRUITS (2008)

When confronting the enormous challenges of sub-Saharan Africa, even those motivated by the best intentions hardly know where to start. This book identifies a wealth of native African fruits—largely neglected by scientists, policymakers, and the world at large—which hold promise to raise nutritional levels, diversify agriculture, and create economic opportunities.

Lost Crops of Africa Volume III: Fruits is the third in a series evaluating underexploited African plant resources that could help broaden and secure Africa's food supply. Volume I (1996) describes African grains and Volume II (2006) vegetables. The 24 fruits highlighted in this report are separated into two categories based on their uppermost level of management: one group is cultivated and better known, while the other includes wild species untouched by modern horticulture (see Table). The study vividly describes the characteristics of each fruit and assesses its potential to help overcome malnutrition, boost food security, foster rural development, and provide sustainable landcare. It is hoped that by highlighting these fruits--Africa-wide and perhaps worldwide--actions will be taken to increase their production and usefulness.

PART 1: CULTIVATED FRUITS

Although these fruits may be cultivated, most are unknown to large-scale organized operations. They are grown mostly as small plantings in villages and home gardens, and are produced more by tradition than horticultural technology. Almost all are raised from seed. As a result, yields are unreliable and often unrecorded, flavors are variable, and varieties unselected. Soil and fertility requirements remain uncertain, breeding techniques in some cases are unknown, and nutritional information is incomplete or lacking. Regardless of all these difficulties, now is the time to apply the art of modern science to African fruits so they can prosper.

Overcoming Malnutrition

Most of the fruits highlighted are useful sources of nutrients, particularly vitamin C and often beta-carotene (provitamin A). Fruits also provide minerals, which are of special value to children who need these elements to build teeth, blood, muscle, bone, and brain.

- *Carissa*, *marula*, and *kei apple* contain more vitamin C than the average orange.
- *Tamarind* pulp, a sweet-tart favorite of children, is a good source of both vitamins and minerals.
- The nutritious flour from *baobab* fruit provides a simple way to add protein, carbohydrate, vitamins, and minerals to other foods, even in remote areas.

Boosting Food Security

Those living in poverty are easily affected by crop and climate fluctuations, natural disasters, or human conflicts that create catastrophic conditions. When grains fail, many trees still yield fruits packed with proteins and carbohydrates, which have often staved off starvation until staple supplies could stabilize.

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- *Tamarind* has been called a tree of life because its fruits can be stored without refrigeration and safely served months later.
- *Marula* provides food during the season when grain stocks run low. Its nuts store so well they can provide nutritious sustenance long after other foods are gone.
- In times of drought African farmers rely on *watermelons* for emergencies. Some remain edible and "potable" up to a year.


Tamarind

Fostering Rural Development

Fruits sell for relatively high prices, can be produced efficiently on a small scale, and are among the poor's few natural treasures. For some rural Africans, there is no better way to achieve a modest income than by producing and marketing fruits and fruit products. Supplies reaching the cities are far below what could be, and consumption remains low. Fruit crops can create a ripple effect in the economy, raising the standard of living and the tax revenues that result from general commerce.

- Across southern Africa, *marula* fruit is appearing in mainstream commerce in jams, juices, and liqueurs.
- *Balanites* seed produces a vegetable oil that is a prized ingredient in desert foods, as well as cosmetics.
- *Butterfruit* (*safou*) pours into cities and rural markets in western Africa, and women peddling them along highways is a common sight.

Sustainable Landcare

Fruit trees are among the most promising tools for securing agricultural systems that are both long lasting and gentle on the land. Benefits from growing fruit crops include lessening soil erosion, lowering soil temperatures, slowing down wind, increasing soil organic matter, reforesting land, and earning carbon credits.

- *Balanites* can help overcome desertification, avoid soil loss, and reduce land destruction caused by livestock. The trees provide shade from the burning sun and shelter from the hot desert winds.
- *Baobab* is nearly indestructible. The trunk soaks in water like a sponge, making it resistant to the grassfires afflicting the savannas each summer.
- *Marula* thrives under exceptional heat and tolerates some of the most inhospitable terrain imaginable.

PART 2: WILD FRUITS

Most of Africa's edible native fruits are wild—rarely cultivated or maintained or improved. Essentially unknown to science, wild fruits still play a crucial role in Africa's rural areas. Most are eaten raw by the children, who also suffer the greatest threat of malnutrition. Today, wild fruits are a vanishing breed, yet there is not much being done to counter this trend because most attention is on domesticated crops. More emphasis needs to be given to fostering wild fruits and restoring their productive contributions to Africa.

Overcoming Malnutrition

A surprising number of wild fruits contribute to countryside nutrition and—requiring no cooking—are especially sought by children. And because wild plants are self-sufficient, they provide for current *and* future generations.

- Yielding under the most daunting conditions, the pulp of *aizen* contains calcium, phosphorus, iron, and vitamins A, B, and C; as well as protein. Its starchy seeds are high in protein and zinc.
- The juice of the jungle *gumvine* is considered extremely healthful. People often use it to season rice, maize, and other grains, prepare lemonade-like drinks, make beer, and flavor foods such as fish.
- *Sweet detar* is an outstanding source of vitamin C—among the best. Its vitamins, quality protein, and food energy from pulp and kernels could help cut malnutrition in much of Africa.

Boosting Food Security

In rural Africa, many people still live near wild fruit-bearing trees and bushes that produce food at times when pampered crops do not. Such emergency foods are critical in the face of famine. Plus, these wild plants have minimum management requirements for their own survival.

- *Icacina* has been known to survive at least four years without rain. It yields fruits, seeds, and tubers, and is an emergency reserve during times when even sorghum succumbs.
- *Medlars* have fruits that can be sun-dried, stored for up to six months, and taste almost like new when reconstituted with water.
- *Tree grapes* are resilient, drought tolerant, and naturally adapted to harsh sites.

Fostering Rural Development

Although wild fruits have been given little horticultural recognition, some promise to help reduce rural poverty. They especially can improve the lives of women, since in many areas of Africa it is women who sell fruits for income. One promising approach is the management and domestication of local fruit trees for the production of exotic juices.

- Some *sugarplums* are already quality fruits, but technical support is likely to lift them far in terms of quality and quantity.
- Most *chocolate berries* already are harvested for sale, but even broader markets could be developed, and byproducts include leafy greens, fodder, and fine timber.
- *Ebony*'s fruit is sweet and savory, and marketed both fresh and dry, though the superb wood remains its greatest financial prize.

Market: Balanites seed (with okra)

Sustainable Landcare

Self-reliant wild fruits are one of the best tools for turning wasteland into a valuable area since they provide food without having to be cut down and without disturbing the land. The protection, establishment, and advancement of indigenous fruit-bearing trees can also help strengthen sustainable farming practices.

- *Aizen*'s environmental endurance is remarkable, and it promises to be a practical way to protect erodible slopes, stabilize dunes, create windbreaks, demarcate boundaries, and provide shade and shelter for livestock and their owners across desert Africa.
- *Star apples* are promising for protecting and improving stressed sites. They could also prove useful in land reclamation, erosion control, and in reducing wind-erosion.
- *Sugarplums* are ideal for protecting soil and conserving habitat and native biodiversity.

Table: Potential Roles for Selected Cultivated and Wild African Fruits

*** = *Outstanding;* ** = *Notable;* * = *Average*	Overall	Nutrition	Food Security	Rural Development	Sustainable Landcare	PRIMARY OCCURRENCE			
						West Africa	Central Africa	East Africa	Southern Africa
Cultivated Fruits									
Balanites	***	***	***	**	***	√			
Baobab	***	***	***	***	***	√	√	√	
Butterfruit	***	***	***	***	***	√	√		
Carissa	**	**	*	**	**				√
Horned Melon	*	*	*	*	*			√	√
Kei Apple	**	*	*	*	**				√
Marula	***	***	***	***	***	√	√	√	√
Melon	**	*	*	**	*			√	√
Tamarind	***	***	***	***	***	√	√	√	√
Watermelon	**	*	*	**	*	√		√	√
Wild Fruits									
Aizen (Mukheit)	***	**	***	**	***	√		√	
Chocolate Berries	***	**	***	***	***	√	√	√	√
Custard Apples	**	**	*	**	*	√	√	√	√
Ebony	***	**	***	***	***	√	√	√	√
Gingerbread Plums	***	**	*	***	***	√	√	√	√
Gumvines	**	**	*	**	**	√	√		
Icacina	**	**	***	**	**	√	√		
Imbe	**	**	*	***	**	√	√	√	√
Medlars	***	**	***	***	***		√	√	√
Monkey Oranges	**	?	***	***	***	√	√	√	√
Star Apples	**	*	*	**	***	√	√	√	√
Sugarplums	***	***	***	***	***	√	√	√	√
Sweet Detar	***	***	***	**	***	√			
Tree Grapes	**	**	**	***	**	√	√	√	√

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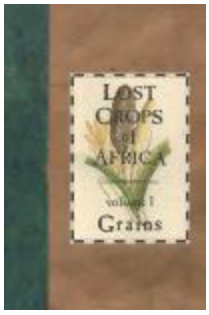
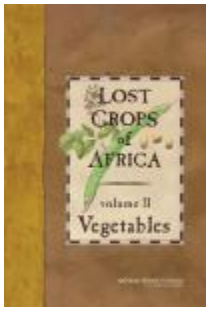


Lost Crops of Africa: Volume I: Grains (1996)

There is an overlooked food resource in sub-Saharan Africa that has vast potential: native food plants. All in all, Africa has more than 2,000 indigenous grains, vegetables, and fruits—"lost" species due for rediscovery and exploitation. This volume focuses on native cereals, dispelling myths about the nutritional value, flavor, and yield of African grains. The report presents information on where and how each grain is grown, harvested, and processed, and lists its benefits and limitations as a food source.



Lost Crops of Africa: Volume II: Vegetables (2006)

This study describes 18 little-known native African vegetables (including tubers and legumes), selected by contributors as promising candidates for increased appreciation in Africa and possibly elsewhere. The report assesses the state of knowledge, the promise, and the limitations of these representative vegetables, with each summarized in terms of malnutrition, food security, rural development, and environmental sustainability in Africa. Every species is also described in a separate chapter detailing uses, horticulture, prospects, and botanical information.

For More Information

Copies of *Lost Crops of Africa Volume III: Fruits* (382 pp.) and related volumes are available from the National Academies Press; (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area), or may be read free online at *www.nap.edu*. For more information on the project, contact staff at (202) 334-2801or visit the Policy and Global Affairs web site at *www.nationalacademies.org/pga* (see Capacity Building).