

The unexploited potential of underutilized fruit crops



COURSE SEMINAR

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Amazing facts

- **30,000 plant species of the 2,50,000 known have potential to contribute to food needs.**
- **Only 7000 of these have been cultivated.**
- **Only 30 crops provide world dietary energy or 'feed the world.'**
- **In India: rice, wheat ,mango covers about 73% attention.**
- **About 6 fruit crops engage 90% researchers
Mango, banana, citrus, grape, litchi, guava.**

What are underutilized Crops?

- **The plant species that are used traditionally for the purposes of food, fiber, oil or medicinal properties etc. and their potential to contribute to food security, health, income generation and environmental services is under exploited.**



The underlying problem can be defined as:

- Over dependence on a few plant species.**
- Genetic Erosion.**
- Narrow Genetic base.**
- Loss of old crops/knowledge.**
- Crop failure.**
- Susceptibility to epidemics.**

Assumptions

- **Population growth will continue.**
- **Agricultural land will be increasingly converted to non-agricultural purposes.**
- **Globalisation will allow more international exchange of knowledge and goods.**
- **Domestic markets for new products will be increasingly influenced by international market forces, such as quality standards.**

- **Growing urbanization will lead to increased demand for convenience food and thereby to increased health problems.**
- **Interest in ecotourism and in ethnic foods will increase.**
- **Dependence of commodity crop farmers on the world market for inputs and sale of products will increase.**
- **Awareness of intellectual property rights/access and benefit sharing policies will grow.**
- **Effects of climate change will become more pronounced.**

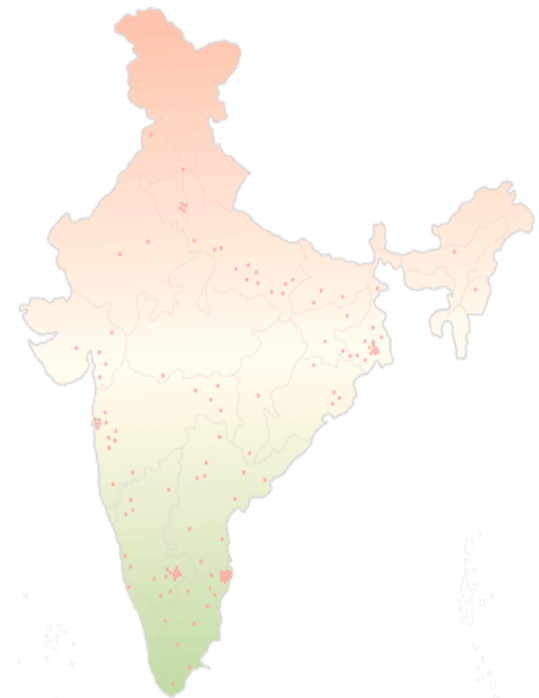
Some factors influencing today's increased interest in underutilized plants

- **Their role as alternative sources of income**
- **Collapse of commodity prices.**
- **Greater appreciation of biodiversity's role in enhancing livelihoods.**
- **Increased participation of communities in setting research agendas.**
- **Search for cultural identities.**
- **Demand for traditional food in large multi-ethnic cities.**
- **Better understanding of the limits of the Green Revolution.**
- **Greater attention to gender-sensitive research.**

➤ **-MSSRF**

Advantage India

- 20 Agro climatic zones.
- Sea level-high altitude zones.
- Vast genetic diversity.
- Muti-ethnic society.
- Oldest civilization.
- Rich traditional knowledge.
- Limited modern development.
- Lesser known plants in use.



Challenges ahead.....

- **Shrinking arable land.**
- **Poor infrastructure.**
- **Poor documentation of traditional knowledge**
- **Poor networking.**
- **Limited scientific data/ lack of references.**
- **Poor shelf life of minor fruits.**
- **Difficult to multiply.**
- **Long process of R&D.**
- **Lack of awareness about new crops.**
- **Food habit difficult to change.**

Impact

- **Diversification of food basket.**
- **Poverty and Hunger alleviation.**
- **Malnutrition & Health.**
- **Mother & child Health.**
- **Development of Cottage Industry/Industrialisation.**
- **Waste Land Development.**
- **Increased Afforestation.**
- **Employment Generation.**
- **Improvement in Economic Status.**
- **Development of Rural Areas.**
- **Export/Tourism Development.**

How to identify crops ?

- Tribal / ethenic/emergency foods.
- *Vaidya/ Hakeems.*
- Religious/ Uses during fasts.
- Festival/Exhibitions/*Melas.*
- Net working and Linkages.





Approach

- **Step I:**
- **Ethno-botanic Info, Exploration, Evaluation, Selection.**
- **Step II:**
- **Crop improvement, Agro-technology development, planting material/seed Identification.**
- **Step III:**
- **Post harvest Mgt, Value Addition.**
- **Step VI:**
- **Marketing, Networking, Awareness.**

Potential Underutilized fruit crops

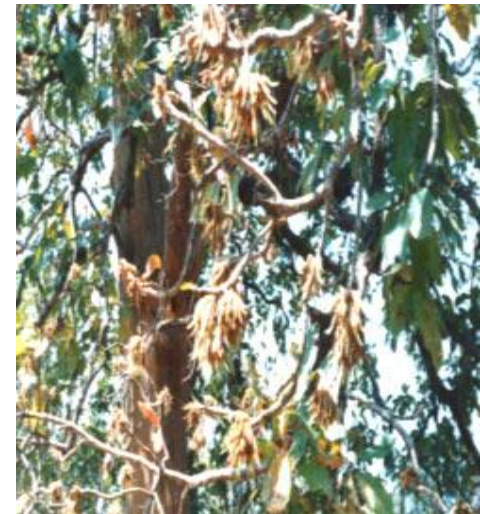
AQUATIC PLANTS

- Singhara (*Trapa natans* Roxb.)
Makhana.

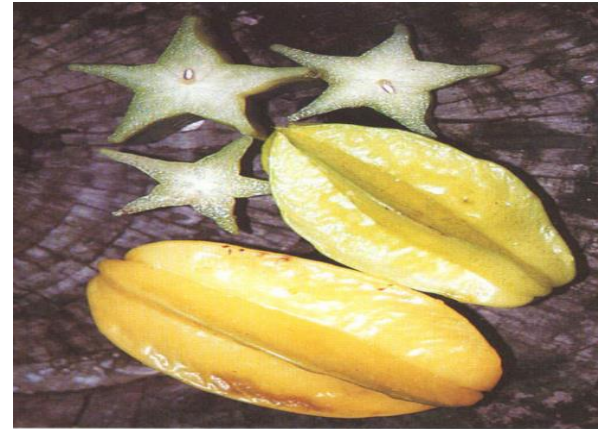


PLANTS FOR PLAINS

- Barhal (*Artocarpous lakoocha*)
- Karonda (*Carrisa karandas*).
- Mahua (*Bassia lattifolia*).



- Kamrakh (*Averrhoa carambola*).
- Khirni (*Manilkara hexandra*).
- Aonla (*Emblica officinalis*).
- Paniyala (*flokarina indica*).
- Halphahari (*Phyllanthus acidismus*).
- Lasodha (*Cordia mixa*).
- Wood apple (*Feronia limonia*).
- Cape gooseberry (*Physalis peruviana*).
- Goolar (*Ficus glomerata*).
- Kadam (*Anthocephalus kadamba*).
- Imali (*Tamarindus indica*).



Carambola stars.



PLANTS FOR HILLS

- Kaphal (*Myrica nagi*).
- Seabuckthorn (*Hippophae* sp.).
- Raspberry (*Rubus* sp.).
- Chilgoza (*Pinus gerardiana*).
- Burans (*Rhododendron* sp.).



Present Demand For Exotic Fruit Crop (Dragon Fruit)

- Dragon fruit (*Hylocerus undatus*).
- Family – Cactaceae.
- Dragon fruit available 3 variants.
 - 1- Red skin with white pulp. (*H. undatus*)
 - 2- Red skin with red pulp (*H. monocanthus*)
 - 3- Yellow skin with white pulp (*H. megalanthus*).
- Red fleshed spp. are rich in antioxidant.

- Pitaya/ Dragon fruit to journey.....
Kamalam fruit.
- Adaptable to different agroclimatic zones.
- Full production attains in 3-4 years.
- Present market demand.
- Lesser input and water.
- Health benefits.
- Fruit is slightly acidic. Rich in Organic acid
(Malonic acid and Citric acid)

- Red colour of the pulp.....Betain (15-25 mg/100g).
- Total phenols, flavonoids and antioxidant potential in pink pulp is higher than white.
- Vitamin C contain (4-10mg/100g).
- It is a herbaceous perennial climbing cactus grow to tropical and subtropical climate.
- Continuously yield for about 20 years.

Varieties....No named varieties are there

- Pink and Red pulp cultivation better yield and adoptability than the white pulp.
- Red skin (pulp colour – Pink, Red, White).
- Yellow skin- white pulp.
- Market preference in india Red and Pink pulp.
- Chinese market more demand for white pulp and other countries (Red and Pink)

Training and Pruning

- Single pole with cement and Iron ring.
- Single pole system showed better performance in growth and yield when compared to other trellis system.
- Regularly pruned to obtain an open manageable and productive umbrella shaped canopy.
- Remove excess side branches.



Dragon fruit plant

SUCCESSFUL MODELS

- **India-** Aonla, Bael, Seabuckthorn.
- **China-**Seabuckthorn.
- **Thailand-** Averrhoea, tamarind.
- **South Africa-** Cassava, Toro, Local Vegetables.
- **Indonesia-**Bamboo.



Immediate Impact

- **Upliftment in Economic status.**
- **Utilisation of nutritive fruit.**
- **Conservation of the plant.**
- **Development of Wasteland.**
- **Employment Generation.**
- **Industrialisation.**
- **Eco- improvement.**
- **Opening of Export avenues.**

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