

Custodian Farmers of Nutri-Millet in Kolli Hills, India: Approaches to enhance their contribution

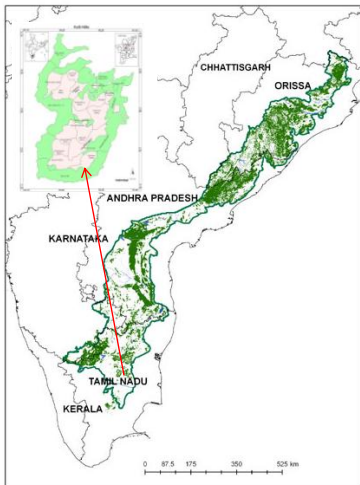
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NATIONAL WORKSHOP ON ENHANCING THE CONTRIBUTION OF CUSTODIAN FARMERS TO THE NATIONAL PLANT GENETIC RESOURCE SYSTEM IN NEPAL

POKHARA, NEPAL 31 JULY - 2 AUGUST 2013


Kolli Hills, Eastern Ghats, India




- Part of Eastern Ghats of India, 1300 MSL
- 14 Panchayats, 305 Settlements
- Total Population – 36,525 (18,511 Male, 18,014 Female)
- Homogenous community - Malayali Tribes - 35,859 (98.17 %)
- 42 Species of cultivated crops (food and Cash crops)
- Hotspot of millets diversity



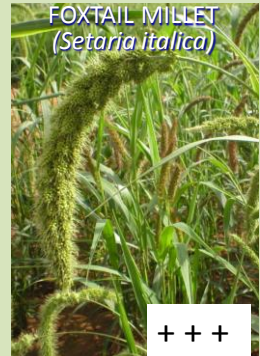
CLIMATE SMART NUTRITIOUS MILLETS




FINGER MILLET
(Eleusine coracana)




LITTLE MILLET
(Panicum sumatrense)



FOXTAIL MILLET
(Setaria italica)



Proso Millet
Panicum miliaceum




Kodo millet
Paspalum scrobiculatum

+ indicates the drought hardness


Inter and intraspecific diversity in Small Millets in Kolli Hills


Zones	LR1	LR2	LR3	LR4
Devanur	Sattaikelvaragu (FM) Suruttaikelvaragu (FM)	Arisikkalvaragu (FM)	Vellaperumsamai (LM)	Thirivaragu (KM)
Alathur	Karunguliyankelvaragu (FM)	Karakelvaragu (FM)	Karumsamai (LM)	Mookkanthinai (IM)
Thiruppuli	Sundangikelvaragu (FM)	Sadansamai (LM)	Thirigulasamai (LM)	Koranthinai (IM)
Gundani	Vellaperumsamai (LM)	Kattavettisamai (LM)	Senthinai (IM)	Panivaragu (PM)
Selur	Perungelvaragu (FM)	Malliasamai (LM)	Perunthinai (IM)	Palanthinai (IM)


Number of Millet Landraces				
Little Millet (LM) 7	Italian Millet (IM) 5	Finger Millet (FM) 7	Proso Millet (PM) /Common Millet -1	Kodo millet (KM) -1



Millet Landscape







21 Land races of 5 species in Kolli Hills

Custodian Farmer of Millets and associated diversity

Participatory Assessment

- Primary data sets – PACs data 2008-09, IFAD project baseline 2012-13
- Key informants interviews and Focus group discussions
- 5 cell analysis – Asses threat status settlement wise
- Transact :seed reserves, storage systems

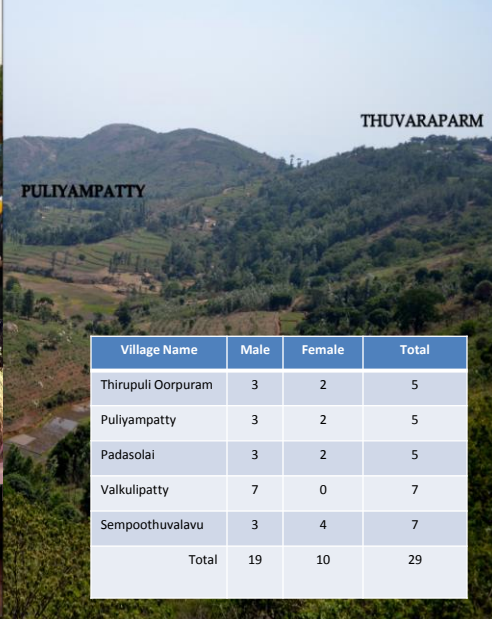
Criteria set by farmers

- Continuity in cultivation of millets for last five years
- Maintain diversity at home and on farm
- Continue to Cultivate and Use and enhance materials
- Willingness to share knowledge and materials
- Maintain locally threatened varieties

THIRUPULI NADU, Kolli Hills - IFAD NUS Project Site

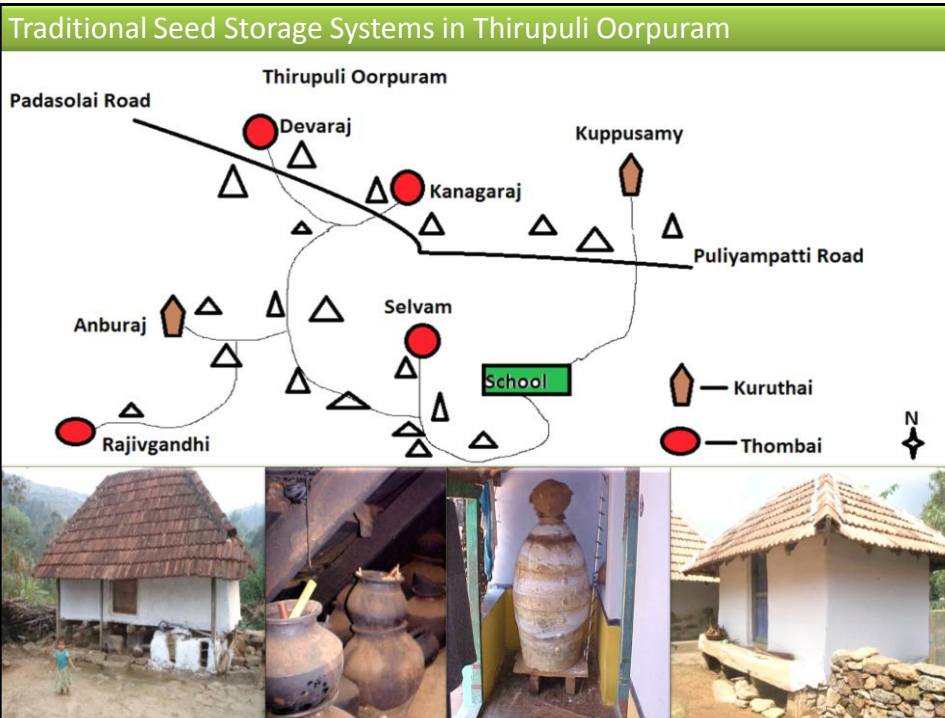


Custodian Farmers Network



Village Name	Male	Female	Total
Thirupuli Oorpuram	3	2	5
Puliyampatty	3	2	5
Padasolai	3	2	5
Valkulipatty	7	0	7
Sempoothuvalavu	3	4	7
Total	19	10	29





Mixed Cropping – Coping Mechanism Against Natural Calamities


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

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

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

CUSTODIAN FARMER PROFILE


Village Name: Padosolai, Farmer Name: Mrs. Malliga
Age:33 No. of Family Member:5,
Occupation: (a) Primary: farmer ,(b) Secondary: labour



Crop	Landrace Name	Traits of the Varieties
Samai/Little Millet	Perunjsamai	Suitable for Mixed Cropping,
Samai / Little Millet	Thirikulasamai	Short duration crop (3-4 Months), better grain yield, tolerant to insect pest.
Thinai / Italian Millet	Palanthinai	Suitable for mixed crop, Taste, survive in poor soil
Thinai/ Italian Millet	Perunthinai	Suitable for mixed cropping ,
Ragi / Finger Millet	Perungkelvargu	Long duration crop (6Month), fodder,
Ragi/GPU 48	Improved Var.	

Custodian Farmer from Kolli Hills - Recognition


A women custodian farmer, Ms.Kodukka Malliga Seeranga from Kolli Hills, she attended in the National level custodian farmer meeting organized by Bioversity International at New Delhi on February 11-12, 2013



Custodian of Climate Smart Nutri-millet:
Kolli Hills, Namakkal
Kodukka Malliga Seeranga

Introduction
Mrs. Kodukka Malliga Seeranga's main source of income is from cotton and paddy rice. However, she also grows millets in the remaining land in her village. The family owns four acres of land, of which one acre is irrigated (hand-irrigated), and another five acres are rainfed. She grows only one or two types of millets in her village. She grows finger millet (ragi) and Italian millet (thinai) in her village. She grows finger millet (ragi) and Italian millet (thinai) in her village. She grows finger millet (ragi) and Italian millet (thinai) in her village.

Recognition
Mrs. Malliga was recognized as a custodian farmer for her role in the conservation and promotion of indigenous millet varieties. She was awarded a certificate of attendance for her participation in the national-level meeting.



Certificate of Attendance

Awarded to
Mrs. S. Malliga

for successfully participating in the
"Workshop on custodian farmers of agricultural biodiversity:
Policy support for their roles in use and conservation"

organized by
Indian Council of Agricultural Research, Protection of Plant Varieties and Farmers' Rights Authority, National Bureau of Plant Genetic Resources and
UNEP-GEF Bioversity International project on 'Conservation and Sustainable Use of Cultivated and Wild Tropical Fruit Diversity: Promoting Sustainable Livelihoods, Food Security and Ecosystem Services'

held at
New Delhi, India
(11-12 February 2013)

S. Aravappan, Ph.D.
Senior Director of Agricultural Research and Education (DARE) and Director General, ICAR
New Delhi, India

Rande Frison, Ph.D.
Director General
Bioversity International,
Bonn, Italy

Documentation System : Linkages with Mainstream Research, Development and Rewarding Systems - FRIS Data Base

CUSTODIAN FARMER PROFILE

Village Name: Thiruppuli Oorpuram

Farmer Name: Ms. Chinnakkal , Age: 55

No. of Family Member: 4

Occupation: (a) Primary: farmer (b) Secondary: labour

Type of cultivation: mixed crop, mono crop

Method of sowing: Line sowing and Broadcasting

Type of millet crop: finger millet and little millet

Variety of millet crops and Traits : perunkelvaragu, sataikelvaragu, surataikelvaragu, sundangikelvaragu, thirikulasami, maliyasamai, katavetisamai.

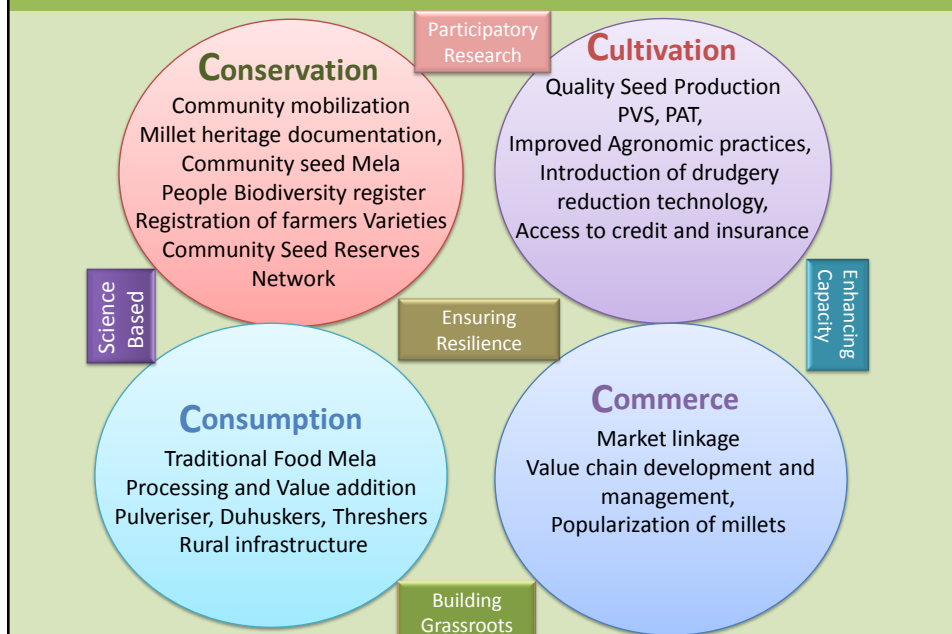
Type of storage system use: Mann pannai

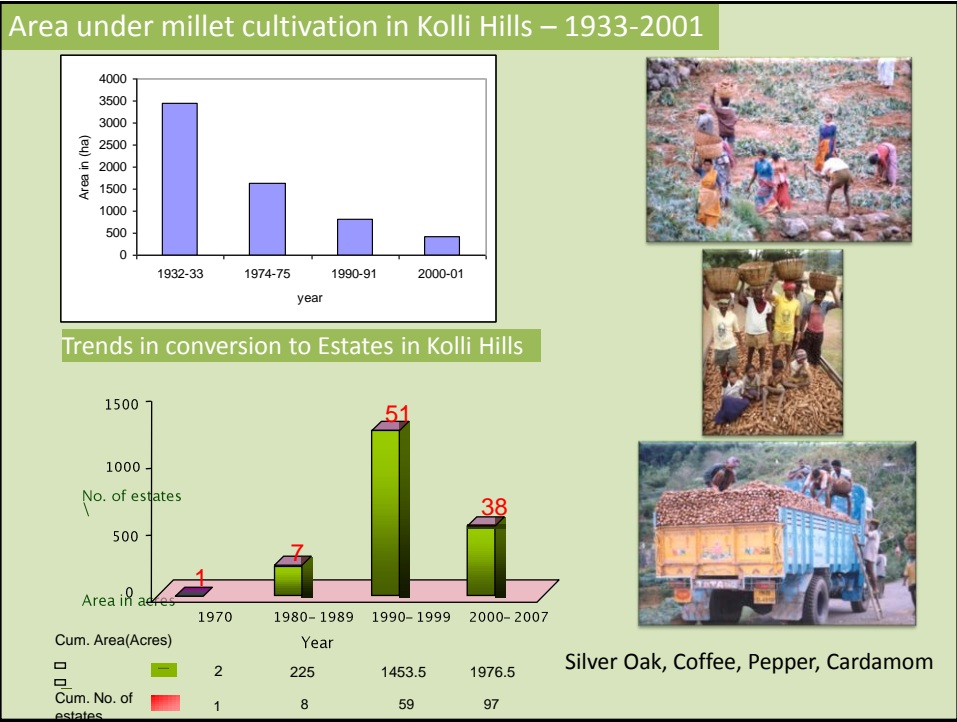
Recipes prepared and consumed: kaali, roti, soru

Need : Improved seed supply for little millet and Italian millet, Little millet processing mill








Enhancing Contribution of Custodian Farm Families using 4C Approach in Millet Conservation and Sustainable Use






On farm issues in Conservation	<ul style="list-style-type: none"> • Abandoned Traditional Seed storage structures • Weakened Seed Exchange practice 										
Participatory Conservation Systems											
Millets	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	
Little millets	900	1389	453	508	510	95	7.5	16.5	56.5	306	
Italian Millets	1089	987	357	435		279			18	55	
Finger Millets			227	240		172			112.8	519	
Kodo Millets		24				43			.5	20	
Barnyard millets						27			.5	11	

Millet seed distribution through Community Seed Banks (in Kg) Source – Annual Report of MSSRF 2000-2010


				
Seed Multiplication	Seed Storage – Thombai	Seed exchange	Seed Distribution	Cultivation

On farm issues in Cultivation


- Limited Access to Quality seeds
- Lack of improved agronomic practices
- Shortage of Farm yard manure




Quality Seed Selection



Traditional vs Modified Method of cultivation




Participatory varietal selection




Vermicompost production

•Led to productivity increase of 33 - 64 %


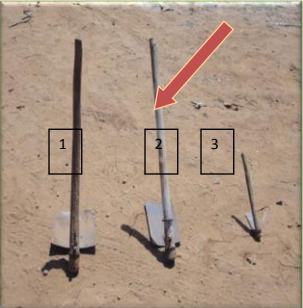
Addressing the Drudgery involved in Sowing and Weeding



Manually Drawn Six-row marker (1 m long)



Konoweeder –
Effective and Women-friendly
when soil moisture is favorable

WEEDING IN TAPIOCA IS DONE BY WOMEN USING WIDE BLADED SPADE (1).
MILLET INTERCROP CAUSED PROBLEMS IN WEEDING WITH THE SAME BLADE.
THIS PROBLEM SOLVED WITH NEW SPADE NARROW SPECIFICATION (2).

Traditional way of Processing millets



Pounding Little and Italian Millet using pestle and mortar



Grinding Finger Millet using stone tool



Grinding Kodo Millet using Wood and Mud Grinder

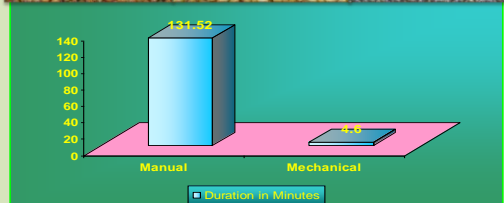
Promotion of drudgery-free grain processing technology



Mini Pulveriser



Pulveriser



Dehusking mill

Lack of refined machineries to process the most neglected millets like Kodo, Barnyard and Proso millets

Often Retained by Custodian Farmers

Kodo Millet



Barnyard Millet



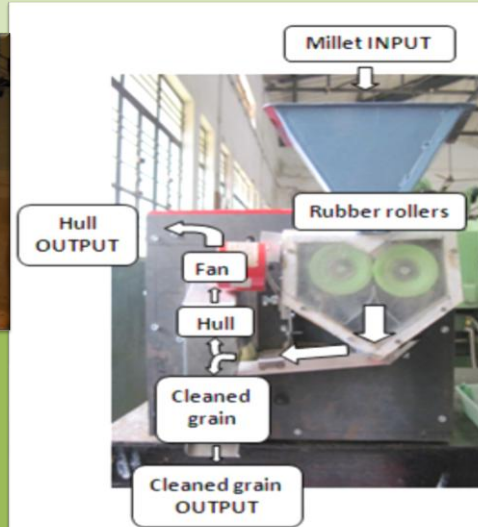
Proso Millet



New Prototype for Little millet developed by McGill University in association with MSSRF, UASD



- Double Pass Process
- 95-98 % Milling Efficiency
- 100 % Separation



PROXIMATE NUTRIENT PROFILE OF MAJOR GRAINS AND MILLETS										
Crop	Calorie K Cal	Protein (g)	Fiber (g)	Ash (g)	Calcium (mg)	Phosphorus (mg)	Iron (mg)			
Rice	345	6.8	0.2	0.6	10	160	0.7			
Wheat	346	11.8	1.2	1.5	31	306	5.3			
Maize	342	11.1	1.2	1.5	10	348	2.3			
Finger millet	328	7.3	3.2	2.6	35.8	250	9.9			
Foxtail millet	331	9.9	10.0	3.5	31	290	4.9			
Little millet	341	7.7	7.6	1.5	27	220	7.0			
Barnyard millet	346	10.8	14.7	4.0	20	280	2.9			
Proso millet	340	10.6	12.2	3.2	24	206	3.5			

Crops	Phenyl alanine	Histidine	Isoleucine	Leucine	Lysine	Methi onine	Threoni ne	Trypto phan	Valine	Argi nine
Rice	2.80	1.30	3.00	5.00	2.30	1.50	2.30	0.80	3.80	4.80
Wheat	2.80	1.30	2.20	4.10	1.70	0.90	1.80	0.70	2.80	2.90
Maize	2.90	1.60	2.40	7.20	2.00	1.20	2.80	0.40	3.00	2.90
Finger millet	6.2	2.6	5.1	13.5	3.7	2.6	5.1	1.3	7.9	5.2
Italian millet	5.3	2.3	5.0	13.3	2.1	2.6	3.9	1.5	5.2	6.1
Proso millet	5.2	2.2	4.5	12.9	2.2	2.0	3.4	0.9	5.1	4.4
Kodo millet	5.8	1.8	5.4	10.2	3.3	1.7	2.9	0.8	5.6	4.2
Recommended	6.0	-	4.0	7.0	5.5	3.5	4.0	1.0	5.0	-

Traditional Recipes of Millet Foods



MOUTHWATERING GOURMETS FROM TRADITIONAL FOODS OF KOLLU HILLS

M.S. SWAMINATHAN RESEARCH FOUNDATION
SAMARUHU
2004



சமையல்: கிணை

சமையல் உருவாக்கல் மற்றும் குறிப்புகள்

M.S. SWAMINATHAN RESEARCH FOUNDATION
SAMARUHU
2004



Cooked by Custodian Farm families

- ❖ Documentation of Traditional Recipes
- ❖ Traditional Food mela
- ❖ Improvement and Fortified Recipes
- ❖ Product development and linked to Value chain



Addressing gap in culinary knowledge related to millets

Building capacities on Culinary Knowledge (Processing, Cooking and Consumption) in Millets and value addition

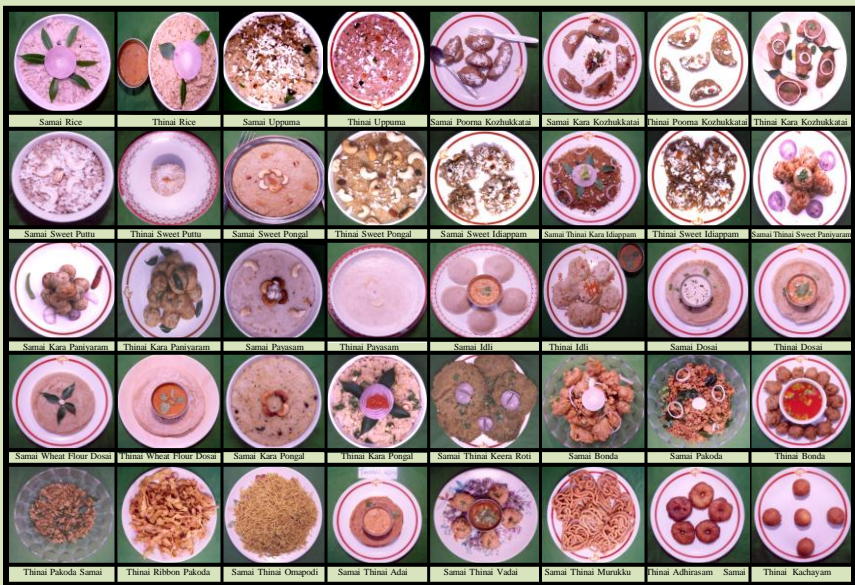


Value addition Training with UAS Dharwad and Bangalore, Avinashilingam University

Capacity Building on Processing Millets

Demonstration of Value added products in Millets to create Nutritional awareness

KOLLI HILLS TRADITIONAL RECIPES OF SAMAI (Little Millet) & THINAI



(Photograph: Dr. E. D. Israel Oliver King)

Millet processing infrastructures, legal requirements, Empowerment of local institutions

- Creating Common Property
- Partnership deed in SHG
- MOU with the Block development Office
- Tax Payer's Identification Number certificate (TIN)
- Sales Tax Certificate (CTC)
- Small Scale industry certificate (SSI)
- Tamil Nadu Food Safety and Drug Administration Certificate



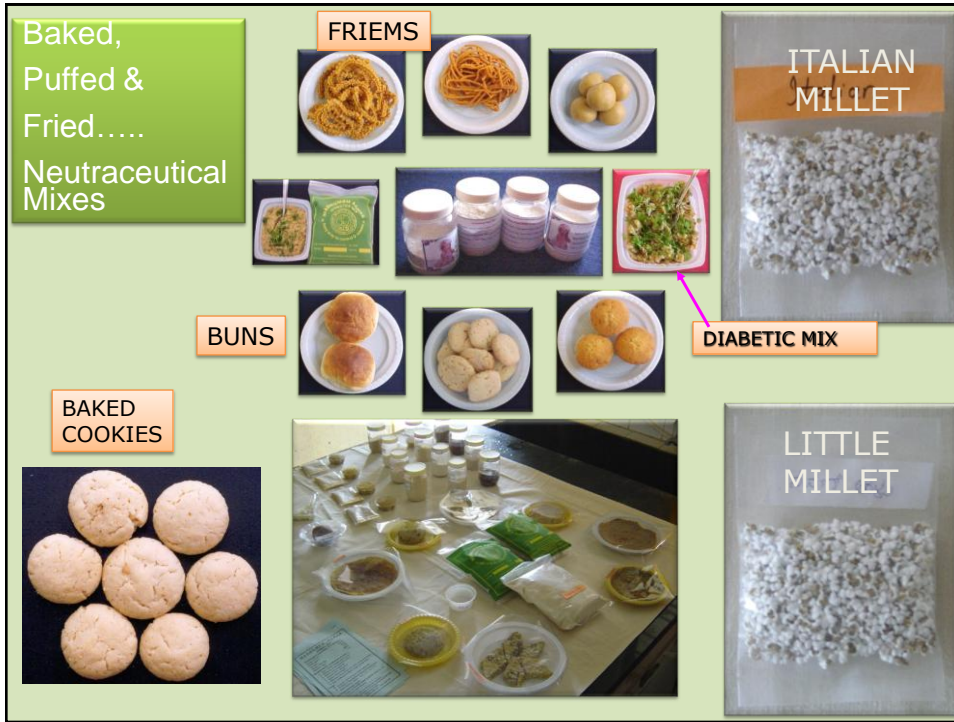
Sales Deed	Dhan Settlement	Partnership Deed	TIN Cert	Sales Tax Cert.	SSI Cert.

Kolli Hills Natural Foods Brand



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





Millet Supply Chain Development

Linkages of products to Health foods shops and organic outlets

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

Quantity of different form of millets Marketed 2001 - 2012

Year	Whole Grain (Kg)	Little and Italian Millet Rava and Flour (Kg)	Value Added Products (Kg)	Gross Returns (Rs)
2001-2002	9000	1200		62,000
2002-2003		2662		70,068
2003-2004		1365		25,524
2004-2005		3138		71,500
2005-2006		2255	1110	116,098
2006-2007		1062	240	50,598
2007-2008		1770	414.45	73,694
2008-2009		2672	831	129,639
2009-2010		1465	1061	125,853
2010-2011		681	984	132,893
2011-2012		1373	1119.75	242,422
Total	9000	19643	5760.2	1100289

Kolli Hills Natural Food Shop

Managed by the KHABCOFED

Collectives of the Members of the federation

Function as a Hub in the supply chain of the Kolli Hills products



Approaches to Enhance Contribution of Custodian farmers

- ❖ Documenting - Scientific identity of local crops and traits - Diverse Varieties
- ❖ Evaluating of local weather adaptive farming practices – Mixed cropping, relay cropping, crop rotation at Farm level – Diverse Practices
- ❖ Designing incentive systems for conservation of Locally Threatened species, least concerned varieties - Cash/Kind Incentives to recognizing custodian/community seed bank managers
- ❖ Targeting custodian farmers : (Local PVS, Quality seed production, contribution in the PBRs, Threat assessment, Varietal registration)
- ❖ Refinement and field testing of new prototype for Little and Italian millets
Developing new prototype for Kodo, Proso and Barnyard millets
- ❖ Networking Custodians forum to access State support for Rural Infrastructure – Threshing yard, Storage houses, Post harvest machineries, mills, drought animals, crop insurance
- ❖ Validation and use of TK on LRs for climate resilient, Nutrient traits of Endangers varieties/ LRs

Thank You

