

Neglected and Underutilized Crops: What They are and How to Identify Local Food Plants



Shining the light on local food knowledge

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Diminishing Plant Species Biodiversity

Fill in the blanks with (your best guess of) the correct numbers:

- During their history, human beings have used over _____ plant species for food, fiber, forage, fuel, industrial, cultural and medicinal purposes.
- Approximately _____ cultivated species are still in use today around the world.
- Less than _____ plant species are currently commercialized and in use on a global scale.
- Just _____ of these provide over 75% of the world's food, with the majority of the calories coming from just three: corn, rice & wheat.

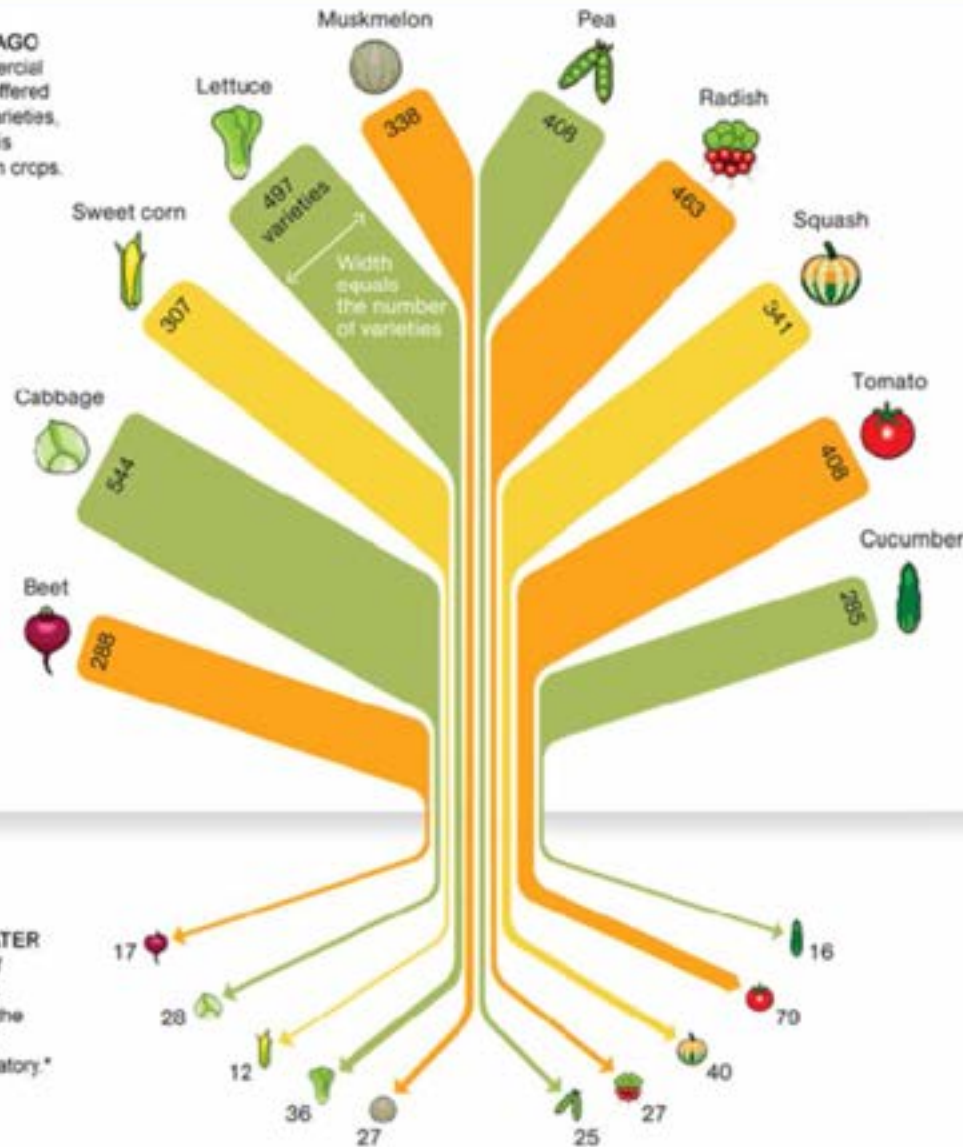
Diminishing Plant Species Biodiversity

Fill in the blanks with (your best guess of) the correct numbers:

- During their history, human beings have used over 40,000 plant species for food, fiber, forage, fuel, industrial, cultural and medicinal purposes.
- Approximately 7,000 cultivated species are still in use today around the world.
- Less than 150 plant species are currently commercialized and in use on a global scale.
- Just 12 of these provide over 75% of the world's food, with the majority of the calories coming from just three: corn, rice & wheat.

Diminishing Crop Species Biodiversity

A CENTURY AGO
In 1903 commercial seed houses offered hundreds of varieties, as shown in this sampling of ten crops.



80 YEARS LATER
By 1983 few of those varieties were found in the National Seed Storage Laboratory.*

* CHANGED ITS NAME IN 2001 TO THE NATIONAL CENTER FOR GENETIC RESOURCES PRESERVATION

JOHN TOMANIO, NGM STAFF, FOOD ICONS: QUICKHONEY
SOURCE: RURAL ADVANCEMENT FOUNDATION INTERNATIONAL

Comparison of seed varieties sold by commercial U.S. seed houses in 1903 with those in the U.S. National Seed Storage Laboratory in 1983. The survey found that about 93 percent of the varieties had gone extinct.

National Geographic, July, 2011

A Narrowing Pool of Global Food Crops

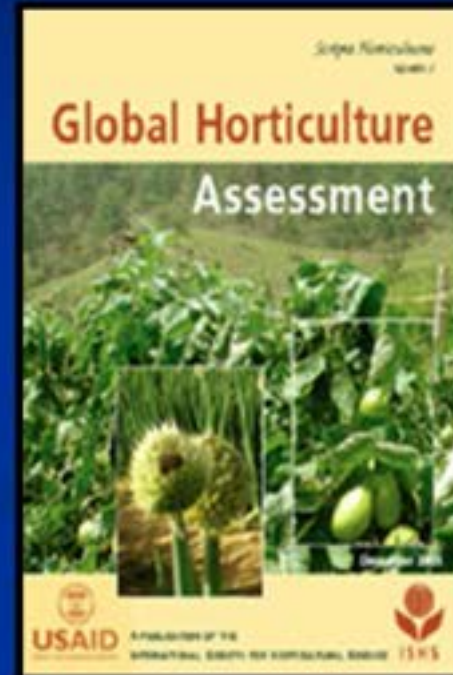
Is it realistic to expect to feed a population of more than 7 billion people, which is expected to rise to more than 9 billion within 40 years, from a base of only 30 crop species?

(Hart, 2007)



Global Horticulture Assessment (2005)

- Theme: Genetic Resource Conservation and Development
- “Development of seed and planting stock programs, *focused on locally adapted and market-demanded varieties*, will lead to greater yields and higher market values. ... *traditional knowledge and native horticultural varieties* must be identified, characterized and conserved.” (Global Horticulture Assessment, pg.2)



Another Look at Neglected and Underutilized Species (or Crops)- NUS

- Definition of **underutilized crops** – “Species with underexploited potential for contributing to food security, nutrition, health, income generation and environmental services.” (FAO- 2007)
- Also known as: neglected, minor, lost, promising, alternative and traditional (Hart, 2007).

But regarded as underutilized by whom?

Neglected & Underutilized Species (NUS)

- Central to local, informal seed systems
- Important role in smallholder farmer livelihoods
- Untapped potential for commercialization (market-driven, science-based)



Wise Use of Underutilized Species Can:

- Contribute substantially to food security
- Increase incomes among the poor
- Improve nutrition and health
- Sustain healthy ecosystems



Why Might a Crop be NUS?

- Limited range of growth (e.g. particular growth requirements)
- Limited recognition (ethnic)
- Products not as able to be transported or processed as wheat, corn or rice for distribution
- Edible portions inconvenient to access (e.g. edible hearts of rattan shoots are cloaked in thorny stems)
- Nutritional issues and toxins require special processing
 - High oxalates (taro leaves and stems)
 - Cyanide compounds (chaya, cassava leaves and tubers)
- Not widely considered as palatable (bitter, astringent)



Job's tears - *Coix lacryma-jobi*



White Thorn Rattan - *Calamus viminalis*



Indian trumpet - *Oroxylum indicum*

Should You Consider Promoting NUS in Your Focus Area?

- Is food security an issue for any specific communities within particular locations/ecosystems in your focus area?
- What are the constraints in accessing food or food-producing crops?
- Are there any environmental factors negatively affecting local food production?
- Are there many alternative crop options available, especially for family food security?



Key questions

Are There NUS of Interest Already in Your Focus Area?



Fan palm - *Livistona speciosa*



Niger seed - *Guizotia abyssinica*



Elephant foot yam - *Amorphophallus paeoniifolius*

- How can you locate them?
- Are they very common among a small population or region but unknown beyond?
- Are they widespread but still considered minor?
- Where can you locate scientific information about these crops?

Key questions

Are There Possible Non-Local NUS That Might Be Useful and Appropriate for Your Focus Area?



Chaya - *Cnidoscolus aconitifolius*



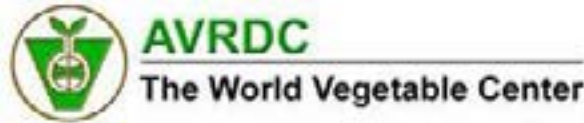
Gac - *Momordica cochinchinensis*

- Are there any non-local underutilized crops that might grow well under local environmental conditions?
- Would such crops be adopted by local growers and consumers?
- How can these crops be located, and evaluated?

Key questions



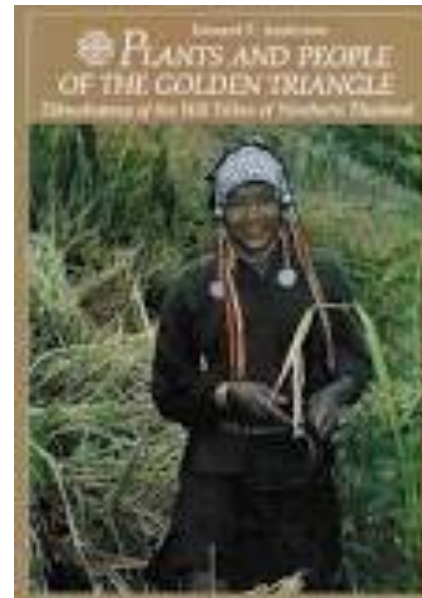
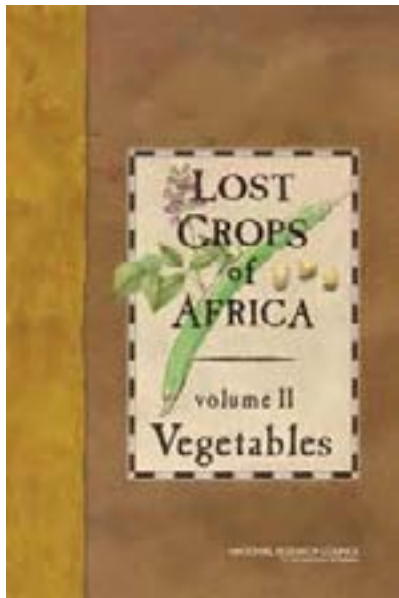
Where to Start: Beginning the Survey- Using What is Already Available



- **The Food and Agriculture Organization (FAO)**
- **CGAIR**
- National or local universities
- Local governmental agencies

Possible international sources of information and seeds for underutilized crops

Resources: Local/Regional Reference Books



Look for authoritative regional publications - Do not forget to consult guides in local/regional languages.

Local/regional sources of information on crops of possible interest

Market Surveys

With knowledgeable persons, survey local markets to determine the availability of different types of major crops as well as underutilized crops.

Field Work



Mountain Date Palm - *Phoenix loureiroi*



Surveying Local Foods and Ingredients

Talk with families, especially the cooks, to determine what is being consumed locally.



Field Work

Field Work: Farm and Garden Surveys

Local farmers and gardeners will be your most valuable resource in determining which underutilized crops are being grown.

Field Work



Field Work: Swapping Seeds



Informal seed sharing or organized seed fairs.



Field Work

“All I saw were some bushes”

What would be a garden full of edibles to a local person might only appear to be random plants to an outsider.

Community-based surveys



Rely on Persons with Local Knowledge to Help Interpret the Information



Community-based surveys

Is It a Wild Food, a Crop, or Both?

- Wild foods, from forests, swamps, lakes and streams are a key component of diets throughout the developing world.
- Some of these foods are also semi-domesticated, being grown on farms, gardens and waterways.

Community-based surveys



Clerodendrum spp.



Vegetable Fern - *Diplazium esculentum*



Giant Bamboo - *dendrocalamus giganteus*

Identifying and Promoting NUS in Agroforestry Systems

- Hilltribe farmers in N. Thailand began to cultivate various wild foods, such as snowflake tree, that were once naturally common.



Snowflake Tree – *Trevesia palmata*



Bitter Rattan – *Calamus siamensis*

Identifying and Promoting Non-Timber Forest Product Species-Based Agroforestry Systems

UHDP worked with local communities to catalog dozens of species of interest (i.e. underutilized crops) and propagate seeds/seedlings



Underutilized crop promotion case study

Identifying and Promoting Non-Timber Forest Product Agroforestry Systems

Farmers planted agroforest plots containing these underutilized crops for household consumption and sale.



Underutilized crop promotion case study

Promotion of Chaya in SE Asia



- Gardeners already have an affinity for greens and appreciate the perennial vegetables, such as chaya, for being a low maintenance crop.
- Successfully introduced/promoted

Opportunities for Identifying NUS

- Underutilized crop surveys offer a excellent chance to learn about local food systems and related development issues.
- Efforts honor local farmer knowledge and contribute toward building helpful relationships.
- The learning arrangement can help lay a foundation for future collaboration for local agriculture development.

Challenges Related to Identifying NUS

- Surveys require significant preparation and cataloging skills as well as essential communication abilities.
- Don't forget gender roles
- Positive identification of underutilized crops encountered in markets, kitchens, gardens or fields may be a challenge.
- Farmers may be suspicious of survey activities