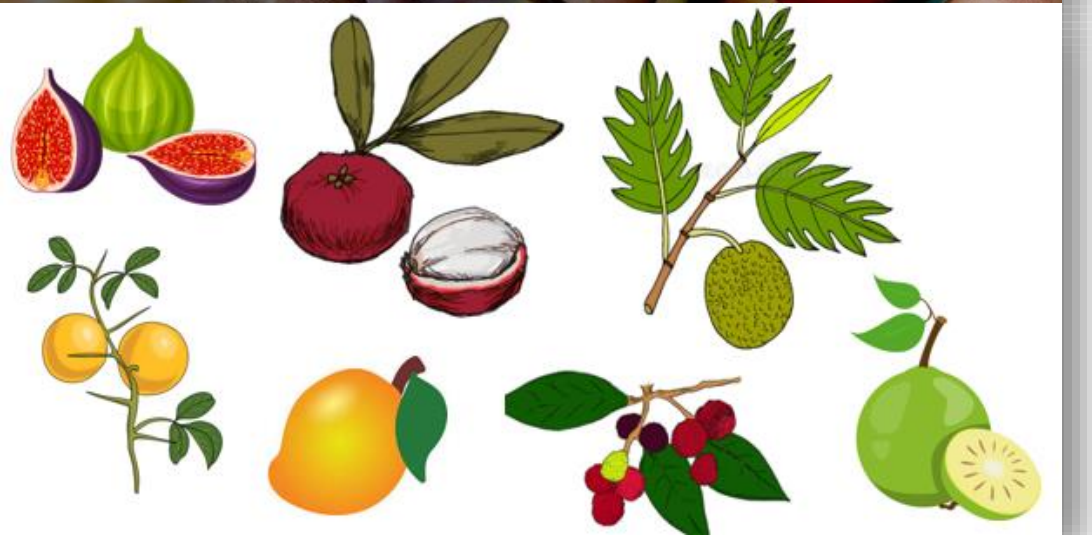

Research for Fruiting Nutrition in Tribal India

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M S Swaminathan Research Foundation
SCIENCE FOR SUSTAINABLE DEVELOPMENT

1. Introduction to project:

Title: Sustainable Tropical Fruit Tree Cultivation for Tribal Nutrition & Livelihoods -
Enhancing health and income through eco-friendly farming methods

- **Growing malnutrition & micro-nutrient deficiency among tribes**
- **Cereal based diet –** resulting in widespread malnutrition, including iron deficiency anaemia, vitamin A deficiency, protein-energy malnutrition, and other micronutrient deficiencies.
- **Limited access to fruits and far below the intake of fruits**

- **Unconventional modes of growing fruit trees that make efficient use of land**, e.g., planting on wasteland, field bunds, community land, forest fringes, and roadside., Providing high nutrition and yield., Intercropping of diverse species for year-around fruit production and other benefits.

- **Geographic location:** The project will engage Malayali tribes of Kolli Hills (Eastern Ghats, Tamil Nadu) and Paniya and Kurichiya tribes of Wayanad (Western Ghats, Kerala), covering 300 families across 10 settlements. – MSSRF has its presence in these locations

2. Project Objectives:

The primary objective of this research is to evaluate sustainable tropical fruit tree cultivation strategies to enhance nutrition security and strengthen the livelihoods of tribal communities in the Kolli Hills of Tamil Nadu and Wayanad district of Kerala.

This study proposes to address the existing nutritional gaps through diversified fruit-based agroforestry systems that are economically viable, environmentally resilient & culturally appropriate for tribal communities.

A range of nutrient-dense tropical fruit trees will be introduced and evaluated, both for their nutritional benefits and adaptability to local agro-ecological conditions.

- Vitamin C-rich fruits such as amla , guava, papaya, and jamun will be promoted for their role in enhancing iron absorption and reducing anaemia.
- Fruits rich in beta-carotene like mango, jackfruit, custard apple, and sapota will help combat vitamin A deficiency
- Protein deficiency will be addressed through fruit trees like moringa, jackfruit (seeds), and breadfruit, which provide affordable plant-based protein.
- Additionally, species like banana, tamarind, and Garcinia will supply zinc and other micronutrients essential for immune and reproductive health.

3. Methodology and implementation approach(1):

The study will be conducted in 10 tribal settlements (≈300 households) in both locations. Thirty households per village will be selected, covering different land types (homesteads, field bunds, degraded land and riverbanks).

A participatory field trial will evaluate suitable fruit tree species (amla, guava, mango, jackfruit, papaya, citrus, jamun, moringa, breadfruit) and cultivation methods (pit enrichment, mulching, organic manure, intercropping, soil moisture conservation and drip irrigation where feasible).

Quality planting material will be raised through community nurseries and maintained with farmer participation, especially women.

Data will be collected on tree survival, growth rate, pest resistance, yield, and seasonal fruit availability. Nutrition indicators such as fruit consumption frequency, Household Dietary Diversity Score and Minimum Dietary Diversity for Women (MDD-W) will be tracked. Both successful and unsuccessful practices will be recorded, analysed and documented.

3. Methodology and implementation approach(2):

Training and capacity building of women and men farmers in various aspects of cultivation and production of seedlings

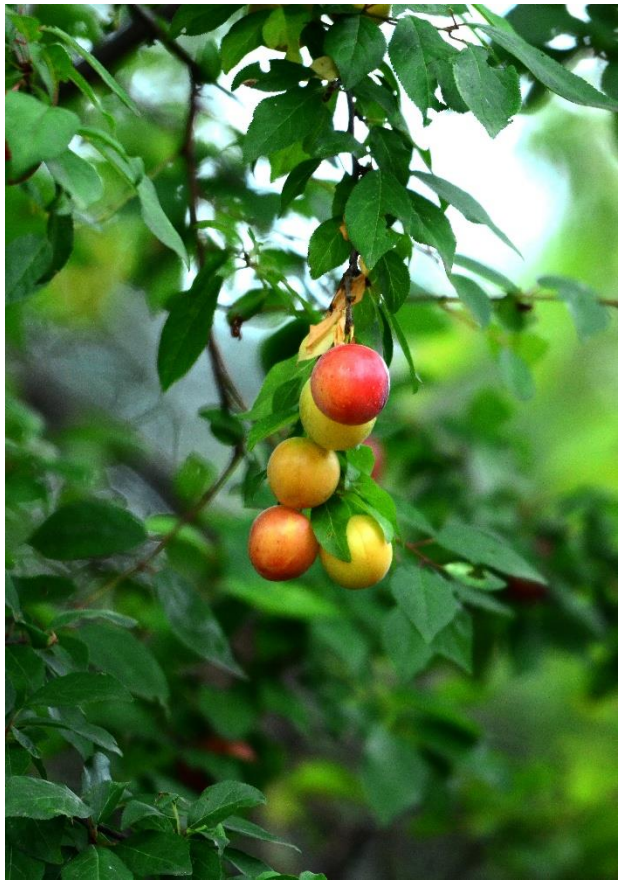
Formation of collectives and their capacity building for sustaining fruit cultivation

Nutrition education and dissemination of nutritional awareness, importance of fruits cultivation and consumption and dietary diversity

Linking fruit cultivation farmers with existing schemes and programmes of Government

4.Social and nutrition impact pathway – Project outcomes/Impact:

- Motivate tribal farmers to engage fruit cultivation for consumption and market – income opportunity
- Tribal farmers acquire skill and knowledge in fruit cultivation and quality seedling production
- The project will ensure access and availability of fruits for consumption in selected tribal villages and its surrounding villages
- Nutrition education, dietary diversity/ importance of fruit consumption
- Low-cost solution to the prevailing malnutrition issues among tribes - iron deficiency anaemia, vitamin A deficiency, protein-energy malnutrition, and other micronutrient deficiencies.



5. Environmental and climate advantages

- Restoration of degraded land and improved soil health – planting of fruit trees on field bunds, wastelands, public places and closer to waterbodies will enhance soil structure, reduces soil erosion and increase organic matters
- Increased vegetation cover (tree cover outside forest) and carbon sequestration
- Climate smart practices and microclimate regulation – drip irrigation, organic input application, perennial trees in farmlands, contribute to micro climate regulation
- Reduces the chances for landslide/ retaining soil moisture
- Enhanced biodiversity and Ecosystem stability – fruit biodiversity rich homesteads
- Supporting climate change adaptation

6. Scaling, sustainability and cost efficiency:

- **Formation of collectives of fruit growers** – for securing support from government, marketing of fruits, and building the capacity of farmers interested in fruit cultivation
- **Community nursery for fruit seedlings** – the community nursery will be equipped with nursery techniques, link them with Agriculture department and Gram Panchayath for promoting fruit crop expansion, make them do smart business/ supplier of fruit seedlings for farmers
- Networking with Forest Department, ecological restoration professionals and Government for commercial supply of seedlings
- Linking the farmers with existing schemes for climate smart agriculture, biodiversity conservation etc
- Market outlet for native fruits – with the support of Agriculture Department and PRIs for establishing outlets for native trees
- Transform fruit growers collectives to a farmer producer Company for fruit business

8.Project Timeframe and Phases(1):

Project Timeframe (24 Months)

Phase-wise Implementation Plan

Stage 1: Baseline Assessment and Planning (Months 1–3)

Stage 2: Nursery Establishment and Training (Months 4–6)

Stage 3: Fruit Tree Planting and Interventions (Months 7–12)

Stage 4: Maintenance, Monitoring and Mid-Term Evaluation (Months 13–18)

Stage 5: Analysis, Documentation and Dissemination (Months 19–24)

7.Budget summary and risk and mitigation strategy(3):

The project team includes coordinators, facilitators, consultants, community mobilisers, and women leader support.

Essential materials include nursery tools, planting supplies, soil amendments, irrigation, and protective tree guards.

Budget covers salaries, training, nursery setup, transportation, monitoring, and contingency funds with local and external support.

- Personnel (30%)
- Nursery & planting materials (25%)
- Training & capacity building (15%)
- Travel & logistics (10%)
- Monitoring & evaluation (10%)
- Admin & contingency (10%)

Risk Mitigation Strategy

- Low cost and quality structures will be ensured to protect seedlings from drought of floods
- By linking with MGNREGA programme, the cost for the seedling production will be minimised, and produce sufficient, if to replace the lost ones
- Community ownership will be ensured by involving Grama panchayath and community council
- Protection of seedlings from grazing will be ensured as community commitment

Alliance
Bioversity & CIAT

CGIAR

Thanks

7.Budget summary and risk and mitigation strategy(1):

Sl. No	Budget Head	Description	Amount (₹)	YR 1	YR 2
A	**Personnel Cost**		**17,04,000**		
A1	Project Coordinator	35,000/month × 24 months	8,40,000	*	*
A2	2 Field Assistants	₹18,000/month × 2 × 24 months	8,64,000	*	*
B	**Nursery Establishment & Planting Materials**		**11,00,000**	*	
B1	Community nurseries (2 units)	Shade nets, tools, beds, pipes	3,00,000	*	
B2	Propagation materials	Polybags, potting mixture, trays	2,00,000	*	
B3	Fruit saplings procurement	10,000 saplings @ ₹60 each	6,00,000	*	
C	**Field Implementation**		**4,90,000**		
C1	Pit digging & planting labour	Local labour support	1,80,000	*	
C2	Manure and organic inputs	FYM/vermicompost, green leaf	1,50,000	*	
C3	Tree guards/Live fencing	Protection from cattle/wild animals	1,60,000	*	

7.Budget summary and risk and mitigation strategy(2):

D	**Irrigation & Water Conservation**		**1,50,000**		
D1	Water harvesting pits & contour bunds	Soil-moisture conservation	1,50,000	*	
E	**Training & Capacity Building**		**2,50,000**		
E1	Farmer training workshops	Nutrition + agroforestry	1,00,000	*	*
E2	Exposure visits	Best practice learning	1,50,000		*
F	**Monitoring, Evaluation & Documentation**		**2,00,000**		
F1	Baseline and endline surveys	Nutrition and livelihood tracking	1,00,000	*	*
F2	Monitoring tools & data collection	Registers, mobile data apps	1,00,000	*	*
G	**Travel & Field Logistics**	**Transport, fuel, field visits**	**4,50,000**	*	*
H	**Community Mobilisation & Meetings**	**Village meetings, women SHG linkages**	**1,00,000**	*	*
I	**IEC Materials & Communication**	**Manuals, posters, nutrition guides**	**1,00,000**	*	*
			45,44,000		
J	Administrative & Overheads (10%)	Office, communications, audit	4,54,400	*	*
		Grand Total	**49,98,400**		