Alternative Crops for Afghanistan: Restoration of Afghan’s Society

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Neighbors of Afghanistan
Pakita & Paktika: Southeast Provinces

12 Districts (Counties)

19 Districts (Counties)
Crops in Afghanistan

• **Wheat** is the staple crop
• **Millets (proso and foxtail)** and **grass peas**: cultivated at very high elevation
• Grain legumes/pulses (mostly exported to Pakistan)
  – Mung bean/Grams
  – Chickpea/Garbazo
  – Lentils
  – Many other legume: Potential?
• Forage legumes
  – Clover (annual)
  – **Lucern (Alfalfa) - perennial**
  – Fenugreek – annual
• Oilseed crops
  – *Brassicas* (canola, brown mustard, Ethiopian mustard);
  – Sunflower,
  – Flax,
  – Safflower
The genus *Vigna* is in the plant family *Fabaceae* (Leguminosae). The genus is named after Dominico Vigna, an Italian botanist of the 17th century. They include some well-known and other less well-known beans formerly — and sometimes still, especially in non-scholarly sources — Included in the genus *Phaseolus*. Common names: "peas", "beans".
Moth Bean/Turkish gram: *Vigna acontifolia*

Small, **drought-resistant annual** trailing herb with small yellow **flowers** and deeply lobed **leaves**, grown especially in dry parts of **South Asia** for its tiny (3-4 mm) edible **beans**, which range in color from light brown to dark reddish brown. The sprouted beans taste somewhat sweet.
Cowpea: *Vigna unguiculata*

- A drought-tolerant and warm-weather crop, cowpeas are well-adapted to the drier regions of the tropics, where other food legumes do not perform well.
- Intercropped with corn, millet, sorghum.
- Cowpeas are a common food item in the southern United States, where they are often called field peas.
Azuki bean: *Vigna angularis*

**Annual vine** widely grown throughout **East Asia** and the **Himalayas** for its small (approximately 5 mm) **bean**. The **cultivars** most familiar in north-east Asia have a uniform red color, but white, black, gray and variously mottled varieties are also known. Scientists presume *Vigna angularis var. nipponensis* is the progenitor. Genetic evidence indicates that the azuki bean was first domesticated in the Himalayas. It was first cultivated in **Korean peninsula** and northeast of China before **1000 BC**.[1] It was later taken to **Japan**, where it is now the second most popular **legume** after the **soybean**.[2]
Snail bean: *Vigna caracalla*

- **Perennial** vine has fragrant flowers with a distinctive curled shape, giving rise to the common names *corkscrew vine*, *snail vine* or *snail bean*.
- Liking full sun and consistently damp soil. It prefers high heat and humidity
- Edible properties to this plant - specifically the flowers - should be verified before attempting.
Vigna mungo (Black gram)

- Common names: urad dal, urd bean, urd, urid, black matpe bean, black gram, black lentil, maas (in Nepali)
- Erect, sub-erect or trailing, densely hairy annual herb. The tap root produces a branched root system with smooth, rounded nodules. The pods are narrow, cylindrical and up to six cm long.
- is largely used to make dal from the whole or split, dehusked seeds.
Vigna radiata (Mungbean)

- Common names: **Mung Bean**, Green Gram, Golden Gram, Mash Bean, Green Soy
- Mung beans are tropical (or sub-tropical) crops, and require warm temperatures (optimally around 30-35°C). **Loamy** soil is best for cultivation.
Rice bean: *Vigna umbellata*

- Warm-season **annual vine** legume with yellow **flowers** and small edible **beans**
- It is regarded as a minor **food** and **fodder** crop and is often grown as **intercrop** or mixed crop with **maize** (*Zea mays*), **sorghum** (*Sorghum bicolor*)
- Produce large amounts of nutritious animal fodder and high quality grain.
- Widely grown in **Indo-China** and extending into southern **China**, **India**, **Nepal** and **Bangladesh**.
Chickpea/Garbanzo: *Cicer arietinum*

- The plant ~20 and 50 cm high and has small feathery leaves on either side of the stem. It has white flowers with blue, violet or pink veins.
- The Desi (local)/kala chana.
- Kabuli (meaning *from Kabul*, since they were thought to have come from Afghanistan when first seen in India) or safed chana.
Lentil: *Lens culinaris*

Lentils have the third-highest level of protein, of any plant-based food after soybeans and hemp.
**Field Peas: *Pisum sativum***

- **Annual plant.** It is a cool season crop grown in many parts of the world; planting can take place from winter through to early summer depending on location.
- The species is used as a vegetable, fresh, frozen or canned, and is also grown to produce dry peas like the **split pea**.
Faba bean: *Vicia faba*

- Faba beans have a long tradition of cultivation in **Old World agriculture**, being among the most ancient plants in cultivation and also among the easiest to grow.
Fenugreek/Greek Hay: *Trigonella foenum-gracecum*

- Annual spring legume, adapted to dry land and responds to irrigation

- Fenugreek yield and nutritional quality similar to alfalfa

- Crude protein (16 to 18%) slight lesser than that in alfalfa (18 to 20%). But holds protein quality much longer throughout the season, giving flexibility for harvest
Colver: *Trifolium*

- Several species are extensively cultivated as **fodder plants**. The most widely cultivated clovers are **white clover**
- *Melilotus* (**sweet clover**) and *Medicago* (**Alfalfa** or 'calvary clover')
- Clover, either sown alone or in mixture with **ryegrass**,
- It is palatable to and nutritious for **livestock**;

White clover: *Trifolium repens*
Forage Soybean
Grass peas: *Lathyrus sativus*

- **Legume** commonly grown for human consumption and livestock feed in Asia and *East Africa*. It is a particularly important crop in areas that are prone to *drought* and *famine*, and is thought of as an 'insurance crop' as it produces reliable yields when all other crops fail.

- Common names: *grass pea, blue sweet pea, chickling vetch, Indian pea, Indian vetch, white vetch, almorta or alverjón* (Spain), *guixa* (Catalonia), *cicerchia* (Italy), *guaya* (Ethiopia), and *khesari* (India).

- Produces a high-protein seed. The seeds also contain variable amounts of a **neurotoxic amino acid** $\beta$-N-Oxalyl-$\alpha,\beta$-diaminopropionic acid or ODAP, causes **neurodegenerative** disease that causes paralysis/Lathyrisim of the lower body.
Two important diseases in grain legumes

Ascochyta blight (top) and fusarium wilt (bottom)
Oil-Seed Crops

Brassicas: Canola, Brown/Indian mustard, Ethiopian mustard

Sunflower

Flax

Safflower
Why Legumes or Oilseed Crops?

- **Grain legume**: “Dal-Roti” Complementary major nutrients with cereals
- **Forage legume**: Support local livestock farming
- **Sustainable Ag**: Soil fertility through biological nitrogen fixation
- **Oil-seed**: Producing and processing oilseed crops can ultimately bring industry needed for job opportunities and economic development, enable women to be a greater part of processing and marketing these products, seed meal as livestock feed or organic fertilizer
- **Horticulture crops**: Nuts, grape, melon
- **Vegetables**: Brassica family- Cabbage, Collard, Kale, cauliflower, Turnip green, Chinese cabbage, Napa cabbage, Bok choy, Turnip green, mustard green
- **Industrial crop**: Cotton
Caroline Clarin, a U.S. Agricultural Advisor on the Paktika Provincial Reconstruction Team (PRT) located at Forward Operating Base (FOB) Sharana in Paktika Province, Afghanistan

- "What is your greatest challenge in agriculture?"
- Most leaders at any level reply with the same list: the need for improved irrigation, orchard trees, fertilizer, and improved seed.
- I have found that basic agricultural education is greatly needed. Vegetable seeds are not available in most local bazaars.
‘Khudar Rajje Prithibi Godyamay Purnimar Chand Jeno Jolsano Roti’

i.e. To a hunger full moon is like a burnt flat bread

Hungry stomach does not understand rational except food