

October 2011
Issue 113

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ECHO is a global Christian organization that equips people with agricultural resources and skills to reduce hunger and improve the lives of the poor.

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Look Inside for Exciting Information about ECHO's New Online Community Portal!

The Importance of Indigenous Food Plants

By Dawn Berkelaar

An important part of ECHO's ministry is sharing information about underutilized plants. Many of the seeds in our seed bank are for crops that have not been heavily researched, but that have been found to grow well under challenging conditions and that are already important to people in some places. Introducing such crops in a new location can make a significant impact on nutrition and food security.

In any location, there will be some *indigenous food plants*. These are edible plants native to and characteristic of a region or country. Closely related are *traditional foods*, defined in an article in *Ground Up* magazine as "plants that formed the pre-colonial diet." In Africa, such plants include sorghum, millet and cowpea.

Indigenous food plants can be an extremely important part of the local diet, for a number of reasons:

- Indigenous food plants tend to be very nutritious, often more nutritious than some introduced (and perhaps more popular) plants.
- Indigenous crops are well-adapted to the regions where they originate. They often are free of pests and diseases, and are able to grow in extremely difficult conditions (in very dry areas or in very acidic or

alkaline soil, for example). Sometimes they have even come to be considered weeds!

- The diversity provided by eating indigenous vegetables contributes to food security. Rather than relying on one food crop, a wide range of food plants are eaten and enjoyed. If one fails to grow and produce, others can be eaten instead.

People in a given area likely have some history of eating indigenous plants, though in many places such knowledge is rapidly being lost. One reason is a widespread impression, especially among younger people, that traditional varieties are 'primitive' or 'old,' and that farming is a disgraceful vocation.

The purpose of this article is not to highlight specific edible indigenous plants, but rather to encourage you to explore indigenous vegetables in your area. We hope some of the resources highlighted in this article will help you in that process.

How to Learn About and Promote Indigenous Vegetables

Ask around. A good way to start is to ask local people—especially elderly people—about foods that people used to eat.

Seed fairs are a concrete and practical way to increase awareness of local varieties. ECHO has a Technical Note on the subject of seed fairs (see www.echonet.org/repository#959:d:SeedFairs). In addition, an upcoming issue of *ECHO Asia Notes* will contain an article about seed fairs (we will put a link to the article in a future *EDN* issue).

Food fairs can also be helpful. *Ground Up* magazine, published by the Participatory Ecological Land Use Management Association (PELUM),

described a display held during an annual agriculture show in Zimbabwe. Mothers who visited the display were given recipes for traditional/indigenous foods, which were advertised as being healthy, cheap and locally available. *Ground Up* also shared information about an international food fair, in which participants from different countries exhibited and shared knowledge about indigenous crops and foods.

Helpful Resources

Crops for the Future (www.cropsforthefuture.org/; formed from the International Centre for Underutilized Crops and the Global Facilitation Unit for Underutilized Species) is an organization “dedicated to the promotion of neglected and underutilized plant species as a contribution to humanity.” Crops for the Future includes both food and non-food crops.

The **Underutilized Species Database** (www.underutilized-species.org/species/about_species.asp) shares information about specific plant species, including origin, distribution and uses. Information from this site is gradually being moved to the Crops for the Future website.

Worldwatch (www.worldwatch.org) has some good resources. Here is a link to their blog:

<http://blogs.worldwatch.org/nourishingtheplanet/tag/indigenous-crops/>

Worldwatch also has a pdf document of African Indigenous Crops, containing one-page descriptions for 20 different crops: www.worldwatch.org/system/files/NtP-Africa's-Indigenous-Crops.pdf

The **NewCROP Database** from Purdue University (www.hort.purdue.edu/newcrop/default.html) shares profiles of a great many new and specialty crops. (One link in the Table of Contents is for “Famine Foods: A list of unconventional food sources.”)

Food Plants International. Bruce French has compiled an online database called “Food Plants International” (FPI; www.foodplantsinternational.com). It contains information on about 18,000 edible plants. Mr. French spoke at ECHO’s December 2010 Agriculture Conference in Florida. FPI information is shared with the objective of “Helping the Hungry Feed Themselves.” The database can be used to identify local plants; it gives “information on scientific name, genus, common names, synonyms, plant description, production and use notes, nutritional value, pictures and references.” Sometimes information is lacking in a category. If

During a tour of the AVRDC-RCA demonstration garden in Arusha, Tanzania, we saw many varieties of plants, including the following:

Jute mallow (*Corchorus olerarius*). Leaves are eaten as a cooked green.

Cranberry hibiscus (*Hibiscus sabdariffa*). Leaves are helpful for anemia; fruits are eaten too.

Ethiopian mustard/kale (*Brassica carinata*). A variety called ML EM-1 has been found to taste especially good.

Spider flower (*Cleome gynandra*). We were told this plant is good for people with HIV.

African nightshade (*Solanum scabrum*).

Hairy lettuce (*Lactuca* spp)

Several **moringa** varieties.

African eggplant. Can eat leaves of some varieties.

Amaranthus cruentus, var “ex Zim.” Leaves of this plant can be harvested continually, as long as it gets enough water.

Amaranthus dubius, “ex Zan.” Very productive; doesn’t seed quickly. Good for the rainy season.

Mung bean (*Vigna radiata*). This is eaten with rice along the coast.

Sunn hemp (*Crotalaria juncea*). Eaten as a vegetable when young.

you have information to add, please contact FPI through their website.

Several documents (mainly geared to Papua New Guinea) are available from the FPI web site. These include *Growing the Common Food*; *Food Plants Book*; and *Food Crops Introduction*.

AVRDC/World Vegetable Centre. AVRDC, The World Vegetable Center (www.avrdc.org), is an organization that encourages the increased production and consumption of vegetables. The Center, located in Taiwan, was established in 1973. It now has many regional centers and offices, and even sub-regional offices.

Globally, the World Vegetable Center has four main research and development themes: collecting germplasm (i.e. seeds of many selections of the same crop, with differences in traits); breeding; production; and consumption. The organization has more than 57,000 plant accessions.

In February, I (with other ECHO staff members) visited the World Vegetable Center-Regional Center for Africa (RCA) in Tanzania. This regional center was established in 1992. Genetic resources scientist Dr. Marilyn Belarmino shared information about the Center’s activities and also gave us a tour of the facilities.

AVRDC-RCA promotes traditional vegetables, including spider flower, nightshade and amaranth. The Regional Center has more than 4000 plant accessions, many of them African, and all open-pollinated (so that seed can be saved and planted). The collection includes 546 accessions of amaranth. Other collected accessions include African eggplant and Ethiopian mustard. Four tomato varieties suited for Tanzania have been developed and shared.

Varieties of indigenous vegetables that are developed by AVRDC-RCA are released through national partners. AVRDC-RCA also works with private seed companies to distribute promising varieties.

AVRDC-RCA provides training in various ways: through a three-month training program; field days; home gardens with nutrition seed kits; Healthy Diet training kits; and work with farmers' groups. The Center holds a seed fair in March and field days in November.

At the Center, seeds are kept in a seed storage room, and regularly cycled through germination trials and grow-outs. Seeds were originally collected in partnership with the German Society for International Cooperation (GIC; better known as GTZ), through an initiative called "Promotion of Indigenous Vegetables in Africa."



Figure 1: A variety of nightshade (*Solanum sp.*) being evaluated for leaf production at AVRDC-RCA. Photo by Tim Motis.

Plant Resources of Tropical Africa (PROTA). PROTA (www.prota.org/) has an online database (also available as six books with accompanying CDs) with around 1200 review articles (covering 2000 species). The goal is to categorize the useful plants of Africa. PROTABASE (the online database) can be searched by scientific name, common name, and geographical distribution. It can also be searched by "commodity group."

So far the database commodity groups include: cereals and pulses; vegetables; dyes and tannins; timbers; medicinal plants; and vegetable oils.

"PROTABASE contains the review articles. The species treated in extended format have a botanical drawing, a distribution map and color photographs to illustrate the species and its uses. The information presented to the user is drawn from different linked databases."

Native Seeds/SEARCH (NS/S) in Tucson, Arizona.

According to the website (www.nativeseeds.org), "Native Seeds/SEARCH conserves, distributes and documents the adapted and diverse varieties of agricultural seeds, their wild relatives and the role these seeds play in cultures of the American Southwest and northwest Mexico. We promote the use of these ancient crops and their wild relatives by gathering, safeguarding, and distributing their seeds to

farming and gardening communities. We also work to preserve knowledge about their uses."

The NS/S seed collection includes 1800 varieties of plants adapted to arid conditions. Many of the varieties are rare or endangered. Currently 350 varieties are available for purchase; more than half are varieties of corn/maize, beans and squash (traditionally referred to by North American natives as the "three sisters"). Other offerings include chia and various species of amaranth and sunflower.

The Native Seeds/SEARCH website also includes helpful information on desert gardening and on saving seeds.

Bioversity International. IPGRI (the International Plant Genetic Resources Institute) and INIBAP (the International Network for the Improvement of Banana and Plantain) are now known as Bioversity International (www.bioversityinternational.org). The Bioversity website has helpful material with regard to indigenous and/or underutilized food plants.

The New World Fruits Database is a source for information on fruits from the New World, including scientific and common names, fruit and plant uses, distribution and origin. You can also find links to extra information.

www.bioversityinternational.org/databases/new_world_fruits_database/search.html

The Bioversity website also has information booklets (pdf format) about 11 food tree species in sub-Saharan Africa, including the bush mango, shea butter and baobab trees. Documents are available in English and French.

www.bioversityinternational.org/about_us/hosted_activities/saforgen/african_food_tree_species_leaflet_series.html

Years ago, IPGRI published a series of 25 monographs on underutilized plants. They are available on the Bioversity website. A list with links to the pdf documents is found here. <http://tinyurl.com/ipgri-pub-links>.

IPGRI has a book about Traditional African Vegetables that can be accessed from the Bioversity website: www2.bioversityinternational.org/publications/web_version/500/begin.htm#Contents

National Academies Press. Several helpful books are available from the National Academies Press (NAP; www.nap.edu), including the "Lost Crops" series. Books can be freely read online, or (if you register an e-mail address and password) downloaded as pdf files. Alternatively, hard copies of the books can be purchased from NAP.

-*Lost Crops of Africa: Volume I: Grains*
www.nap.edu/catalog.php?record_id=2305

-*Lost Crops of Africa: Volume II: Vegetables*
www.nap.edu/catalog.php?record_id=11763

-*Lost Crops of Africa: Volume III: Fruits*
www.nap.edu/catalog.php?record_id=11879

-*Lost Crops of the Incas* is also available from NAP:
www.nap.edu/catalog.php?record_id=1398

Asian Plant Name Databases. *ECHO Asia Notes (EAN;* Issue 5, April 2010) highlighted a few helpful websites. Especially when working among different language groups, these databases are helpful for figuring out the scientific name if you know a common name, and vice versa. The information from *EAN* is reprinted here:

1. “The Multilingual Multiscript Plant Name Database (MMPND; www.plantnames.unimelb.edu.au/Sorting/List_bot.html) hosts more than one search engine related to international botanical taxonomy and plant references. It also offers access to a massive collection of indexes, lists and references for a wide range of plant groups including bamboos, vegetables, conifers, palms, fungi and medicinal plants. Associated with the University of Melbourne, MMPND is a one-stop resource for development workers, educators, students, researchers, translators and others whose work might lead them into the often confusing world of international and regional plant names.

“One key component of the MMPND is the ["On-line Bibliographical Resources"](#) section, which lists links to dozens of sites suited to either professionals or plant enthusiasts. These resources provide indexes, photo galleries, search engines and information sources for dozens of botanical categories including aquatic plants, forage crops, spices and weeds.

“For those in need of international and regional plant names, MMPND offers extensive lists in 70 languages, including those in authentic, non-Romanized Asian scripts (e.g., Chinese, Thai, Burmese). From *Abelmoschus* to *Zoysia*, international names for roughly 500 genera of plants are offered. Additionally, separate indexes of plant names for several Asian languages include Bengali, Burmese, Chinese, Hindi, Japanese, Korean, Malay, Nepali, Tamil, Thai, Urdu and Vietnamese.

“Michel Porcher, who began developing this valuable on-line resource in 1995, reports that MMPND receives over one million hits per week. With such a vast array of botanical information, that should come as no surprise.”

2. Glossary of Asian Vegetables. “Mike Fennema, who works with CRWRC in Laos, recommended another useful website called the [Glossary of Asian Vegetables](#)



(<http://new.dpi.vic.gov.au/agriculture/horticulture/vegetables/vegetables-a-z/asian-vegetables/asian-vegetables-glossary>; previously titled *Thesaurus of Key Asian Vegetables*);

“Hosted by the Department of Primary Industries for the state of Victoria, Australia, the web-based glossary provides

different regional names (in the Latin alphabet) and photos of 74 key Asian vegetables.

“Providing multiple Romanized Asian names for 74 species of vegetables is a major undertaking. Since such phonetic spellings are unable to communicate tones and various linguistic nuances, persons familiar with these regional names may find a few limitations. But shortcomings aside, this glossary offers a valuable and concise tool for anyone looking for names and photos for Asian vegetables.”

The list of resources shared here is certainly not exhaustive. If you know of a similar helpful resource for learning about and promoting indigenous food plants, please let us know.

Conclusion

Indigenous food plants have traditionally been very important in communities, but many are becoming rare or endangered. Their advantages make them well worth investigating. We hope the ideas and resources in this article help you to learn about and promote indigenous food plants, resulting in better nutrition and food security for small-scale farmers and their communities.

Famine in the Horn of Africa

By Bob Hargrave

The current drought and famine in the Horn of Africa are deeply distressing. The severe drought of the past year has put an estimated 12 million or more people in danger of starvation.¹

The news coming out of Ethiopia, Kenya and Somalia is discouraging. According to the Director General of the International Food Policy Research Institute (IFPRI), the news is “nothing short of shocking:

- More than 12 million people in need of life-saving care in Ethiopia, Kenya, and Somalia.
- 29,000 children dead since mid-May.”²

As early as last year, the Famine Early Warning System Network (FEWS-NET) warned of drought.³ In Ethiopia and Kenya, plans were made and food is being delivered to those in greatest need. But as Josette Sheeran, Director of the World Food Program, remarked in a recent interview, “Droughts may not be avoidable, but famines are.”⁴ In Somalia, relief food cannot get to people who need it, due to the lack of security. It is there that this crisis has been officially declared a famine.⁵

The situation is also serious in the refugee camps in Kenya near the Somali border. In a recent address to IFPRI, US Secretary of State Hillary Rodham Clinton commented on Dadaab, a refugee complex in Eastern Kenya:

“Even before this emergency, it was the largest refugee camp in the world. Some people have been living there now for 20 years. It was originally built for 90,000 people. Twenty years later, more than 420,000 live there, including thousands of third generation residents.” She also commented, “Well over a thousand people arrive every day.”¹

Our thoughts and prayers go out to the millions who are suffering through this crisis, and to those who are working tirelessly to save lives.

Can this be Africa’s last famine?

What can be done to prevent famines in the future? What should be the role of ECHO and those of you in the ECHO global network?

Scientists, policy makers and development practitioners agree that long term solutions include:

- Assisting smallholder farmers to increase production
- More drought-tolerant crops
- Resilient farming systems, flexible enough to produce under variable conditions
- A functioning government
- Improved infrastructure
- Favorable national and international trade policies
- For pastoralists:
 - Better access to fair markets
 - Better animal health care
 - Good range management systems (appropriate stocking rates; access to water; managed forages)
 - Diversification into crop production, incorporating agroforestry practices and supplemental irrigation where possible.

Long-term solutions for dealing with drought and avoiding famine will take concerted effort from all stakeholders, from the individual farmer with limited resources (and those of you living among and assisting those communities) all the way up to international policies and the highest levels of government.

We at ECHO work to provide you with information, ideas and encouragement, so that you can promote proven best practices such as Conservation Agriculture (see [EDN 98-1](#)) and Farmer Managed Natural Regeneration ([EDN 58-4](#) and [90-3](#)). We encourage you to cooperate with government agriculturalists to identify crops that are best suited for your country and climate zone. Kenya and Ethiopia have strong agricultural research organizations and have developed drought-resistant crops. There has also been a renewed interest in indigenous vegetables, as reported in this issue. In many of the drier areas, improvements in supplemental irrigation will be key to reducing risk for farmers while increasing production and crop diversity.

ECHO cannot offer a simple immediate solution to the disaster in the Horn of Africa. But we all have a part to play in improving the complex global system of food security. Thank you for your faithful service in your community. May we all continue striving for a world without hunger.

Footnotes

¹ Remarks by US Secretary of State Hillary Rodham Clinton at IFPRI. www.state.gov/secretary/rm/2011/08/170417.htm

² Shenggen Fan, Director General, International Food Policy Research Institute (IFPRI), Opening Remarks, IFPRI Special Event,

From Famine to Food Security: Meeting the Challenge in the Horn of Africa, Address by US Secretary of State Hillary Rodham Clinton, August 11, 2011.

www.ifpri.org/sites/default/files/Shenggen_Fan_Statement.pdf

³ www.fews.net/Pages/default.aspx

⁴ www.pbs.org/newshour/bb/world/july-dec11/famine2_07-29.html

⁵ Famine thresholds surpassed in three new areas of southern Somalia www.foodsecurityportal.org/sites/default/files/somalia_08032011.pdf

East Africa’s Drought: Q and A

World Vision (WV) Australia is involved in both agricultural development and relief work in East Africa. We asked folks there to answer a few questions regarding the current drought and famine.

In what ways have you been involved with addressing the drought and famine in the Horn of Africa?

Ms. Andrea Swinburne-Jones sent a link with details on work WV has been doing

(www.worldvision.com.au/Issues/Emergencies/Current_Emergencies/HornOfAfricaDrought2011.aspx). WV has provided food, water, and relief items, has helped rehabilitate wells and boreholes, and has provided seeds for planting prior to the upcoming rains. Current WV emergency response includes food distributions; supplementary feeding for malnourished children and lactating women; medical support (disease control, and immunization of children and mothers); provision of water; livestock vaccinations; and provision of seeds for planting prior to the upcoming rains.

Could you give us your assessment of the severity of the drought there? Perhaps compare it to previous droughts in that part of Africa.

Ms. Swinburne-Jones commented that this is the worst drought in 60 years, and that the number of drought cycles has increased so that droughts are happening more frequently.

Tony Rinaudo is not directly involved in famine relief, but has had long-term involvement in developing and promoting long term solutions and preventative measures. He also responded to several questions.

In your experience, what have been the most successful approaches or farming systems in coping with drought?

Tony Rinaudo (TR): “1. Agroforestry farming systems including Farmer Managed Natural Regeneration (FMNR), which come under the umbrella of ‘Evergreen agriculture.’ Measurements in West Africa indicate that crops grown in the presence of trees produce double or more the yield compared to crops in the open; fodder availability for livestock increases; wild foods return and alternative income streams (through sale of wood and non-timber forest products) becomes possible. So through forestry and agroforestry, communities become much more resilient to the vagaries of the weather. Even when the annual crops fail, trees provide ongoing income and food streams for people to access. In many marginal years when crops would have failed, the

presence of trees [moderates] the weather conditions and enhances soil fertility enough for the crops to ‘produce something.’

To watch short videos about Evergreen Agriculture and FMNR, see: www.youtube.com/watch?v=pT29wqcACIA and www.youtube.com/watch?v=E9DpptI4QGY

“2. Soil and water conservation measures. In the Tigray region of Ethiopia, communities have restored barren hills through creating enclosure areas for natural regeneration of trees, and they have dug kilometers of contour ditches and blocked erosion gullies with mini dams. This has resulted in less flooding when it does rain, and in dry periods people don't have to worry because water tables in the lowlands have risen—now many farmers have motor pumps and can produce two to three dry-season cash crops per year.

“3. Conservation agriculture. The work of Foundations for Farming and other groups promoting such practices (sowing seeds in fertilized pits, mulching, minimum till, etc.) have resulted in great increases in yield without reliance/dependence on inaccessible or expensive inputs.” [See [EDN 98-1](#).]

Are there specific crops or tree-crop (agroforestry) combinations that have proven to be resilient in light of reduced rainfall?

TR: “FMNR remains my first recommendation, because it is cheap, rapid and does not rely on external resources. Anybody can do it and the impacts can be felt with increasing effect from the first year on. In particular, *Faidherbia albida* could be one of the great untapped resources of our time, if its effect on crops and livestock were appreciated. See “Turning Back the Desert” in chapter 3 of www.wri.org/publication/world-resources-2008-roots-of-resilience

See also www.agriculturesnetwork.org/magazines/global/securing-seed-supply/the-development-of-farmer-managed-natural

“In my experience moringa is also greatly underutilized, even in many parts of Ethiopia where it is indigenous.

“I also remind readers of the ECHO article Paul Woods and I submitted some years ago—“The Green Famine” [In [EDN 77-1](#)]. Sorghum, millet, cassava, sweet potato, pigeon pea, lablab bean and many others remain excellent drought-resistant food crops. However, they have low status in many societies. I don't advocate for the complete replacement of maize with these other crops, but any agricultural system that is dependent on a single, annual crop such as maize in a highly variable climate is risky to say the least. In such climates, maximization of biodiversity is critical to food security. Biodiversity [almost] guarantees that in any year there will be something that can be harvested, either to sell or to consume directly.

“WVA and SIM, and now other organizations, continue to research, develop and promote edible-seeded acacias. There is still much to be done, but we know enough for certain environments to promote these drought-hardy species and their nutritious seeds.” See:

http://210.247.227.129/Libraries/AnnualProgramReview09_CaseStudies/Wattle_We_Eat_for_Dinner.sflb.ashx

What other advice would you give to development workers serving farmers in famine-affected areas? This could be specific, in terms of farming techniques, or a few key principles that our readers should be aware of.

TR: “1. Start with and build on what people already know. If they are growing and prefer maize, it is nearly always possible to increase yields through simple steps like mulching, zai holes, micro-dosing with NPK (see [EDN 84-3](#)), improved seed, and timeliness of planting.

“2. There is nearly always an individual or group in-country who have introduced or devised a successful approach: permaculturalists; organic farming groups (e.g. Kenya Institute of Organic Farming in Kenya); IFAD; etc. Facilitate learning and exchange visits, and get your farmers talking and planning what they want to do to confront their problems.

“3. Get a copy of the film 'The Man who stopped the desert.' It is an inspirational story about Yacouba Sawadogo. Along the lines of point number 1 above, Yacouba simply improved on the traditional planting pit. While his neighbors' crops failed, he was able to feed his family. For a trailer, see: www.youtube.com/watch?v=Dzah_5y65AU

“4. A message to agencies involved in long-term agricultural programs: redouble your efforts to introduce sustainable farming techniques. Too many development agencies confronted with slow onset disasters, as in the case of drought-induced famine, get so caught up with relief that they put development activities on hold. While the services that relief agencies provide in times of such extreme crisis are essential, this is the very time when efforts to introduce sustainable and appropriate methods should be increased.

“During the severe famine of 1984 in West Africa, our team ran a ‘food for work’ program which introduced FMNR on a district-wide scale. Nearly 20 years later, we have discovered that this action directly contributed to the fact that Niger is the only African nation experiencing net afforestation [establishment of forest where there was no forest previously], with some 5 million hectares of farmland now having tree cover. As a result, Chris Reij, Gray Tappan and Melinda Smale wrote about this in chapter 7 of *Millions Fed: Proven successes in agricultural development: ‘Re-Greening the Sahel: Farmer-led innovation in Burkina Faso and Niger’* (www.ifpri.org/publication/millions-fed).

“Many villages now have 10 to 20 times more trees than 20 years ago. In the area where the project took place, 88 percent of farmers practiced FMNR in their fields, adding an estimated 1.25 million trees each year.

“Because of FMNR, farmers in Niger are producing an estimated additional 500,000 tons of cereals a year. This additional production covers the requirements of 2.5 million people out of a total population of about 15 million in 2009. FMNR also has an indirect impact on food security through tree crop products, which farmers can harvest and sell in local

