Methods and Best Practices for enhancing use of Nutritious Small Millets in India

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Overview

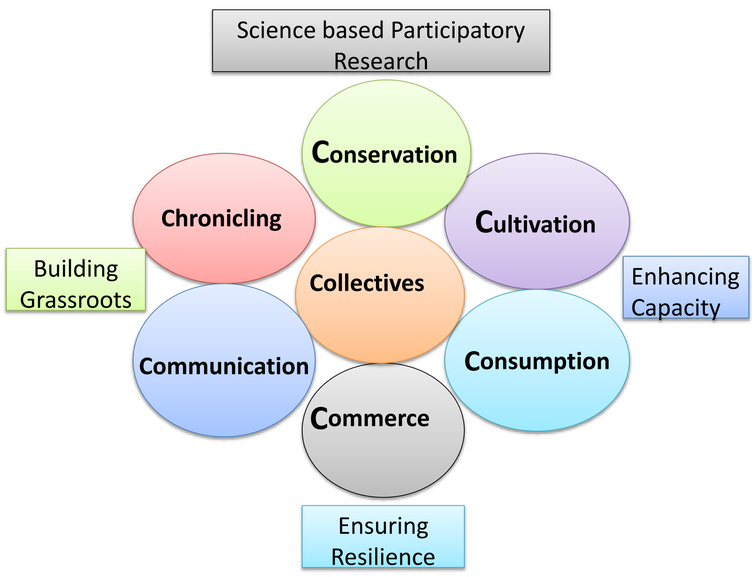
Small millet diversity belongs to the Genus *Eleusine, Setaria, Panicum, Paspalum* are rich in calcium, iron, folic acid and several micro nutrients. In addition to being climate resilient crops, they form a key component of Agrobiodiversity in hill tops; rain fed plains in India ensuring food and nutritional security for poor and marginal communities. The popular millet across India is finger millet, which is cultivated over nearly 1.6 million hectares with annual production of 2.4 million tonnes and productivity of around 1,534 kg/ha. The area under other small millets is slightly smaller (1.1 million ha) with notable lower productivity (635 kg/ha; 0.7 million tonnes/year).

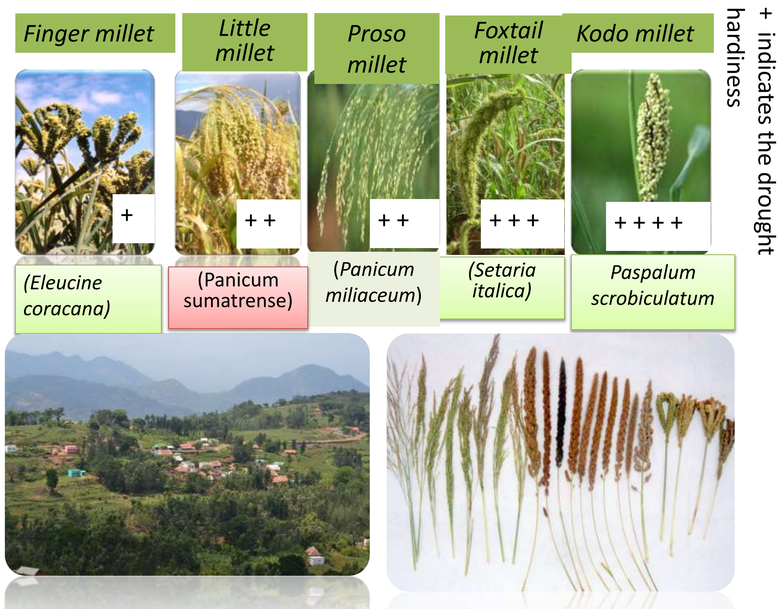
Status and Drivers

The area under small millet cultivation in India has significantly decreased since 1950s, which is ascribed to a number of agronomic and socio-economic drivers: Lack of suitable improved varieties and cultivation practices, poor extension systems for yield enhancement and crop promotion, lack of specific post-harvest and processing technologies for small holders, low economic competiveness, poorly organized value chains, lack of attractive modern food recipes, insufficient awareness of nutritional value and income opportunities.

Holistic '7C' Approach

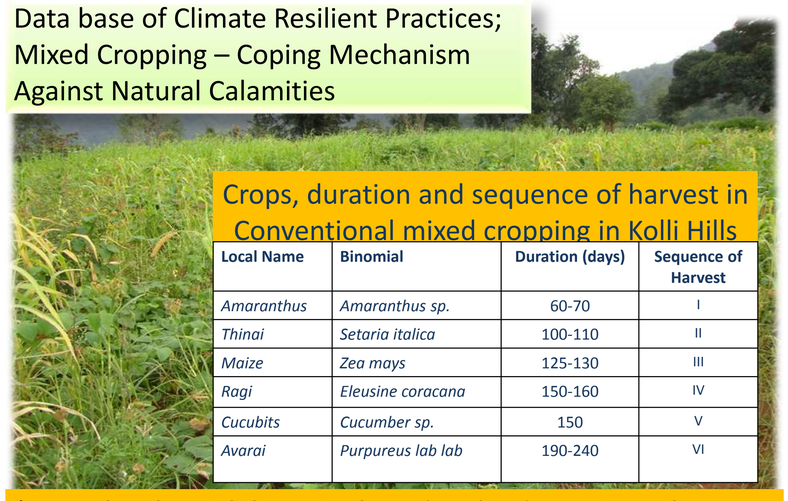
With the support of IFAD and Bioversity International, these challenges in millets were addressed in a holistic '7C'approach (Chronicling, Conservation, Cultivation, Consumption, Commerce, Collectives and Communication) over a last decade, involving custodian farming communities, state government, research and development institutions and private entrepreneurs that has resulted in continued conservation on farm, greater awareness about nutritional importance and enhanced use of nutritious small millets by varied stakeholders in India.





Chronicling Climate Smart Farming Practices

Data base of Climate Resilient Practices; Mixed Cropping – Coping Mechanism Against Natural Calamities



Crops, duration and sequence of harvest in Conventional mixed cropping in Kolli Hills

Local Name	Binomial	Duration (days)	Sequence of Harvest
Amaranthus	*Amaranthus sp.*	60-70	I
Thinai	*Setaria italica*	100-110	II
Maize	*Zea mays*	125-130	III
Ragi	*Eleusine coracana*	150-160	IV
Cucubits	*Cucumber sp.*	150	V
Avarai	*Purpureus lab lab*	190-240	VI

* Farm level variability exist based on land terrain, Soil, Farmers preferences

Traditional Knowledge, Database and linking with *Exsitu*

- Community Biodiversity Register
- Morphometric characterisation
- Local Community Seed Bank
- Scaracia Mugnosa Community Gene Bank
- NBPGR National Gene Bank

Custodians of Agrobiodiversity Network

❖Custodians: Conserve, Cultivate, Share, Innovate

Crop	Landrace Name	Traits of the Varieties
Samai/Little Millet	Perunjsamai	Suitable for Mixed Cropping,
Samai / Little Millet	Thirikulasamai	Suitable for mixed cropping, Taste, survive in poor soil
Thinai / Italian Millet	Palanthinai	Suitable for mixed crop, Taste, survive in poor soil
Thinai/ Italian Millet	Perunthinai	Suitable for mixed cropping ,
Ragi / Finger Millet	Perungkelvarg	Long duration crop (6Month), fodder,
Ragi/GPU 48	Improved Var.	High Productivity

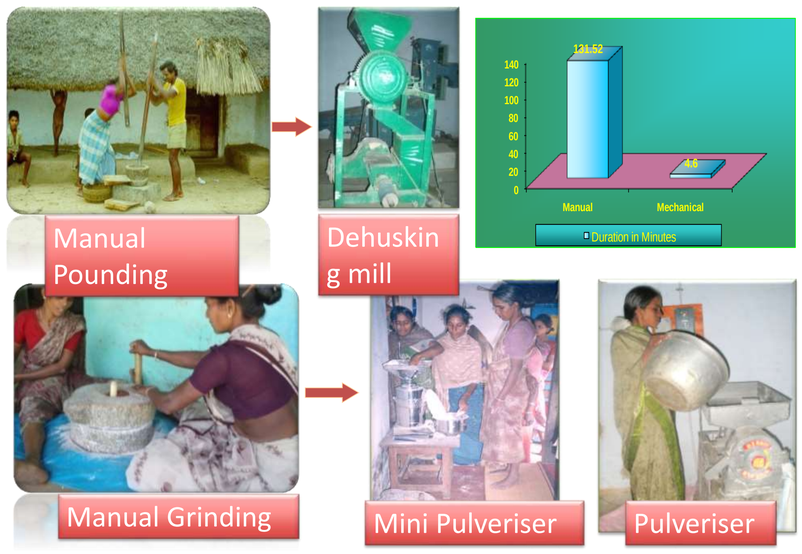
Recognizing Custodian Farmers

Productivity Enhancement(PVS, QSP, Intercropping)

- Farmer participatory research in identifying high yielding varieties through PVS
- Yield Enhancement Demonstrations for increasing productivity with profitability
- Promotion of intercrops for better nutrition
- Reduction of drudgery of women in crop production - row maker, cono weeder, inter cultivation and modified spade

FARMERS' METHOD	IMPROVED METHOD
Traditional seed	Selected quality seed
Broadcasted seed	Row planted seed
Little or no manure & fertilizers	Promote healthy soil management with use of manure & fertilizers
No regulation of plant population	Thinning and seedling density regulation
Weeding or no weeding	Weeding & interculture

Implements to reduce drudgery in processing



Value addition, Branding, Value Chain Development

Producer – Procurer - processor – Value adder – Distributor - Consumer

Value Added Products
Finger Millet Malt (Ragi Malt)
Thinai Payasa Mix
Thinai Laddu
Samai Bajji Mix
Samai Uppuma Mix
Samai Rava Dosa Mix
Little Millet rice
Italian Millet rice
Finger Millet Flour

Year	Whole Grain (Kg)	Millet Rava and Flour (Kg)	Value Added Products (Kg)	Gross Returns (Rs)
2001-2002	9000	1200		62,000
2015-2016		15,081	1179.65	13,12,855

Popularizing strategies

Further Reading:

Stefano Padulosi, Bhag Mal, Oliver I. King and Elisabetta Gotor. Minor Millets as a Central Element for Sustainably Enhanced Incomes, Empowerment, and Nutrition in Rural India. Sustainability 2015, 7, 8904-8933; doi:10.3390/su7078904

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