Technical Session – Market opportunities for NUS crops: Status and outlook -

Government efforts to promote NUS crops

Dr B Dayakar Rao, Principal Scientist
Indian Institute of Millets Research (IIMR)
Hyderabad

dayakar@millets.res.in

Presentation at IFAD-EU-CCAFS Project
National Stakeholder Meeting, 19-20 June, 2015
Bhopal
Common names of millets in India

**English**: Great Millet/Sorghum
- Bengali: Jowar
- Gujarati: Jowari, Juar
- Hindi: Jowari, Juar
- Kannada: Jola
- Marathi: Jowari, Jondhala
- Oriya: Juara
- Punjabi: Jowar
- Tamil: Cholam
- Telugu: Jonna

**English**: Spiked Millet/Pearl Millet
- Bengali: Bajra
- Gujarati: Bajri
- Hindi: Bajra
- Kannada: Sajje
- Marathi: Bajri
- Oriya: Bajra
- Punjabi: Bajra
- Tamil: Kambu
- Telugu: Sajja

**English**: Finger Millet
- Bengali: Marwa
- Gujarati: Nagli, Bavto
- Hindi: Ragi, Mandika,
  Marwah
- Kannada: Ragi
- Marathi: Nagli, Nachni
- Oriya: Mandia
- Punjabi: Mandhuka, Mandhal
- Tamil: Keppai, Ragi, Kelvaragu
- Telugu: Ragi Chodi

**English**: Italian Millet/Foxtail Millet
- Bengali: Kaon
- Gujarati: Kang
- Hindi: Kakum
- Kannada: Navane
- Marathi: Kang, Rala
- Oriya: Kanghu, Kangam,
  Kora
- Punjabi: Kangni
- Tamil: Tenai
- Telugu: Korra
Common names of millets in India

**English : Little Millet**

- Bengali: Sama
- Gujarati: Gajro; Kuri
- Hindi: Kutki, Shavan
- Kannada: Same, Save
- Marathi: Sava, Halvi, vari
- Oriya: Suan
- Punjabi: Swank
- Tamil: Samai
- Telugu: Samalu

**English : Kodo Millet**

- Bengali: Kodo
- Gujarati: Kodra
- Hindi: Kodon
- Kannada: Harka
- Marathi: Kodra
- Oriya: Kodua
- Punjabi: Kodra
- Tamil: Varagu
- Telugu: Arikelu, Arika

**English : Common Millet/ Proso Millet**

- Bengali: Cheena
- Gujarati: Cheno
- Hindi: Chena; Barri
- Kannada: Baragu
- Marathi: Vari
- Oriya: China Bachari bagmu
- Punjabi: Cheena
- Tamil: Pani varagu
- Telugu: Variga

**English : Barnyard Millet**

- Bengali: Shyama
- Gujarati: ....
- Hindi: Sanwa
- Kannada: Oodalu
- Marathi: ...
- Oriya: Khira
- Punjabi: Swank
- Tamil: Kuthiraivolly
- Telugu: Udalu, Kodisama
All India production, area and yield of millets
TE 2013

<table>
<thead>
<tr>
<th></th>
<th>Area (‘000 hectare)</th>
<th>Production (‘000 Tonnes)</th>
<th>Yield (Kg/Hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorghum</td>
<td>6614</td>
<td>6097</td>
<td>920</td>
</tr>
<tr>
<td>Bajra</td>
<td>8562</td>
<td>9796</td>
<td>1149</td>
</tr>
<tr>
<td>Ragi</td>
<td>1197</td>
<td>1899</td>
<td>1581</td>
</tr>
<tr>
<td>Small Millets</td>
<td>784</td>
<td>443</td>
<td>565</td>
</tr>
<tr>
<td>Total</td>
<td>17157</td>
<td>18235</td>
<td>1054</td>
</tr>
</tbody>
</table>
Distribution of Small Millets in India

Nationwide average production


Source: Ministry of Agriculture

Major millet producing states in India (2009-10)

- Bajra
  - Rajasthan: 58.05%
  - Haryana: 6.57%
  - Others: 6.7%
- Jowar
  - Madhya Pradesh: 53.63%
  - Andhra Pradesh: 4.94%
  - Others: 8.89%
- Ragi
  - Karnataka: 69.47%
  - Maharashtra: 11.61%
  - Uttar Pradesh: 9.52%

Source: Ministry of Agriculture

Area under millets

- Bajra: 9.43 million ha*
- Jowar: 7.06 million ha
- Ragi: 1.50 million ha

*2010-11 advance estimates; ** 2009-09 provisional figure, # hectares
Uniqueness of Millets

- Staple food for many centuries in the semi-arid tropics
- Suitable for dry lands with low rainfall
- Require less water, mature early and cultivated in water scarce conditions
- Highly Resilient to different ecological conditions - climate change
- Unique nutritional properties - “Nutri-cereals”
- Promising crops for Food & Nutritional security
All India trends in Area, Production and Yield of Sorghum: TE 1969-70 to TE 2012-13

<table>
<thead>
<tr>
<th>Items</th>
<th>Kharif</th>
<th>Rabi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>-78</td>
<td>-41</td>
</tr>
<tr>
<td>Production</td>
<td>-51</td>
<td>+7</td>
</tr>
<tr>
<td>Productivity</td>
<td>+120</td>
<td>+82</td>
</tr>
</tbody>
</table>
PER CAPITA CONSUMPTION OF SORGHUM IN RURAL & URBAN AREAS (KG/MONTH)

Quantity in kg/yr rural

Quantity in kg/yr urban
# Nutrient Composition of Millets vs Fine Cereals

(All values for 1000 gms)

<table>
<thead>
<tr>
<th>Food</th>
<th>Protein (gms)</th>
<th>Minerals (gms)</th>
<th>Fibre (gms)</th>
<th>Calcium (mg)</th>
<th>Phosphorous (mg)</th>
<th>Iron (mg)</th>
<th>Carotene (µg)</th>
<th>Thiamine (mg)</th>
<th>Riboflavin (mg)</th>
<th>Folic acid (µg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorghum</td>
<td>104</td>
<td>16</td>
<td>16</td>
<td>250</td>
<td>2200</td>
<td>41</td>
<td>470</td>
<td>3.7</td>
<td>1.3</td>
<td>200</td>
</tr>
<tr>
<td>Pearl millet</td>
<td>116</td>
<td>23</td>
<td>12</td>
<td>420</td>
<td>2960</td>
<td>80</td>
<td>1320</td>
<td>3.3</td>
<td>2.5</td>
<td>455</td>
</tr>
<tr>
<td>Italian millet</td>
<td>123</td>
<td>33</td>
<td>80</td>
<td>310</td>
<td>2900</td>
<td>28</td>
<td>320</td>
<td>4.7</td>
<td>2</td>
<td>150</td>
</tr>
<tr>
<td>Finger millet</td>
<td>73</td>
<td>27</td>
<td>36</td>
<td>3440</td>
<td>2830</td>
<td>39</td>
<td>420</td>
<td>4.2</td>
<td>1.9</td>
<td>183</td>
</tr>
<tr>
<td>Little millet</td>
<td>125</td>
<td>19</td>
<td>22</td>
<td>140</td>
<td>2060</td>
<td>8</td>
<td>0</td>
<td>2</td>
<td>1.8</td>
<td>-</td>
</tr>
<tr>
<td>Kodo millet</td>
<td>77</td>
<td>15</td>
<td>76</td>
<td>170</td>
<td>2200</td>
<td>93</td>
<td>0</td>
<td>3</td>
<td>0.9</td>
<td>90</td>
</tr>
<tr>
<td>Rice*</td>
<td>64</td>
<td>7</td>
<td>2</td>
<td>90</td>
<td>1430</td>
<td>10</td>
<td>-</td>
<td>2.1</td>
<td>0.5</td>
<td>110</td>
</tr>
<tr>
<td>Wheat (whole)**</td>
<td>118</td>
<td>15</td>
<td>12</td>
<td>410</td>
<td>3060</td>
<td>53</td>
<td>640</td>
<td>4.5</td>
<td>1.7</td>
<td>366</td>
</tr>
</tbody>
</table>


*Rice - parboiled and milled.
GAPS IN MILLET PRODUCTION, UTILIZATION & MARKETING

- **Inconvenience** - Drudgeries in processing methods-consumption patterns
- **Lack of processing technologies and equipment**
- **Unexploited Nutritional merits of millets**
- **Inconsistent quantity and quality** - Safety and quality assurance
- **Low marketed surplus** - due to low remuneration to the farmers~ supply chain issues
- **Neglected policy front** - lack of both input subsidies (fertilizer, electricity and irrigation) & output price incentives - PDS supply of fine grains at reasonable cost
- **Changes in income, consumers tastes and preferences & urbanization**
Value chain in Sorghum/Millets

IIMR led consortium

Partners: ITC ABD, NIN & (Formerly ANGRAU)
Millets Value Chain

**Gaps**
- Lack of market
- Lack of supply chain management
- Lack of convenience in preparation
- Lack of social status
- Lack of Entrepreneurship development
- Lack of product & market development strategies

**Interventions**
- Product specific production e-choupal
  - Buy-back assurance
- Building and aggregation
- Ready-to-eat food products
- Rebranded-nutritional and health certification
- Capacity building & Entrepreneurship development
- Packing, labeling & promotion through innovative approaches

**Functions**
- Farm production
  - Procurement
  - Primary processing
    - Product development/refinement/ent
    - Upscaling
  - Market development/linkages
  - Promotion
  - Consumption (R/U markets)
  - Feedback
  - Storage
  - Retrofitting/mechanization
  - Safety certification/linkages
  - Pricing policy/sensitization

**Stakeholders**
- Farmers
- Pvt. aggregator
- Small-scale processors/SHG/women/NGO’s
- R&D institutes
- Entrepreneurs
- Pvt. Players in food business
- Policy makers
- Consumers (rural/urban elite)
Sub project objectives

1. To enable **market-driven millets production for specific end-uses**, procurement and primary processing for continuous supply-chain management.

2. **Fine-tuning of the technologies** for development of millet food products and upscaling.

3. Testing for **nutritional evaluation** and safety of selected millet foods.

4. Assessing consumer acceptability, price and market strategies, and social and **policy imperatives**.

5. Developing **entrepreneurship** and appropriate strategies to promote and **popularize millets for commercialization** through value-addition and branding as health foods.
Features of value chain on millets/sorghum

Funded by National Agricultural Innovation Project (NAIP)

- End to end solutions- production to consumption approach
- Pilot scale using the new integrated Value chain approach
- PPP based consortium- Public institutions: NIN, SAU’s & Private sector partner ITC
- Backward integration & forward integration ably supported by of ITC (ABD)
- IIMR has been identified as CENTRE OF EXCELLENCE WITH FUNDING SUPPORT BY THE DAC, GoI
Sub-project
Interventions & Achievements
Obj.1: Market-driven Sorghum production

- 1500 beneficiary farmers were technologically backstopped with DSR developed 10 product specific sorghum cultivars in 2 seasons in 3000 acres for four years

- Beneficiary farmers were provided Buy-back assurance by ITC (ABD) under market assured e-choupal model in PPP mode

- On-farm technological backstopping resulted income increase by five times in kharif & doubled rabi season respectively (4 years average over baseline)

- Beneficiary farmers linked up with other actors in the value chain
  - ITC - ABD has provided procurement, bulking, assembling and linking farmers with other actors of value chain - backward integration model
  - Farm level value addition – flaking at farm gate -10 times value addition - other farmers are motivated & neighboring villages/farmers followed the suit

- Achieved in bringing change in mindset of sorghum farmers by giving commercial colour to sorghum cultivation
Farm level Training and demonstrations

Orientation workshop Borisawant

Popularization - Choupal Haat at Ambulga
Obj.2: Development of sorghum/millet food products and upscaling

- Diversification of processing technologies ~ flaking, extrusion, baking, popping, parboiling, semolina, & blending of flours
- Developed/fine-tuned/standardized 30 convenient sorghum/millet based products technologies
- Shelf life enhancement by 6 months through diversified processing like extrusion and flaking attained
- 30 processing machineries retrofitted and standardized optimizing conditions for making suitable for sorghum/millets including primary processing
- Of developed products, 3 products i.e multigrain atta, suji & cookies were upcaled
- Resolved drudgeries in processing, cooking and shelf life
- Established Centre of Excellence on sorghum processing lab catering research, production for business, training and quality control functions are being undertaken
Sorghum processing methods have been initiated under NAIP as a means of value addition

**Primary Processing**
- Destoning and grading
- Dehulling
- Milling
- Flaking
- Baking (Biscuits preparation)

**Limitations of the Sorghum based product manufacturing**
- Inconsistent availability of sorghum grain in quantity and quality
- Lack of knowledge processing interventions
- Inadequate promotional awareness on health aspects
Grading machine

Roasting & flaking machine

Dehuller

Semolina machine

Extruder
Upscaling of Processing machinery for sorghum/millets
Upscaling

Multigrain Atta,/ Rava
Upscaling

Sorghum Biscuits (500 - 1000 kg/day)
Obj. 3: Nutritional evaluation and safety of selected millet foods (NIN)

- Established nutritional superiority of sorghum food products over other cereals & organoleptic evaluation of 17 sorghum recipes

- Clinical trials by NIN indicated that there is reduction in glycosylated haemoglobin levels among the diabetic patients from 7.9 to 7.2 due to replacement of 50% sorghum diet

- GI & GL of sorghum processed foods found to be lower than wheat and other cereals

- The anthropometric and biochemical indices have not altered significantly due to switch over to sorghum diet among the school children – clinical trials conducted for 8 months

- HACCP compliance established – entire value chain process
Obj. 4: Assessing consumer acceptability, price and market strategies, and policy imperatives

- Consumer acceptability studies - Commodity India (independent agency) & identified 9 sorghum products - high market potential - targeted for commercialization

- Pricing of products determined & feasibility analysis established product-wise

- Centre of Excellence (CoE) on sorghum processing set up in IIMR
**Entrepreneurship Development (IIMR-ITC-PJTSAU-NIN)**

1. Trainings
2. Capacity building measures
3. Demonstrations
4. Hands on experience
5. Entered MoU for technology
6. Licensing

**Clientele:**
- Rural women - 2000
- Urban entrepreneurs - 300
- SHG's - 3000
- Farmers - 5000

**Topics:**
- Primary food processing
- Secondary food processing
- Retrofitting of machinery
- Handling on operations
- Recipe making
- Packing & Nutritional labelling
- Marketing & Creation of awareness
- Trouble shooting

**Number of trainings:**
- INSIMP - 16 trainings for 1000 stakeholders from AP, Karnataka, Tamilnadu and Maharashtra
- paid training programmes
- Exposure visits >1000 nos

**Locations:**
- In house at IIMR
- Other locations
  - Parbhani, Adilabad, Mahabubnagar, Solapur & Nanded
  - other locations
Entrepreneurship Development

- Branding, Packaging & marketing
- Primary Processing
- Secondary Processing
- Post Harvest Training at IIMR
Demonstration in Centre of Excellence (CoE)
Women empowerment

- Trained 2000 women on sorghum processing and marketing
- Currently 50 women are engaged in sorghum processing across the country
- MoU with 4 women entrepreneurs
- The processing of sorghum/millets and requires less capital investment
- Increasing demand of convenient and health foods, women were effectively exploiting the advantage to target sorghum among health conscious urban population.
**Commercialization Interventions**

- **9** Sorghum product technologies commercialized on pilot scale through DSR’s brand ‘EATRITE’ while 4 products - brand ANGRAU foods

- **15 MoUs** including multinational M/s Britannia were made under different business plans

  - Currently marketed through Heritage fresh retail chain & Choupal Fresh- ITC in Hyderabad~ unorganized retail sector

  - **Nutritional Labeling** of Eatrite products for highlighting the nutritional benefits vis-à-vis over existing products.

  - Roping of small / medium scale entrepreneurs vis-à-vis large players of food industry in different channels

- **Horizontal expansion of Eatrite Products**- New Delhi - NAFED Bazaars; Bangalore - Kottaram Group

- **Thus, convenience RTE/RTC options are provided to consumers among sorghum foods**
1. Sorghum Rich Multigrain Atta
2. Sorghum Suji (upma)
3. Sorghum Khichdi rawa
4. Sorghum Idli rawa
5. Sorghum vermicelli
6. Sorghum pasta
7. Sorghum Atta
8. Sorghum flakes
9. Sorghum Biscuits
Jowar rich multigrain atta

Multigrain Roti

1000 gms SKU
Shelf life 3 months
Jowar Flakes

500 gms SKU
Shelf life 4 months
Jowar cookies

100gms SKU
Jowar rava (suji)

Three variants
- Jowar idly rava
- Jowar upma rava
- Jowar khichidi rava

500gms SKU
Jowar pasta

80gms SKU
Jowar Vermicelli

200 gms SKU
Sorghum recipes

Sorghum instant pongal

Sorghum chivda

Sorghum Muesli
Products in pipeline

Puffs from sorghum

Sorghum extruded product
Packaging & Labeling
Eatrite products on shelf
MoU signed between IIMR and Britannia
Promotional campaigning

• **Outsourced agency** to promote sorghum/millets
• Created awareness on Nutritional merits and health benefits on sorghum/millets to both urban and rural consumers
• **360 degree communication** – ATL and BTL communications adopted aggressively
• Specially **fabricated exhibition van** – jowar rath was used to carry the message
• New age Media. **Massive awareness** is created on sorghum as health and nutria food in Hyderabad - imparting **awareness to across 400000 consumers**
• **Rural consumer drive** was undertaken by ITC rural choupal haats to sensitize the convenience and nutritional aspects of the outputs from the sub-project
• Distributed literature and **employed TV, print media**
• More than 200 Roadshows, in mall promotions, nutritional campaigns
• **Showcased our technologies in important national and international events**
Jowar Rath - Fabricated mobile exhibition van

Version 1

Version 2

Version 3
Directorate of Sorghum Research
Brand

Eat Jowar - Stay Healthy
OUTDOOR HOARDINGS
Exhibitions, Trade Fairs & Road Shows
Awareness through public transport
ITC arm, ICAR bid to promote sorghum consumption

Offer comprehensive solution to farmers — from sowing, to production and marketing

G.V. Narasimha

ITC and ICAR have joined hands to promote sorghum. A new initiative under the name of "JowarMaah" aims to help farmers in the state by providing a comprehensive solution, from sowing to production and marketing. The joint venture is expected to boost the farmers' income and help in the promotion of sorghum as a nutritious and healthy alternative to other cereals.

Under the "JowarMaah" initiative, farmers will be provided with seeds, training, and support for production. The initiative will also focus on creating a market for sorghum products, helping farmers to sell their produce at a better price.

Sorghum is a nutritious grain that is rich in protein, fiber, and other essential nutrients. It is grown in the state of Telangana and is known for its drought-resistant properties. The joint venture will help in promoting the cultivation of sorghum and make it more accessible to consumers.

In addition to promoting sorghum, the initiative will focus on educating farmers about the benefits of sorghum and its role in sustainable agriculture. This will help in creating a strong demand for sorghum products, thereby increasing the farmers' income.

The "JowarMaah" initiative is expected to benefit farmers, consumers, and the state's economy. It will help in diversifying the state's crop basket and promoting a healthy and nutritious diet for the people of Telangana.

Jowar just got tastier

Dr. B. Bavakar Rao

Jowar, a traditional grain, has recently gained popularity due to its health benefits. It is rich in fiber, proteins, and essential nutrients. Jowar is now available in many easy-to-use forms, like thalipeeth, that can be added to your meals.

Apart from its nutritional benefits, Jowar flour is also a boon for diabetics as it digests slowly. This makes it the perfect choice for breakfast or tea time.

Another interesting pick would be the Jowar dosa. Jowar flour is blended with wheat, and the resulting mixture is a healthy and nutritious option.

INGREDIENTS

100 grams blackgram dal
300 grams rice flour mixed with jowar
1 tsp oil
1 tsp baking powder
salt to taste
water as required

METHOD

Soak the blackgram dal overnight for eight hours. Drain the water and grind into a fine batter. Add salt, baking powder, and the jowar-rice mix. Mix thoroughly. Allow it to ferment overnight. Add a teaspoon of oil, or the pre-heated tawa, and pour the batter on it. Spread the batter evenly and fry till the dosa is crisp.

The writer is a nutritionist and scientist with the National Research Centre for Sorghum, Gandhi University.
IN MALL PROMOTIONS
7.5 tons of Eatrite products supplied to Future Retail Limited (Big Bazaar)
Awards received by IIMR as a result of NAIP Intervention

Best Innovator Award, FICCI 2014

South India Hospitality Award 2013
National Brainstorming Session, November, 2010

Global Consultation on Millets, 18-21 December 2013
POLICY SENSITIZATION

- Sensitized Policy makers and other stakeholders through organizing National Seminar on Millets 2010.
- INSIMP a Rs 300 crore initiative by Government of India (DAC launched in 2011 and is still in operation in millet growing states.

  Offshoot of NAIP-MVC up to 500 processing clusters set up so far in 8 states under INSIMP in MH, KA, and AP have launched supply of millet foods on pilot scale—technology backed by IIMR.

- Mainstreaming of millets in public funded welfare programmes.
The Centre of Excellence (CoE) is now in full swing disseminating the technologies developed under NAIP to people from across the country.

P K Basu, Secretary, Ministry of Agriculture, GoI Inaugurates Centre of Excellence for Sorghum value addition and Processing.

Outstanding Award from ICAR

A group of Foreign Visitors at CoE
Way forward

1. **Change the perceptions** of NUS as unimportant ‘poor man’s food’.
2. **Develop capacity** in researching, teaching, policymaking, trading and farming NUS.
3. **Undertake more research** on NUS, particularly with regard to their adaptive qualities and the links between NUS and nutrition and livelihoods.
4. Involve the **full range of stakeholders** in participatory partnerships to promote and conserve NUS, particularly farmer and women’s organizations.
5. Find innovative ways to upgrade NUS market value chains and to **develop and market value-added products**.
6. Put in place legal frameworks, policies and financial incentives to promote NUS and **encourage agricultural diversification**.
7. **Encourage collaboration** in researching, promoting, conserving and sustainably using NUS, and coordinate activities and multi stakeholder platforms across sectors.
To include all the millets under IIMR
## Partners in commercialization of Eatrite sorghum products

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Organization</th>
<th>Location</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M/s Future retail limited</td>
<td>Mumbai</td>
<td>Marketing</td>
</tr>
<tr>
<td>2</td>
<td>M/s Adroit foods</td>
<td>Bangalore</td>
<td>R &amp; D</td>
</tr>
<tr>
<td>3</td>
<td>M/s Britannia Industries</td>
<td>Bangalore</td>
<td>R &amp; D</td>
</tr>
<tr>
<td>4</td>
<td>M/s Hope Blessing pvt Limited</td>
<td>Delhi</td>
<td>Marketing</td>
</tr>
<tr>
<td>5</td>
<td>ITC (foods) Ltd,</td>
<td>Bangalore</td>
<td>licensing</td>
</tr>
<tr>
<td>6</td>
<td>M/s Heritage Fresh Ltd</td>
<td>Hyderabad</td>
<td>Marketing</td>
</tr>
<tr>
<td>7</td>
<td>M/s Bhagyanagar Foods</td>
<td>Hyderabad</td>
<td>Licensing</td>
</tr>
<tr>
<td>8</td>
<td>M/s Vegan Enterprises</td>
<td>Hyderabad</td>
<td>Licensing</td>
</tr>
<tr>
<td>9</td>
<td>M/s GUV Foods</td>
<td>Hyderabad</td>
<td>Licensing</td>
</tr>
<tr>
<td>10</td>
<td>M/s Kottaram Foods</td>
<td>Bangalore</td>
<td>Licensing</td>
</tr>
<tr>
<td>11</td>
<td>M/s Nova Traders</td>
<td>Hyderabad</td>
<td>Marketing</td>
</tr>
<tr>
<td>12</td>
<td>M/s Sri Venkateswara enterprises</td>
<td>Hyderabad</td>
<td>Marketing</td>
</tr>
<tr>
<td>13</td>
<td>M/s Chandurotis</td>
<td>Hyderabad</td>
<td>Marketing</td>
</tr>
<tr>
<td>14</td>
<td>M/s Matheses</td>
<td>Hyderabad</td>
<td>Technology licensing</td>
</tr>
<tr>
<td>15</td>
<td>M/s Madhav Kalyan Foods</td>
<td>Rajahmundry</td>
<td>Marketing</td>
</tr>
</tbody>
</table>
Policy issues related to millets

Strengths

- Increase in production by 47 Lakh tonnes despite decline of > 50% area (193 Lakhs ha).
- High yield potential of hybrid Bajra & Jowar and HYVs of Ragi.
- Three fold increase in yield (283%) by adoption of hybrid and lesser options for arid areas (Rajasthan, Gujarat and Haryana) attributed to lowest decline of area (23%) under Bajra.
- Yield stagnation below 500 kg up to 10th plan attributed to largest decline (85%) of area under minor millets.
- Area from millets largely diverted to high value crops soybean, maize, cotton and sugarcane.
- Responsive under low and high input management.
Weaknesses

- Limited use of inputs due to high risk under rainfed farming & poor resource base of farmers.
- Non-availability of HYVs, quality seeds of small millets.
- Fast changing food habits, easy access of consumer to rice and wheat through PDS.
- Lack of assured procurement and non-supply of millets under PDS.
- Non availability of ready to eat food products and lack of awareness about the health benefits.
- Lack of dedicated millet processing unlike rice.
Potential & Prospects of Millets

- Availability of large number of hybrids hybrid of jowar (>20) and bajra (>60) and HVYs of ragi (>20) during last 15 years.

- **Jowar**: Yield of 6,500 Kg/ha in Guntur (A.P.) over an area of 2,000 ha during Rabi 2005-06 as against NAY 949 Kg/ha.

- **Bajra**: Yield of 2040 Kg/ha of bajra over an area of 5.77 Lakh ha in Haryana during 2011-12. Recorded maximum yield of 5,500 Kg/ha in Punjab and 5,000 Kg/ha yield in U.P. after potato with hybrids.

- **Ragi**: Yield of 2783 Kg/ha in TN over an area of 1.07 Lakh ha and yield of 3520 Kg/ha in Chittor (AP) under INSIMP as against NAY 1580 Kg/ha.

- **Kodo millet**: Highest yield of 3661 Kg/ha in TN and 1333 Kg/ha in Chhattisgarh under FLD as against NAY 646 Kg/ha (XI Plan).

- **Italian millet**: Yield of 2375 Kg/ha in Karnataka under FLD.

- **Little millet**: Yield of 1908 Kg/ha in TN and 1703 Kg/ha in M.P. under FLD.

- **Barnyard millet**: Yield of 1592 Kg/ha in Uttrakhand under FLD.
Development programmes—past

• Integrated Cereals Development Programme (ICDP) subsumed under MMA from 2000-01 had limited provision only for demonstration and minikit component.

• Enhanced support for demonstration of improved PoP, seed minikits, SRR, Micro-nutrients, soil ameliorants and farmers training under MMA.
INSIMP

• National Brainstorming on millets in November, 2010 at Hyderabad (DAC –ICAR).

• Announcement of Rs.300 Crores under RKVY for ‘Nutri-cereals’ in budget of 2011-12.

• A new scheme “Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP)” was launched in March, 2011.

• The scheme has a unique features to support improved technologies for production, post-harvest and awareness among the consumers.
INSIMP- contd..

• Large size cluster (200-1000 ha) demonstration involving all categories of farmers – Free input up to 2 ha per farmers + seed minikits + training+ support services.

• Incentive for certified seed production of hybrids and HYVs.

• Creation of institutional infrastructure for value addition – CoEs each for sorghum, pearl millet and small millets.

• Support for processing & awareness campaign.
Impact of INSIMP

- Large area coverage under improved PoP:

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
<th>Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12</td>
<td>6.87 lakh/ha</td>
<td>7.73 lakh/ha</td>
</tr>
<tr>
<td>2012-13</td>
<td>7.73 lakh/ha</td>
<td>7.69 lakh/ha</td>
</tr>
<tr>
<td>2013-14</td>
<td>4.11 lakh/ha</td>
<td>3.33 lakh/ha</td>
</tr>
</tbody>
</table>

- Demonstration includes large area of small millets.

- Area increase under sorghum in AP and Tamil Nadu, finger millet in Jharkhand, Maharashtra and Tamil Nadu and small millets in AP, Karnataka and Maharashtra.

- Larger yield gains have been recorded under Small millets in UP (33%), Karnataka (28%), Tamil Nadu (13%) and Uttarakhand (3%).
• In order to meet the requirement of Refinement/ retrofitting, demonstration and capacity building of entrepreneurs on post-harvest technologies and market linkages between producers and processors, three Centre of Excellence (CoE) have been set up.

• More than 300 PHT units comprising of pre-processing machine (cleaner-cum-destonner-cum grader & dehuller and processing machines rawa/flour/flacking/popping) installed in the States of AP (70), Gujarat (16), Karnataka (125), MP (12), Maharashtra(38), TN(25) and UP(31).
Price and policy support

- Major millets like jowar, bajra and ragi are covered under MSP.

- MSP fixed for 2013-14 for bajra, ragi and jowar indicates an increase of 42%, 55% and 67% respectively over 2010-11.

- Millets may be procured by the State Governments and their agencies primarily to extend the benefit of MSP to the farmers. After retaining the stock required for consumption under TPDS, the balance stock as disposed off by FCI through open tender.

- The difference between the economic cost of millets and amount realized from distribution/sale of the stock is reimbursed to the State Govts. as a subsidy by the Ministry of Food, Consumer Affairs and Public Distribution.
Inclusion of millets under Mid-day-Meal (MDM)

• Ministry of HRD provides support for supply of 100 gm/child for primary (1-5th std.) and 150 gm/child food grain for post-primary (6-8th std.)+ Rs. 4.25/- per child (veg./spice/cooking). Millets have been included under MDM by HRD Ministry. States were persuaded by DAC.

• Millet based MDM was launched on pilot scale basis from 26th January, 2013 in Mahabubnagar (AP), Kolar (Karnataka) and Rural Pune (Maharashtra).

• Inclusion of 7 more districts in Karnataka during 2013-14.

• Launching of Millet based supplements in Ariylaur and Perambalur districts of TN during 2013-14.
INSIMP- Contd……

Massive campaigns comprising of the following have created awareness and demand for millets:

- Food festivals/millets melas/exhibitions.
- Road shows/hoardings/writing on buses/walls.
- Use of jingles/VCDs.
- Publications about recipes in regional languages.
- Attractive pamphlets on food products made out of millets.
Millets de-husking machine being developed at UAS, Dharwad

100% efficacy of dehulling of little millets
Other Initiatives taken by Government

- Decided to include coarse cereals including INSIMP under NFSM during 12th plan, already approved.

- Launched a pilot scheme on Nutri –Farms with an allocation of Rs. 200 crore high malnutrition burden districts of 9 States during 2013-14 Assam, Bihar, Chhattisgarh, Jharkhand, MP, Orissa, Rajasthan, UP and Uttarakhand for promotion of micro nutrient rich cultivars of cereals including pearl millets, finger millet and vegetables.

- The scheme also provides assistance for production and development of supply chain through SFAC.
INSIMP is being continued as NFSM during 12th Five Year Plan (2012-17) with new targets of additional production of food grains of **25 million tons** of food grains comprising of **3 million tons of coarse cereals** by the end of 12th Five Year Plan.
NFSM contd..

It has Five components

• NFSM- Rice
• NFSM-Wheat
• NFSM-Pulses
• **NFSM-Coarse cereals** and
• NFSM-Commercial Crops.

Out of five components NFSM-Coarse Cereals - covered **182 districts covering 27 states**
## Summary of Interventions and Pattern of Assistance in Coarse Cereals

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Interventions</th>
<th>Pattern of Assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Demonstration</strong></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Demonstration on Improved Package (Cluster Demonstrations)</td>
<td>Rs. 5000 per ha</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Seed Distribution</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hybrids of Coarse Cereals</td>
<td>Rs. 50/- per kg or 50% of the cost whichever is less</td>
</tr>
<tr>
<td></td>
<td>High yielding Varieties of Coarse Cereals</td>
<td>Rs. 15/- per kg or 50% of the cost whichever is less</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Local initiatives</strong></td>
<td>Funding will be on Project basis, up to 5% of the total allocation to the State.</td>
</tr>
<tr>
<td>7.</td>
<td><strong>Project Management Teams at State and District level</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Districts covered under NFSM-Coarse Cereals (182)

<table>
<thead>
<tr>
<th>State</th>
<th>No of Districts covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Andhra Pradesh</td>
<td>5</td>
</tr>
<tr>
<td>2. Arunachal Pradesh</td>
<td>7</td>
</tr>
<tr>
<td>3. Assam</td>
<td>4</td>
</tr>
<tr>
<td>4. Bihar</td>
<td>11</td>
</tr>
<tr>
<td>5. Chhattisgarh</td>
<td>5</td>
</tr>
<tr>
<td>6. Gujarat</td>
<td>8</td>
</tr>
<tr>
<td>7. Haryana</td>
<td>5</td>
</tr>
<tr>
<td>8. Himachal Pradesh</td>
<td>5</td>
</tr>
<tr>
<td>9. Jammu &amp; Kashmir</td>
<td>7</td>
</tr>
<tr>
<td>10. Jharkhand</td>
<td>11</td>
</tr>
<tr>
<td>11. Karnataka</td>
<td>11</td>
</tr>
<tr>
<td>12. Kerala</td>
<td>1</td>
</tr>
<tr>
<td>13. Madhya Pradesh</td>
<td>16</td>
</tr>
<tr>
<td>14. Maharashtra</td>
<td>8</td>
</tr>
<tr>
<td>16. Meghalaya</td>
<td>3</td>
</tr>
<tr>
<td>17. Mizoram</td>
<td>4</td>
</tr>
<tr>
<td>18. Nagaland</td>
<td>4</td>
</tr>
<tr>
<td>19. Odisha</td>
<td>6</td>
</tr>
<tr>
<td>20. Punjab</td>
<td>3</td>
</tr>
<tr>
<td>21. Rajasthan</td>
<td>12</td>
</tr>
<tr>
<td>22. Sikkim</td>
<td>2</td>
</tr>
<tr>
<td>23. Tamil Nadu</td>
<td>10</td>
</tr>
<tr>
<td>24. Tripura</td>
<td>2</td>
</tr>
<tr>
<td>25. Uttar Pradesh</td>
<td>20</td>
</tr>
<tr>
<td>26. Uttarakhand</td>
<td>4</td>
</tr>
<tr>
<td>27. West Bengal</td>
<td>3</td>
</tr>
<tr>
<td>28. Telangana</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>182</strong></td>
</tr>
</tbody>
</table>
### Particulars

<table>
<thead>
<tr>
<th></th>
<th>Rice</th>
<th>Wheat</th>
<th>Pulses</th>
<th>Coarse Cereals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Demonstration (Rs/ha)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Individual Crop*</td>
<td>7500</td>
<td>7500</td>
<td>7500</td>
<td>5000</td>
</tr>
<tr>
<td>2. Cropping Based Approach</td>
<td>12500</td>
<td>12500</td>
<td>12500</td>
<td>-</td>
</tr>
<tr>
<td><strong>B. Seed Distribution</strong> (Rs/ Kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. High Yielding Varieties</td>
<td>10</td>
<td>10</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>2. Hybrid (Rice &amp; Coarse Cereals)</td>
<td>50</td>
<td>-</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td><strong>C. Plant Protection (Rs /ha)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. PP Chemicals &amp; Bio-pesticides</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>2. Weedicides</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td><strong>D. Micro-nutrient &amp; Soil Ameliorants (Rs / ha)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Gypsum /phospho-gypsum/ bentonite sulphur</td>
<td>-</td>
<td>750</td>
<td>750</td>
<td>-</td>
</tr>
<tr>
<td>2. Micronutrients</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>3. Bio-fertilizers (Rhizobium/ PSB)</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>4. Lime / liming materials</td>
<td>1000</td>
<td>-</td>
<td>1000</td>
<td>-</td>
</tr>
<tr>
<td><strong>E. Local initiatives</strong></td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Cost norms for Field Day, distribution of publicity material and visit of scientists/GOI and state officials @Rs. 250, Rs. 250 and Rs. 300, respectively

**20% of State’s Seed distribution of Hybrid/HYV to Central Seed Agencies like NSC/SFCI
Reimbursement of subsidy for distribution of Hybrid/HYV seeds s will be made directly to agencies by the Ministry*
Other initiatives under NFSM

Value Chain integration of small producers:

• Majority of the farmers are small producers who face difficulties in managing high risk involved in farming mainly due to
  – weather aberrations,
  – uneven access to technologies,
  – unreliable input supplies,
  – erratic power supply,
  – inadequate marketing arrangements etc.

• Forming and strengthening of Farmer Producer Organizations (FPOs) is likely to mitigate at least some of the risks and constraints faced by the farmers.

• The formation of FPOs may offer
  – a collective strength for seed production and seed procurement,
  – access to credit and improved technologies,
  – reduce transaction costs,
  – facilitate value addition,
  – tap high value markets and enter into partnerships with private entities on more equitable terms.

• SFAC has already demonstrated the benefits of aggregating farmers into FPOs during the XI Plan.
Marketing support for pulses and millets:

• For promoting the production of pulses and millets, it is proposed that marketing support would be provided to growers in form of **insurance cover**, 

• Dal mill and **millet processing unit to individual/communities, incentives to processing agencies etc. Assistance will be limited to 50% of the cost of the items.**

• Funds will be allocated to SFAC and similar organizations at Centre/State levels against specific proposals approved by NFSMEC.
International Interest

- USAID has shown interest in investment on development of technologies for value added product both for human and livestock; improved milling and marketing etc. through innovative prizes and awards.
Reinventing of millets as health & convenient food is in offing!

dayakar@millets.res.in
Mobile: 9989710405