"Developing Value Chain of Nutrimillets in India"

Workshop on Enhancing the contribution of Neglected and Underutilised Species for Thriving local Economies and Climate Resilient Communities

23 Feb 2015, LIBIRD, Pokhara



E.D.Israel Oliver King
M.S.Swaminathan Research Foundation,
Chennai

ediok151173@gmail.com







Key issues

- Fading traditional farming practices
- Eroding crop genetic diversity
- Limited access to farm tools and techniques and productive assets
- Limitation in value chain and markets
- Adequate Policy support to on-farm conservation

IFAD NUS: Best Practices to promote

on-farm conservation

- "Crop diversity assessment
- "Custodian farmers network
- " Quality Seed Production, PVS, IAP
- Community Seed Banks Network
- Seed fairs and Traditional Food Mela
- " Processing and Value addition
- Enterprises and Market linkages
- Peoples Biodiversity Registers and Biodiversity Management Committee
- " Village Millet Resource Centers
- " Community Infrastructure Development
- Kolli Hills Agro biodiversity ConserversFederation
- Community Biodiversity Management Fund



































indicates the drought hardiness



Millet Landraces Diversity across Species in Kolli Hills

Custodians of Agrobiodiversity Network













Custodians:

Conserve, Cultivate, Share, Innovate 6 Networks formed, 126 farmers profiles documented



Chronicling Climate Smart Farming System

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	Scientific Name	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

Chronicling Knowledge and Diversity

M.S.SWAMINATHAN RESEARCH FOUNDATION, CHENNAI

Scarascia Mugnozza Genetic Resource Centre

Collection Date: 26.04.2013 Collection No. 0015

Accession No. 0015 Species Name: Panicum Sumatrense

Common name: Little Millet Cultivar/Vermicular Name: Vellaperumsamai

Regions explored: Kolli Hills Village block: Alathur Nadu Taluk: Kolli Hills

District.-Namakkal

Source : Farmers field

Status : Landrace
Frequency : occasional

Material : Seed

Sample Type : Population

Habitat : Cultivated Distributed

Disease Symptom : Nil
Insect, Pest Nematode :Nil
Infection : Nil

Cultivation Practices : Rain-fed

Season : Kharif (June second week)

Associate crop(s) : Sole/red gram, mustard, beans, amaranths, other millets

Soil colour : red laurite
Soil texture : Sandy loam

Stoniness : Stony/Pulverised

Land Aspect : **Up land**

Slope : slope

Topography : Mountainous valley

Agronomic Score : Average

Photograph : Colour

Additional Notes : Drought tolerant

Farmers; Donor's name : Thangaiyan

Collector's name : M.N.Sivakumar
Collector's Address : MSSRF, Kolli Hills

Collections given to Gene Bank Manager on













Recognizing Custodian Farmers

Village Name: Padosolai, Farmer Name: Mrs. Malliga, Age:33 No. of Family Member:5



Crop	Landrace Name	Traits of the Varieties
Samai/Little Millet	Perunjsamai	Suitable for Mixed Cropping,
Samai / Little Millet	Thirikulasamai	
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.	



Community Seed Banks and Networks

On farm issues in Conservation

"Abandoned Traditional Seed storage structures"
"Weakened Seed Exchange practice

	2000-01	2001-02	2002-	2003-	2004-	2005-	2006-	2007-	2008-09	2009- 10	2010-11	2011-12	2012-	2013-
Millet*			03	04	05	06	07	08					13	14
Little	900	1389	453	508	510	95	7.5	16.5	56.5	306	298	176	197	432
Millet														
Italian	1089	987	357	435		279			18	55	150	63	81	353
Millet	100)	707	007	100		_,,			10		100	00	O1	
Finger			227	240		172			112.8	519	232	246	270	562
Millet			221	240		1/2			112.0	317	232	240	270	302
Kodo		24				43			.5	20	10	5	10	15
millet		24				43			.5	20	10	3	10	15
Proso						27			5	11	10	7	15	35
Millet						21			.5	11	10	1	15	33

Millet seed distribution through Community Seed Banks (in Kg)



Seed Multiplication



Seed Storage – Thombai



Seed exchange



Seed Distribution



Cultivation

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



Farm implements to reduce drudgery of women in on farm work



Manually Dravin Six-row marker (1 m long)

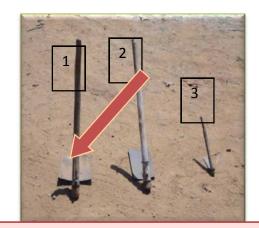


Star Weeder

TM	IM
8hr per person X3 = 24 hrs /Acre	1hr per person X2 = 2 hrs /Acre
80% of women time s	aved

TM	IM
6hr per person X12= 72 hrs /Acre	6 hr per person X4= 24 hrs /Acre
75% of women time s	aved





TM	IM
6hr per person X12= 72 hrs /Acre	6 hr per person X7= 42 hrs /Acre
40% of wome	n time saved

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).

Implements to reduce drudgery of women in post harvest processing



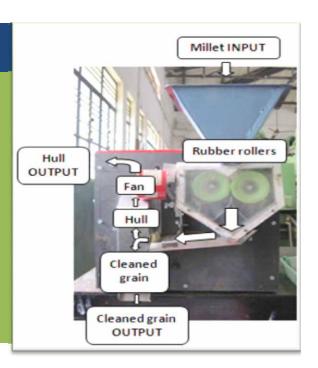




New prototype for Little millet - McGill



- "McGill University in association with MSSRF, UASD
- "Emery and Centrifugal Technology
- Double Pass Process
- " 95-98 % Milling Efficiency
- " 100 % Separation
- " McGill University



Multi-location Participatory Technology Appraisal

Region	Location	Qty of Grain at Start in Kg	Qty of Grain at End in Kg (Rice)	Qty of Husk mixed with rice in Kg	No of Time Passing	Duration for Dehullin g/5kg (hr:m:s)	Starting time of dehullin g (hr:m:s)	Ending time of dehulling (hr:m:s)	E.B reading (kwh)	Opening reading (kwh)	Closing reading (kwh)
Kolli	Puliyampatti	5	4.100	0	8	2:15:17	04:00:0	06:15:17	1	00977(9)	00978 (5)
Hills					Times		0 pm	pm			
	Keeraikkadu	5	2.900	1.100	8	2:23:20	10:30:0	12:53:20	1	02137(3)	02137(9)
					Times		0 am	pm			
	Chinnamangalam	5	4.275	0	8	1:44:10	2:30:00	04:14:10	1	634(8)	635(4)
					Times		pm	pm			
	Namakkal	5	4.260	0	8 times	2:21:20	8:30:00	10:51:20	1	0837(2)	0837(8)
							am	am			

Promoting Nutritional literacy with traditional crops







Millets Food Fair, Seed Fair, Inter School Competition, Village Knowledge Centres







Value addition Training in Nutrition Science



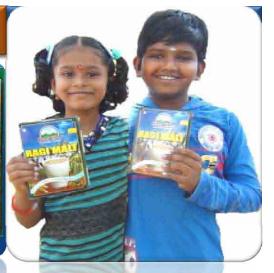
Gap in culinary knowledge in millets

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

Diverse Millet Product Development







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

Baked,

Puffed &

Friedõ ..

Neutraceuti cal Mixes





































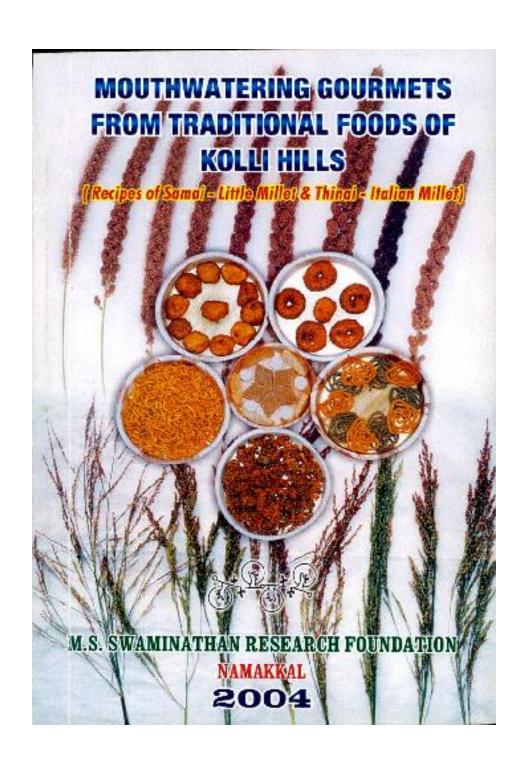






KOLLI HILLS TRADITIONAL RECIPES OF SAMAI (Little Millet) & THINAI (Italian Millet)







கொல்லிமலை இயற்கை சூழலில் விளைந்த சிறுதானிய உணவுப்பொருட்கள்



குழந்தைகள் முதல் பெரியவர்கள் வரை அனைவகுக்கும் ஏந்த சத்தான உணவு

எங்களது தயாரிப்புகள்

- 1. माकाण अमीमी
- 2. தினை அரிசி
- 3. Епопи илој
- 4. தினை மாவு
- 5. ғтары Сътарғ жылды
- 6. Ентарио 🖭 інцилі абохарал
- 7. माकाप प्रश्लेखी कराकावा
- 8. தினை பாபாச கலவை
- 9. **திலை** லட்டு
- 10. हुमस्री काम्लोट
- 11. ग्रास्टी काळा
- 12. ராகி முறுக்கு

நமது உடல் ஆரோக்கியத்திற்கு தேவையான புரதம், கால்சியம், இரும்புசத்து மற்றும் நார்ச்சத்து அதிகம் நிறைந்தவை

தயாரிப்பு&விற்பளை:

கொல்லிமலை வேளான் பல்லூபிரினப்பாதுகாப்போர் கூட்டமைப்பு இந்தியன் வங்கி பின்புறம், செம்மேடு கொல்லிமலை, நாமக்கல் மாவட்டம் - 637411 தொலைபேசி: 9488410655, 9843918198

ஆலோசனை:

ம.சா.சுவாமிநாதன் ஆராய்ச்சி நிறுவனம் 42/B2 பி.வி.ஆர் தெரு, காந்தி நகர், மோகலூர் ரோடு, நாமக்கல் - 637001 தொலைபேசி: 04286-224499,9488536504,9443364287



Millet based Nutritional Awareness for Children



Millet Value 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

Viluppuram (1)

Year	Whole	Little and	Value Added	Gross Returns (Rs)
	Grain (Kg)	Italian Millet Rava and Flour	Products (Kg)	Coimbatore (2)
	` ",	(Kg)	, o ,	
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	1,16,098
2006-2007		1062	240	50,598
2007-2008		1770	414.45	73,694
2008-2009		2672	831	1,29,639
2009-2010		1465	1061	1,25,853
2010-2011		681	984	1,32,893
2011-2012		1373	1119.75	2,42,422
2012-2013		3658	1660.2	4,20,054
2013 -2014		2.122	100115	
		6109	1694.15	6,14,283
Total	9000	29410	9114.55	21,34,626

Chennai (2)
Thiruppathur (1) Madurai (1)
Erode (1)
Salem (4) Mayiladudhura
Karaikkal (1) Kumbakonam
Paramathi Velur (1)
Karur (1) Thiruchengode
Dindigul (1) Namakkal (3)

Kolli Hills Natural Food Shop

Vellakovil (1)

Managed by the KHABCOFED

Collectives of the Members of the federation

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



Thiruppur (1)

Tanjavur (2)



Community Based Infrastructure creations through Social Capital building

- 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.

Remote Automatic Weather Stations in Kolli Hills	LOCATI ON	DATE	TIME	TEMP (c)	R.H %	W.S- km/s	W.D(°)	Rain - mm	Solar - W/m2	Batter y
-137	VENDAL A PADI	23-1- 2015	11:10: 00 PM	11.24	98.47	0.00	0.00	0.00	0.00	13.10
	NAVAKA DU	17-2- 2015	12:10: 00 AM	18.06	74.21	0.20	106.56	0.00	0.00	13.20
	ARIPALA PATTY	17-2- 2015	12:40: 00 AM	15.12	89.19	0.00	0.00	0.00	0.00	13.20
	PULIYA M PATTI	17-2- 2015	12:20: 00 AM	19.53	67.52	2.01	145.17	0.00	0.00	13.00
	THUVAR APALLA M	7-2- 2015	12:30: 00 PM	19.00	100.00	2.21	339.46	0.00	152.52	13.60
	KEERI KADU		10:00: 00 AM	23.68	90.00	0.40	29.05	0.00	151.72	13.90
www. weatherdata.in	SEMME DU	15-2- 2015	10:25: 00 AM	0.00	0.00	1.80	345.00	0.00	0.00	13.90

Campaigning for Millets

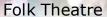








Road Show



Rural Markets





Exhibitions at Various Fora

*Mass campaign for inculcating importance of millets in Conservation, Cultivation, Nutrition, Value addition, Consumption and linking with Markets

Awareness-raising and marketing campaigns, have increased the use of millets among users



Collective Action and Governance

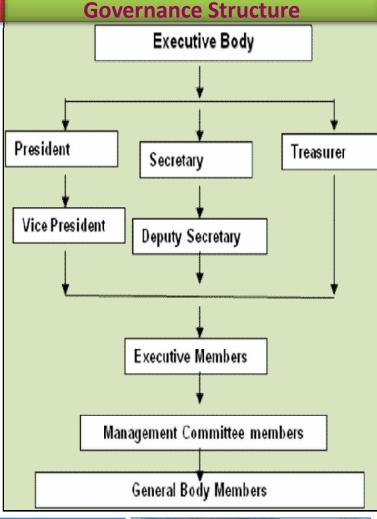
Assets of KHABCOFED

- Total of 109 Groups (16 Men, 30 Women, 1 Mixed, 62 Farmers clubs
- Membership of 985 Males and 526 Females
- Millet producers, Custodian Farmers, Organic producers, Traditional Knowledge holder, Folk Artists, Healers and Entrepreneurs
- Managing 9 Pulversing mills,3
 Dehsuking and Flour mill
- Organic produce collection centres and Community based Value addition units each at three locations
- Village Millet resource Centres at 16 location
- Managing Internal control systems farms under organic farming
- Community based natural food shops at 2 locations
- Total Financial turnover is 75, 29, 913INR

















ARTICLE IN PRESS

Food Policy xxx (2008) xxx-xxx



Contents lists available at ScienceDirect

Food Policy



Please cite this article in press as: Gruère, G. et al., The role of collective action in the marketing of underutilized plant species: ... Food



The role of collective action in the marketing of underutilized plant species: Lessons from a case study on minor millets in South India

Guillaume Gruère^a, Latha Nagarajan b.*, E.D.I. Oliver King^c

- * International Food Policy Research Institute (IFFRI), 2083 K Street, NW, Washington 20006-1002, USA b Rutgers, the State University of New Jersey, New Brunawick, NJ 08001-852, USA
- ⁶M.S. Swaminathan Research Foundation, Chennai, India

ARTICLE INFO

Article history: Accepted 2 October 2008 Available online xxxx

Keywords Underutilized species Agricultural marketing Agro-biodiversity

ABSTRACT

Underutilized plant species are generally defined by their unexploited economic potential, making them an appropriate focus for market development. This paper analyses the role of collective action in the pro-cess of market development for minor millets, an underutilized plant species, in the Kolli Hills of Tamil Nadu, India. Based on a series of focus group discussions, we analyze the role and involvement of selfhelp groups in the minor millet marketing chain recently set up by the M.S. Swaminathan Research Foundation. We then compare the role of collective action in this new market with the cases of marketing chains for cassava and organic pineapples, two cash crops with expanding production in the same area. Our analysis shows the critical role of collective action as a necessary but not sufficient condition for the successful commercialization of underutilized plant species for the benefit of the poor and the conservation of agro-biodiversity.

© 2008 Elsevier Ltd. All rights reserved.

Introduction

Underutifized plant species can be characterized by the fact that they are locally abundant but globally rare, that scientific information and knowledge about them is scant, and that their current use is limited relative to their economic potential (Gruère et al., 2008). Most of these species could benefit from market development as a means of supporting their long-term use while generating sustainable income for the producers and market chain actors,

Minor millets in South India are examples of underutilized plant species. Finger millet (Eleucine corocona), foxtail millet (Setaria italica) and little millet (Panicum milliaceum) are considered 'minor' because of the lack of research investment they attract, and their limited commercial importance in terms of area, production and consumption (Nagarajan and Smale, 2007). In the Kolli Hills of Tamil Nadu, a genetically diverse pool of minor millet varieties has long been grown by the tribal farming communities for their own consumption without being formally traded. Despite a traditional consumption preference for minor millets by the local population, in recent years the area devoted to minor millets has declined considerably to the advantage of substitute crops such as cassava, rice, pineapple and coffee, which are grown exclusively for sale. In response to this development, the M.S. Swaminathan Research Foundation (MSSRF), a leading non-governmental organization based in Chennai, India, has led 'conservation-cum-com-

Policy (2008), doi:10.1016/j.foodpol.2008.10.006

0305-9192/\$ - see front matter © 2008 Elsevier Ltd. All rights reserved. doi:10.1016/j.foodpol.2008.10.006

mercialization' intervention programmes over the last 10 years in Kolli Hills. These programmes aim to raise the market potential of minor millets through value addition and help the farming communities maintain their agro-biodiversity by providing economic incentives for its conservation (MSSRF, 2002).

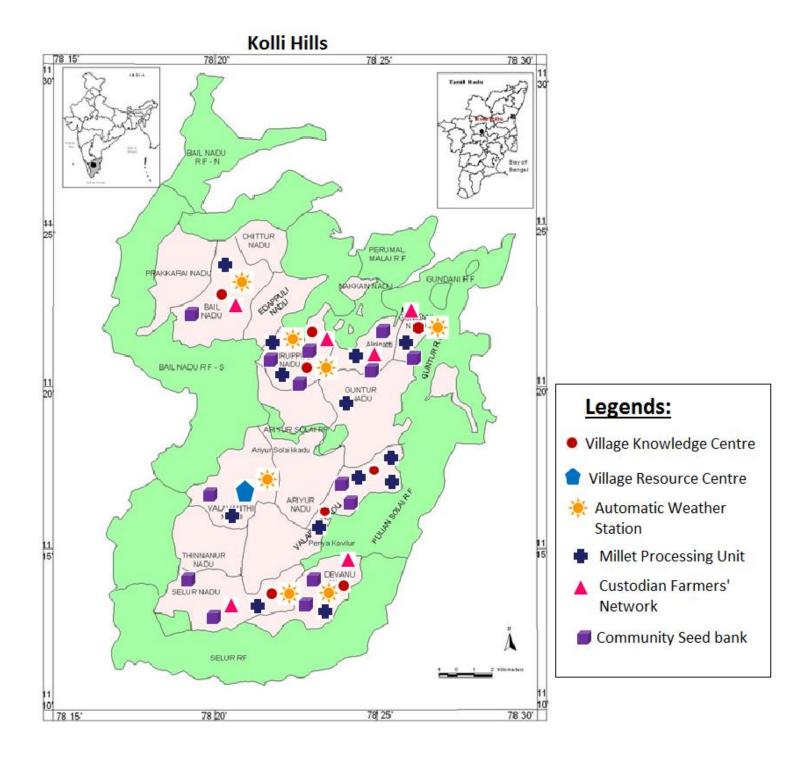
In this paper we analyze the market development initiative for minor millets in Kolli Hills with a specific focus on the role of collective action and group initiatives organized by MSSRF, Based on a series of focus group discussions with stakeholders held during the summer of 2006 and 2007, we analyze the key collective activities that take place in the minor millet value chain and compare it to the cases of two competing cash crops in the same region; cassava and organic pineapples.

In our analysis, we define collective action as the set of actions and initiatives undertaken voluntarily in cooperation by a group of individuals in pursuit of a shared interest (Meinzen-Dick et al., 2004). By focusing on market chain development, we are specifically interested in the structure of incentives among market actors and the role of these groups in making the supply chain effective. In this setting, collective action can play different roles; within the supply chain, it provides a means to realize scale economies, pool resources, ideas and effort; secondly, it can increase internal demand; and lastly, it may also affect agents external to the chain, such as outside consumers or policymakers. Small producers often face higher transaction costs especially when they specialize in products for niche markets (Poulton et al., 2005). Through collective efforts, small producer groups can take advantage of niche market opportunities (Bebbington, 1996). This case study

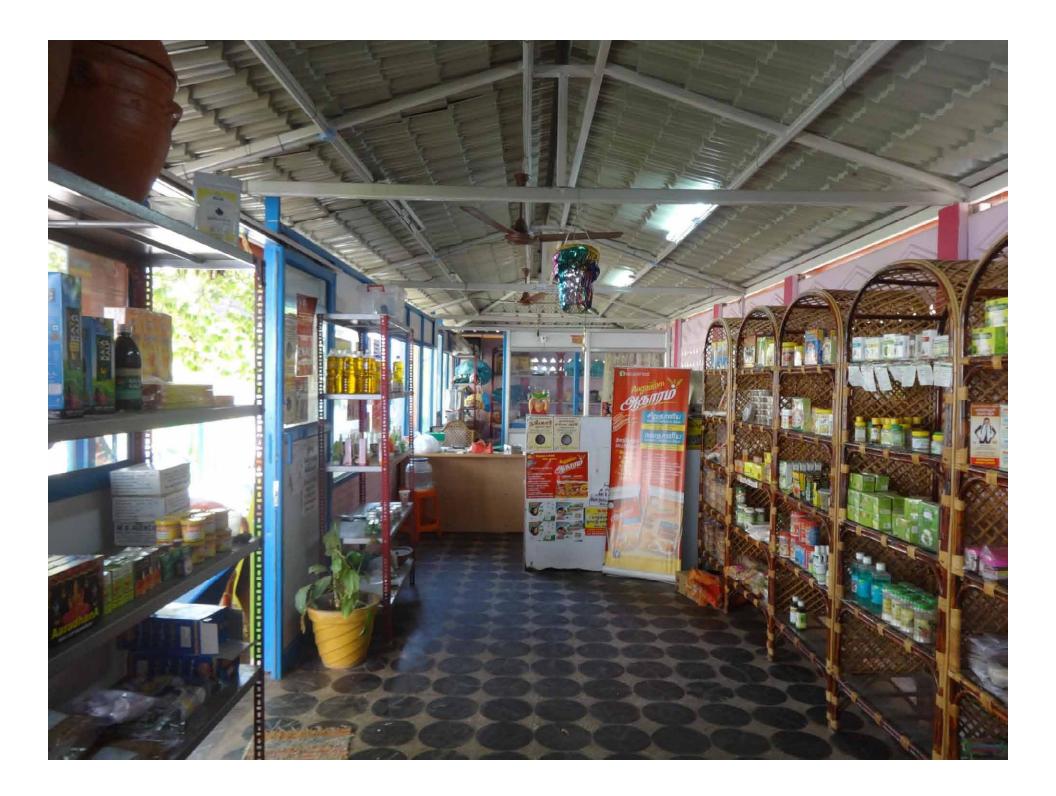
www.nuscommunity.org

www.academia/EdIsraelOliverKing

^{*} Corresponding author. Tel.: +1 202 862 5626 E-mail address; nagarajan@aesop.nutgers.edu (L. Nagarajan).













நாமக்கலில் இனிய திறப்பு விழா

Hooming Country

மோகனூர்ரோடு, சவுத் ஸ்கூல் எதிரில், நாமக்கல்,

டிராமத்து பாட்டியின் கைவண்ணத்தல் உடுவான....

- > 100% இயற்கை உணவகம்...
- > मीप्रा हार्मिय २ळाव्युक्तंः...
- மனிதனின் ஆரோக்கியமான முழு அயுளுக்கு
 100% சுத்தமான இயற்கை சைவ உணவுகள்....

எங்கள் தெயாகவ்கொண்ட

தன்ய வாடிக்கையாளர்களே வடுக !வடுக !!!

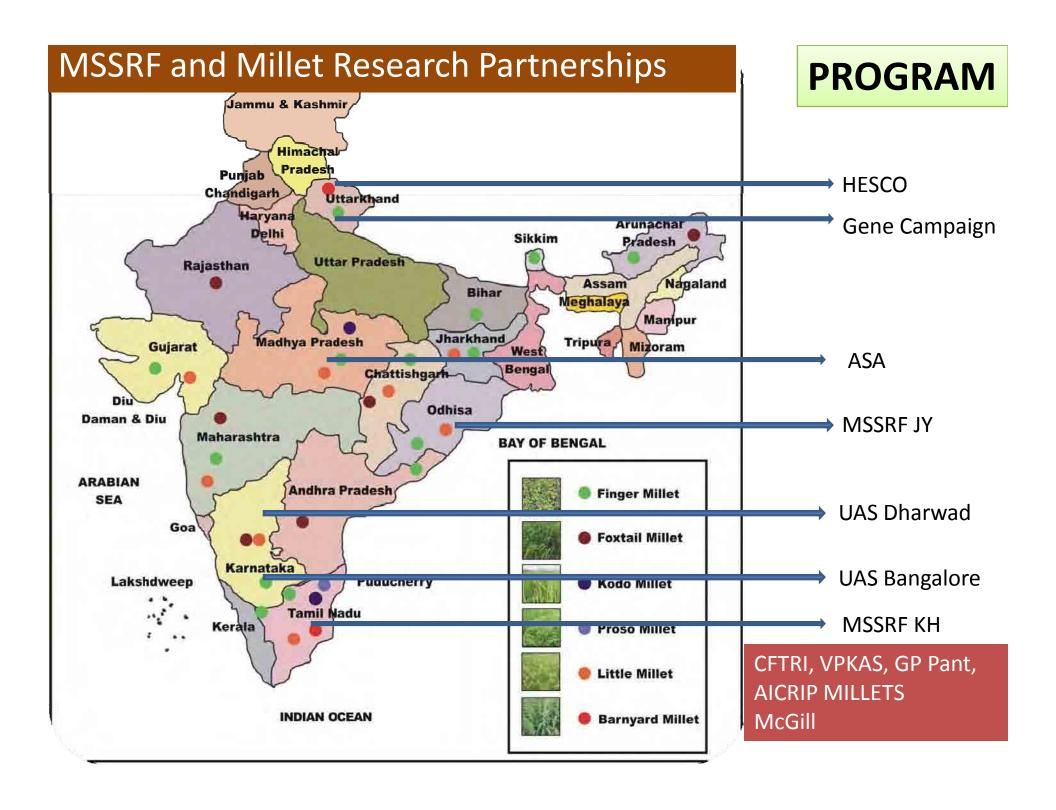
என்றென்றும் புகர்பா டிபன் சென்டர்

மாமக்கள்

23 Prigraps 2015

> ஏழாம் சுவையுடன்....





Influencing Policy:

- Food Security Act to include Nutricereals (Millets) in Public distribution System in India
- Provisions to recognize farmers in Indian legislation – Protection of Plant Variety and Farmers Right Act 2001, Biological Diversity Act 2002

Policy: National level Policy and Support for Conservation and Sustainable use Nutrimillets

- National Brainstorming Session, November, 2010
- ❖ Global Consultation on Millets, 18-21 December 2013
- ❖ Announcement of Rs.300 Crores under RKVY for ∴Nutri-cerealsøin budget of 2011-12
- ❖ A new scheme õInitiative for Nutritional Security through Intensive Millets Promotion (INSIMP)ö was launched in March, 2011.
- ❖ Inclusion of millets under Mid-day-Meal
- **❖**Support for Machinery upgradation
- Support for Producer companies
- Government of Orissa and Karnataka to introduce the Millets in the Noon meal programme
- Tamil Nadu government has introduced a programme for creating awareness on Traditional Foods which includes millets

SAP for Millet Conservation and Sustainable Use

Participatory Research

Conservation

"Millet traditional knowledge documentation in PBR

"Seed bank and Seed network systems

"Custodian Farmers network

"Community Seed Fair and Diversity blocks

"Collection and characterization of LRS, Farmers Vars.

"Validation of TK on LRs for climate resilient traits

"Registering farmers Varieties - PPVFRA

Design incentive systems for conservation

Cultivation

"Promote Local PVS, Quality seed production

"Improved Agronomic Practices

Refining, improving, customizing drudgery reduction technologies on farm

Enhancing Capacity

"Access to credit systems

"Partnership with Agriculture research institutes

Science Based

Ensuring Resilience

Commerce

"Build media relationship for popularizing millets

"Product development based on landraces nutrient traits

"Diverse Value chain development and management -

"Partnership with Socially responsible Industry

"Market assessment, product development and Value chain Development

Consumption

"Encourage R&D for gender friendly Processing eqp.

"Access state support for Rural Infrastructure

"Innovate new recipes- partnership with Food & Nutrition

"Community millet food fair and Nutrition education

"Inclusion in PDS, ICDS, Nutrition prog.

Building Grassroots

