

#### **Preface**

The year 2023 is declared by the United Nations as the International Year of the Millet, following a proposal by India. According to FAO Director-General QU Dongyu, "As the global agrifood systems face challenges to feed an ever-growing global population, resilient cereals like millets provide an affordable and nutritious option, and efforts need to be scaled up to promote their cultivation. Millets can play an important role and contribute to our collective efforts to empower smallholder farmers, achieve sustainable development, eliminate hunger, adapt to climate change, promote biodiversity, and transform agri-food systems,"

Millets are cereals, like rice or wheat, but referred to as coarse cereals, an obvious reference to the external texture, which is not smooth. Millet is a common term for categorizing small-seeded grasses that are often called Nutri-cereals. Some of them are sorghum (jowar), pearl millet (bajra), finger millet (ragi), little millet (kutki), foxtail millet (kakun), proso millet (cheena), barnyard millet (sawa), and kodo millet (kodon). An essential staple cereal crop for millions of smallholder dryland farmers across Sub-Saharan Africa and Asia, millets offer nutrition, resilience, income, and livelihood for farmers, and have multiple uses such as food, feed, fodder, biofuels, and brewing. They are deeply rooted in Indigenous Peoples' culture and traditions and help guarantee food security in areas where they are culturally relevant.

Millets are nutritionally superior to wheat and rice owing to their higher protein levels and a more balanced amino acid profile. Millets also contain various phytochemicals which exert therapeutic properties owing to their anti-inflammatory and anti-oxidative properties. Further, millet grains are rich sources of nutrients like carbohydrates, protein, dietary fiber, and good-quality fat; minerals like calcium, potassium, magnesium, iron, manganese, zinc, and B complex vitamins.

Millets require very little water for production and have a short growing period under dry, high-temperate conditions, therefore a good fit for arid and semi-arid regions. Millets are primarily grown during the kharif season in rainfed areas as these crops require less water and agricultural inputs than other cereals. Millets use 70% less water than rice; grow in half the time as wheat; and need 40% less energy in processing. They are hardy crops that can withstand extreme heat conditions. They are used for food and fodder. Therefore, they make strong economic sense in the mixed farming systems of India. In addition, millets sequestrate carbon, thereby adding to CO<sub>2</sub> abatement opportunities, contribute to improved agro-biodiversity through their rich varietal diversity, allow for mutually beneficial intercropping with other vital crops, and have significant cultural value due to their long history on the Indian subcontinent.

Millets were an integral part of the Indian food system, but due to the push given to food security through Green Revolution in the 1960s, the production and consumption of millets gradually diminished over time. Before the Green Revolution, millets made up around 40 percent of all cultivated grains, which has dropped to around 20 percent over the years. According to the Ministry of Agriculture and Farmer Welfare, till the 1965-70 time-frame, millets formed 20% of our food grain basket but are now down to 6%. If we take wheat versus jowar as an example, jowar went from close to 12 to 3.1% in about 65 years, and wheat, from 7.6% to 16.2%. Between 2013-14 and 2021-22, the major millets such as bajra, jowar, and ragi's combined production dropped by 7 percent to 15.6 million tons

during the last eight years. While bajra output has been stagnant, both jowar and ragi production has declined.

Some of the main barriers, which have limited the production and consumption of millets are the absence of production support in terms of input supply and subsidy (seed and nutrients), irrigation support, and marketing support, when compared to the support enjoyed by other crops. Absence of improved methods of production technologies, lack of organized seed distribution mechanisms to supply good quality seeds for millet crops following farmers' preferences and lack of appropriate post-harvest processing technologies for small millet except for finger millet have equally contributed to the problem. Further more, competition from other market-friendly remunerative crops changes in preference patterns in consumption has resulted in an inadequate appreciation of millets and moving away from them. This is mainly due to the inclusion of only rice and wheat into the Public Distribution System (PDS). This in turn resulted in a drastic decline in consumption even where there is production. Lack of public procurement and marketing support; Inadequate research on production improvement and food product promotion for small millet; and absence of public or privately funded promotion of millet as a nutritious food category.

According to Department of Agriculture and Farmer Welfare India produces more than 170 lakh tonnes of millet, which is 80 percent of Asia's and 20 percent of global production. India produces all the nine commonly known millets and is the largest producer and fifth-largest exporter of millets in the world. Most of the states in India grow one or more millet crop species. Rajasthan, Uttar Pradesh, Haryana, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, and Telangana are the major millets producing states.

Recognizing the enormous potential of millets, which also aligns with several UN Sustainable Development Goals (SDGs), the Government of India (GoI) has prioritized imillets. A meeting of the consultative committee on agriculture headed by NITI Aayog member Ramesh Chand was held in October 2017. Based on the recommendations of NITI Aayog, the agriculture ministry decided to create a sub-mission on "Nutri-Cereals". In April 2018, millets were rebranded as "Nutri Cereals", followed by the year 2018 being declared as the National Year of Millets, aiming at larger promotion and demand generation. Also, Prime Minister of India Shri Narendra Modi had called for the inclusion of millet in the public distribution system.

In the meantime, the Minimum Support Price (MSP) was also declared for millet. If we see the last five years' trend, the Minimum Support Price for jowar, bajra, and ragi increased 73 percent, 65 percent, and 88 percent to Rs.2,990, Rs.2,350, and Rs.3,578 in FY 22-23, respectively. They were priced at Rs.1725, Rs.1425, and Rs.1900 respectively in FY 17-18.

The Government of India under Shri Narendra Modi spearheaded the United Nations General Assembly (UNGA) resolution for declaring the year 2023 as the International Year of Millets and the proposal of India was supported by 72 countries.

UNGA declared 2023 as the International Year of Millets in March 2021. India pushed for recognizing the importance of millet and creating a domestic and global demand along with providing nutritious food to the community.

On 6th December 2022, the Food and Agriculture Organization (FAO) of the United Nations, organized an opening ceremony for the International Year of Millets – 2023 in Rome, Italy. Shri Narendra Modi has also shared his vision to make International Year of Millet (IYM) 2023 a 'People's Movement' alongside positioning India as the 'Global Hub for Millets'. This has galvanized interest in millet among various stakeholders like farmers, the youth, and civil society and pushed governments and policymakers to prioritize the production and trade in these cereals.

The Ministry of Rural Development (MoRD) through its Deendayal Antyodaya Yojana – National Rural Livelihood Mission (DAY-NRLM) has made significant efforts to increase the production of millets across India. The major interventions made are - transferring improved technologies at the last mile for enhancing production, availing good quality seeds through convergence and promotion of seed banks, availing finance through Revolving Funds (RF) and Community Investment Funds (CIF) to take up millet production and post-harvest processing, promotion of value-added millet products to increase its market appeal and running camps and other activities to promote millet consumption in the local areas. All these efforts have resulted in increased production and consumption of millets in India.

This book captures the history and trends of millet in 12 states of India and the efforts of DAY NRLM to contribute towards increased millet production and consumption in India. The experiences and reflections there of will help generate more attention on this forgotten crop among all the stakeholders, facilitate the NRLM officials for further immersion and prioritize millet cultivation for improved livelihoods and nutrition. The best practices and experiences will inform policies related to millet cultivation in India and beyond.

#### Acknowledgement

The government of India spearheaded the United Nations General Assembly (UNGA) resolution for declaring the year 2023 as the International Year of Millets (IYM) for recognizing the importance of millet and creating a domestic and global demand along with providing nutritious food to the community. IYM 2023 has galvanized interest in millet among various stakeholders like farmers, the youth, and civil society and pushed governments and policymakers to prioritize the production and trade in these cereals.

PRADAN as DAY-NRLM Support Organisation (NSO) was entrusted to conduct work along the NMMU and SRLMs of 12 states to document the efforts of DAY-NRLM for the promotion of millets for wider dissemination. It has been a collective exercise and a joint journey, in which PRADAN recognizes the valuable contributions from different stakeholders whose inputs helped to develop this book. We are thankful to NRLM to facilitate this exercise at multiple levels, and for mobilizing all key people on board to bring this publication. Special thanks to the NMMU and State Rural Livelihood Missions (SRLMs) for their constant support and involvement during the exercise.

In this spirit, we would like to thank the entire NMMU team, especially the honorable additional secretary, Mr. Charanjit Singh, and Mr. Raman Wadhwa, Deputy Director (Administration), NRLPS, for their continuous encouragement and mentoring. Sincere gratitude to Mr. Jayaram Killi, National Mission Manager, Mr. Vivek Kunj, National Mission Manager, Farm Livelihoods, and Mr. Bajranga Pattnaik, Mission Manager, Farm Livelihoods for their invaluable support.

We are also thankful to the honorable mission directors of Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan and Telangana. Special thanks and recognition to the State Project Managers (SPMs), Farm Livelihood of all the 12 states for their timely support.

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Special recognition and thanks to the core team members from PRADAN NSO team such as Monisha Mukherjee, Kuntal Mukherjee, Sukanta Karmakar, Sumendera Punia, Amit Kumar Singh, Surjit Behera and Prabhat Jha, for generously sharing their knowledge and inputs throughout the process of documenting this book and for their valuable time for coordination, framework development and successful completion of the document.

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This book would not have been possible without the generous grant from Axis Bank Foundation and Colmpact. We are hopeful that this publication will help to generate more discussions on millet among all the relevant stakeholders and contribute towards the honourable Prime Minister's vision of turning millet promotion into a 'People's Movement' alongside positioning India as the 'Global Hub for Millets'.

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Andhra Pradesh

# Andhra Pradesh Millets - Super Meal to The World'











#### Context:

Andhra Pradesh is known as the Rice Bowl of India with a surplus of nearly 5 Lakh tons of rice that have been dispatched from Andhra Pradesh to other rice deficit states by the food corporation of India in the last 3 years. The state has a cultivated area of 42.06 lakh hectares. Cereals and millets account for nearly 64.4% of total production. Nine different varieties of millet are grown in the state among which sorghum, bajra, and ragi constitute 91 % of the total Area. Historically, millet is the traditional food source for low-income households for nutritional security, particularly for drought-prone Rayalaseema and North Andhra regions.

#### The potential of Millet and Varieties Grown:

#### **Jowar**

Jowar is one of the principal food-grain crops in the state. It is sown both in kharif and rabi seasons mostly under rain-fed conditions. This crop accounted for 1.62 percent of the total cropped area during the year 2020-21 in the state. Jowar crop is predominantly grown in the districts of Guntur, Kurnool, Anantapuram, YSR, and Prakasam Districts. These districts together accounted for 96.48 percent of the total jowar area under this crop during 2020-21 in the state.

The area sown under jowar was 1.20 lakh hectares during 2020-21 as against 1.55 lakh hectares in 2019-20, showing a decrease of 22.58 percent. The production of jowar was 4.1 lakh tons during 2020-21 as against 3.89 lakh tons in 2019-20, showing an increase of 5.40 percent. The increase in production is mainly due to favorable seasonal conditions during 2020-21. The yield rate of jowar was 3428 Kgs per hectare during 2020-21, as against 2510 Kgs per hectare in 2019-20, showing an increase of 36.57 percent.

#### Bajra

Bajra crop is generally sown under rain-fed conditions in the state mostly during the kharif season and to a less extent in the rabi season. Prakasam, Kurnool, YSR, Chittoor and Ananthapuram districts are major contributors of the crop during the year 2020-21 and these districts accounted for 87.83 percent of the total area under the crop in the state. The area cultivated under this crop is 0.31 lakh hectares in the year 2020-21 as against 0.25 lakh hectares in 2019-20 showing an increase of 24 percent.

The production of bajra was 0.7 lakh tons in 2020-21 as against 0.59 lakh tons in 2019-20, showing an increase of 18.64 percent. The average yield rate of bajra was 2281 kgs/hectare in 2020-21 as against 2328 kgs/hectare in 2019-20, showing a decrease of 2.02 percent

#### Ragi

Ragi crop is cultivated as irrigated and unirrigated crop during both khairf and rabi seasons but is predominantly sown during kharif season. Visakhapatnam, Chittoor, Ananthapuram, Srikakulam, and Guntur districts together accounted for 93.70 percent of the total area under the crop during 2020-21. The area sown under ragi was 0.33 lakh hectares during 2020-21 as against 0.34 lakh hectares in 2019-20, registering a decrease of 2.94 percent over the previous year.

The production of ragi was 0.39 lakh tons in 2020-21 as against 0.44 lakh tons in 2019-20, showing a decrease of 11.36 percent. The yield rate of ragi was 1197 Kgs/hectare in 2020-21 as against 1320 Kgs/hectare in 2019-20, showing a decrease of 9.32 percent when compared to the previous year.

#### **Minor Millets**

Korra, varagulu, samlu, vooda, and other cultivated millets come under "minor millets". These crops are mainly under rainfed conditions and the area under these minor millets accounted for about 0.3 percent of the total cropped area in the state during 2020-21. Kurnool, Prakasam Visakhapatnam, YSR, and Ananthapuramu districts together accounted for 91.7 percent of the total area under minor millets in the state during 2020-21. Kurnool District alone accounted for 27.6 percent of the state area under minor millets. The area under minor millets was 0.21 lakh hectares in 2020-21 as against 0.22 lakh hectares in 2019-20, showing a decrease of 4.55 percent. The production of minor millets was 0.18 lakh tons in 2020-21 as against 0.22 lakh tons in 2019- 20 showing a decrease of 18.18 percent. The decrease in total minor millets can be attributed to the decrease in the areas of Samalu and Korralu.

It could be seen that the production trends for all the millet are on a slight decrease from the Year 2017-18 to 2021-22. Also, the area under cultivation is decreasing from the Year 2017-18 to 2021-22 except for the total coarse cereals. The yield on the contrary is increasing for jowar.

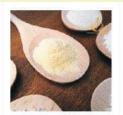
#### Value-Added Products

Millets-based ready-to-cook and eat products become famous in the state due to their nutritional and health benefits. Individual SHG members and collective are preparing various millet recipes through micro-enterprises. 1284 SHG individuals are being engaged in millet food processing. Ragi laddu, ragi malt, ragi mudda, jowar roti, millet kara, millet bundi, millet arisalu, and millet murukulu are the traditional food that is being consumed in the state. In addition, cookies, chocolates, biscuits, barfis, noodles, and sweets are also produced by SHG enterprises.

The following food products are prepared by women enterprises and widely consumed across the state.

#### a) Millet Flour:











Kada Millat Flaur

Foxtail Millet Flour

Little Millet Flour

Barnyard Millet Flour

Organic Millet Flour

#### b) Millet Flakes:











Little Millet Flakes

Finger Millet Flakes

BrownTop Millet Flakes

Foxtail Millet Flakes

Pearl Millet Flakes

#### c) Noodles:









Following case studies talk about the results of some interventions around millet in the state.

#### Case 1: Good Life's; Building Pathway from Farmer to Entrepreneur

Sreelatha is a member of Mylara SHG from a small village Utukur, Sathya Sai District, Andhra Pradesh. She is educated up to intermediate. She also helped the other SHG members in making the finger millet powder. In addition to this, she is credited for attending various workshops besides representing in varied exhibitions where her product and her client care are bestowed with many accolades. She acquired knowledge from IIMR and start the Good Life Finger Millet Powder which is very popular. She overcame many challenges like creating a customer base as well as competition in the market, where customers demanded free samples. To attract market linkages, small sachets of 10gms were developed in attractive packing taking the expertise of Mr.C.Raghunatha Reddy (Husband) and Mr.Rasheed (Social scientist). They developed the design & brand having obtained licenses from Govt. authorities' viz., FSSI, IIMR & University of Agriculture, Tirupathi.

Sri. Satya Sai Multispecialty Hospital was contacted with the product description as well as orders of Navodaya Residential School, Lepakshi, Sathya Sai District & Madanapalli, Chittor District were supplied timely. This has given a cushion in pushing the products into the market to face corporate competition. To have better inputs like dry fruits at wholesale price, they were sourced directly from companies and primary producers. Special attention was given to ensure hygiene while preparing and packaging the products.

Sreelatha plans to train similar SHG members on EDP lines in ragi malt making, mixing, and packing under hygienic conditions and explore further value added products.









Sreelatha, Millet Entrepreneur

Processing of Ragi Malt Millet Powder with SHG members led by Sreelatha

Please visit: http://sreelathafoods.com

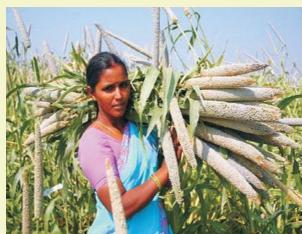
#### Case Study 2: Producer Collectives - Stakeholders to Shareholders

In Andhra Pradesh, the Andhra Pradesh Rural Inclusive Growth Project (APRIGP) formed 168 FPOs of the small and marginal farmers in 2017 and provided hand-holding support through AP SRLM (SERP). One of the FPO in Sri Sathya Sai district called Gudibanda FPO has taken up finger millet intervention as one of the activities. The climate is also suitable for the cultivation of finger millet.

Ragi is grown in the kharif season. The ANGRU has declared this area suitable for finger millet cultivation. Gudibanda is a border mandal of Karnataka state, and they consume ragi in "Ragi Muddha". In Gudibanda mandal 112 farmers have sown millet variety MR 1 (Guli) in 150 acres of land. The FPO Gudibanda has provided knowledge on quality seeds and proper awareness in the year 2022-2023. The crop is still in the fields and not yet harvested. FPO Gudibanda is planning to expand the crop to another 50 villages.

#### Case Study 3: Inspirational Farmer – Introduction of New Variety

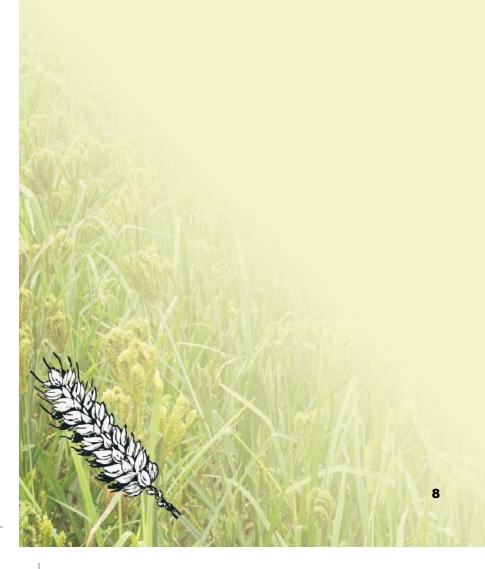
T. Rangamma a farmer of Aminabad village in Tuggali mandal of Kurnool district Andhra Pradesh is a member of the Sri Venkateswara Farmers Producers Group. She cultivated bajra millet (MAHABEEJ -1005 variety) on 4 acres of land. She got 60 quintals yield @15 quintals per acre. Bajra millets (sajja) market price per quintal is Rs.3200. She also processed, graded, and packed the millet and sold them in the open market. The farmer processed one quintal of bajra millets in the Kurnool mill and got 60 kg of dehusked bajra millets. The cost of processing at the mill is Rs.100 per quintal and the transportation charge is Rs.200 making the total expenditure to be Rs.300. As 60 kgs of bajra millets is sold at Rs.1920, after expenses Rs.1620 is her net income per quintal. Finally, she got a total income of Rs.1,15,200 from her four acres. The net profit is Rs.75,200. She is a role model for other farmers and another 20 farmers have come forward to cultivate bajra in the coming year.





#### Learning and policy recommendations to be taken by the Government:

- Providing crop insurance to all millets crops by Government of India.
- Ensure and take policy decisions to provide millet chikki to children in all Anganwadi centers and schools. Introduction of millet-based recipes in mid-day meals at least 3 times a week to increase consumption and better nutrition.
- More incubation centers are to be established for innovation and experimentation of new technologies.
- MSP (Minimum Support Prices) to all millets and procurement of millets through Markfed will help the small and marginal farmers to take up millet on large scale.



Bihar



# Women Farmers Reviving Millets, Bringing Nutritional and Financial Security in Bihar ANIL KUMAR, ASHISH KUMAR, RAVIKANT KUMAR, SNIGDHA PRIYA, SOURAV KUMAR, NAVEEN KUMAR SINGH









#### Millet Production in Bihar: Prospects and Challenges

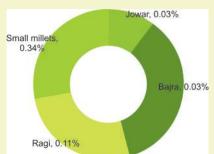
#### Introduction

The Ganges river divides Bihar into two halves North and South Bihar. North Bihar consists of agroclimatic zone I (North-West Alluvial Plain) and II (North-East Alluvial Plain) which are flood prone whereas South Bihar consists of agroclimatic zone III (a) and III (b) (South Alluvial Plain) which are prone to drought. About 80% of the rural population in Bihar is engaged in agricultural activities, which is much higher than the national average. In the absence of major industries, agriculture is the mainstay of Bihar's economy, with rice, wheat, jute, maize, and oil seeds as the major crops.



Figure: Agroclimatic Zones of Bihar

Millet is grown in Bihar for ages with jowar (sorghum), bajra (pearl millet), ragi (finger millet), jau (barley), and minor millets, like, barnyard, foxtail, kodo, etc. being the important

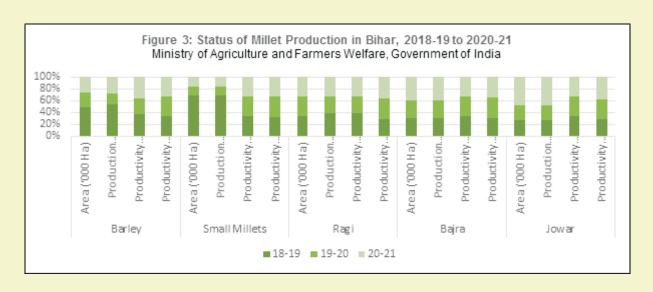


millets grown in some parts of Bihar. In South Bihar, people still have ragi, locally called 'madua', in their food habits. In the Northern Plains, ragi is limited to occasional eating. South Bihar because of its rugged topography, and less rainfall has one of the most favorable agroecological conditions for millet cultivation. As per the Directorate of Economics and Statistics, Bihar's share in India's production of millet is quite low (see Figure 2).

Figure: % of Millet Grown in Bihar, 2021-22

#### The trend of Millet Production in Bihar

NSSO data extracted from the 68<sup>th</sup> round on household consumption shows that Bihar with 18.69 kg/household/month minor millet consumption is among the highest minor millet-consuming states. Specifically, Southern Bihar's topography and agroecological situation makes it more prone to drought during scanty rainfall. As millets need 70% less water than rice and can grow in harsh conditions, it seems millet to be an obvious choice for farmers. But the situation on the ground is different. Despite millet being a climate-resilient and nutritious crop, the high demand for major cereal crops like wheat, rice, and maize, and the lack of price realization for millets, the overall production of millets is declining in Bihar. As per the Ministry of Agriculture and Farmers Welfare, there is a constant decline in the area and production of millet production in Bihar, with minor millet production areas reduced to 23% from 2018 to 2021. However, there has been a slight increase in jowar and bajra production areas owing to its use as fodder with an increasing trend of people adopting improved cattle rearing (see Figure 3).



#### **Challenges in Bringing Focus Back to Millet**

With the United Nations declaring 2023 as the International Year of Millets (IYM), institutions in Bihar have geared up to create awareness of the benefits of cultivating and consuming millet. In this regard, the Rajendra Prasad Agricultural University, Pusa has already sent a proposal to the Bihar Government to set up a Center of Excellence (CoE). Terming millet as the 'miracle crop', the agriculture department of Bihar has planned to promote the production of millet in a mission mode under the proposed fourth agriculture road map.

Despite all these efforts, still there are critical challenges, that need to be addressed to bring back the focus to millet as a major crop in Bihar as mentioned below:

Low Demand in the Market	<ul> <li>Lack of awareness among people on the nutritional benefits.</li> <li>Change in the food habits of people, millet is less preferred as a staple food.</li> </ul>				
Production Challenges	<ul> <li>Low yield as compared to rice and wheat.</li> <li>Lack of subsidy on the purchase of millet seeds.</li> <li>Lack of research on millet production and processing technologies.</li> </ul>				
Price Realization	<ul> <li>MSP is available for millet, but FCI does not procure them, as millet is not linked to PDS.</li> <li>Despite the niche market, farmers don't get the high price.</li> </ul>				
Supply Chain Challenges	<ul> <li>Lack of market research, erratic supply chain with fluctuating demand and supply.</li> <li>Lack of input supply and public procurement support.</li> </ul>				

### Bihar Rural Livelihood Promotion Society(also known as JEEViKA): A Positive Force for Change

Bihar Rural Livelihood Promotion Society (BRLPS) has started the promotion of millets among the farmers through its State Rural Livelihood Mission (SRLM). The BRLPS has

identified 11 districts as drought-prone, viz., Jamui, Gaya, Aurangabad, Sheikhpura, Nawada, Munger, Lakhisarai, Bhagalpur, Banka, Jehanabad, and Nalanda. There is an enhanced thrust in these areas on millet farming to counter the detrimental effects of unpredictable rainfall in the largely rain-fed agricultural regions of Bihar. Bihar SRLM, JEEViKA started the revival of millet in the following 22 blocks of the 11 districts as shown in the map below (see Figure 4).



Figure 4: Districts in the 'Pilot for Millet revival' with the number of blocks depicted in different colors

#### Testimonial 1: Mangiya Devi, Chakai

"We used to grow madua (ragi) earlier as well, but JEEViKA's support in the introduction of small machines reduced our drudgery and increased the yield".

She attended the Sarasmela at the Gyan Bhawan in Patna in September 2022 and sold 432 kg ragi flour, and 37 kg biscuit packets.

#### Testimonial 2: Gangiya Devi, Chakai

"We had a practice of producing millet for cattle feed and less for self-consumption, but now we grow millet to market it as one of the sources of our households' income".

She attended the Sarasmela at the Gyan Bhawan in Patna in September 2022 and sold 150 kg ragi, 80 kg ragi flour, and 6 kg biscuit packets.

- The following interventions are made by BRLPS for increasing production and consumption of millet in the state of Bihar
- 1. Awareness and Capacity Building
- Awareness generation activities:
  - Promotion of different recipes and health benefits through attending different farm fairs and symposiums.
  - Inclusion of different line departments, like the agriculture department, agriculture institutes, KVK, and cooperative institutions to raise awareness and support in building an ecosystem of support.
- Training on new techniques for productivity enhancement: Techniques like line sowing, System of Millets Intensification (SMI). These techniques help in proper aeration and sunlight to the crop, less wastage of water, helps in weeding, and hence results in higher productivity.
- Promotion of Farmers Field School (FFS): This helps in the capacity building of each
  farmer through peer-to-peer learning as the meeting happens on regular basis.
  Extensive field demonstration and learning outcome at the individual level is
  taken care of. After training and field demonstration, a field visit is a major
  component of the FFS and it is done by trained Community resource persons
  Community Resource Persons (CRPs) who are also farmers of that same
  community.
- 2. Supporting Production and Processing
- Community Hiring Centre (CHC) for farm mechanization: 477 CHCs have been established throughout the state to support different farm interventions. Timesaving, timely sowing, drudgery reduction, and increase in productivity are the key role that CHC is playing in Millet cultivation.
- Post-harvest processing technology: Improvement and dissemination of post-harvest processing technology addressing needs at different magnitudes
- 3. Creating Business Institutions
- Introduction of technologies through small processing units for de-husking and polishing at a local level.
- Promoting and strengthening FPOs in the selected districts on millet processing, value

Following case studies talk about the results of some interventions around millet in the state

#### Case 1: Promoting Improved Methods is Essential for Increasing Production

In South Bihar's hilly areas, farming is difficult. It is also known for high poverty with Rs 30,000-40,000 annual household income. Crops like ragi and kodo with NTFP-based activities like bidi making, bio-degradable (leaf) plates making, collecting firewood, and selling the same are major livelihood options in the area. Most of the area is rainfed with traditional practices. High labor costs and low productivity further aggravate the situation. JEEViKA team intervened with some new techniques and adoption mechanisms for increasing the production area and yield. Some of the major initiatives were:

- a. Training and development of new techniques like line sowing, use of cultivator, thresher, and reaper.
- b. Regular monitoring for proper adoption of technique as well as scaling up of millet cultivation, making it a main source of income for the

- interested farmers.
- c. Evaluation of the growth and behavior change in perspective of uses like self-consumption to sell the produce in the market.
- d. For productivity enhancement and drudgery reduction, custom hiring centers (CHC) got established.

#### Productivity Enhancement of Millet in Chakai, Jamui District

Through the adoption of new techniques of millet cultivation, women farmers in Chakai block have realized good income. The initiative was taken by the collective action of JEEViKA staff and community-level federation named Pragatisheel CLF in February 2021. After three cycles of crop cultivation in the area, average yield has reached around 420 quintals per acre. Total millet production in the area reached around 420 quintals per acre. Details are given in the table below:

SI.	Indicators	Before	After Intervention	
No.		Intervention		
1	Farmers Engaged	180	450	
2	Total Land (acres)	80	350	
3	Productivity (kg/acre)	20-25	30-35	
4	Price realization without processing (per quintal)	Rs 2500	Rs 3200	
5	Price realization after processing (per quintal)	Rs 3000	Rs 4500	

#### Rashmi Kumari become part of the Cluster Approach of Millet Farming

Rashmi Kumari, a resident of Tulsiya village in Bihariganj block of Madhepura district, joined Priya SHG in the year 2009. Her main source of income has always been farming. Earlier she had to face a lot of difficulty regarding capital investment, due to which she always depended upon money lenders, fertilizer and seed shops.

JEEViKA started the cluster approach of millet cultivation on 16 acres of land in the village. Rashmi joined this initiative and cultivated millet on 0.75 acres plot, producing 4.2 quintals of millet. She easily sold the produce in the nearby markets. She also observed that crops

like millet do not need a lot of irrigation or fertilizer and can be grown on uplands. By seeding early, one can also go for taking another crop from the field.

#### Impact of Mini Tool Kit Bank on Nandu Devi's Livelihood

Nandu Devi, a resident of Dhibra in Gurua block of the Gaya district. She joined Shankar SHG promoted by JEEViKA in 2015. Nandi Devi lives with her husband and has 2 daughters studying in High School. She runs a vegetable shop, and her husband is a farmer.

Community-based Village Organization (VO), 'Kranti VO' received project support for starting a mini tool kit bank at the village level for drudgery reduction in farming. This model runs

on a nominal charge basis and maintenance is done through its profit. It helped her in properly using human resources: saving time, and dependency on labor.



Pic 2. Nandu Devi with her Millet Produce (PC. JEEViKA)

Nandu Devi is one of the leading farmers who hired the tool kit and started the cultivation of millet on 1.02 acres of land. She hired a cono-weeder, sprayer, and manual harvester. As millet crops are ready in 60-70 days with efficient use of mechanization, she could also grow rice as a second crop from the same field, earning a gross income of about Rs 65,000.

#### **Testimonial 3:**

In Chakai, women farmers producing millet have taken 100 shares each worth Rs.10 in JEEViKA promoted producer company "Agroacre JEEViKA Mahila Producer Company. Processing unit facilitated by an NGO, PRADAN in the area has also helped in the value addition of their produce in making millet flour, biscuits, etc.

#### Case 2: Revival of Millet through JEEViKA Promoted CBOs in Saharsa

Saharsa is in the Mithila region towards the North of Bihar. In Saharsa two blocks Sattarkatiya and Kahara are suitable for millet production, and millet farming has been a traditional practice. But of late, farmers faced a lot of issues, such as:

- Low yield of millet
- Use of traditional seeds, with less focus on storage and quality
- Seed replacement not in focus
- Use of millet as fodder, less focus on consumption or sale.
- Suboptimal package of practices

The local JEEViKA team planned to revive millet through the business collective it promoted.

In the year 2018, JEEViKA facilitated the formation of a farmer producer company, 'Saharsa Women Jeevika Producer Company Ltd' (SWJPCL) registered under the company act 2013. The company has an authorized capital of Rs.10 lakhs and a paid-up capital of Rs.10 lakhs. 1800 SHG women farmers are its shareholders. The company's turnover in the financial year 2022-23 was Rs. 5.1 Crores.

#### Its Business includes:

- Input supplies to farmers of rice, wheat, maize, and vegetables.
- Output business of maize, wheat, millets, and fox nut.





#### The interventions chalked out were:

- a. Timely seed supply and seed replacement- existing seeds were replaced with High Yield Variety finger millets- GPU 48 and RAU-08 with 105 farmers.
- b. Training and capacity building of farmers on improved techniques, like pre-nursery technique, System of Millet Intensification, line sowing, sorting, and grading, etc.
- c. Handhold support to farmers through local cadres like village resource persons.
- d. Establishment of the seed bank.
- e. Regular reflection meetings with millet farmers.
- f. Assured buy-back facility through SWPCL with timely payment to farmers.

#### Results of the intervention:

- a. Seed replacement and improved practices increased the yield of millet by 20-30%.
- b. Farmers started adopting new techniques of farming.
- c. Aggregation of produce helped in ensuring buy-back.
- d. Sorting and cleaning helped in better price realization.

The overall impact was a change in attitude towards increasing the area coverage of millet. It also led to new initiatives in 'Branding, Packaging, and Marketing:

- SWPCL procured the millet directly from farmers and after value addition converted it into ragi flour and multi grain flour and sale through Green Delights and other channels.
- FPC planning to introduce other value-added products like millet chikki, cookies, biscuits, mixers & other ready-to-eat food items.

#### **Case 3: Bringing Nutritional Security to the Families**

Millet farming was prevalent in large areas of Bihar, especially in South Bihar but over the years, farmers shifted to paddy. Anita, an employee of PRADAN says, "de-husking millet is a laborious and time-consuming process. There is no minimum sale price for millet in the state and farmers got poor rates. All these acted as disincentives for millet farming. Further, millet flour is a little bitter and the taste has to be acquired". As foodgrains became available to the people through the Public Distribution System (PDS), millet was largely relegated to be used as fodder for animals". Hence, apart from the production and marketing of millet, JEEViKA, and other organizations engaged in millet trying to bring back renewed focus on millet as a nutritious food choice.

#### Promoting Millet as a nutritious food in Chakai

Jamui is among the 250 most backward districts as per the Niti Aayog. As per the National Family Health Survey 4 (2015-16), 47 percent of children below 5 years and 37.5 percent of women in Jamui district are malnourished. Chakai is one of the tribal-dominated blocks of the district. PRADAN began the work on improving nutrition status of women and children in Chakai in 2018. Market studies revealed that millet had good potential for farming as its demand is rising in urban areas as people are becoming aware of its nutritive and health



benefits. The first challenge was to change the mindset of the rural people. As it was seen as poor people's food, farmers were not interested in millet cultivation. Some of the steps taken were:

- Motivate women farmers by sharing studies on the nutritive value of millet and its health benefits.
- Providing good quality seeds to farmers that would give better yield and taste.
- Collaborated with the Indian Institute of Millets Research (IIMR), Hyderabad on improving the millet variety.
- Mobilized processing machines with help of the government to de-husk the millet which saved farmers a lot of labor and improved the taste.

Ensuring production is not enough unless the product is marketed. So, a food producer organization (FPO), 'Kodo Bazar Federation'. The NGO, PRADAN is also in talks with the district administration to promote millet it in Anganwadis (ICDS centers) to boost demand and consumption. The FPO currently has 350 members who have contributed Rs.2000 each towards the share capital. The state government also initially gave Rs.1 lakh to the FPO as working capital. This year, FPO has also started procuring millet from local farmers and selling it to the market after initial processing.

The administration also helped the FPO to procure processing machines from Tamil Nadu in March 2021. The destoning and sorting machine has a per day capacity of 2 metric tons while that of the de-husking machine is 1 metric ton. The processing through the huller machine is currently around 20 kg per day due to irregular electricity supply and limited capacity. Around 2,000 families in 60 villages of Jamui are now growing millet after this intervention. Anita says, "the farmers can earn Rs. 6,000-8,000 from millet farming, and millet can be a good crop for crop diversification, and soil management, and can give benefit with low out-of-pocket expenses".

#### Lila Devi, a campaigner for millet in her area

Lila Devi, a 38-year-old woman is a resident of Bisanpur village of Sattarkatiya block in Saharsa district. Since 2017, she is a member of Kundan SHG associated with Shakti VO. She is not only a millet farmer but also recognized as 'Badki Didi' (elder sister). She constantly motivates other women for growing millet and includes millet in their diet. She says, "my mother-in-law had diabetes, I learned that madua (ragi) helps control diabetes, so I began millet farming". She further says that it has helped her mother-in-law and now her entire family eats millet. She received training from JEEViKA on the benefits of nutritious millet. She motivated 80 farmers to adopt millet cultivation and the acceptance is growing slowly but surely. She says more and more women now understand the benefit and are willing to cultivate millet.

#### Testimonial 4: Soniya Kumari, Chakai

Sonia is a CRP in Chakai and says, "I have motivated people after getting training in millet. Acceptance is gradually increasing; 70 farmers have already adopted millet cultivation in my village".

#### Testimonial 5: Rekha Devi, Chakai

"I am from Baljori village and have taken up millet farming in 2018 after learning about it from PRADAN. Millet farming provides my family with food security and nutrition and my income is rising. 10 families have adopted millet cultivation, and many more are eager".

#### Conclusion

Looking at the climatic vagaries, efforts need to be made by the different agencies to promote millets in Bihar. We can say that a journey towards climate-resilient agriculture has started, and millets are one of the suitable options, but market demand is a key driver of production. By incorporating millets in different schemes like midday meals, PDS can help in increasing the production area. In recent decades, researchers have rediscovered the multiple advantages of millets that led to their renewed popularity. Millets can help to control blood sugar, improve digestive health, and protect the heart. Millets are gluten-free and contain high content of protein, fiber, and antioxidants. They can be cultivated easily with little water and in all soil types. Some of the policy recommendations emerging from the efforts and cases in Bihar can be summarized as:

- Support for a location-specific package of practices (PoPs) for all millets, with a special focus on small millets inclusion.
- Establishing seed banks and providing support to local institutions and enterprises.
- Support for the inclusion of adequate technology, especially for weeding, harvesting, threshing, and dehulling.
- Support for drying and threshing yards: such infrastructure will improve the effectiveness of dehulling and the quality of dehulled grains by reducing the incorporation of impurities.
- State and Central Governments need to provide investment support for the installation of processing units by rural entrepreneurs at small to medium scale to handle the location-specific combination of millets (including small millets). This infrastructure will also promote household consumption.
- Procurement of millets shall be done by FCI, based on a relevant MSP.
- Inclusion of millets into the PDS, ICDS program, mid-day meal, and menus of various food-based welfare schemes implemented at the state level.

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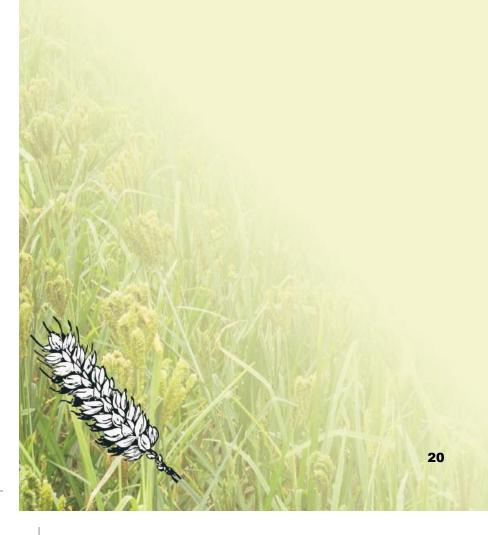
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#### Millets in Chhattisgarh-Abrief context

Historically millets have always been a major component of indigenous cultures and traditions. Since times immemorial, the communities of Chhattisgarh especially in the northern hills and southern plateau region have grown millets. 20 out of 33 districts have historically been engaged in the cultivation of millets. However, Chhattisgarh also popularly known as the Rice Bowl of India. It has seen a massive decline in millet production over the past decade owing to farmers shifting to paddy cultivation and the lack of proper remuneration mechanisms around millets. Archaeobotanical studies of plant and grain remain obtained from archaeological sites during the past two decades pointing towards a continuous history of millet cultivation in Chhattisgarh, especially in the southern Dandakaranya region.



#### Opportunities in Millet cultivation in Chhattisgarh

- Sustainable food source for combating hunger in changing world climate scenario
- Resistant to climate stress, pests and disease
- Rich in micronutrients like calcium, iron, zinc, iodine etc
- Rich in bioactive compounds and better amino acid profile
- · Gluten free: a substitute for wheat in celiac disease
- Climate resilient crop
- Sustainable income source for farmers
- Low investment needed for production
- · Value addition can lead to economic gains.

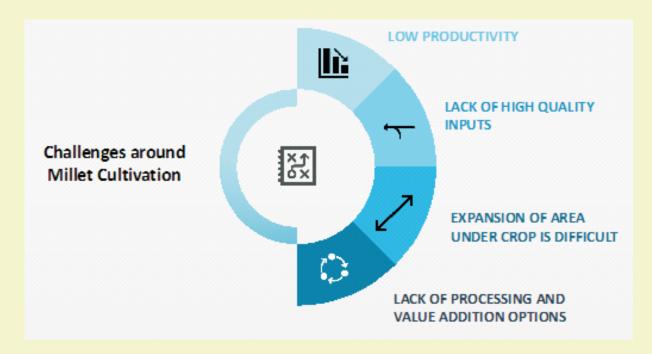
Food Security

**Nutritional Security** 

**Health Security** 

**Economic Security** 

#### Challenges in millet cultivation



- Low productivity of millets in comparison to wheat, rice and maize: Millets have lower productivity in the state. This is attributed to their cultivation in marginal lands in rainfed farming. The yield gap in millets is largely a reflection of farmers' cultivation technologies that offer ample room for improvement. The state' average yield gap for rabi sorghum, kharif sorghum, bajra, ragi and small millets over 2009-2014 was 58%, 151%, 62%, 183% and 156%, respectively.
- Resistance to pests and diseases: Though millets have minimal pests and diseases, some pests and diseases often cause significant losses in sorghum (shoot fly, stem borer, grain mold), pearl millet (downy mildew and blast) and finger millet (blast). No productive cultivars with highly significant resistance to these pests and diseases are available and management options are mostly limited to agronomic and chemical methods.
- Area expansion in non-traditional areas: Bringing the additional lands under millets cultivation is another important factor in increasing the production, especially the fallow and wastelands and the non-traditional areas are more sustainable without competing with the high remunerative crop.
- End-product specific cultivars: Geometrical and nutritional evaluation of several cultivars available in all the major millet growing areas and mapping them to the suitable end-use is essential for better end-product quality and scaling up the value addition by the giant processors.
- Seed hubs & breeder seed production There is a huge need for identifying various product-specific cultivars and establishing seed hubs for breeding and producing such seeds to establish demand-driven production. The development of seed hubs that can deliver quality seed at high production.

#### Efforts to revive millets in Chhattisgarh

#### Millet Mission – an initiative by Government of Chhattisgarh

The rich history of millets in the state and the constant demonstrations and policy influencing done by several like-minded civil society organizations have led to the state taking cognizance of the efforts and launching a state-wide millet mission program.

Major highlights of this program -

- The mission will increase the nutritional level of the people in Vananchal. At the same time, the value addition of these crops will also provide employment and the economic condition of the farmers will also improve.
- On the special initiative of the honourable Chief Minister of Chhattisgarh, the State Government has decided to procure kodo, kutki, and ragi on support price and to include these crops under Rajiv Gandhi Kisan Nyay Yojana.
- Keeping in view the rich nutrients found in small cereal crops, the district administration and Krishi Vigyan Kendra in North Bastar (Kanker) district are giving information to the farmers of the district for improved farming under Millet Mission.
- Kisan Vikas Samiti has been formed for the production and collection of kodo-kutki, with which 300 families are associated.
- Processing units have been set up at Krishi Vigyan Kendra Kanker, in village Chilhati
  of Bhanupratappur block, and in village Ghotulmunda of Durgukondal block for value
  addition of minor cereal crops. Processing work is being done by SHGs in these three
  units.
- Women of Self-Help Groups (SHGs) engaged in collection and processing work have been employed for more than 850 days. On the initiative of the district administration, farmers and women groups producing small cereal crops have been linked to this processing center.
- The products prepared in this center are being provided through Aanganwadi to malnourished, anemic, and pregnant mothers and malnourished children in the form of kodo rice khichdi and ragi in the form of halwa.
- The state Government is gearing up to implement the 'Chhattisgarh Millet Mission' in Chhattisgarh to increase the scientific production of kodo-kutki-ragi. Chhattisgarh Government has declared the support price of kodo-kutki as Rs. 3000 per quintal. Now to expand the scope of Rajiv Gandhi Kisan Nyay Yojana, the state Government has decided to give incentives at the rate of Rs. 9000 per acre to the farmers for cultivating the kodo-kutki crop.
- The state Government has also provisioned Rs.10,000 per acre for the farmers who take kodo-kutki crop, instead of paddy.

Similarly, CGSRLM in association with various agencies has attempted to create models to influence the state around large-scale cultivation of millets. This has been in the domain of increasing production, developing marketing channels, value addition, and creating niche millet-based products. Through this, SHG collectives have tried to create a movement around millet promotion and greater uptake by the community.

Following are some best practices available in the state around millet.

#### Case study 1: Reviving lost glory: Millet cultivation for the Poor



Bhanupratappur, with less than 10% assured irrigation support and more than 58% anemic prevalence is one of the most poverty-stricken areas of the most poverty-stricken areas of the state of Chhattisgarh. Millets traditionally are one of the major crops that are cultivated in the region. However, there has been a 17% decrease in the past three years in its cultivation area. One of the primary reasons behind it is the visibly low production figures as compared to other cereal crops, most notably paddy. Another reason is the absence of a suitable procurement mechanism for millets akin to the paddy model. The presence of middlemen doesn't help either

as it results in unregulated price fluctuations leading to lesser belief in cultivating it as a remunerative crop. All these factors combined have resulted in the gradual decrease of millet cultivation and the conversion of suitable millet lands into paddy lands

However, the low crop productivity has by far been one of the most pressing challenges that have led to the decline of the crop. With more focus on generating higher incomes, millets were beaten to the race by more commercial crops like paddy. CGSRLM and PRADAN's work in Bhanupratappur involved a two-pronged approach of working on a multi-stakeholder collaboration level to work on production benchmarks of the crop and devise a procurement mechanism to build an avenue for the sale of this crop. A combination of practices was introduced to boost the production and productivity of the crop.

#### The same is listed below:

- · Seed selection, priming, and treatment
- Nursery preparation
- Field preparation
- Transplanting using the SRI method
- Weeding and trolling
- Non-chemical pest and disease management

In the process part, the major interventions were the selection of villages based on their land resources, generating community interest and participation through awareness mechanisms, building capacities of the communities and cadres through intensive training and capacity-building approaches, and instituting mechanisms to facilitate convenient marketing of the produce through aggregation and linkage with government schemes. It also involved creating infrastructural provisions to aid the value addition of the product through government support.

The first and most important tangible change that was seen was in the average crop productivity. Adoption of the intervention package led to an increase in productivity from

the average 2.5-3 quintals per acre to 5-6 quintals per acre for the SMI method and 4-4.5 quintals per acre for the improved method, a 150-200% jump in its standards. This created great momentum in the community. Another key factor was the adoption of this practice in scale. More than 1000 farmers adopted the SMI and improved cultivation practices leading to significant production.

However, with significant production, the question of aggregation and marketing of the produce also came into the picture. Thus, a procurement strategy was thereby formulated with the support of Zila Panchayat, Kanker wherein KVK would aggregate the produce from SHG collectives promoted by CGSRLM, process it, and/or connect it with the ICDS department for the Ready to Eat Scheme. This entire collaboration framework aptly named "Kanker Millet Mission" was to ensure increased production, collectivization of produce, explore the scope of processing, and link it with the ICDS department. This initiative has paved the way for more women farmers to participate in the process of millet promotion and marketing. This has also created a glimmer of hope amongst women farmers who are mostly associated with the CGSRLM. In discussions conducted around this pilot, most of the women farmers believed this arrangement would trigger in increasing the acreage of millet crops and would incentivize farmers to cultivate it more commercially. Also, techniques introduced for increasing production helped farmers understand the potential of production per acre.

But this is just the tip of the iceberg. The potential for millet in the Kanker district is immense and can be scaled up to a great extent. The extension of production techniques, aggregation mechanisms, and awareness campaigns will go a long way in increasing the prevalence of millet production in the entire district. It carries the potential of being done with more than 30000 families of the district harnessing more than 5000 MT of produce. The community mobilization achieved through CGSRLM will play a crucial role in the scale-up of millet cultivation throughout the district through large-scale awareness campaigns and capacity-building efforts. Also, cadres groomed under CGSRLM such as Krishi Sakhi and Udyami Sakhis will play a major role in scaling up the activity and in achieving production benchmarks. Large collaborations will however be required, post scale-up of production with big corporate houses to ensure marketing of the produce. Soon, the initiative can easily think of value addition with around 500 MT of millets. As per this potentiality, GO-CSO-RI-CBO collaboration can be another good potentiality to ground millets mission more.

#### Case study 2: On it's the way back: Reviving millets in Narharpur

Narharpur is a tribal-dominated block of Kanker district of state Chhattisgarh. Agriculture is the main source of livelihood and millet is one of the traditional crops of this block. A few decades ago, millet was one of the major crops having large area coverage and was a high-consumption commodity in the community. But with the passage of time and changing circumstances such as the introduction of PDS for food security, provision of MSP for paddy, and changing market scenario the coverage of crops decreased significantly. Farmers are converting their uplands into medium lands and lowlands for the purpose of paddy cultivation due to assurance of MSP support. Due to this development millet cultivation has been affected to a higher extent. The scarcity of seeds was also a major challenge.

PRADAN in association with CGSRLM and agriculture department started to engage in millet cultivation in the Narharpur block for the last 2 years, to increase the coverage of



crops and enhance forward and backward linkages of millet. For sustainable enhancement of livelihood and income of the community, we took millet as one of the two major crops to be done in the APC (Agriculture Production Cluster) approach under 2<sup>nd</sup> phase of the High Impact Mega Watershed Project supported by BRLF, ABF and MGNREGA cell of Chhattisgarh Government. We have developed a Package of Practices for millets crop based on the local context. We are also organizing awareness

drives, training, and capacity building of community and community-based women's organizations on regular basis around a package of practices including improved methods and farm mechanization to increase productivity.

In rabi season 2022-23,154 farmers of Narharpur block were linked to Seed Corporation of Chhattisgarh for finger millet seed production in an area of 176 acres of land and with the support of the agriculture department demonstration we provided them 8.8 quintals of quality seeds and other inputs for the crop. The agriculture department and PRADAN Jointly organized awareness drives such as orientation meetings, slogan writings, etc. around millets cultivation at the village and block levels which brought quite a big change in millet cultivation in this rabi season and the area under millet during this rabi season is 2075 acres. We are expecting production of 100 metric tons. So, we are exploring processing and value-addition options through different processing units in the district. There are processing units run by KVK Kanker and a private processing unit having a capacity of 300 MT and 3000 MT respectively, these are going to support us in forward linkages of the produce.

Season	Number of Farmers cultivating millet	Area under Millet (in Acre)	Numbers of farmers in seed production	Area under millet seed production (Acre)
Rabi 2022-23	1153	2075	154	176

<sup>\*</sup>Source Seed Corporation Chhattisgarh, Kanker & Agriculture Department Narharpur

#### Case study 3: FPC's spearheading market linkages.

Bastanar block of Bastar district is known for abundantly practicing ragi cultivation. Women farmers usually sell ragi after production in the local haat in which they never receive fair prices due to an unstructured supply chain mechanism. Due to fewer possibilities of infrastructural support system at the rural level, aggregation remain a challenge and farmers are unable to set relationship with big markets for the marketing of product.

Bhumgadi Mahila Krishak Producer Company Ltd (BMKPCL) was established under the Special Value Chain project in 2017 through the Chhattisgarh State Rural Livelihood Mission. The prime mandate of this FPC was to closely work with small and marginal women farmers and cater to the issues of aggregation and systematically build the system of supply chain and finally ensure good returns to all shareholders in the form of a dividend.

In this way, BMKPCL works for the upliftment of livelihood standards of the small and marginal farmers of the Bastar division. After this joining formality was over, farmers constituted the producer group (PG) in their village. Training related to production, aggregation, marketing, buyer and seller approach, and different business techniques was imparted by CGSRLM.

Benefits of women members after becoming a shareholder -

- To know about the exact price of the different products
- To know the right market to sell the products
- Ensuring correct measurement of products and ensuring weighing arrangements
- A solution to the problem of a proper transaction by local vendors and middlemen
- To get money to sell the product at the right time
- Helping to deliver products to mandis and markets
- To get fair prices according to the grading (A, B, C) of different products
- To obtain information on handling, storage, and grading of products
- Procurement of produce at the village level, which reduced the transportation cost
- Complete transparency in the measurement of quality of products and the payment system
- · Bonus and dividend on products sold to the company
- Facilitating the company to sell its product at the doorstep of the farmers
- Proper diagnosis of any kind of problem will be done by the cluster head of the producer company and the members of the company.

Through these interventions women farmers in the form of producer groups became strengthened and the impact was also visible in terms of figures. In the last 4 years, 111.2 quintals of ragi, 35.7 quintals of kodo, kutki (171.62 quintals) were produced, which were processed and sold to the various institutions and traders (NACOF India, Zila Panchayat Bastar, Women and Child Development Department, Bastar, TRIFED- Raipur, Harihar Bastar Bazaar, Delhi, Saras Melas, Bihan Bazaar, Rajya Utsav, Raipur and to other local traders) by the producer company.



## Case study 4: Minor millet's promotion ensures a delta change in the northern hills of Chhattisgarh





CGSRLM is working in 28 districts and 100 blocks. PRADAN NSO is working as a TSA to CGSRLM in Farm livelihood and livestock. Due to favorable climatic conditions, the Mainpat block was selected to promote millets. The SHG members with specific criteria of nutrition security as one of the prime objectives of BIHAN were selected for this intervention. After the selection of farmers, convergence with the agriculture department and KVK was done to arrange inputs for these women farmers.

The following practices were applied for ensuring production amongst the women farmers of village Katkalo

- · Seed selection, priming, and treatment
- Nursery preparation
- · Sowing of seeds
- Preparing Jeevamrut
- Field preparation
- Plough the field three times
- · Transplanting using the SRI method
- Weeding and trolling
- Non-chemical pest and disease management
- · Neem solution (for sucking pests and mealy bug

Based on the above practices, there was a significant increase in the production benchmarks of the crop. The same is listed below:

#### Farmers Data of Katkalo village:

Sl No	Name of the Farmer	Village	Panchayat	Acreage	Investment (Rs)	Yield
1.	Ratnavati	Katkalo	Katkalo	1 Acre	7500	5 quintals
2.	Urmila Khes	Katkalo	Katkalo	1 Acre	7900	6 quintals
3.	Rambati	Katkalo	Katkalo	1 Acre	8200	5.5 quintals
4.	Sulochana	Katkalo	Katkalo	1 Acre	7100	4.9 quintals
5.	Prem Muni	Katkalo	Katkalo	1 Acre	7860	5.2 quintals
6.	Suraj Muni	Katkalo	Katkalo	1 Acre	8100	5.4 quintals

On the initiative of the district administration regarding the promotion of millets in this geography, farmers and women's groups producing small cereal crops will be connected to the processing center. The products of the farmers after harvesting are collected through the women's group in the processing unit. In this center, the work of packaging is being done through the women's collective in the processing unit. Pregnant mothers suffering from anemia and malnourished children are provided with ready-to-eat khichdi and halwa through Aanganwadi didi. It is noteworthy that Chhattisgarh Government not only has the support price of kodo and kutki declared as Rs. 3000 and Rs. 3100 per quintal but also with the extension of Rajiv Gandhi Kisan Yojana has included a clause of input support price of Rs. 9000 per acre. Farmers taking urad crop instead of paddy provision has been made to give input subsidy of Rs. 10000 per acre.

#### Case study 5: Millet's cafe – rare innovations to promote super-grains.

On 29th January 2023, honourable Prime Minister Shri Narendra Modi, in his radio program 'Mann Ki Baat' spoke about 'Millets Café' which was started in Raigarh, Chhattisgarh, in May 2022. This café is unique as its menu has dishes made of millets only. Millets Cafe was conceptualized by then collector of Raigarh, Mr. Bhim Singh and developed by the 2018-batch IAS officer and CEO of Raigarh Zilla Panchayat, Mr. Abinash Mishra. Mr. Bhupesh Baghel, honorable Chief Minister of Chhattisgarh has taken a firm step to promote this type of initiative in all millets growing districts.

The average footfall of this cafe is 50 on weekdays and 70 on weekends. Health-conscious communities, foodies, and bloggers are their primary customers. The most popular recipes here include millet cheela and dosa, millet momos, millet pizza, millet manchurian and kodo biryani. In less than one year, the cafe has already reached a break-even point and is moving towards a profitable business. For popularizing the cafe, a lot of new experiments are being done and a recipe book of all these unique recipes is being shared in other parts of the state and the country. Recently, to promote it, millet delicacies were served in Vidhan Sabha as well.

This cafe was opened in collaboration with the Transforming Rural India Foundation (TRIF), the district administration and Woman and Child Development Department provided administrative support. Now, it is run by Vikas Mahila Kshetra Sangh (VMKS). An integrated project was implemented focusing on awareness among the farmers, capacity building for the usage of the Sri Vidhi technique for millet by the Women and Child Development Department from the farmers, and its inclusion in Integrated Child Development Services' Ready-to-Eat packets and Take-Home ration was also promoted.

This millet cafe was conceptualized for the promotion of millet and to make it a part of the mainstream culture. The cafe demonstrates a variety of mainstream and traditional recipes made from different millets. "We want to provide healthy food and make sure that it satisfies the taste buds of the customers. With the initial support from the district administration, now our cafe is self-sustainable," said Rohini Patnaik, who heads the operations of the VMKS and the millet cafe. Neeraja Kudrimoti,



SPO aspirational districts from TRIF also mentioned, "Visits from self-help groups (SHGs) helped us understand the potential of millets. A lot of the recipes were innovated before the launch of the cafe. The whole idea was created considering sustainability as a major factor. We even employed professional chefs for ensuring good food quality and taste." Chhattisgarh aims to be the millet hub for the country, the government has also launched an integrated mission on millets to promote not only production but also processing, consumption, and market absorption.

#### Case study 6: Millets in every plate- an innovative way to reach from farm to plate

Surajpur district, block Odagi consists of 4 clusters (Odagi cluster-31villages, Chendra

cluster-17villages, Lanjit cluster-16villages, and Biharpur cluster - 36 villages). The population of these clusters sums to 20141. The major livelihood of this area is NTFP (Non-timber forest product) and paddy. Almost all villages of these clusters lie near the vicinity of the forest area. A few years ago maximum farmers did a variety of coarse grain cultivation like jowar (sorghum), bajra (pearl millet), kodo (cow grass), kutki (little millet), ragi (finger millets).



Big traders usually exchange paddy with NTFP as a system of barter and apart from this always purchase other coarse grain at lucrative rates from the rural farmers. This activity impacts the lifestyle of these poor farmers a lot. In between a lot of farmers abandoned the cultivation of coarse grain like ragi, kodo and kutki since paddy promotion was the major focus and since inputs for paddy promotion were available in a proper manner, farmers were inclined towards paddy cultivation. The scenario changed after the evolution of NRLM. Initially, the women farmers were constituted into SHGs, and in those SHGs, the discussion was facilitated regarding the nutritional importance of ragi and other coarse grains. A lot of training was conducted to build the capacity of women farmers and enhance their trust level to achieve levels of empowerment.

After this development, the small and marginal farmers started growing coarse grain again. Through SHGs, these products were purchased, and good rates were given to farmers by which their trust level increased to heights. After purchasing all the coarse grain products, they were accumulated in one space and were sold to Menium Greens company of Hyderabad. The dividend was also shared with all the farmers. Farmers got a margin of Rs 4 per kg which was a dream for her previously. Previous year 15 tons of kodo and 15 tons of sawan (Indian barnyard millet) were purchased in a similar process and 5 tons from both the variety were preserved in the village organization for an emergency. Department of Agriculture is very active in this area and as a scope of convergence, they are supporting valuable inputs to small and marginal farmers for production enhancement. MSP of Kodo in CG is Rs.30 per kg.

In the financial year 2021 – 2022, 1735 quintals were sold and in 2022 – 23, 610 quintals of kodo were purchased and sold in MSP fetching a revenue of Rs.52,05,000 and Rs. 18,30,000 respectively. Now women members are capable enough and using bank linkage, RF, and CIF for millet cultivation.

#### **Future Course of Action**

SRLM in its future course of action has charted out an action plan for further scaling up of millets across the state. In congruence with the millet mission, SRLM has planned to include 55000 farmers of 89 blocks of 17 districts under its millet-focused annual action plan. In addition to this, the SRLM has also focused on capacity building and promoting more value addition and marketing of millets through processing units established with the support of KVKs and the agriculture department.

The state has already announced the addition of millet in Mid-day-Meal scheme in addition to its presence in Aanganwadi centres for children and malnourished, pregnant, and lactating women. This is a very good step to increase the in-situ consumption of millet and provide a buyback mechanism for the farmers. The Chhattisgarh millet mission initiative holds a lot of potential in providing farmers with a market option that is very much crucial in scaling up the crop. In addition, the crop's inclusion in Rajeev Gandhi Kisaan Nyay Yojna opens a plethora of opportunities for the community to shift away from paddy and cultivate millets in suitable lands in both the kharif and rabi seasons.

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# Millets: Forgotten Grains, Revitalized for the Future OMDEVSINH CHUDASAMA, KASHMIRA VAISHYA HARIKA NATHA SAPNA NISTARWAD









#### **Background**

Millets have a long history in the state of Gujarat, located in Western India. They have been an important staple crop in the region for centuries, grown and consumed by local communities for their nutritional and economic benefits.

In Gujarat, millets are grown in both rainfed and irrigated areas, with the most common types being pearl millet (bajra), finger millet (ragi), and sorghum (jowar). These millets are often grown alongside other crops such as cotton, maize, and groundnut.

#### Different kinds of Millet in Gujarat State

Sr.no.	Name	Regional Name
1	Pearl Millet	Bajri
2	Sorghum	Juar
3	Finger Millet	Nagli, Bavlo
4	Kodo Millet	Gajro
5	Proso Millet	Cheno
6	Little Millet	Kuri
7	Foxtail Millet	Kang
8	Barnyard Millet	Sama

Historically, millet played a crucial role in the diets of the rural population in Gujarat. They are highly nutritious, and rich in protein, fiber, and minerals such as iron and calcium. Millets are also well adapted to the arid and semi-arid climate of the region, making them a reliable source of food and income for small-scale farmers.

Despite their many benefits, the cultivation and consumption of millet declined in Gujarat over the past few decades due to the introduction of high-yielding cereal crops such as rice and wheat, which were heavily promoted by government policies.

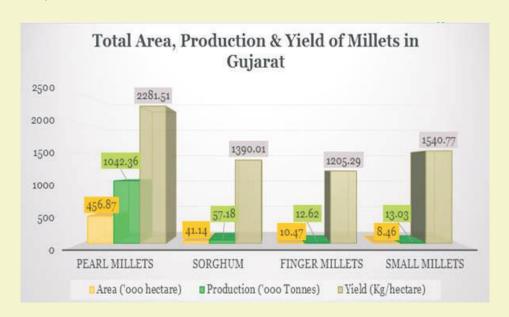
In recent years, there has been a renewed interest in millets in Gujarat, as people have become more aware of their health benefits and the need for sustainable food systems. The state government has taken several initiatives to promote millet cultivation and consumption, such as providing subsidies for millet farmers and organizing millet festivals to raise awareness about the benefits of these grains.

Today, efforts are being made to promote the cultivation and consumption of millets in Gujarat, through initiatives such as research and development, capacity building for farmers, and public awareness campaigns. These efforts aim to revive the role of millets in the state's agricultural and culinary traditions and to contribute to a more sustainable and diverse food system.

Millets are now being incorporated into the diets of people in Gujarat in various forms, such as bread, porridge, and snacks. They are also being used to make traditional dishes like Dhokla, Khakhara, and khichdi. Millets are now considered a valuable component of Gujarat's food culture and are seen as an important tool for building a sustainable and resilient food system that addresses the Objectives of Sustainable Development Goals (SDGs) such as No Poverty, Zero Hungry, Good Health and well-being, Climate Action, Responsible Consumption, and Production, etc.

#### Current scenario of millets in the state

The following graph shows the area, total production, and yield rate of the major millets cultivated in Gujarat.



The decrease in millet production in Gujarat has become a significant concern for farmers and policymakers. Despite being a traditional crop of the region, millet production has seen a consistent decline over the years. The problem statement stemming from the decrease in millet production in Gujarat could be framed as follows:"Despite being a traditional crop in Gujarat, millet production has been declining in the region, leading to several economic, social, and environmental issues. This decrease in millet production has negatively impacted the livelihoods of small farmers, reduced the availability of nutrient-rich food, and threatened the sustainability of the agricultural sector. Therefore, it is essential to identify the underlying causes of this decline and develop effective strategies to promote millet cultivation and revive the production of this valuable crop in Gujarat."

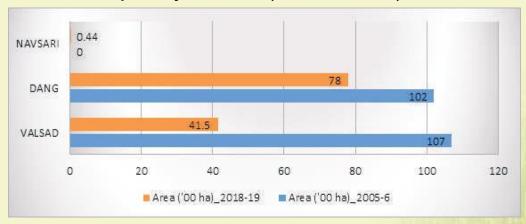
#### Sorghum Area Gap in Major Districts (2005-06/2018-19)



#### Pearl millet Area Gap in Major Districts (2005-06/2018-19:



#### Finger millet Area Gap in Major Districts (2005-06/2018-19)



The above pictorial representation shows a steady decline in all forms of millet in the major millet-growing pockets of Gujrat in the past decade.

#### **Need for Promotion of Millets:**

**Ease of Cultivation:** Millets are small-seeded grasses that are hardy and grow well in dry zones as rain-fed crops, under marginal conditions of soil fertility and moisture. Millets are also unique due to their short growing season. They can develop from planted seeds to mature, ready-to-harvest plants in as little as 65 days.

Climate Resilience: Millets require very less water as compared to rice and wheat and are considered drought-tolerant crops. These crops are majorly grown in regions receiving less than 450 mm rainfall (compared to about 700 mm minimum for maize). About 50% of sorghum and 80% of millet production is used for human consumption while the rest is used for poultry feed, potable alcohol, and other industrial purposes.

**Nutritional sufficiency:** With diabetes, hypertension, and cardiovascular disease becoming more prevalent, millets have returned as a viable option to live a healthy life and can reduce the incidence of these lifestyle diseases. Millets have many nutritional, nutraceutical, and health-promoting properties especially the high fiber content, nature of starch has a major role in reducing the risk of diabetes and other related diseases. Indeed, millets act as a prebiotic feeding microflora in our inner ecosystem. Millet will hydrate our colon to keep us from being constipated. The high levels of tryptophan in millet produce serotonin, which is calming to our moods. Niacin in millet can help lower cholesterol. Millet consumption decreases triglycerides and C-reactive protein, thereby preventing cardiovascular disease. All millet varieties show high antioxidant activity. Millet is glutenfree and non-allergenic.

#### Here are some facilitating factors to enable the increase of millet cultivation:

- **1.Increasing Demand:** There has been a growing demand for millets in recent years, both domestically and internationally. This is due to their high nutritional value, gluten-free nature, and their ability to grow in harsh climatic conditions. Millets are also considered to be an eco-friendly and sustainable food option.
- **2. Government Support:** In Gujarat, we are promoting millet cultivation and consumption through various policies and programs. For instance, National Food Security Mission Nutri Cereals, under this scheme following crops and districts are covered:

Jowar- Banaskantha, Bharuch, Surat and Tapi

**Bajra**- Ahmedabad, Anand, Banaskantha, Bhavnagar, Gandhinagar, Junagadh, Kheda, Kutch, Mahesana, Panchmahal, Patan, Sabarkantha, Surendranagar, Vadodara, Gir Somnath, Aravalli, and Mahisagar

Ragi- Dang and Valsad

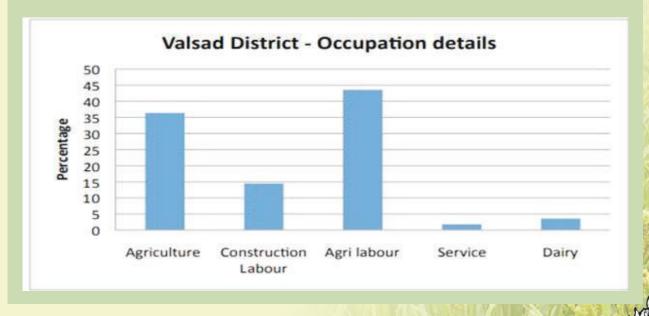
In this scheme cluster demonstration, certified seed distribution (Hybrid Seed, HYVs Seeds), certified seed production, micro-nutrients, plant protection chemicals and bioagent, weedicide, manual sprayer, cropping system based training, warehouses for safe storage of agriculture inputs, mini grinder machine, formation of FPOs in cluster area, creation of processing units for FPOs (100% GoI), Centre of Excellence (CoEs) (100% GoI), creation of Seed Hub (100% GoI), state level workshop, districts level festival, roadshow, creation of awareness, publicity and seed mini kits distribution are covered under this scheme.

- **3. Increased Awareness:** There has been increased awareness about the benefits of millets among consumers, thanks to various awareness campaigns and social media. This has led to the introduction of millet-based products in supermarkets and online stores, such as millet-based snacks, breakfast cereals, etc.
- **4.Value-Added Products:** There has been an increase in the production of value-added millet products in Gujarat, such as millet flour, porridge mixes, and snack foods. This has helped to create new markets for millet and has also helped to increase the incomes of millet farmers.
- **5. Millet Festivals:** The state government has organized several millet festivals in recent years to raise awareness about the benefits of millet and to promote their consumption. These festivals have been very successful in creating awareness among the public, and they have also provided a platform for farmers and producers to showcase their products.
- **6. Nutrition Programs:** There has been an increased focus on using millet in nutrition programs, particularly for children and pregnant women. Millets are being used to make nutritious meals and snacks, and they are also being distributed through various government programs.
- **7. Research and Development:** There has been a renewed interest in millet research and development, particularly in terms of enhancing their nutritional value, breeding new varieties, and developing value-added products.
- **8. Global Trade:** Millets are increasingly being traded globally, particularly between Africa and India. This has led to the development of new markets for millet and has also helped to increase the incomes of millet farmers in developing countries.

#### Success stories on millets in Gujarat:

# Case Study 1: Millets as a sustainable income source - the story of Siddhi Vinayak SHG

Valsad is one of the highly tribal-populated districts in Gujarat. In Valsad, though agriculture is the main occupation of the tribal families, many families also depend on agricultural labor as a source of livelihood. Many others have taken up the cultivation of fruit trees, and vegetables thereby increasing the need for labor.



Migration is also an important contributing factor of the life of these communities. After the monsoon season, more than 70% of tribal communities migrate for an average of 6 to 7 months of the year for work. (Halwe, V., 2010)

The members of the Siddhi Vinayak SHG, Ambheti, Kaprada block of Valsad district were no different. Most of them were dependent on wage labor as the main source of livelihood. The members were looking for an opportunity to break free and start some enterprise for additional income.

Valsad GLPC staff and the Agriculture Department of Gujarat conducted several awareness, training, and capacity-building programs on millet and organic practices in Valsad district through the Agri-Nutri garden concept and encouraged women collectives to build their enterprises on millet by providing access to credit through bank and CC loans. This came as a big blessing for Siddhi Vinayak SHG.

They started a small papad production unit as a group activity. In Gujarat, in-house papad production is very common. In congruence with this in Valsad, this Siddhi Vinayak SHG started ragi (finger millet) papad. This further capitalized upon the rural economic scenario post covid and tapped on the health and nutrition benefits of millet as a whole.

Ragi is commonly used to make rotis but due to taste and non-availability, many turn down its use on daily basis. Siddhi Vinayak SHG found a way to resolve this problem by making tasty ragi papad that helps them earn additional income. To capture market opportunities, members of Siddhi Vinayak SHG started selling papad in nearby areas and at fairs. Shortly after initiating this endeavor, Siddhi Vinayak SHG members started getting work orders from other SHG members in the nearby village. Also, participating in the district Saras fair helped them reach out to more customers. Currently, they are earning monthly around Rs.25,000 to 30,000 through this activity.



Women of Siddhi Sakhi Mandal, making papad of millet.

This practice of in-situ commodity preparation of millets created a source of employment for SHG women as well as helped motivate fellow SHG members of other villages to take up this activity. Women who were earlier working primarily as farm laborers now found a sustainable source of income for themselves.

#### Case Study 2: Innovation to create sustainable income opportunities

Dang is one of the tribal districts of Gujarat and more than 80% of farming is done using traditional practices. Rice, okra, vegetables, and millet are major crops in this region. Due to the topography of the region, farming and industry development is difficult. This in turn affects local employment giving communities and especially women very few sources of sustainable income.

Ragi (finger millet) is one of the traditionally grown crops in the region and 70-80% of farmers cultivate ragi with other crops. The surplus ragi is sold at throwaway prices in the market. In absence of a stable market, despite healthy production, the return on efforts was really low.

Members of Riddhi Siddhi Sakhi Mandal established themselves as the "Aatmanirbhar" members in the region following honourable Prime Minister Shri. Narendra Modi ji's vision "Vocal for local" and "Aatmanirbhar Bharat". These women found a unique way of employment by tapping into untapped resources through the generation/creation of rural enterprise.

In Nadagkhadi village of Dang district, Riddhi Siddhi Sakhi Mandal started making and selling bakery items from finger millet (ragi) with the use of the local resource, RSETI training, bank loans, DAY-NRLM ushering into a new spiral of prosperity.



Riddhi Siddhi Sakhi Mandal was formed under GLPC in the year 2017 with monthly savings of Rs.100 per member. Group members were imparted various training on gender, health, financial literacy, and many more. Through a series of reflection and vision-building events, these group members realized that in addition to saving they had to start certain entrepreneurial activities for maximizing their livelihoods. In consultation with GLPC staff, they decided to start producing ragi-based bakery products. In the Dang district "Dangee" is one of the famous dishes served in hotels and homes which includes ragi-based items as part of the recipe.

Taking advantage of this, members of the SHG experimented with different recipes and tried to capture the local market. Success was limited but this first-hand experience gave them a sense of direction. Gradually through RSETI training, SHG members were able to diversify with different bakery products like biscuits, nan khatai, and many other products with ragi papad which are currently very high in demand. The SHG members have visited different fairs (melas) to brand and market their products.

As a result of this endeavor, Riddhi Siddhi Sakhi Mandal produced and sold ragi-based bakery items for Rs. 7 Lakh and employed 10 members in their production house to provide healthy, nutritious finger millet-based bakery products.

The small fire of "Atmanirbhar" ignited by Riddhi Siddhi Sakhi Mandal acted as a source of motivation for many other SHG women. They have influenced other members of the adjacent areas to take up similar activities and are also acting as an incubator for the sale of such products.

#### Case Study 3: Addressing nutritional woes through the millet

Anandba Jilubha Jadeja is a member of Sai Ram Sakhi Mandal of Tindlava village of Rapar block of Kutch. Anandba is a testimony to many girls and women in her village suffering from anemia and low HB issues. Being a victim of anemia several years ago, she understood the seriousness of the situation and wanted to help her fellow women to address the situation.

Anandba became a member of Sai Ram Sakhi Mandal in the year 2019. Soon after her joining SHG, she realized that the activities of a group are not restricted only to savings and credit operations but also to orchestrating a movement to change/contribute to society through several activities. Post joining SHGs and then interacting with the local



Aanganwadis she educated herself about measures that can work as a solution to the issue of nutrition that was plaguing so many women in her village. That is when she came across millet and its nutritional benefits.

However, millet in its raw form was not liked by communities much for consumption. Anandba, therefore, started bajara khakra production and selling in her town as an additional source of income. However, the road to success was not so easy. Khakra being a popular food had many competitors. However, the quality of the product was one of the major determining factors. Anandba made sure that the quality of the product was fit for sale. Slowly, her khakra was consumed and her innovation of bajra khakhra subsequently became a hit.

Her endeavor not only reaped social but economic benefits as well. The additional income from selling bajara khakhda helped her pay the education fees of her children and meet her daily expenses.

#### The way forward for millet in Gujarat through GPLC support

Millets have been gaining attention in recent years as a nutritious and sustainable alternative to other grains like rice and wheat. Here are some ways forward for millets:

- **1. Improving production through the introduction of good quality seeds**: Millets have been suffering from low productivity due to a lack of good-yielding seed varieties. This has impaired production systems when compared to popular crops like rice and wheat. To address this, GLPC has signed a Memorandum of Understanding with Hill Millet Research Station, Navsari Agricultural University (NAU), for supplying bio-fortified seeds of the finger millet variety named Gira.
- **2.** Increasing millet production through farm mechanization: As demand for millets grows, we need to increase their production to meet this demand. This can be done through the development of better agricultural practices, such as improved irrigation and crop management, as well as the use of new technologies like precision farming. GLPC in support of line departments such as DAC and FW, DAHD is subsidizing various farm mechanization techniques under the SMAM scheme and custom hiring centres.



CHC Centre, Jaibhim Sakhi Mandal, Ambareli Village, Ahmedabad District, Gujarat.

**3.Developing Millet-Based Value-Added Products:** Value-added products like millet-based snacks, ready-to-eat meals, and baked goods can increase the consumption of millets and create new markets for farmers. Developing these products requires investment in research and development, as well as marketing and distribution. Under millet value chain activities Producer Groups(PG) were developed exclusively on millets. sively on millets.

**4. Promoting Millets in Urban Areas:** Urbanization has led to a shift in diets towards more processed and refined foods. By promoting millets in urban areas, we can encourage people to consume more nutritious and sustainable foods, and also create new markets for millet farmers. GLPC supports and encourages the millet farmers to participate in Saras fairs at district, state, and national levels.



Source: Pictures from Saras Mela, Ahmedabad, 2023.

Overall, promoting millets as nutritious and sustainable food, increasing production, developing value-added products, providing government support, and promoting millets in urban areas are all important ways forward for millets for the GPLC.

#### Recommendations

Promoting millets can involve various strategies that can help increase awareness, acceptance, and consumption of millets. Here are some recommendations for promoting millets:

**Creating Awareness Campaigns:** Awareness campaigns can be run through various media channels such as TV, radio, social media, and print media. These campaigns can highlight the benefits of millet, including its nutritional value, health benefits, and sustainability. They can also showcase success stories of farmers who have benefited from growing millets.

**Partnering with the Private Sector:** Private sector companies can play a crucial role in promoting millet. They can invest in Research and Development, develop innovative millet-based products, and market them effectively. By partnering with private sector companies, governments, and non-governmental organizations can ensure that there is a demand for millets and that they are available to consumers at an affordable price.

**Encouraging Millet Consumption in Public Institutions:** Governments can encourage millet consumption by including millet in public food programs, such as school feeding programs, hospitals, and other public institutions. This can create a market for millets and encourage farmers to grow more millets.

**Providing Incentives to Farmers:** Governments can provide incentives to farmers to grow millets, such as subsidies, free or low-cost seeds, and other support measures. This can help increase the availability of millet and reduce the cost to consumers.

**Encouraging Millet-Based Farming Practices:** Governments can encourage millet-based farming practices that are sustainable and climate-friendly. This can include promoting organic farming practices, using local seed varieties, and encouraging the use of agro-forestry and other sustainable farming practices.

**Conducting Research and Development:** Research and development are essential for promoting millets. Governments and private sector companies can invest in Research and Development to develop new millet-based products, improve yields, and develop new processing and storage technologies.

Overall, creating awareness campaigns, partnering with the private sector, encouraging millet consumption in public institutions, providing incentives to farmers, encouraging millet-based farming practices, and conducting research and development are all essential for promoting millet.

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Case Studies from Dang District

Recipes from Dang District





### Jharkhand's Emergence with Millet as an Economic, Healthy and Climate Smart Produce



KHALID HUSSAIN, NAVNEET KUMAR, AFFAN RANA, BINOD KUMAR, NIRANJAN KR. TIWAR





# Jharkhand

#### Introduction

Agriculture is the primary occupation of the people of Jharkhand. However, due to low irrigation coverage mostly it is rain-fed and mono cropped by paddy. The topography is highly undulated and the climate is very suitable for the cultivation of millets. Two three decades ago farmers used to cultivate millet in 50-60% of the total agricultural land. The various types of millets like sorghum (sorghum bicolor) commonly known as jowar or tilai

gangai in Jharkhand, pearl millet commonly known as bajra, finger millet commonly known as ragi or maduwa, and kodo millet commonly known as kodo were cultivated at scale. There are 32 tribes in Jharkhand and for all of them, millet was the staple food. Gradually paddy and wheat have replaced millet due to the government's push for these crops. In addition, the sowing and transplanting time of millet is the same as the paddy causing labor scarcity and millet getting less attention. Further, the primary processing of various millet is laborious work. Culturally also people have started attaching low



value to this crop as it has been projected as an inferior crop.

After the emergence of serious health conditions like high blood sugar and high blood pressure, and increased awareness following the National Millet Year in 2018, people in Jharkhand are turning towards millets as a healthy food option. As the International Year of Millet is 2023, there is expected to be a significant increase in both millet cultivation and consumption in the region. Therefore, it is likely that Jharkhand will become a leading producer of millets, offering economic, nutritional, and climate-smart benefits. The state

#### Farmers Pity - A standard to surpass

In Jharkhand's Gumla district, Adivasi farmers have been cultivating pearl, ragi and sorghum millets for years. "We cultivate these millets for our consumption only," said Shorai Oraon, a Adivasi farmer in Gumla. "The price of millets is very low. They are not remunerative. Therefore, we have reduced the area under cultivation of these crops," he added. In southern Jharkhand - Khunti, Gumla, Simdega, Lohardaga, East and West Singhbhum - there was 20-30 per cent decrease in the total area of millet cultivation

government of Jharkhand has launched several initiatives to promote the cultivation of millets and to support the livelihoods of the tribal communities that traditionally cultivate them.

# Types of millets in Jharkhand and area coverage:

In Jharkhand, millet cultivation is primarily rain-fed, and the state has the potential to produce 1.5 million metric tons of millets per year, although the current production is only around 350,000 metric tons. The most commonly cultivated millets in Jharkhand are finger millet, pearl millet,

#### **Region Wise Millet Promotion**

There are different types of millets grown in the state. Santhal Pargana region is known for bajra and jowar, Palamau region is known for gondli (little millet- kutki, sama) whereas the Kolhan and most of the other parts in the state grows ragi (finger millet).

**Ragi** - In Jharkhand finger millet is the second most popular crop besides rice. But most of the farmers follow traditional methods and hence are not able to reap it productively. Traditional methods reap them a harvest of 5-8 quintals per hectare.

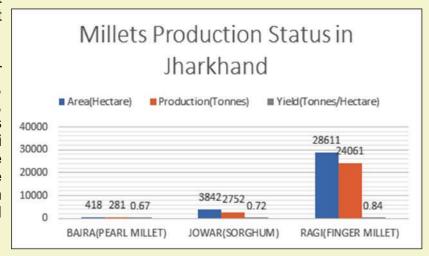
**Bajra and Jowar -** The Santhal region in Jharkhand is famous for growing bajra and jowar though some blocks of Gumla also grows bajra and jowar. Bajra and jowar are now is widely been used as multigrain flour and are been sold from Palash stores in the state. The startups are also purchasing these millets for further value addition.

**Gondli (Little Millet-Kutki-Sama) -** Gondli (little millet- kutki-sama-panicum sumatrense) is a variety of millet known as early rice of tribals in Jharkhand. This is cultivated in Mahuatanr block of Latehar district of the state as well as in the adjoining area sharing border with Chhatisgarh state. Earlier many farmers were engaged in growing gondli on their upper land as it requires less moisture and almost no fertilizers. But later on, acreage of production is reduced day by day as gondli processing requires lots of labor (raw gondli is converted into rice using DHENKI) and the market is dependent on aggregators and traders.

Ragi madua (finger millet) chilka (roti) produced with ragi flour is particularly well-liked among the people of the state of Jharkhand. The indigenous population most frequently

consumes madua roti, but even urban residents eat it occasionally.

Gondli is famous in the other region of Jharkhand, particularly in Latehar, Garhwa and Palamu. It is mostly consumed as gondli rice or gondli kheer. In the past, this was the only rice that people in this region was consuming, and it is still popular today.



Production of the state

Jharkhand depicted in the graph indicates ragi (finger millet) is mostly cultivated in the state.

Due to their widespread popularity, urban residents have begun to favor the millets such as bajra (pearl millet) and jowar (sorghum) as multigrain flour, which are primarily grown in the Santhal region of the state. Moreover, bajra is utilized as livestock fodder.

Millet cultivation in Jharkhand faces several challenges, including:

Erratic rainfall and drought: Millet cultivation is mostly rain-fed, and erratic rainfall and drought can lead to lower yields and crop failure.

Lack of improved millet varieties: Many farmers in Jharkhand still cultivate traditional millet varieties that are low-yielding and susceptible to diseases and pests.

#### Institutions involved in the promotion of millet

#### Birsa Agriculture University-BAU

BAU with its 21 KVKs in the state working on awareness building and capacity building of the farmers, providing quality seeds to enhance productivity and post-harvesting support. In addition, providing support to manufacturing millet-based products such as vermicelli, chow, biscuits, pasta, etc., through its food-processing cell. BAU has developed three varieties of ragi i.e. 1.A-404, Birsa Mdua-2, and Birsa mdua-3. All three are brown-seeded. In addition, one white-seeded variety of ragi is also developed i.e JWM-1(Jharkhand white Madua-1), but it is under the process of release by the state govt. All these varieties are well suited to the state of Jharkhand.

#### **NABARD**

NABARD is implementing its model millet project in 24 districts of the state to create awareness and increase the production and consumption of millets.

#### NGOs and FPOs

There are several NGOs in the state working on millet promotion, they are into awareness building, cultivation, processing, and value addition.

#### Major gaps in millet production

Despite the potential benefits of millet cultivation in Jharkhand, several gaps hinder its growth and development. Some of these gaps include

**Lack of awareness:** There is limited awareness among farmers, consumers, and policymakers about the health and nutritional benefits of millet. This results in low demand for millet-based products and limited incentives for farmers to grow millet.

**Low productivity:** Millet crops in Jharkhand are often grown using traditional farming practices and low-yielding varieties, resulting in low productivity and profitability for farmers.

**Limited market access:** There is a lack of organized marketing channels for millets in Jharkhand, making it difficult for farmers to access markets and obtain fair prices for their produce.

**Inadequate research and development:** There is a need for research and development activities to improve millet varieties, processing technologies, and value-added products that can increase the demand for millets.

**Limited government support:** The government needs to provide better support for millet farmers, including training, extension services, and financial incentives, to encourage more farmers to grow millets and increase production.

**Rice/Wheat – Taste/palatability:** Due to the flavor and palatability of rice and wheat, millets have been displaced by the latter. Ragi and gondli have been replaced as the state's staple dishes by rice and wheat.

**MSP Support to Paddy:** Unlike some states offering MSP support to millet in the country, Jharkhand too planned to introduce millet under MSP still it is to be rolled out.

**Difficulty in processing:** The drudgery involved in decorticating little millet has significantly reduced millet production there.

**Social strata:** In the Santhal region of Jharkhand many millets like Jowar is used for fodder and in our society millets are thought to be the food of economically disadvantaged section of the society so millets are considered as subclass food.

Addressing these gaps will require a concerted effort from various stakeholders, including farmers, researchers, policymakers, and the private sector. By addressing these gaps, Jharkhand can unlock the full potential of millet cultivation, contributing to sustainable development, improved nutrition, and food security in the region.

#### Government initiative to promote millet in the state

The government has taken steps to promote the cultivation and consumption of millets, including the formation of a dedicated cooperative focused on millets in the Simdega district. Additionally, several machines have been installed to increase millet processing on a larger scale. Pulverizers, lifters, and the de-stoner have been installed at the cooperative. The machinery will provide an opportunity for high processing in less time. Currently, the cooperative members are focused on ragi flour production and further, they have a plan to start value-added products like- vermicelli, noodles, ragi cookies, papad, etc.

#### Intervention by Jharkhand State Livelihood Promotion Society(JSLPS)

JSLPS provides support to farmers in the state through the provision of quality seeds under the NRLM livelihood project (MKSP and Farm) and the UDAAN project. While under NRETP-VC and other projects, the collectivization of millets mainly ragi has been done through producers groups. Primary processing (collectivization, cleaning, stitching, and packaging) is done at the PG level for the further sale of commodities to the primary or

secondary market. Many PGs are involved in the pulverization of ragi and ragi flour is sold either through the inhouse brand Palash or sold in the open market. Jharkhand State Livelihood Promotion Society signed a Memorandum of Understanding (MoU) with NGO Wassan to include the

Cultivation Processing Value Addition Marketing

families of Primitive Vulnerable Tribal Groups of the State in the mainstream of development by connecting them with a strong livelihood through Jharkhand Millet Mission.

#### Institutional arrangement to promote millet in the state

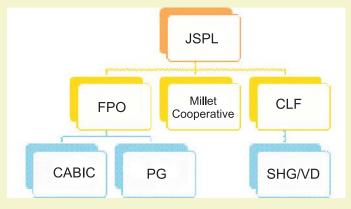
#### **FPCs on Millet**

There are more than 40 FPCs under the JSLSP ambit and 100 from other schemes, which are into millet collection and processing. The FPOs are offering a good platform to the farmers in providing input, collecting their produce, processing, value addition, and marketing their produce.

#### **Cooperative Society Exclusively For Millets**

Many of the households in the Simdega district of the state of Jharkhand engage in finger millet cultivation during the kharif season. The district produces 3500.76 MT of millets

annually on an area of 2496.8 ha (as per an internal JSLPS district-level survey). Considering this as a potential source of income, a cooperative society comprising Simdega district SHG members has been established in Kolebira Block. Millet flour production is being scaled up by installing equipment like pulverizers, lifters, and de-stoners at cooperatives to minimize the physical labor required and increase production efficiency. This leads to higher production levels and potentially increased profits.



#### **Community Agriculture Business Incubation Centre (CABIC)**

CABIC is an agriculture-based incubation center under FPC that supports farmers in quality input supply, collectivization of their produce, selling raw millet, and also adds value by preparing ragi flour for market, cookies, etc.

#### **Producers Group**

Collectivization of millet farmers at village level is done along with moisture check, packaging, weighing, and then further linkages for sale. More than 150 PGs are directly into millet cultivation and marketing.

#### Didi Café-A Food Court in the state

Didi café is an initiative of JSLPS where every block and district has a food court near the block and district secretariat. The café is the best platform from where the millet is been promoted by preparing different dishes of millet.

#### **Palash Marketing Chain**

The state government under JSLPS has initiated selling rural women's produce through a chain of Palash marts in the state. bajra, jowar, ragi, flour, cookies, etc. been sold through the Palash mart.

#### Can Jharkhand revive millet as economic, healthy, and climate-smart produce?

A few important aspects of the state offer some promise for the revival of millets.

- Ragi is a staple among the state's indigenous inhabitants. No tribal day is complete
  without it. The most popular dish in the state is ragi roti with chatni, ragi chilka, and
  ragi laddu. The popularity of millet has increased public awareness, and more
  people are beginning to consume it in a variety of ways. The millet price is also
  rising, and access to the market has gotten simpler recently.
- Gondli-little millet is still popular in the state.
- Bajra and jowar being understood as the best millet are gaining the popularity.
- Agriculture University is coming up with new high-yielding varieties of Jharkhandspecific millet. The yield enhancement from high yielding varieties will increase the income of the farmers. The KVKs under BAU across the state are creating awareness, training the farmers, and providing input.
- JSLPS under NRLM has the target of reaching 15,000 farmers with 300 PGs will certainly increase the area of cultivation.
- More startups are being established in Jharkhand so the demand for the millets is rising, so the farmers will get good prices and market as well.
- NABARD is working for the promotion of millet in the state, several NGOs are also working on cultivation, collection, processing, and value addition. FPOs, PGs, SHGs, VO, and other CBOs are focusing on millet.

There is hope that if the efforts are given consistently, very soon the lost glory of millet can be revived in Jharkhand. Following are few of the successful case studies.

#### Case Study 1:

Sanjita Nagesia is a member of a women's group in the village of Surkai, Jharkhand, which aims to improve the economic status of low-income families. She cultivates and processes gondli millet, which is seen by some as the food of the poor. Despite the laborious and time-consuming process of decorticating the millet using a traditional tool called Dheki, Sanjita is committed to maintaining the traditional methods of millet processing, as it has been a practice in her family for generations. People in the area enjoy gondli prepared as rice or khir, a concoction prepared with milk.

The recent increase in awareness of organic and traditional foods, particularly millets, has led to an increase in demand for millets in India. Sanjita Nagesia has benefited from this trend by selling her gondli millet in packets in the market and through Palash Mart. By promoting millet consumption, Sanjita has not only improved her own economic condition but also contributed to combating malnutrition and improving food security in her community. This case study highlights the important role that women's self-help groups can play in promoting sustainable agriculture and improving the livelihoods of marginalized communities through the promotion of traditional agricultural practices.

#### Case Study 2: Madua(Millet) ke Laddu Wali Didi

Sushanti Devi, also known as Madua Wali Didi, is a member of the Chameli Aajevika Sakhi Mandal in the remote Bishunpur Block of Gumla district at Jharkhand. She grows ragi on a

small plot of land of 60 decimals. She takes care of the entire process, from harvesting the crop to cleaning, and then gets it processed at local mills. She has been raising awareness about the numerous health benefits of ragi laddu, which is a tasty snack made from a nutritious grain called ragi.



She conducts meetings with several SHGs and motivates them on its cultivation, consumption, its health benefits. From her effort of mobilizing the women farmers, more than 399 farmers are growing madua(ragi) on approximately 200 acres of area.

Sushanti Devi is a member of Chatti Serka Mahila Utpadak Samuh (Producer Group) and a member of the Rural Service center. She was eventually able to comprehend the economic and health benefits of millets to her group, so the PG group started preparing ragi laddu for sale in the market, turning the snack into a source of income for the group in addition to being a healthy food option for their families.

Recently, the ragi laddu was even sold in a millet carnival at Chattisgarh, demonstrating the popularity and success of the initiative. Sushanti Devi's efforts have helped to promote not only the health benefits of ragi but also the economic opportunities that come with producing and selling the nutritious grain.

#### Learning and way forward

To promote millet cultivation and consumption in Jharkhand, the following steps can be taken:

There is a need to **increase awareness** among farmers, consumers, and policymakers about the nutritional benefits of millet. This can be achieved through various awareness campaigns, training programs, and workshops.

**Capacity building** of different stakeholders including producers, SRLM livelihood team for all aspects (production, consumption, value chain development), SRLM other than livelihood team for consumption and value chain, line department, other development organizations, etc.

Farmers need access to high-yielding varieties of millets, improved farming practices, and

appropriate technologies to increase productivity and profitability.

**Behavioral change** through IEC (Information, Education, and Communication) is required extensively to include millet in the main course of the food system.

**Convergence** with institutions and research stations for quality input supply, processing, marketing, etc.

There is a need to **create market linkages** for millet farmers, including establishing processing and marketing facilities, and building partnerships with private sector companies and other stakeholders.

**Strengthening millet-based value chains** can create new opportunities for farmers, processors, and traders, and provide incentives for increased investment in millet production and processing. The SRLM will invest in value chain-based intervention to create new opportunities.

The government needs to **provide policy support**, including research and development, extension services, and financial incentives, to encourage more farmers to grow millets and increase production.

**Innovation** in millet-based products and processing technologies can increase the demand for millet and create new business opportunities for farmers and entrepreneurs.

By taking these steps, Jharkhand can promote millet cultivation and consumption, generate income and employment opportunities, improve food and nutrition security, and contribute to climate change mitigation and adaptation effort.





# Karnataka reflecting as 'Millet Icon' of India

PARESH PARAB, ARVIND TIWARI, DR. VENKATESH G, PRABHANJAN M. C, KALPANA ANGADI









#### Millet production in Karnataka Context

Geographically Karnataka is situated on a tableland where the western and eastern ghat ranges converge into the Nilgiri hill complex. The neighboring states bounded by Karnataka include Maharashtra and Goa in the north and north-west; the Arabian sea in the west; Kerala and Tamil Nadu in the south and Andhra Pradesh in the east. The state extends to about 750 km from north to south and about 400 km from east to west. It covers an area of about 1,91,796 sq. km. It is the 8th largest state holding 5.83% of the total geographical area of India.

#### History of Millets in Karnataka

Karnataka has a long history of cultivation of millets. It has been an inseparable part of the diet of Kannadigas for ages. The traces from history shows that the millets were very close to the heart of people in Karnataka and used as a main course in their regular diet.

The presence of finger millet in India dated to approximately 2300 BC at Hallur, Karnataka, during Harappan levels. Finger millet was the staple of Neolithic Karnataka. The Hallur site in the Haveri district of Karnataka yielded crop cultivation patterns during 2000-1000 BC, comprising of Neolithic-Chalcolithic and early Iron Age.

The people of the ash mound tradition grew millets and pulses, some of which were domesticated in this part of India, for example, brown top millet, green gram, and horse gram. They also herded cattle, sheep, and goats and were largely engaged in pastoralism. This era may be seen as establishing the basic South Indian repertoire of rainfed millets and pulses, sown in synchrony with the southwest monsoon.

As per the references in South India, foxtail and proso millets were the staple diets for the people from the Sangam period (300 BC to 300 AD).

During Satavahanas (1st to 3rd century AD) and Vataka dynasty (250-270 AD), sorghum was abundantly used over rice in the Deccan region, which changed gradually The term 'yavanaala' mentioned in the Indian text Charaka Samhita (100-200 AD) is attributed to sorghum.

A 17th century Kannada poet who belonged to this period, speaks in glowing terms of

sorghum which was and is the staple food of the common people in North Karnataka districts.



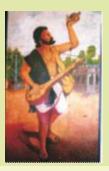


#### Kautilya's Arthashastra says...

Kodrava (kodo millet), ... and priyangu (foxtail millet) will increase three times the original quantity when cooked; ...

Kannada poet Kanakadasa (16<sup>th</sup> Century) has immortalised finger millet in his Ramadhanya

**Charithre'**; it is an allegory on the conflict between the socially strong and weak castes and classes, presented as an argument between two food grains, rice and finger millet (ragi), a most creative literary piece with a powerful social message. Sarvajna, grains will increase twice the original quantity when moistened; and two and half times when soaked to sprouting condition.



Leslie Coleman, a Canadian scientist, who worked for British as the second director of agriculture in Mysore state, when posted in Bengalur initiated research on finger millet. He was farmer-friendly and also ate finger millet 'mudde' with them. He contributed the first finger millet variety in 1918.



The Kannada language composition 'Ragi thandheera' written by Purandara Dasa, a 15th-century Indian poet, is much celebrated in Karnataka to highlight the popularity of finger millet (ragi) during those times. Fernao Nuniz, a Portuguese traveler, who visited Vijayanagar Kingdom in the 16th century AD, mentioned that sorghum was the major food grain consumed in South India.

James Scurry (1766–1822 AD), a British soldier who was held captive by Hyder Ali and Tipu Sultan for 10 years (1780–1790) at Srirangapatam, wrote that during his march from Bengaluru prison to another place, he was fed with food made from finger millet flour.

When the Tungabhadra dam was built in the 1940s, surveyors recall that rice was difficult to obtain; like Buchanan's servants, they found eating millets distasteful, enduring memory of a hardship posting. Today, rice is more easily obtained, even among the poor, whose grain purchases are partially underwritten by government programs that supply low-cost rice, but not millet

The irrigation infrastructure of the middle periods, in particular, transformed the area around the imperial city of Vijayanagara. Rice, along with a variety of other irrigated crops, transformed regional landscapes, formed the foundation of a series of elite cuisines, and also changed the pattern of diet from millets to newly introduced crops like paddy.

Early Historic and earlier middle periods – by the second millennium CE, the cult of rice were well-developed, reservoirs were being built by politically ambitious local leaders, and, in the far south, canals watered multi-cropped fields of rice, sugarcane, areca nut, coconut, flowers, and other valued wet crops. Rice-based meals also played a role in expanded temple-based rituals in the later middle periods.

With the introduction of the Green Revolution, rice and wwwheat gained wide importance, and due to support for various irrigation schemes, fertilizers, pesticides, and mechanization the area under millets got replaced by commercial crops.

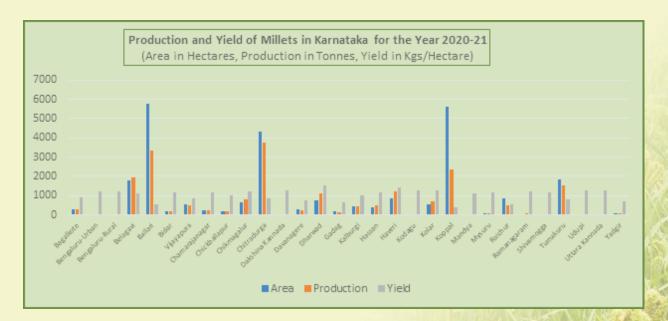
Due to continuous efforts from Snajeevini-KSRLPS in convergence with line departments of the Government of Karnataka, the depletion in the area is brought under control. The varietal improvement, the package of practices, inclusion in the public distribution system, and MSP for millets played important role in saving the millets from being extinct from the state.

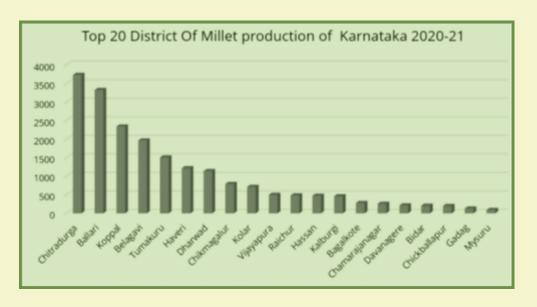
#### Millet Area and Production

The total area under production and yield of millet in Karnataka is 26,236 hectares with 20,400 tons and a yield of 778 kgs per hectare. Sorghum, pearl millet, and finger millet (ragi) are the major millets grown in Karnataka state while small millets foxtail millet, barnyard millet, proso millet, little millet, and kodo millet are commonly grown throughout Karnataka state. Except for the coastal part, the remaining part of Karnataka is engaged in the regular growing of millet. The 26 districts of Karnataka are considered prominently millet growing districts in Karnataka.

#### Production and Yield of Millets in Karnataka for the Year 2020-21

(Area in Hectares, Production in Tonnes, Yield in Kgs/Hectare)





Source: E-Catalogue for Export of Millets and Value-Added Products, Karnataka by APEDA

#### The potential of Millets and Varieties Grown in Karnataka

Most of the millet crops are grown in Karnataka and are popularly known as nutri cereals as they provide most of the nutrients required for the normal functioning of the human body. millets are rain-fed crops and are grown in regions with low rainfall and thus assume greater importance for sustained agriculture and food security. Based on the area grown and its grain size the millets are classified as major millet and minor millets. The major millets include sorghum (jowar), pearl millet (bajra) and finger millet (ragi/mandua), minor millets include foxtail millet (kangni/Italian millet), little millet(kutki), kodo millet, barnyard millet (sawan/jhangora), proso millet (cheena/common millet),and brown top millet (korale).



### Types of Millets grown in Karnataka

I	MAJOR MLLETS	
A	PEARL MILLET (BAJRA) Pearl millet, known as the 'Queen of Millets' is the most extensively cultivated millet and is popular in Karnataka. It's popularly grown in the northern part of the state. Pearl millet in the form of roti is a regular part of the diet used in Karnataka. The pearl millet plays a major role as fodder for the livestock. As per the data from the Department of Statistics, the pearl millet is grown on a 3,38,952 hectare area with a production of 3,67,056 tons of production with a productivity of 1140 Kg per Ha in Karnataka.	
В	SORGHUM (JOWAR) Sorghum commonly known as the "King of millets', is a highly productive crop plant, which can be used for grains, livestock feed, or industrial purposes. Sorghum is grown as a part of the diet in most parts of Karnataka except the coastal belt. in Karnataka sorghum is grown on a 9,13,988 hectare area with a production of 10,45,642 tons of production with a productivity of 1204 Kg per Ha in Karnataka.	
С	FINGER MILLET (RAGI) Finger millet, often known as ragi in India, stands unique among the cereals such as barley, and oats with higher nutritional contents and has outstanding properties as a subsistence food crop. Finger millet is used in many forms in the diet of infants to adults. Ragi mudde, roti, extract, and dosa is the popular forms used in the state. The ragi is grown on a 6,73,713 hectare area with a production of 11,62,531 tons of production with a productivity of 1816 Kg per Ha in Karnataka.	
II	SMALL MILLETS The small millets are grown in 52,381 hectare area with a production of 38,089 Tons of production and 765 Kg per Ha of productivity.	
A	FOXTAIL MILLET Foxtail millet is an annual grass plant, that produces seeds that possess health-promoting properties. This millet is more popular in the southern part of the state.	
В	BARNYARD MILLET  Barnyard millet is a short-duration crop that can grow in adverse environmental conditions with almost no input and can withstand various biotic and abiotic stresses. All these features make barnyard millet an ideal supplementary crop for subsistence farmers and also an alternate crop during the failure of monsoons in rice/major crop cultivating areas.	

С	KODO MILLET In India, kodo millet is grown mostly in the Deccan region of northern Karnataka. The kodo millet is less popular as compared to other millets in Karnataka.	
D	PROSO MILLET Proso-millet is an underutilized crop that is a highly nutritious cereal grain used for human consumption, bird seed, and/or ethanol production. The proso millet is popularly used for a light diet specifically for fasting days. Laddu, upama, halwa, etc. are the popular items made from proso millet	
E	LITTLE MILLET Little millet (panicum miliare) is one among the minor millets grown to a limited extent all over Karnataka up to altitudes of 2100 meters. The little millet is used as same as proso millet and is sometimes used as a replacement for it.	

<sup>\*</sup> Data source: Department of Statistics, Government of Karnataka

#### **Problem statement**

Millet is part of the regular diet and grown widely in Karnataka but after the Green revolution, paddy and wheat were used widely and the market conditions favored these crops. The farmers adopted them and millet underwent negligence. The Minimum Support Price for the millets is not fixed which is a problem in marketing. The seeds of the improved varieties are not available for all the millet. So even though the area coverage under millet is more in the state the farmers are facing challenges in terms of seed availability, varietal improvement, the package of practices, etc.

#### Initiatives of Sanjeevini - Karnataka State Rural Livelihoods Promotion Society

To resolve the issues faced by the farmers Sanjeevini- Karnataka State Rural Livelihoods Promotion Society (KSRLPS) has started initiatives under Mahila Kisan Sashaktikaran Pariyojana (MKSP) to provide at the par status of 'Farmer' to women engaged in farming by involving the partners like Green Foundation, MYRADA, and Sahaj Samrudhha. The interventions like varietal improvement, Seed banks, crop demonstrations, farmer field schools, value chain development, etc. were carried out for the promotion of millet. The Sanjeevini-KSRLPS in convergence with the Department of Agriculture and the Universities of Agriculture Sciences adopted and disseminated different advanced technologies for the cultivation of millets. The Krishi Sakhis (Farm CRPs) were trained for advanced technologies in millets at KVKs and the District Agricultural Training Centres of the Agriculture Department. The well-trained workforce of Krishi Sakhis was deployed for last-mile delivery of extension services in millet growing areas.

A few of the success stories and case studies as a result of the efforts taken by Sanjeevini-KSRLPS in partnership with other NGOs are as follows:

#### Case study 1:Rare Varieties Demonstration on millet

In Karnataka, there are indigenous varieties of millet having unique characteristics. The preservation of such varieties is a challenge in the world of modernization. Once the genotype is lost it's also a loss of biodiversity and specific nutritive values of that variety. Nowadays it has become difficult to avail the pure seed of rare indigenous varieties of millet.

Rare variety demonstration is the process of demonstrating phenotypes (varieties) of different crops like millets, finger millets, paddy, oil seeds, and other seeds to the community to enable them to select seeds for further propagation based on their preferences or choice of characteristics. The seeds collected are also conserved in community seed banks for future use.

In 2020, a rare variety demonstration was carried out for ragi, and other millets. The process began in May 2020 by sourcing various varieties of indigenous seeds from across our seed banks. A farmer each was handpicked from the Maralwadi clusters to multiply ragi seeds. In June 2020, seed germination tests were carried out before sowing the seeds for multiplication.

Village	Cluster	ster Crop No. of var	
Hosadoddi	Maralwadi	Ragi	110
Hosadoddi	Maralwadi	Millet	17

Rare variety demonstration was carried out for ragi (finger millet) and other millets in the Hosadoddi and Maralwadi clusters in Kanakapura in 10 guntas (0.25 acres) of land. Indigenous varieties of ragi and millet seeds were sourced from various seed banks and selected for rare variety demonstration. The seeds were treated with vermicompost and sown in the nursery for germination. After a few days, the seedlings were uprooted with their tags, treated with Panchagavya, and transplanted onto the main field which was treated with Pongamia powder, vermicompost, and farmyard manure. Ragi was cultivated using the Guli method which produces higher yields. It is a method of transplanting ragi seedlings by maintaining a 25×25 cm distance between each crop. The advantages of this method are an increase in the number of productive tillers per hill, so more yield per unit of cropped land, ease of doing intercultural operations and ease of adopting machine harvesting, etc.

Weeding, rouging, and application of bio-inputs such as Panchagavya and Jeevamrutha were carried out regularly for these crops.

The 110 varieties of ragi and 17 varieties of millets were harvested. Roguing, threshing, packing, and labeling were done and 110 master samples of ragi were collected. The farmers were trained to preserve the particular genotype by a method that can be used for many years to maintain the pure seed of the variety.

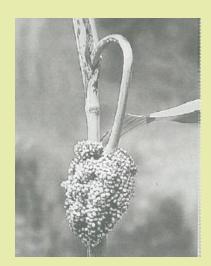


#### Case Story 2: Sorghum characterization workshop

Maintaining the purity of seed and finding the seed with the best quality and vigor is a real challenge for farmers. The seed is getting adulterated due to mixing and cross-breeding. The productivity of a particular variety will also be determined by the characterization.

To avoid these problems and segregation of pure seed characterization a workshop was carried out. The two-day workshop conducted by Samuha at Tavargera, in February 2004 brought more than 61 farmers from Koppal, Raichur, Haveri, Chikmagalur, Bagalkot, and Bijapur districts together.

As many as 23 varieties of sorghum were sown in November 2003 on a quarter acre of land belonging to Basamma Devendra Gowda in Vyakarnal village of Raichur district, to conduct experiments on the characterization of these varieties. The 23 varieties were bought from Regional Agriculture Research Station (RARS), Bijapur.



During flowering time, to ensure the purity of the varieties, the best ear heads were selected and covered with brown envelopes to prevent cross-pollination. Knowledgeable farmers identified the good varieties, characterized them, and ranked them. The ranking is done based on the following parameters:

- Long ear-heads
- Healthy plants not affected by pests and diseases
- Height of the plant
- Grain size, and the inflorescence, which bends during the flowering stage

Farmers were asked to tag the varieties based on the criteria. 11 farmers ranked the Gidmaldandi variety as their first preference. 10 farmers ranked the Neelgal variety as the second preference.

## Succes Story 1: Inspiring women to thrive in agro-industries by setting up millet processing units

The income from millet production is less as compared to the other crops. To attract the farmers for millet cultivation prime price has to be gained by the millets. Millet processing is a tool that has the potential to provide a prime price to the millet which can give incremental income to the farmers for sustainable livelihoods.

By setting up millet processing units, SHG leader Bibi Jan has helped sustain agricultural livelihoods in Dharwad.

Bibi Jan, the convenor of a self-help group in Theerth village of Kundgol taluk in Dharwad

district, has come a long way. In her journey, she has been resolute in bringing others along with her, including over 1,000 farmers and a 14-member team of women. The millet processing unit run by the self-help group that she leads has created, enriched, and saved livelihoods in the village and surrounding areas.

"The lessons I have learned are innumerable," says Bibi Jan, recalling the challenging road that brought her here. Change first began in her life in 2019, when she heard that the local self-help group needed a leader. Her desire to apply for the role was quickly quelled when her husband was not on board with the idea. "In my community, it is rare for women to go outside the house and do things on their own," she explains. It took a great deal of convincing, from her and the social workers, for her family to agree with the idea.

Elaborating on what motivated her to lead the self-help initiative, Bibi Jan says, "Most women in our village are dropouts who have studied till middle school. Women do

not have knowledge about agriculture or about making a living on their own."

A community millet processing unit with six machines has been set up by the SHG. The



team collaborates with farmers to source millets. The profits have been so consistent and significant, that over 300 farmers have shifted to millet cultivation, and now sell their produce to these units. The unit is almost fully run on renewable energy, with three solar-powered milling machines, as well as solar lights and fans.

"There is a stable demand for millets, compared to other products," Bibi Jan says. This move came at a crucial time for farmers in the taluk. "We (the farmers) were once content cultivating cash

crops like maize, cotton, and chili," recalls Ishwar gouda Patil, a local farmer. Cultivators would make an income of around Rs. 5,00,000 per annum. However, climate change, severe drought, and erratic rains led to heavy losses. "We were devastated, not knowing what to do with the land," says farmer S P Dyammappanavar. adding that the introduction of millet cultivation came as a godsend. Hundreds of women, too, who were once engaged in farming had migrated to the garment industry following setbacks in agriculture. Through

the self-help group, these women were able to return to the fields - this time, to take up non-chemical farming.

Apart from promoting millet cultivation, Bibi Jan has also embarked upon a new venture of bringing back traditional food items to plates. Her team also



sets up stalls at fairs and food festivals, showcasing North Karnataka cuisine and drawing huge crowds. A recent Kisan Swaraj Sammelana held at Mysuru saw the group making a profit of over Rs.2,00,000 in a matter of three days.

Apart from this, she is instrumental in establishing a community seed bank, which stored more than 120 varieties of millet crops that were on the brink of getting extinct, says Krishna Prasad, founder of Sahaja Samrudha.

#### Case study 2: Papamma-A Success Story

Seed availability is a big challenge for growing millets. The millets are short-duration seasonal crops and are normally grown once a year under rainfed conditions. There are not many efforts taken by any agency to maintain the seeds throughout the year. To address this challenge farmers were trained to maintain the seed banks which was later found to be very effective in the future.

For 47-year-old Papamma, a woman farmer of Kurubarahalli, Kolar District, life changed after the CSBN project started in her village. Till then a very poor family, her family now lives a comfortable life and is respected for practicing organic farming for the past four years. "It is all thanks to the seed bank set up by Green Foundation and Grama Vikas," says this winner of the title "BEEJA MATE" from Green Foundation for her outstanding contribution to seed conservation.

Their five-acre dry land is partially rain-fed and partially irrigated. After Papamma became a part of the seed bank, she showed a keen interest in learning about growing local varieties and landraces. Her leadership qualities surfaced quickly and she soon learned about seed treatment, preparation of bio-pesticide, seed selection, and other activities related to the seed bank. She has been preparing organic urea and also the bio-pesticide Poochimarund.

The fire in Papamma drives her to learn new things. On her exposure visit to Therubeedi, she learned a new practice of seed treatment using castor seeds. "If I find that it works for me, will spread this practice across the villages," she says like a true scientist. Papamma has visited several organizations. As a leader of the community seed bank, she talks about its uses and also brings home new knowledge and experiences that she acquires.



So inspired has Papamma been by the concept of a seed bank that she has a seed bank in her house too. She has now conserved 58 varieties of seeds in her bank. Her seed bank has three varieties of ragi, four varieties of paddy, six varieties of minor millets, three varieties of oil seeds, four varieties of pulses, and 37 varieties of vegetable seeds. She also

has a very rare variety of tomatoes- orange, bullock's heart

Papamma is an expert at preparing a growth promoter called 'Amrutham' - a mixture of cow dung and jaggery (sour). When applied to food crops, the yield is enhanced. Papamma's popularity lies in the fact that she happily and generously shares her winning practices with other farmers.

#### Learning and way forward

Sanjeevini - Karnataka State Rural Livelihoods Promotion Society (KSRLPS) has conducted interventions in convergence with the Department of Agriculture and NGOs. Due to constant efforts under convergence and implementation of interventions with the Government of Karnataka a lot of changes reflected in the community.

- **1. Support for seed production:** There is a shortfall in the targeted seed production. Seed production of proven and successful indigenous varieties of millet need to be done along with the promotion of seed village and seed bank schemes.
- **2. Promotion of soil health and best practices for millets:** As millets are grown mostly in marginal lands in diverse ecosystems, support needs to be given for location-specific, eco-friendly measures for improving the fertility of the soil.
- **3. Installation of processing unit:** State and central governments have to provide investment support for the installation of processing units for dehulling and making flour by rural entrepreneurs at small to medium scale to handle a location-specific combination of millets (including small millets). This infrastructure will promote household consumption.
- **4. Minimum Support Price for Millet:** Millet should get MSP on the lines of other major cereals such as rice and wheat. The assured market will encourage farmers to grow millet.
- **5. National Food Security Mission**: Importance and focus should be extended to millets equally as is being given to other crops like rice, wheat, and pulses in NFSM guidelines and budget allocation.
- **6. Rashtriya Krishi Vikas Yojana:** Specific guidelines must be created to facilitate the participation of civil society organizations and farmers' organizations and for Public-Private Partnerships for better reach in the remote areas where millets are being grown and for effective implementation in partnership with farmers.

#### Karnataka – Government initiatives for promotion of the millets

- Raita Siri' is an exclusive scheme for the promotion of production, value chain development, and marketing of millet and millet products. Karnataka's state government giving millet producers Rs. 10,000 per acre under this scheme.
- Promotion of millet entrepreneurship in coordination with IIMR under 'Stree Samarthya Yojane'.
- Regular trade fairs & exhibitions in organics and millets for awareness creation, promotion and to establish linkages.
- Organics & millets, national trade fair 2017, international trade fair 2018 & 2023 organized to establish market linkages.
- The strong customer base for organic & millet products due to extensive consumer awareness programs.
- Around 128 organic & millet marketers/traders/processors/exporters.
- Bengaluru, the organic & millet hub of India with over 400 exclusive organic & millet outlets, more than 400 corporate retail outlets, and around 20 exclusive organic/millet restaurants.
- Karnataka has developed a brand called "Siri" for millets as they are referred to as 'siridhanya' or rich grains.
- Karnataka has started implementing the distribution of millets through PDS where the grains are sourced and distributed locally.
- It is procuring ragi and jowar by giving a bonus of 20-25 percent above the MSP from farmers.
- Department of Agriculture developed a digital platform for the promotion of organic farming and millet on their website for knowledge dissemination.





Brochure on 'Raithasiri' scheme from Department of Agriculture, Government of Karnataka

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APEDA Millet portal; https://apeda.gov.in/milletportal/ APEDA Karnataka Millet Value Added Products Catalogue



## Attapady the Millet Capital of Kerala SHAMEENA PN, SAIJU E, MEERA ED









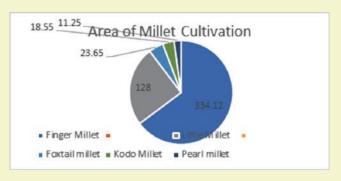
#### Millets - Kerala Scenario

Kerala, despite performing better in several health index parameters, the state has the dubious distinction of being home to a higher number of deaths caused by lifestyle diseases in the productive age population. Diabetes, hypertension, obesity, heart attack, and stroke are more prevalent in the state. Rice is the most important food crop grown in Kerala. But the area cultivated with paddy has increasingly been converted to other crops as well as non-agricultural purposes mainly due to low relative profitability in paddy cultivation. Coconut, pepper, cashew, rubber, tubers, banana, etc. are some of the other crops cultivated in Kerala. Millets, or small-grained cereals, are making a comeback. Only 0.03 lakh hectares of land is under millet cultivation in the state and the production stands at 2000 tons, roughly 626 kgs per hectare. Mostly it is being cultivated in Attappady region of Palkad district in Kerala.

#### Prospect of millets in Attappady, Kerela



Attapady is situated in the Palakkad district, is a part of the Nilgiri biosphere reserve, and is specially demarcated as its agricultural restoration buffer zone taking into consideration the incredibly rich agricultural practices and indigenous crop diversity.



Source of data: Primary data collected from the Attapady area

#### Favorable factors for millet cultivation

The food culture of the tribes is the most favorable factor which made Kudumbashree intervene in millet cultivation. While the majority of Keralite depend on rice, the tribal community largely depends on millet for their food.

The other factors that favor growing of millets in Attapady are:

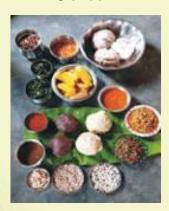
**Agro climatic zone:** Tropical monsoonal zone receiving both southwest and north-east monsoons in addition to summer rains.

**Soil type:** The main soil type of the area is red loam with PH ranging from 5 to 5.5.

Annual average rainfall: 900 mm.

#### Millets of Attappady

Millets are full of nutrients as well as medicinal values and hence are called nutraceuticals. The photos shown below show the variety of dishes prepared in Attappady. Incorporating diets with millets that are gluten-free, fiber-rich, and repositories of life and energy is the need of the hour. Millets are also available in value-added forms like ragi puttu, ragi flour, and ragi pappad.





#### Kudumbashree interventions in millet farming

The Kudumbasree Mission Kerala is involved in the comprehensive development of the Irula, Muduga, and the Particularly Vulnerable Tribal Group(PVTG), Kurumba Adivasi communities of the Attappady Integrated Tribal Development Block of Palakkad. This program is being managed by an exclusively Adivasi women's organization named Panchayat Samithies. The women's Self Help Groups in the 192 far-flung Adivasi hamlets in the three different panchayats in Attappady namely Agali, Sholayur, and Pudur, and the inaccessible highland Kurumba hamlets have been organized under four Panchayat Samithies. They are the Agali, Sholayur, Pudur, and Kurumba Panchayat Samithies.

#### Millet cultivation under the Kudumbashree initiative (2022-23)

SI No	Name of millet	Area (Acre)	Production (kg)	Number of groups
1	Finger Millet	334.12	82859	349
2	Little Millet	128	32132	180
3	Foxtail millet	23.65	5260	13
4	Kodo Millet	18.55	5218	9
5	Pearl millet	11.25	2765	6
	Total	665.49	164050	703

#### Agri festival (Kambalam)

A unique community ritual of land preparation before and after sowing seeds namely "Kambalam" which was stopped and almost forgotten for the last thirty years was revived to mobilize the workforce and increase community participation in land preparation for millet cultivation. As Kambalam was held at the beginning of the agricultural restoration work there was a major mobilization of the community in the festival. It was in 2019 when the number of women farmers had increased to more than 4000 that Adivasis from many hamlets came forward to revive their sacred Kambalam ritual. Subsequently, Kambalam was grandly held in 12 hamlets with the full participation of not only Adivasis of all ages but also students, officials from the ITDP, Forest and Agriculture Departments, teachers, and political leaders. More than 2000 people participated enthusiastically in the festival and relished the traditional food items of the Adivasis, mostly prepared from their farm produces.

It became a symbol of celebration, conservation, and restoration of seeds, soil fertility, and unity of humans. The celebration became a learning space of green philosophy and practice, traditional food culture, and indigenous life visions. Ritualistic songs and dance make Kambalam a festive occasion with heads (moopan) of the hamlets leading the celebration. Traditional songs are rendered by groups and they dance to the beats of instruments as they sow seeds. In 2022, the first event was held on May 20 at Kallakkara hamlet, where 22 farming groups cultivated millet on 42.4 acres, followed by programs at Moolakombu and Kunnanchala hamlets. One of the key highlights of the Kambalam festival was the traditional food festival that accompanied the event in all the hamlets. The diversity and richness of the highly nutritive and wholesome food items made of millets like finger millet, little millet, kodo, and foxtail millets accompanied by curries and chutneys were the main food items. New innovative items like noolputtu, payasam, sweetmeats, etc were also part of the feast of the food festival.

Women farmers of Joint Liability Groups (JLGs), following their traditional tribal practice, were eager to take up a kind of "collective farming" of mixed crops (panjakrishi) after many years since modern agriculture took their land by storm. They firmly believe that this endeavor has every possibility to become successful in the long run because they will have the blessings of 'Bhoomathai' (Mother Earth). As most of them still retain their knowledge, seeds, and desire for farming in an indigenous way, they want to revive the ancient ways of cultivation. The only difficulty was the preparation of land which has been lying fallow for many years, which needed a massive collective effort. *Kambalam* helped bridge that gap

and generate excitement around millets. These JLG women were provided with Rs. 15,000 for meeting initial expenditures on a revolving basis. To purchase the inputs like seeds, Rs. 1750 member was provided. Rs.3 lakhs were given as a JLG linkage loan to JLG s in which loans up to Rs.1 lakh was given at 4% interest (interest subsidy up to 5%). The Corpus Fund (CF) was disbursed through the Ooru samithies and based on the microplan submitted by the groups. The farming groups would submit the plans and the amount would be distributed on priority. The amount would be used for a variety of purposes like seed purchase, preparation of organic fertilizers, pesticides, soil conservation, irrigation, fencing, marketing, etc.

#### **Area Incentive**

An area incentive of Rs.2300 per acre is given from the State Plan Fund to JLGs for meeting the initial investment requirements for millet cultivation.

#### Challenges

The indigenous farming practiced by the Adivasis had always been ecologically viable and sustainable. But during the last few decades, unsuitable crops that deplete the fertility of the soil and which need tilling and chemical fertilizers, and lethal pesticides have been introduced in the Adivasi lands. Also, groundnut, cotton, mulberry, banana, sugar cane, rubber, coconut, areca nut, and many other unviable crops have introduced and replaced the rich and diverse indigenous farming culture of Attappady. Also, rice has become a staple diet in Kerala. Hence finding a local market for the millet is a challenge. An effort was made for the brand building of the products of Attappady. The Hill Value brand is an example of such an initiative taken up by the mission.

#### Case study 1: Support for Marketing

Hill Value Brand for Marketing and Distributing Farm Produce Cultivated by Adivasi (Tribal) Women of Attappady:

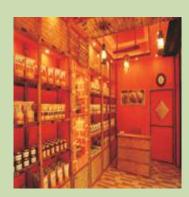
#### **Background**

The lack of fair prices for the agricultural produce from the Adivasi hamlets, exploitation by market intermediaries, and inaccessibility of the hamlets lacking marketing opportunities had led to financial losses and many giving up agriculture. The idea of marketing the millets and pulses, condiments like mustard and sesame, and other hill products by branding them as 'Hill Value' came up in this context.

#### **Problem statement**

As Attappady is hilly terrain and hamlets are without any transportation facilities, farmers cannot transport their agricultural produce to the marketing centers and get a fair price. As they do not have collection centers, during the harvest season, market intermediaries from the cities buy off their produce underpriced than market prices. Adivasis lacked bargaining power as traditionally they only shared their produce. For example, a kilo of ragi would fetch them Rs. 20 or 25 when they sell to the local shops, remaining oblivious of increasing market rates and devoid of farmer groups or unions.







#### The Intervention

The most critical activity that the Mahila Kisan Sashaktikaran Pariyojana (MKSP) program carried out was finding a sustainable and profitable market for the farm products which the Adivasi women's collectives cultivated. The first step was the formation of JLGs of 4 to 10 Adivasi women to take up farming. These groups were registered in the Panchayat Samithi, elected from the hamlet-based exclusive Adivasi Self-Help Groups ('ayalkkoottam') of women. In total, 1037 JLGs have been formed so far and under their leadership, producer groups, and entrepreneur groups have been organized. The latter groups are in charge of collecting the produce from the farmers, cleaning, processing, grading, packaging, labeling them, and marketing them under the brand name 'Hill Value'.

A mill for dehusking and processing the millets and pulses has also been started by the women's collectives. The entrepreneur groups were given training in processing, labeling, and marketing at the Indian Institute of Millet Research Institute, Hyderabad. Ragi powder, little millet rice, maize flour for puttu and other preparations, rava or sooji (granulated millet or semolina), varagu (kodo millet) rice, kambu (pearl millet) rice, thina (foxtail millet) rice were the main produce marketed. Overall, 32 products are being marketed including bamboo rice, forest honey, a variety of pulses, indigenous small mustard, pepper, coffee powder, and sesame.

This has brought profit to the farmers and producer groups as they have started getting a fair price for their farm products. From the sale via online and different exhibitions and trade fairs, profits are running into lakhs of rupees for these groups. Earlier, a product like Ragi used to get Rs.20 to Rs.25, which is now being purchased at Rs.40 to Rs.45 by the entrepreneur groups. For the other millets and pulses also, there is an increment of 25% to 30 % in price.

#### The Impact

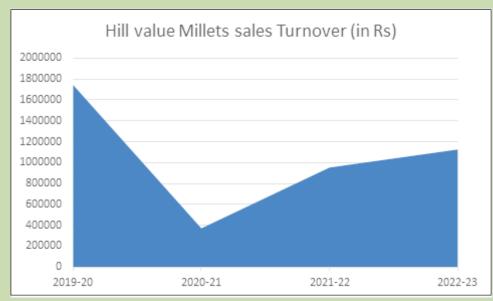
At present, the Adivasi women farmers are growing indigenous millet varieties of Attappady on 665.49 acres of land. This is a remarkable restoration of many lost endemic seeds, local cultivars, and landraces of these invaluable crops. They were able to procure, process, and market their farm produces at a remunerative price and make a profit in addition to ensuring food and nutritional security. They now market 30% to 40 % of their

produce, which is in addition to what they consume. The Planning Board in recognition of this endeavor sanctioned Rs. 1 crore to the Panchayat Samithies to continue the work. This success has led to more women taking up millet farming as a livelihood and also becoming entrepreneur groups





Hill value Sales - Graph showing Sales (in Rs.) in 2019-20 to 2022-23



Source of data: Primary data collected from Hill Value sales

#### Challenges and way forward

The Hill Value venture has helped the Adivasi women farmers to find sustainable and efficient marketing for their agricultural products so that they get remunerative and timely income. The social and economic progress they are achieving through this enterprise has started bringing a sustainable solution to the perennial poverty and malnutrition that plagued the tribal communities in Attappady.

However, the food culture of Kerala is mainly rice based. Hence the local demand is less. Mostly the demand is from urban areas. Value addition and efforts for increasing the shelf life, marketing in other parts of the country, etc. need to be explored.

#### Conclusion

The institutions and empowerment programs which have been initiated in Attappady will surely benefit if the necessary support and encouragement are extended to them relentlessly. Collaboration with various institutions to support and guide the value chain interventions will help in increasing the scientific and optimal production and marketing of the millets produced by SHGs thereby helping them to get good income. Collectivization, primary processing, value addition, etc. to be given more focus so that the members engaged in cultivation can fetch high prices. Also, awareness building about the health benefits of millet especially gluten-free properties can help in preventing cardiovascular diseases. Consumption of millets helps Kerala to fight against lifestyle diseases and micronutrient deficiency-related diseases. The millets should be procured at Minimum Support Price (MSP) and distributed through Public Distribution System (PDS) so that the producers and the consumers gain an advantage through the system.

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# Millets: Restoring a Lost Legacy MR. MANISH SINGH PAWAR, PRATUL KUMAR PAYASI VIJAY GOSWAMI, SOURABH UPADHYAY









#### Background:

Globally, the year 2023 has been declared the International Year of Millets. Madhya Pradesh proudly referred to as the heart of India aims to be the most millet productive state of India. Although millets are grown throughout the country, Madhya Pradesh owing to its favorable agro-climatic conditions and the presence of substantial indigenous communities across the state has the potential to become a hotbed of millet cultivation. Madhya Pradesh is the largest producer of minor millets in India with the highest area under small millet cultivation (32.4%). This coupled with a suitable topography makes Madhya Pradesh one of the most suited states for exacerbating millet production in the country.

#### Millets in Madhya Pradesh: A brief overview

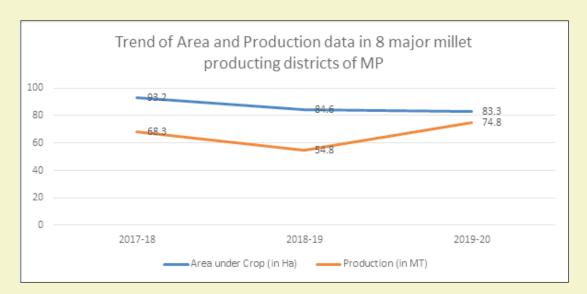
#### **Varieties of Millets Grown**

Millet	Scientific Name
Pearl Millet	Pennisetum Glaucum L
Sorghum	Sorghum Bicolor
Finger Millet	Eleusine Coracana
Small Millets	Scientific Name
Foxtail Millet	Setaria Italica
Barnyard Millet	Echinochloa Frumentacea
Kodo Millet	Paspalum Scrobiculatum
Proso Millet	Panicum Miliaceum L
Little Millet	Panicum Sumatrense

Millets have been grown in MP since time immemorial. The tribal populated districts of the state have been home to a large variety of millets - especially minor millets for several centuries. However, there has been a massive decline in the overall cultivation of this crop, and has been relegated to a mere 8-9 districts out of 52. The overarching reason responsible for this massive decline can be attributed to the increasing focus on commercial crops like paddy and wheat which gained traction from the state's Minimum Support Price (MSP) program. The current data suggests a decline of over 7.35% per year in the cultivation and yield of small millets in the entire state which is more than the national average of 5.34% overall.

In the state, millets are majorly grown in 8 districts. A common linker amongst all these districts is that they have the same average annual rainfall of around 1400 mm and the presence of indigenous communities in the region.

The following data best illustrates the break-up over the past 3 years:



The current use of millets is limited to consumption, wherein kodo and kutki rice have been traditionally consumed by indigenous communities. These have also been able to provide nutritional benefits to the communities because of persistence in their palette.

The other problems in millet cultivation are the lack of marketing channels available for millet in general along with the dearth of inputs mainly good quality seeds. Moreover, government schemes also encourage the adoption of crops like paddy and wheat with the assurance of market, land development, and irrigation whereas such focused interventions are missing when it comes to the promotion of millets.

#### Reversing the trend: Our major efforts

The MPSRLM has been continuously engaged in the betterment of marginalized and indigenous communities through the state. In our endeavors, it was realized that the need to revive millet cultivation is of paramount importance. The MPSRLM carried out a series of discussions and deliberations with the women collectives to understand the prerequisites for scaling up this diminishing crop. The major efforts of our SRLM have been:

- 1. Creating awareness and interest amongst the community around the cultivation of this crop.
- 2. Demonstrating models of increasing production of this crop through providing technical guidance, input support, and marketing support.
- 3. Value addition of products and promotion of millet bases dishes to capture the palette of rural and urban communities and increase consumption.



A holistic approach addressing multiple bottlenecks in the supply and demand of minor millets is being applied in Madhya Pradesh through the project "Linking agro-biodiversity value chains, climate adaptation, and nutrition: Empowering the poor to manage risk". Multiple stakeholders are being consulted and involved to devise value chain interventions for these millets that are pro-poor and gender-sensitive. Led by Action for Social Advancement (ASA), key actions being taken include increasing the availability of high-quality seed, building collective action, and marketing to raise consumer awareness and demand. Processing is one of the major challenges that is making rural families turn away from millet consumption. Processing equipment to ease drudgery and increase the quality of processing is a key action being taken to increase rural consumer interest and demand for minor millets. Food fairs and targeted marketing for urban consumers are other activities being pursued to increase consumer awareness and help reverse perceptions of millets as "food of the poor."



#### **POP Matrix**

The following matrix illustrates the major bottlenecks and the remedies that have been planned by MPSRLM to boost the production of small millets in the region:

Practice to be promoted	Current bottleneck	Transformative Situation	
Use of high-quality seed	Use of indigenous seeds	The quality of seeds available to the farmers is generally of substandard level. They are often very old seeds that have stayed with the farmers or their families for several years.	
Line sowing	Seed broadcasting method	Instead of simply broadcasting the seeds on a patch of land this leaves greater space for weeds to grow and thus weeding would be easier	
Weeding	No weeding mechanisms practiced	This leaves more light and nutrients to be utilized by the millet crops	
Organic fertilizers	Fertiliser application is minimal	Aids the production and output of the crops. Compared to chemical fertilizers, they are cheaper to procure and do not harm the soil or the nearby environment.	
Organic pesticides	Pest and disease management practices are minimal	Aids the production and output of the crops. Compared to chemical pesticides, they are cheaper to procure and do not harm the soil or the nearby environment.	

Traditional production practices are also one of the major bottlenecks thwarting the production of this crop. Very little effort is given to cultivating this crop which leads to severely low production and even lower monetary returns. This also stems from disinterest in this particular crop. MPSRLM in its efforts is striving to demonstrate increased production benchmarks of this crop to improve its scalability and stem interest among the farmers.

Millets have been excluded from our food basket. The current generation is unaware of millet- its taste and nutritional benefits. The reason for this is a lack of awareness about the nutritional benefits, the not-so-sumptuous taste, and the tag of "a poor man's food" also acts as a hindrance in scaling up this crop. By organizing food melas, the SRLM is effectively trying to promote the consumption of this crop both in rural and urban circles. This will in turn trigger better market absorption and better nutritional sufficiency in the

#### Case Study 1: Addressing marketing woes through Farmer Producer Companies

Districts - "Dindori and Mandla" lying in the central-eastern range of Madhya Pradesh are characterized by their high poverty ratio of 74.5% and 67.6% respectively. Both Dindori and Mandla districts have significant rural and tribal population ratios. It has been observed that the majority of rural and tribal households in the region are engaged in the cultivation of kodo and kutki. A detailed value chain study of the crops in the district indicated that although millets have high demand in the market due to lack of transparency in the system, the menace of commission agents, and low processing capability in the state, it has been rendered unviable for cultivation by small and marginal farmers.



It was therefore thought that collectivization of small and marginal farmers through producer groups and federating them into farmer producer organizations can effectively help break the nexus of middlemen and help tackle the input as well as the marketing issues that have been acting as a hindrance to native production systems

These promoted FPCs are the key institutions providing the availability of quality millet seeds to last-mile farmers as well as ensuring better price realization for maximized returns. Three farmer-producer companies in the Project area are currently engaged in attributing a commercial significance to the millet crop by providing farm mechanization, input, and marketing support. Best-quality indigenous seeds in the area are being identified through a participatory trial basis and are being scaled up to fulfill the need of 2500 shareholding farmers in the FPCs. These sorted seeds are then supplied to the farmers who then follow the prescribed package of practices (POP Matrix) to ensure maximum yields. A state-level consortium of FPCs is helping in exploring better market prices for the crops to maximize returns. These FPCs carry out a market-driven cleaning, sorting, and grading of millets to maximize monetary returns.

#### Case Study 2: Value addition as an added tool in the arsenalomic well-being.

The traditional folklore of this area has been that a farmer who has more kodo is wealthier. However, this traditional folklore had been on a decreasing trend ever since. For the past 20-30 years, kodo had disappeared from the traditional folklore and has instead been replaced by more lucrative crops like paddy and wheat.

In the year 2015, SRLM started its operations in the Sidhi district. In one of its several operations, SRLM had prioritized promoting millets in the entire region. In this, the team interacted with those farmers who were dropping out from millet cultivation. The SRLM team organized a campaign in SHGs, VOs, and GPs to create awareness around the importance of millet and the potential of its market but the challenge was to assure market and better price realization. Thus an FPC named Singh Dev Mahila Kisan Producer Company Ltd. Was formed with support from FDRVC with millets as its primary commodity.

Currently, in Kusmi and Sihawal blocks, around 1254 farmers are doing millet cultivation intensively in 65 villages. In Kusmi block 7 D3C (digital commodity collection centers) are running and 1030 formers are shareholders of Mahila Kisan producer Company Limited who are selling their millet and getting 25 to 26 rupees per kg. To augment their production, processing units have also been set up and are being operated by SHGs in congruence with the FPC. These processing units are involved in the polishing of millets and flour making which is helping in diversifying the commodity line-up and also helps in better price realization.



As a result of these interventions, the farmer count has increased from 250 to around 1250 and the cultivated area has increased from 500 to 3125 acres. This significant increase in the count of farmers as well as cultivation areas proves the hypothesis that wherever forward and backward linkages have been established, it has resulted in farmers adopting and scaling up millets. Decentralized village-level collection centers have also facilitated market availability and helped to provide doorstep service to the farmers.

The FPC will be launching the distribution of the products in all the major cities within 500 Km of Mandla along with the traditional millet rice markets in the south. The target cities would be Bhopal, Jabalpur, Indore, Nagpur, etc. The FPC also plans to be registered on popular e-commerce sites such as Big Basket, Milk Basket, Amazon, Flipkart, etc.

The PC would use the procurement infrastructure to tap into the captive market that comprises the member shareholders, NRLM-promoted SHG members, and other rural households residing in the PC's catchment area. To tap into the demand of the state government bodies and other parastatals, the products would be listed with the state's procurement agencies and with the state government equivalent of GEM (Government e-Marketplace)

### .Case Study3: Making communities self-reliant through scaling of indigenous seeds

People used to mock me, and run away from me but I only had two motives; one to serve my parents and the other to promote farming by saving the millet seed."says Lahari Bai, a Baiga tribal woman from Silpadi village of Madhya Pradesh, who lives in a two-room house with her parents. Where one room is used as a living room and kitchen; the other room has been converted into a seed bank that has preserved more than 150 rare seeds of the market including kodo, kutki, sanwa, madhiya, salhar, and kag.

Lahari Bai grows these seeds on her land, then the seeds she gets distributes to the farmers of her village and 15 nearby villages. She distributes seeds for free, but sometimes farmers give them a portion of their crop instead.

Vikas Mishra, District Collector of Dindori, who nominated Lahari Bai for a scholarship of Rs. 10 lakh of Jodhpur ICAR, says "If she gets a scholarship, Lahari Bai will be seen giving

information about these seeds to Ph.D. students."

27 साल की आदिवासी महिला बनीं मिसाल! 150 किस्म के मिलेट्स को सहेजकर घर में बनाया बीज बैंक

Her case is exemplary because she has been able to demonstrate the promotion of indigenous seed banks through traditional knowledge and help in the betterment of communities by providing them with seeds. A similar approach can also be taken up by the government through the identification of entrepreneurs/individuals/groups who can take up seed bank promotion and provide them with requisite financial and technical support.

#### Diversifying the food palette: inclusion of millets in the food regime

Millets have been diminishing in the food pattern of the communities and MPSRLM has tried to tackle this through our Didi café model. Under this, more than 10 such cafes have been promoted across the state who are preparing various dishes based on millet. The main aim of these cafes is to promote the consumption of millet through diversified dishes and increase uptake through the promotion and branding of these dishes. One such café is from Mandla district which is being run by Om Devi Mahila Samuh and received a special mention from the Hon'ble Chief Minister of Madhya Pradesh<sup>3</sup> who tasted these millet dishes and greatly appreciated the endeavors of these women. This helped to create an example across the state and sent a message for the promotion of such dishes and their consumption.

#### Future prospects and policy recommendations for millet cultivation

The state needs to take into cognizance the efforts that are being carried out by MPSRLM and several other government agencies and draft a policy framework to support the scaling up and marketing of millets. A state-wide millet mission as an MSP support scheme can boost the production of the crop by incentivizing assured market as well as help in providing a remunerative business prospect for our FPOs and women collectives, Also. more investment is needed in building the ecosystem for millet cultivation like introducing farm implements for threshing, harvesting, and processing that can reduce drudgery as well increase the final cost of the produce. Since millet is a sturdy crop with noted nutritional benefits, the same can also be linked with departmental initiatives to trigger consumption of the crop. Food melas and promoting millet dishes have been one of the ways already demonstrated by MPSRLM. This can be developed into a full-scale movement by integrating with MDM and other such government provisions under NFSA and ICDS. Also, women federations can play a significant role in procuring and marketing the product to government nodal agencies that would also help establish their identity of providing input as well as marketing services to the entire region thereby contributing to their economic empowerment. Initiatives like that of the Mehadwani federation which has developed a special breakfast bar recipe - based on a mix of kodo, soyabean, and groundnut – for 226 Aanganwadi rural child care centers covering over 5000 children can be taken to scale and replicated. This will promote in-situ consumption of the product and will help address the nutritional woes of children as well as women.

#### **Endnote**

We hope to see Madhya Pradesh as a hotbed of small millet cultivation in the coming future. If everyone works in conjunction, a very good model can be developed for the entire nation that would help makes communities more climate resilient, small and marginal farm-holders more income sufficient, and address the nutritional woes of children and women.

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#### **Background**

Agriculture is the mainstay of the state of Maharashtra. The principal crops of the state are rice, jowar, bajra, wheat, pulses, turmeric, onions, cotton, sugarcane, and several oil seeds including groundnut, sunflower, and soybean. The state has huge areas, under fruit cultivation of which mangoes, bananas, grapes, and oranges are the main ones. The state has 24 percent of the drought-prone area of the country. However, the state has potential for growth in the agricultural sector despite challenges. The state has nine agroclimatic zones favorable for cultivating multiple crops, fruits, and vegetables around the year.

#### The potential of millets and varieties grown

Recurring drought is a major challenge in the drought prone area of Maharashtra state in India. Agriculture (e.g., rainfed cropping and livestock) is the major income activity of over 64% of the state's population. However, agricultural output depends on the monsoon; nearly 56 percent of the net sown areas (NSA) are dependent on rainfall which is highly erratic in India. Western parts of Maharashtra's food (sorghum and pearl millet) have been now trending as "superfood". In the past, it was well known as "poor man's food", hence did not get much attention for marketing domestically and internationally. During post Covid-19 pandemic era everybody taking care for boosting their immunity, hence these foods (millet) promise better health and are increasingly being seen as a food that can reduce lifestyle ailments. Recognizing the agricultural and health benefits of these "poor man's foods" as superfoods, the central government and state functionary has been promoting the cultivation of nutri-cereals which include sorghum (jowar), pearl millet (bajra), finger millet (ragi) and other small millets, little millet (kutki), kodo millet, barnyard millet (sawa), foxtail millet (kagni) and prosco millet (chena). Under the project funded by World Bank on "Climate Resilient Agriculture" kharif pearl millet and rabi jowar have been focused in the western parts of Maharashtra.

#### Objectives of millet promotion

- 1. To increase the number of nutritious cereal crops in people's diets by creating public awareness about the health benefits of millet.
- To increase the production of millets by increasing the area and productivity of these crops.

#### **Millet Production Statistics**

(in '000' Ha) and Production (in '000' Tonnes)

Sr.	Crop	2020-21		2021-22	
No.		Area	Production	Area	Production
1	Sorghum (Jowar)	379	381	209	173
2	Pearl Millet (Bajra)	687	906	504	458
3	Minor Millets	0	0	0	0
4	Finger Millet (Ragi)	82	94	73	94

Source: Commissionerate of Agriculture, Government of Maharashtra (As published in Economic Survey of

#### Changes in millet crops from 2001-02 to 2021-22 in Maharashtra

- o Kharif sorghum crop area has decreased by 89 percent, production by 93 percent, and productivity by 34 percent.
- o The area under the rabi sorghum crop has decreased by 55 percent, and production by 4 percent, but productivity has increased by 114 percent.
- o Millet area has decreased by 71 percent, and production by 58 percent, but productivity has increased by 50 percent.
- o The area under the ragi crop has decreased by 53 percent, and production by 28 percent, but productivity has increased by 52 percent.
- o The area of total nutritious cereal crops has decreased by 68 percent, and yield by 57 percent, but productivity has increased by 34 percent.

#### **Crop-wise major producing districts and areas (Lakh Ha.)**

	Sorghum	Solapur (3.18), Ahmednagar (2.68), Osmanabad (1.89), Beed (1.79), Satara (1.57), Sangli (1.36), Pune (1.35), Parbhani (1.20), Jalna (0.88), Jalgaon (0.86).
	Bajara	Ahmednagar (1.52), Nashik (1.14), Beed (0.73), Satara (0.61), Dhule (0.58), Sangli (0.54), Pune (0.52), Solapur (0.40), Aurangabad (0.37), Jalgaon (0.22)
The second second	Ragi	Nashik (0.19), Kolhapur (0.17), Palghar (0.12), Ratnagiri (0.10), Satara (0.05), Raigad (0.03), Pune (0.03), Thane (0.02), Sindhudurg (0.02).

#### Reasons for the declining area and production of Millets in Maharashtra

- During the decade of 1991 to 2000, due to the increase in the area under soybean, tur, and sugarcane crops in the Kharif season and gram in the Rabi season, the area under millet crops decreased significantly. The area under millets is shrinking due to various reasons, which is worrisome, One thing we have observed is that farmers struggle to harvest millets as it is very labor-intensive.
- Despite a reduction in the area under millet cultivation, the production had not been affected. The per hectare yield of the crop, which was around five quintals per hectare a decade ago, has now nearly doubled.
- Soybean, cotton, and sugarcane crop-based processing industries have discouraged farmers from millet crops. Farmers are not earning enough profit out of millet. It takes at least four months to harvest bajra and jowar. Thus, maximum farmers have switched to cash crops and cultivation of vegetables, including leafy vegetables, to earn quick money.
- An increase in irrigation facilities and availability of water has increased farmers' inclination towards higher-yielding cash crops. Like, bananas, sugarcane, cotton, soybean, horticultural crops, etc.
- Lack of awareness among the people about the nutritional importance of millet crops results in reduced demand resulting in the lower area under millet cultivation.
- Modernization, mechanization, and processing of millet crops have not been developed much. Lack of development of backward-forward linkages in terms of developing a farmer-to-consumer chain has hampered millet cultivation.

#### Minimum Support Prices (MSP) of millet crops

- The central government is encouraging to increase in the area under millets by increasing the minimum support price of millets every year.
- The MSPs should be fixed for other minor millets also which will boost the production of minor millets.
- In Maharashtra, the government is also giving a special focus on minor millet growth. The increase in MSP can be referred from the following table.

Sr. No.	Crop	2017-18	2022-23	Growth (%)	
1	Jowar	1725 2990		73	
2	Bajara	1425	2350	65	
3	Ragi	1900	3578	88	

#### **Utility of millets in Maharashtra**

In Maharashtra previously millets was a staple food. In our everyday diet we have been eating bajari bhakri, jawar bhakari, papad, kurdaee, dahi dapate, kharwadiand laadu.

#### Maharashtra Millet Mission

To celebrate the "International Year of Millets - 2023" in Maharashtra, the "Maharashtra Millet Mission" is being implemented with a provision of Rs. 250 crores.

Activities to be implemented under Maharashtra Millet Mission:

- State-Level Agriculture Council
- District-level agricultural/millet festival
- Millet daud (run/walk for millet)
- Millet culinary arts / culinary competitions
- Promotional publicity through lectures by dietitians on millet
- "Millet of the Month" i.e. millet special month concept
- Awareness generation among the students about the importance of millet health and diet
- Publication of cereal recipe books under the concept "Identity of Nutritious Cereal"
- Distribution of millet seed minikits to every farm under the "Millets to Fields" campaign
- Makar Sankrati Govt issued a decision to observe bhogi day as "Millet Day" henceforth across the state
- "Millets Special Issue" of Shetkari magazine was released on the occasion of the International Year of Millets

#### Plans for area, production and productivity, and publicity

- National Food and Nutrition Security Mission (Provision Rs. 110 crores)
- Maharashtra Millet Mission under National Agricultural Development Scheme (Provision - Rs. 50 Crores)
- ATMA Yojana: (Rs. 5 Crore)

#### Schemes for the promotion of process industries

- Pradhan Mantri Micro Food Processing Scheme: PMFME (Provision Rs. 50 Crore)
- Chief Minister Agriculture and Food Processing Scheme

#### Scheme for Strengthening Farmers' Production Companies

- Hon. BalasahebThakare Agribusiness and Rural Transformation Project: SMART (Provision - Rs. 25 Crore)
- Nanaji Deshmukh Agricultural Sanjeevani Project (POCRA) (Provision Rs.05 Crore)

#### Maharashtra State Rural Livelihoods Mission (MSRLM) – UMED

#### **Objectives of MSRLM**

- Encouragement to rural women for the cultivation of millets
- Establishment of millet-based enterprises for better livelihoods of women

#### **Activities**

- MSRLM will conduct awareness campaigns from the village to the state level
- MSRLM will engage approximately 50,000 women for millet cultivation over approx. 45,000 acres of land
- Technical and financial support for the training and capacity building for improved practices of millet cultivation, seed replacement, and processing of millet products
- Millet-based enterprise development technical and financial support
- Organization of traditional millet recipe competitions at cluster, block, and district levels
- Special events like millet food festivals, exhibitions, buyer-seller meet, etc. at district and state levels.





#### Case Study 1: Bajra and ragi nutri cookies: Eat healthy-wealthy business

#### Savitribai Phule Cluster Level Federation (CLF) - Nachangao, Wardha

Savitribai Phule Cluster Level Federation (CLF), Nachangao is located 18 k.m. away from Wardha district. It has a population of 18464. This CLF has 18 VO (Vilage organization). Apti, Wagholi, Ekamba, and Khatkheda are the 4 villages covered by this CLF. Pulgaon is a big marketplace located nearby Nachangaon.

Bajra (pearl millet) is available around the year in the Wardha district. Bajra roti is the major food habit of the area. In the year 2020, women from this CLF decided to produce bajra cookies. Umed - District Mission Management Unit helped them with training which was

conducted at Krishi Vigyan Kendra, Durgapur, district Amravati. Training regarding bajra cookies recipe standardization, production technology, packaging, and nutrient analysis of the product was given to rural women. After completion of successful training, women took a loan of Rs.3,00,000 from the Village Organization (VO). Women established a bakery unit and started the business of manufacturing bajra cookies in the village. The first time they sold their product at the state level Mahalaxmi SARAS held in Mumbai and sold 200 Kg bajra cookies in January 2020. They



earned Rs. 56,000 of profit in 2020-21 as shown in the given table.

Initial Investment in Rs.	Turn over	Expenditure	Repayment	Profit
300000	821520	429520	336000	56000

While running the unit the women faced a lot of difficulties. They had to convert the mindset of all women to start the business. They were not sure whether these products will get any market. But when they were able to sell their products in the Mahalaxmi Saras Mela, it helped them in increasing their courage. Also, the women came to know the demand for the product. It was not only tasty but also nutritious. Later on due to corona pandemic situation, the marketing of this product was hampered badly. But from 2022 onwards, women are regularly manufacturing



cookies and selling them locally as well as in other districts through Umed Mart, exhibitions, etc.

#### Case Study 2: Adarsh Mahila Prabhag Sangh (CLF), Palghar

Palghar has a 31% tribal population. The main occupation of people here is farming. They cultivate paddy, finger millet, pulses, vegetables, and horticulture crops. Most of the women in Palghar are engaged in household work and farm labor work.



Adarsh Mahila Prabhag Sangh (CLF) of Palghar comprises of total 426 Self Help Groups (SHGs) where almost 85% women population are tribals. In meetings, women of this CLF often discussed the appropriate livelihood opportunities for them as their livelihoods predominantly depended upon farming. In 2019, Women and Umed staff together studied the various local resources for livelihoods. Later on, they identified that Palghar women have sufficient quantities of finger millet which they either sell in the market but at low prices or consume in meals in the form of 'Bhakari'. Palghar district was also facing

problems like malnutrition in children and women.

Umed block and cluster staff identified the problem and guided the women over the processing of nutritious ragi. In the beginning, the training and capacity building of women were conducted by MSRLM. Umed sent selected women to Krishi Vigyan Kendra, Durgapur, district Amravati for four days in December 2019. There at KVK women were trained technically which helped them to standardize their ragi processed product viz. 'nutri cookies – ragi Cookies'. Initially, women manufactured cookies in their homes and rented the bakery unit for further processing



due to a lack of funding and space. The first time, they launched their product in the 'Mahalaxmi – SARAS' exhibition was in January 2020.

Later on, the COVID-19 wave hits them hard. All transportation was restricted in the area. Hence, production and selling were hampered badly. Meanwhile, women decided that they will use this time for fetching funds and the availability of space for their processing unit. Umed-MSRLM was helping them throughout the process. Women started their businesses with the help of the Community Investment fund (CIF). To date, they borrowed Rs. 5 lakhs and are repaying it timely. In September 2021, Umed also helped them through the PMFME scheme as they received Rs. 4 lakh funds through the scheme. Women also struggled a lot with space availability. Finally, in the same period, Zilla Parishad's old primary school building in the village became available for them through a contract. Despite COVID-19, women's turnover for the year 2021-2022 was Rs.1,50,000. In the year 2022-2023, the turnover increased to Rs.1,82,000 through the selling of cookies locally, in exhibitions, etc. Today Adarsh Prabhag Sangh (VO) has its processing unit. Women are committed to making this processing business even bigger.

#### Case Study 3: Goodness of millets: Traditional jowar products

#### Jijau Self Help Group, Koshtgao (SHG) - Koshtgao, Tel. Renapur, Dist. Latur

Jijau Self Help Group, Koshtgao is located 25 K.M. away from Renapur block headquarters of Latur district. Farming is the main business of the village. In the kharif season, bajra is the major crop followed by jowar in the rabi season. In the local market of Renapur, both these crops generally fetch low prices. Mrs. Manisha Giridhar Suryavanshi one of the members of Jijau SHG, Koshtgao made plans to get a better price for her farm produce of bajra and jowar.

Umed - Block Mission Management Unit and District Mission Management Unit supported her by providing training regarding the preparation of different food products of bajra and jowar at Krishi Vigyan Kendra, Manjara, Latur. After completion of successful training, Manisha took a loan of Rs.2,60,000 from the Bank and her SHG. She started her



business of manufacturing bajra chakli, sandge, jowar papad, laddu and kurdayee on large scale at her home. She gave employment to two women members of the same SHG.



Initially, she faced a lot of difficulties like creating a demand for millet products. Umed - Block Mission Management Unit arranged an exhibition at the block level and allotted a stall to her. Due to the premium taste and quality with attractive packaging of all millet products prepared by Manisha, there was a huge demand. District Mission Management Unit organized 5 days of Hirkani Mahostav at the district level from 26<sup>th</sup> January to 31 January 2023 in which she also participated and sold her products. Manisha. At present, her business turnover is Rs. 4,25,000 per year.

#### Case study 4: Change in Women's life: Farming to processing

#### Matoshri Self Help Group (SHG) – Sasure, Tel. Barshi, Dist. Solapur

Mrs. Vaishali Phulchand Aware of Sasure village in Barshi taluka of Solapur district is an inspiration for all.

Vaishali lost her mother when she was young. She had to face many hardships from a very young age and while studying in class 10<sup>th</sup>, her maternal uncle and aunt got her married. After marriage, agriculture was the main occupation of her household. Mrs. Vaishali always felt that she should help his husband to do something unique in agriculture, but Vaishali could not do anything against the family system and the elders' opinion.

Suddenly, in 2016, her life took a turn when Umed-MSRLM came to her village. She became a part of a Self Help Group. Due to her honest work and leadership skills, women also started trusting her. She started to participate in meetings of Village Organization (VO) and Cluster Level Federation (CLF) where she freely expressed her view on different livelihood aspects. Later on, she became a Krishi Sakhi in the village.

She owns agricultural land but the expenditure on agriculture was too much for her. Due to the sudden outbreak of disease on the crop, agriculture was not profitable, but after her training as a Krishi Sakhi, she saved 94% of the cost of agriculture by using all the organic methods like agricultural testing, soil testing, pheromone traps, Nimark, Brahmastra, Dashaparni extract. She learned and started using all the organic methods of farming, germination capacity, seed processing, and vermicomposting.

She was thinking that instead of depending entirely on the money from the sale of agricultural produce, she should do some business by processing the agricultural produce. Umed— MSRLM encouraged her and sent her to the Indian Institute of Millet Research, Hyderabad for training on how to make nutritious products from sorghum, with this training she started making biscuits, chakli, cakes, and other nutritious products. Through the Umed campaign, she promoted her products in the entire Solapur district under the Rukmini brand of Solapur District. The demand for her product started to increase. She also works as a trainer. Due to this, she could reach many women.



She started setting up her stalls at various places like Mahalakshmi Saras, Rukmini Saras, and Hirakni Mahotsav organized by Umed-MSRLM and gradually the demand for her sorghum products increased. Solapur district is known as the granary of sorghum and today various food products are made from sorghum in the district, thus attracting consumers. A 10<sup>th</sup>-class educated woman who became a successful entrepreneur creating a brand of sorghum products is a great role model for other rural women.

#### Learning and way forward of millet promotion

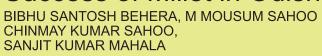
- **1. Support for seed production**: There is a shortfall in the targeted seed production of proven and successful indigenous varieties of millets. There is a need to promote more seed villages and seed banks through schemes.
- **2. Installation of primary processing unit:** State and central governments may provide investment support for the installation of processing units for dehulling and making flour by rural entrepreneurs at small to medium scale to handle a location-specific combination of millets (including small millets). These infrastructures will promote household consumption
- **3. Promotion of millet processing & marketing under state & central schemes:** The millet entrepreneurship models may be promoted under central and state government schemes like SMART Yojana, 10K FPO central sector schemes, National Food Security Mission, Rashtriya Krishi Vikas Yojana, etc. This will help for easy processing and consumption at the local level to provide more health benefits.
- **4. Promotion of agroecological practices (AEP) for millets:** As millets are grown mostly in marginal lands in diverse ecosystems, support needs to be given for location-specific, eco-friendly measures for improving the fertility of the soil.
- **5. Minimum Support Price for millet:** Millet should get MSP on the lines of other major cereals such as rice and wheat. The assured market will encourage farmers to grow millet.
- **6. Procurement of millets and distribution under the Public Distribution System**: Maharashtra Government is procuring millets from farmers as per availability and distributing them through Public Distribution System which can be a potential market for millet growers. There needs to be sufficient production of millets for the distribution system to operate optimally.

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# SRLM Interventions in Success of Millet in Odisha











#### Introduction



It made the headlines in January 2023, when the first commercial consignment of 600 kg of whole millet and 375 kg of millet flour was exported to Dubai from Odisha. As reported by The Times of India, this consignment has been sourced from a women-managed farmer producer organization (FPO) 'Shaktimayee Ward Mission Shakti Mahasangha' in Odisha.

The practice of millet cultivation in Odisha is thousands of years old. The archaeobotanical finding confirmed the presence of millet as found in two Neolithic settlements- Golbai Sasan and Gopalpur in Odisha (near Chilika Lake) (see Fig.1). Hardenberg (2018) observed that at various points in history, 'coarse' millets of hilly terrain competed with 'fine' rice of coastal regions of Odisha. In Odisha, the green revolution ushered in the late 1970s to early 1980s. The focus on rice was evident, as the area under millets in Odisha was reduced from 0.74 million hectares in 1980-81 to 0.15 million hectares in 2017-18. However, in the last decade, there have been renewed efforts by the Odisha state government and its institutions, SRLM, and other civil society actors for its production, consumption, and marketing. A lot of initiatives spearheaded by the Odisha Millet Mission, like the inclusion of millet in the public distribution system, mid-day meals, the provisioning of MSP, and campaigns for millet production and consumption have brought back the focus on millet farming. Therefore, it is important to have a look at the trends of millet production, challenges, the impact of initiatives, and the way forward to bring back millet to the food plates of people.

#### Millet Production: History and Trends

Odisha is rich in agroecological and cultural diversity, and a state to many ethnic tribal groups. Among the people of Odisha, millet has been one of the important crops. Among tribals of Odisha, like 'Dongria Kond', different kinds of millets have always been their staple. Several types of millets, including finger millet (ragi or madua), foxtail millet, kodo millet, pearl millet (bajra), little millet, and sorghum (jowar), have been grown in different regions of Odisha. Little millet



has been cultivated in Odisha since the Neolithic Period. Millets are widely grown in undulating terrain of hilly areas towards the south of Odisha. However, millet cultivation is widespread and is grown across the state (see Fig. 2). APEDA (2023) in its report says that finger millet, little millet, and foxtail millet occupy major areas under cultivation, with the share of finger millet being 86 percent.

The 1960s and 1970s in Odisha show considerable expansion in millets cultivation area and output. But in the 1980s, millet production experienced a reversal leading to a decrease in area and output. The three major millets, bajra, jowar, and ragi, have been experiencing a decrease since the 1990s, first beginning with little millets in the 1980s. The breakdown of millets output shows that the drop since the 1980s is primarily due to the area impact, while it was also due to the yield effect in the 1990s and 2010s

Despite this long-term declining trend of production, over the past five years, Odisha has recorded a 14-fold increase in millet production, from 3,340 hectares (ha) in 2017-18 to 52,230 ha in 2021-22. Even the average yield has improved by 28 percent because of sustainable agricultural practices and quality seeds. Now millet is being cultivated in 19 districts, 143 blocks, 2250 GPs, 20576 villages, and involving 201226 farmers in Odisha. The total coverage area under millet at present is 76558.53 ha, with the majority area under ragi.

#### Challenges faced in the current scenario

Around nine types of millets are grown in Odisha, but the provision of MSP is only available for little and foxtail millet. In the last two decades, little and foxtail millets didn't get much attention. A lack of research on millet is also a hurdle to increasing the yield. There is a lack of technology and availability of high-yielding varieties, which slows production. The unavailability of adequate processing units in every district creates a major constraint in production and timely availability. No proper storage facility is available forcing farmers into distress selling. In addition, government schemes to promote rice and maize have also replaced the millet area. Altogether it has led to the decline of millet cultivation in Odisha. The major highlights of constraints are:

- 1. Low productivity of millets: Millets are mostly grown in low fertile rainfed land, which results in low fertility. A proper package of practices is not followed by the farmers. It is found that for farmers who practice SMI (System of millet intensification) in finger millet, the yield has doubled.
- 2. The area under millet is declining: In comparison to 1960, the area under millet cultivation has been reduced to more than 50%. If the fallow and wastelands are brought under millet cultivation, production can increase. Millet farmers need to be incentivized as well to encourage them to grow millets.
- 3. Pest and diseases: Millets are hardy crops and very less infestation of pests and diseases occurs, but some pests and diseases cause significant loss in major millet like sorghum, pearl millet, and finger millet.
- 4. Millet seed production: Getting quality millet seeds in the local market is a challenge. Although there are no issues in sorghum and pearl millet as private players have entered this segment. There are still opportunities to bring quality seeds of minor millets by breeding and producing seeds.

#### **Emerging Focus on Millet in Odisha**

The Government of Odisha started the Odisha Millets Mission (OMM) in 2017 to resurrect millets on farms and plates. OMM is also known as the special plan for promotion of millets in tribal areas of Odisha. By including millet in the public distribution system (PDS) and other government nutrition programs, the goal was to combat malnutrition. Therefore, production, consumption (both in urban and rural areas), processing, and marketing are

the four main aims, according to Srijit Mishra, director of the Nabakrushna Choudhury Centre for Development Studies (NCDS). The emphasis is on bringing millets back to farmers and onto menus. Odisha Millet Mission along with SRLM and other civil society organizations (CSOs) are organizing various campaigns and training in various districts, specifically in rural and tribal areas of Odisha, viz., Koraput, Rayagada, Gajapati, Ganjam, Balangir, etc. for increasing the acceptance of millet cultivation and its value addition and marketing.

#### **Scope of Interventions**

- Awareness generation of the nutritious benefits of millet
- Processing and value addition to produce millet powder, papadum, etc.
- Infrastructure support- custom hiring centers (CHC), seed centers, bioresource centers (BRC), etc.
- Ensuring minimum support price (MSP) to boost millet farming.
- Food availability through mid-day meals in schools (MDM), and public distribution system (PDS).
- Implementing the mandi system for millet procurement from the farmers.

#### Initiatives taken by the Odisha government

To overcome the problem of malnutrition and drought, the government has taken the initiative to encourage citizens to have a healthier diet and help farmers overcome the challenges of drought through millet farming. Two major initiatives Odisha Millet Mission (OMM) and Odisha Livelihood Mission (OLM) for reviving millet production are discussed below.

#### Odisha Millet Mission (OMM)

The Odisha government launched the Odisha Millet Mission (OMM) in 2017. It is a flagship program launched by the Department of Agriculture and Farmers Empowerment, Government of Odisha. The program started with 8,030 farmers on 7,444 acres. It is a unique program for the promotion of millet in the tribal areas of Odisha focusing on improved production of nutritive cereals, local consumption, procurement under MSP, and distribution through PDS. In 2017, the mission was launched in 30 blocks spread over seven districts. By 2021, it has been successfully implemented in 84 blocks of 15 districts. The mission is set to extend to 142 blocks of 19 districts by the end of the financial year Further, the agriculture department plans to cover 81,700 hectares in 2022-23. The OMM also improved the involvement of women-led Self-Help Groups (SHGs). As a result, SHGs increasingly participated in the millet value chain from processing, value addition, and marketing.

#### Odisha Livelihood Mission (OLM)

In Odisha, the role of OLM plays an important role in the marketing and promotion of millets and helps in growing the production of millets and marketing through various value-addition training, campaigns, and other need-based support to the farmers. Campaigns to promote the nutritional value of millet have helped in increasing local consumption.

#### **Objectives of these Two Initiatives**

- ❖ Increasing household consumption of millet by 25% compared to the baseline.
- Revolutionizing millet food culture in urban and rural areas.
- Conservation and promotion of millet landraces through seed preservation and propagation.
- Promotion of post-harvest and primary processing enterprises on millets.
- Improving productivity of millet-based crop systems.
- Promotion of millet value-addition enterprises in rural and urban areas of Odisha
- ❖ Inclusion of millets in PDS, ICDS, MDM, Welfare Hostels, and others.
- ❖ Facilitating the millet markets and exports of millet-based products from Odisha.

#### Milestones Achieved from the Initiatives

- Odisha became the first state to declare direct benefit transfer (DBT) to farmers.
- Odisha became the first state in the country to complete benchmarking of prices of little millet and foxtail millet.
- Odisha became the first state to develop standard specifications for minor millet machinery through a recognized panel of experts from different scientific institutions.
- Received the award for best government initiative on millet promotion by MoFPI-IIFPT.
- ❖ The first state to include Ragi laddu in ICDS through the support of the District Mineral Foundation.
- Third state to distribute millets in PDS in the country.
- Odisha was declared as the best millet-promoting state under the 'Poshak Anaj Awards' by ICAR-IIMR and FAO.

Below are a few success stories

#### Case Study 1: From Monocropping to Intercropping

Golap Bishi is a progressive farmer at Telenpali village in Khaprakhol block of Balangir district. Traditionally, his father was cultivating different varieties of millet like little millet, sorghum, and finger millet. After the boom of cotton as a cash crop in the area, his family replaced traditional millet cultivation with cotton. After several years of cotton farming the productivity of his land was reduced due to high chemical usage. And due to increases in the price of fertilizers, pesticides, and labor, the cost of cotton cultivation became higher. Odisha Millets Mission supported farmers like Golap to revive millet in their farms.

Regular training programs were organized for the farmers on the importance of millet cultivation. And with the incentive support and procurement of millets under minimum support price, many farmers have started showing interest to grow millets in their areas in mixed and intercropping methods. This system of diversified cropping has not only boosted farmers' income but also provided them with a diverse nutritious diet around the year, resulting in better health outcomes. A local NGO called Youth Council for Development Alternatives (YCDA) is facilitating the implementation of the millets program under OMM at

Telenpali village. Golap started increasing his millet cropping area. As he was interested in growing diverse crops, he intercropped finger millet with sorghum, maize, green gram, and

black gram. He cultivated finger millet as the main crop and sowed in a 6:4 ratio on 1 acre of land through improved practices.

He harvested 3.2 quintals (q) of finger millet, 3 q of sorghum, 3.5 q of maize, and 1 q of pulses. He invested Rs. 4500 to cultivate all these crops, and earned a total income of Rs.33644, with a net profit of Rs.29144. Apart from the finger millet, the family members often consume fresh maize and pulses in their meals. Golap also offered his surplus produce to his neighbors, friends, and relatives. Golap recalls that during the COVID-19 situation, his family members consumed a lot of fresh nutritious, and green vegetables. His parents and children are very happy to eat millet-based recipes at home.



#### **Initiatives Highlight 1: Minimum Support Price for Millet**

The government of Odisha has approved the procurement of ragi through the Tribal Development Cooperative Corporation of Odisha Limited (TDCCOL). The government of Odisha has announced the minimum support price for Ragi to be Rs. 3295.00. During the year 2020-21, a total amount of 204000 quintals of ragi has been procured against the target of 200000.

#### **Initiatives Highlight 2: Public Distribution System**

The Government of Odisha included millet-based entitlement in PDS in 2020-21. This year, 94,745 quintals of ragi were targeted for distribution in 14 districts covering 50,60,460 households. Till 31st March 2021, a sum of 3,474.24 Quintals of Ragi from the state pool was distributed among the eligible beneficiaries under the State Food Security Scheme (SFSS).

#### Case study 2: Introducing Ragi Thresher

A relief from drudgery for women Tribal women farmers in Southern Odisha's Koraput district mostly used traditional techniques for threshing ragi, which is labor intensive and increases processing costs. Women spend around 5-6 hours a day drying and extracting ragi seeds manually. This complete process takes three to five days, for which women usually invest an amount of Rs.3000.

To address this issue, 10 ragi threshers-cum- pearler were distributed among 10 women self-help groups (SHGs) in the Boipariguda block of Koraput district in 2021. These threshers were introduced under Odisha Millets Mission in Boipariguda block. After the distribution of ragi threshers to SHGs, they are now able to smoothly process marketable quality ragi. One of the SHGs known as Sabari SHG of Doraguda village at Doraguda Panchayat in Boipariguda block has been earning good income from their processing units. Women farmers often bring their harvested ragi to process with the help of a ragi thresher managed by Sabari SHG. A farmer pays Rs.1 for one kg of ragi to the SHG.

Sabari SHG plans to provide ragi threshers to millet farmers on a rental basis to reduce the manual drudgery of women, who generally involve in this kind of post-production activity. The SHG has decided to charge Rs.100 per quintal of ragi processing. The threshers



usually process 3 to 4 quintals per day. By using the thresher, the time taken for threshing is reduced to a day in comparison to 5-6 days when done manually. Acceptance of threshers is increasing, and many farmers are showing interest to process their raw ragi into fine and marketable quality which could fetch a better market price. As of now, the Sabari SHG is generating increased income for both

ragi farmers as well as women SHG members and strengthening their livelihood. This became possible as necessary impetus has been provided by OMM and its partner civil societies in convergence with the Department of Mission Shakti, and the Department of Women and Child Development.

#### **Initiatives Highlight 3: Community Seed Centre (CSC)**

To ensure the accessibility of superior quality seeds of different varieties locally, community-managed seed centers (CMSCs) were set up in each block. Training programs were organized for FPOs on storing/preserving quality seeds. Besides, FPOs are also supported with working capital for acquiring seeds and overseeing the operational costs. 169 CSC already established in the state.

#### **Initiatives Highlight 4: Community Hiring Centre (CHC)**

To facilitate farmers adopting agronomic practices, drudgery reduction tools, and farm equipment through forming 227 Custom Hiring Centers (CHC). FPOs were provided working capital to purchase the equipment and lease a workspace. These centers are managed by Farmer Producer Organisations and WSHGs who maintain inventory and records for day-to-day operations. 578 ragi thresher units, 287 pulverizers, and 20 ragi cleaner-cum-graders have already been distributed, which are being managed by different SHGs in the state.

#### <u>Initiatives Highlight 5</u>: Inclusion of millet in state nutrition program

Under OMM, millet *ladoo* as a morning snack has been introduced as Supplementary Nutrition Programme (SNP) under the Integrated Child Development Scheme (ICDS) in Keonjhar and Sundargarh districts with the support of Women & Child Development, Mission Shakti, and financial support from District Mineral Foundation of the respective districts. According to research by Mishra et al. (2014) on Pentia tribal communities on the nutritional benefits of millet, 81% of respondents believe that millet has medicinal properties and regular consumption of millet prevents frequent sickness. 96% of households relate better eyesight and higher longevity.

#### **Initiatives Highlight 6: Bio-Resource Centre**

These are promoted to increase the organic input manure production and to promote its use at the block and GP levels. These centers are promoted through Farmer Producer Organizations in 10 blocks of the seven districts. These centers focused on producing and marketing five products - Jeevamrutha, Handikhata, Nimastra, Agniastra, and Bijamruta.

#### Case Study 3: Millet Mandi in Ganjam District

Gokul Madhaba Mahakud of Bhagabanpur village in Ganjam village expressed his happiness in the hard-earned money he earned from selling the ragi from his 3 acres of land. Last year for the first time mandi was organized in his village where he sold 4 quintals of ragi at Rs. 3377 per quintal and received Rs.13,508 in his bank account. Earlier, local traders used to pay only around Rs.15,00-2000 for 1 quintal of ragi. And the payment was also paid in fractions and was mostly irregular. In the year 2019, the Panchanan Farmers Producer Organisation (FPO) was established with 2000 members. The objective of the formation of FPO is to provide input support to farmers like high-yielding seeds, agriculture implements, information on procurement as well as providing handholding- support and other marketing solutions at farmers' doorstep. During the harvesting period, the farmers were provided training on the post-harvest management of ragi and its Fair Average Quality (FAQ) specifications. Largely, village-level planning meetings were organized by the FPO to prepare an estimate of production and surplus. Based on this plan, the CRPs collect farmers' documents and enrolled all the willing farmers at M-PAS for procurement. After the verification of these documents by the

distress sell due to low prices for ragi. In the year 2021-22 through this initiative of FPO in Kharif Marketing Season (KMS), a total of 3599.30 quintals of ragi were sold at the MSP. In Sorada block, the FPO through its marketing support is aiming to cover the millet growers in 151 villages of 24 Gram Panchayats.



Assistant Agriculture Officer, a final procurement list was generated defining the numbers

#### **Initiatives Highlight 7: Millet Mandi**

To safeguard the millet farmers from exploitation and ensure that farmers get the proper price, millet mandi has been introduced in Odisha. It is now being executed in Koraput, Ganjam, and Nabarangpur where the producers sell their products in an open auction system. By approaching this system millet produce of the farmers is getting promoted and they are being saved from distress sales.

#### Initiatives Highlight 8: Millet Tiffin Centres and Millet Shakti Cafe

Millet tiffin centers were launched in rural areas to create a demand for millet recipes and ensure access to diet diversity that is locally acceptable and highly nutritious. SHGs entirely manage these centers. They prepare a range of millet-based ready-to-cook food and snacks. To set up these tiffin centers, the OMM has sponsored Rs. 30 000 for each SHG. 76 millet tiffin centers had already been established between December 2021 and January 2022. An additional 21 such centers have been approved. Similarly, Millet Shakti Cafe has been established inside the campus of Keonjhar Collectorate, more such Cafe are in pipeline.

#### Case study 4: Millet Shakti Tiffin Centre in the Mayurbhanj District

One of the pioneer women SHG, Baba Simreshwar in Bangriposi has contributed greatly to the program of Odisha Millet Mission in the Mayurbhanj district. They were brought together by adversity, but they stayed together as a group and opened a Millet Shakti Tiffin Centre in collaboration with Odisha Millets Mission and Mission Shakti Department. Gradually, with the increased confidence in group abilities and solidarity, through the group's monthly savings, a small working capital for opening a millet tiffin center was arranged. Financial support from the Odisha Millets Mission helped the group further. Millet Tiffin center started the business of millet products like khurma, mixture, and rose cake and supplied it to the cities of Bhubaneswar, Keonjhar, Sundargarh, and Rourkela.

The members have shown regular innovation to enhance the variety and outreach to the



customers with quality products. SHGs experimented with preparing ragi khurma by using date palm jaggery instead of sugar, which was more socially acceptable and also healthy. This khurma has been liked by everyone and it improved the business of the SHG millet tiffin center by expanding the customer base. Today, no millet outlet in the state is complete without ragi khurma as one of its products. The millet tiffin center business is now soaring and

has led to an increase in the consumption of millet products. The socio-economic impact of such changes has been evident amongst the group. One of the members, Mrs. Sosmita Jena says, "we have saved money for our children's education, but most importantly we are enjoying what we are doing". Another member added to it proudly, "I am now financially

independent and can even save some money for my future generation". Now this SHG has become a role model not just when it comes to increasing income but also in matters of teamwork, resilience, and leadership.

#### Initiatives Highlight 9: Millet Food Festivals

According to Saxena (2020), for the revival of an Indigenous community, seed festivals locally known as Burlang Yatra (Indigenous Biodiversity Festival) in the district of Kandhamal in Odisha (India) can be a good way. This annual event brings together millet farmers to share knowledge and practices, including the exchange of Indigenous heirloom seeds. OMM adopted this approach to create awareness about the production, productivity, consumption, and marketing of millet through millet food festivals, cooking competitions, and celebrating local millet food cultures.

#### Initiatives Highlight 10: Value-addition and Marketing

OMM, OLM, and ICRISAT aim to strengthen the state's millet value chains by introducing millet processing units to produce nutritious-food products. Licensed by the Food Safety and Standards Authority of India (FSSAI), AIP-ICRISAT's first unit is being established in the Semiliguda block of the Koraput district. Similar millet processing units are being planned for other millet-growing districts of the state. In these units, different snacks, sweets, and ready-to-eat food are being produced to promote the availability of healthy food and foster local entrepreneurship.

The programs and activities as discussed above have been implemented under the leadership of OMM and OLM with the active support of 61 NGOs as facilitating agencies, and 84 Community-Based Organisations as implementing agencies in 84 Blocks of 15 Districts. This shows the kind of collaboration, the state has been able to forge to take forward the agenda of promoting millet cultivation in Odisha. The state government of Odisha observed 10th November 2022 as 'Millet Day' in the state, sending a signal of the government's priority on rejuvenating millet farming.

#### **Way Forward**

- OMM promotes the production and consumption of seven millets. But so far, the
  focus has been on ragi, which has accounted for 86 percent of the total area under
  millets, according to data on the OMM website. In contrast, little millet, foxtail millet,
  sorghum, pearl millet, kodo millet, and barnyard millet cover less than 13 percent of
  the area. All kinds of millet need focus.
- In 2020-21, the state government procured slightly more than 20 million kg of ragi.
  However, this accounts for only 27 percent of the total ragi produced. This practice
  has prompted farmers to consume more millet in all seasons, shows a mid-term
  evaluation by NCDS in 2019-20. But given that the average yield is 1,500 kg per ha,
  much of the produce is not procured, and farmers are forced to sell it at a distressed
  rate, which needs a fix.
- OMM officials admit that despite ragi being distributed in PDS and as a mix through Anganwadi centers in two districts, its consumption has not been picked up in a meaningful manner, which needs a strong thrust.
- Selling millet products, such as cookies, savory snacks, vermicelli, and processed millets, under a "Millet Shakti" brand through food trucks, cafés, kiosks, and other outlets.
- The full potential of SHGs, though, has not yet been realized. So far, only three
  women's SHGs manufacture and process Millet Shakti products, which limits the
  volume available, income generated, and consumption.

- OMM also leverages farmer-producer organizations (FPOs) to provide better marketing linkages. Until now, OMM has tapped into existing FPOs to sell processed millets in the open market or aggregate produce for Tribal Development Cooperative Corporation of Odisha Limited; if a block does not have an FPO, an SHG or community group shall be registered as one.
- Currently, there are 76 FPOs under OMM. But some of them are engaged only in minor processing and aggregation, without plans of scaling up market linkages. Encouraging FPOs with better incentives and benefit-sharing will help them compete in the market.

Lastly, for the next five years, Odisha has set targets like the revival of millet foods in urban and rural areas, covering 1,000-2,000 ha and 4,000 households in each block under improved agricultural practices and supporting 142 FPOs for marketing and exports. But, to meet them, the mission and its staff must recognize the shortcomings and act on them.

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DR. GAJENDRA KUMAR SHARMA VISHAL SINGH VARMA



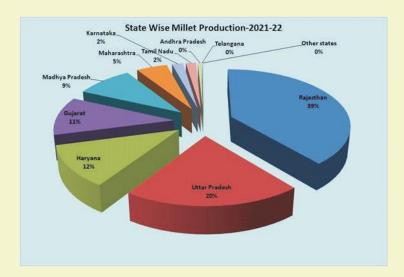




#### The context of millet in Rajasthan

Rajasthan has the highest contribution to the production of millets in India. Rajasthan produces 39 percent of millets. Uttar Pradesh is in second place with 20 percent, followed by Haryana with 12 percent and Gujarat with 11 percent in third and fourth place respectively.

Rajasthan is a dry climate region, whose northwestern part is almost a desert. In this context, according to the climatic conditions and resource availability here, the cultivation of millet is given priority. Pearl millet is the major contributor (91%) followed by jowar (9%) in the production of millet in kharif season. In the rabi season, barley is the largest contributor (almost 100%) in millet production. During the summer season, bajra is the only variety of millets grown in Rajasthan. Bajra constitutes the highest share (79%) followed by barley (13%) and jowar (8%) in total production of millet in Rajasthan in 2020-21. Compared to the year 2019-20, an increase of 14 percent has been registered in the production of millet in 2020-21.



#### Medieval Perspective of Bajra (Pearl Millet) & Rajasthan

Sher Shah Suri, the then-ruler of the Delhi sultanate, was an Afghan invader. He wanted to capture Rajasthan to extend his rule. He was confronted by Jaitaji and Kupaji, the generals of King Maldev of the Jodhpur Marwar region. This was a matter of 1543-44. At this time the battle of Giri-Sumel was fought, in which Sher Shah Suri became weak in front of courageous warriors of Rajasthan's Marwar Army. Marwar's army had reached close to Delhi. In such a situation, Sher Shah Suri decided to leave the battlefield. After escaping, Sher Shah Suri said, 'Bolyo suri ban yun, giri ghat ghamsaan, muthi khatar bajra, kho deto hindwan'. That is, 'Today I would have lost the whole of India for a handful of bajra' (Majumdar, R.C. (2020). Sher shah Suri mentioned bajra because of its importance from the ancient and medieval era, and also showed the importance of pearl millet as food grain in Rajasthan. This is probably the only battle in the history of mankind, where the name of millet is mentioned and highlighted.

Rajasthani cuisine includes everything from gatte ki sabzi, ker sangri, to bajra khichda andbajra roti with lasuni(garlic) chutney. Bajra is a robust crop that thrives in arid climates, high temperatures, and low soil fertility, which is why it has become such an important part of Rajasthani cuisine. Rajasthan, surprisingly, produces the most bajra, and India is the world's largest producer of this millet.

#### Types of Millets grown in Rajasthan

I	MAJOR MLLETS	FIGURE
A	PEARL MILLET (BAJRA): Pennisetum glaucum Rajasthan has the highest area under pearl millet with the highest production in the country. The state occupies nearly 46 lakh ha area with a production of about 28 lakh tonnes and productivity of 400 kg/ha. Rajasthan reported 4.53 mn tons Bajra production in 2021. The major bajra-producing districts in Rajasthan are Jodhpur, Barmer, Nagaur, Bikaner, Churu, Ganganagar, Sawai Madhopur, Alwar, Kota, Tonk, Jhunjhunu, Pali, and Jaisalmer.	
В	JOWAR (SORGHUM): Sorghum bicolor Rajasthan's dry climate and sandy soil provide favorable conditions for the cultivation of jowar. Kota, Sawai Madhopur, Jaipur, Tonk are the important Jowar-producing districts. Jowar sown in 5,59,686 Ha area, from which production of 5,903,40 MT was received. There was an 8% production share in millets of jowar and the yield in Kg/ Hectare is 1055.	
C	BARLEY(JAU): Hordeum vulgare Rajasthan is the largest producer of barley in India. The total production of barley in India was 1.67 million metric tons in 2021 which was a bit lesser than the year 2020 when it stood at 1.72 million metric tons. Barley is sown in Jaipur, Hanumangarh, Shri Ganganagar, Alwar, Sikar. Barley was sown in 2,69,747 Ha area, from which production of 9,39,182 MT was received. There was a 13% production share in millets of jowar and the yield in Kg/ Hectare is 3482.	

Data source: Department of Statistics, Government of Rajasthan

#### **Problem statement**

In some village areas of Rajasthan, farmers are not getting a market to sell their crops. To sell crops in bulk they have to locate certain small shops since there is no profitable market or demand nearby. This also makes the distribution of crops difficult. Farmers get low pay for millet which urges them to decrease millet production and grow other crops instead to earn a better income.

#### Initiatives of Rajeevika-Rajasthan Grameen Ajeevika Vikas Parishad

All rural livelihood programs in the state are implemented under the aegis of the RGAVP and the program is trying to bring effective convergence amongst all government and non-government initiatives for rural development. To enhance economic opportunities and empower the rural poor with a focus on women and marginalized groups in Rajasthan, Rajeevika is providing technical and financial support to farmers through FPOs and associated SHGs, where millet is promoted. The interventions like improvement in crop production and variety, potential seed banks, crop feasibility analysis, farmer field schools, value chain development, etc. were carried out for the promotion of millet. The Rajeevika in convergence with the Department of Agriculture and the Universities of Agricultural Sciences adopted and disseminated different advanced technologies for the cultivation of millets. The Krishi Sakhis were trained in advanced technologies in millets at KVKs and the district agricultural training centres of the Agriculture Department. The well-trained workforce of Krishi Sakhis and Udyam Sakhis were deployed for last-mile delivery of extension services in millet growing areas.



The followings are a few of the success stories and case studies as a result of the efforts taken by Rajeevika in association with FPOs and SHGs.

#### Case Study1: Improved cultivation of millet through bio-fortified seeds

Rajasthan Government is promoting millet consumption to improve nutrition levels among



various segments of the population. The state has a favorable climate for the cultivation of jowar and bajra millets, as these crops require less water and are less affected by pest and disease outbreaks.

Under the National Rural Economic Transformation Project, millet bio-fortified variety Dhanshakti was demonstrated by Rajeevika to control anemia among women and children. Gopal Kanwar of Anjali SHG from Lambaharisingh village also participated in the demonstration. Dhan Shakti, a bio-fortified variety of millet, is the first variety to be enriched

with minerals released in India. 71 mg per kg of iron and 40 mg per kg of zinc are found in this variety, which is twice as compared to normal varieties.

#### Preparation of the field

Before the sowing of millet, deep plowing was done in May with soil turning plough. The field was prepared by two plowing with the cultivator. Due to this weeds and harmful underground insects were destroyed in the field.

#### Seed treatment

Before sowing, bajra seeds were treated with azotobacter and PSB culture. To get good production in rain-fed sandy soil, the seeds of the millet variety Dhanshakti were treated with Bijamrit.

#### Seed rate and sowing

Generally, 4 kg certified seed of millet per hectare was used and a 40-45 cm distance was kept between rows. Sowing was done with the first rains of June. After 15-20 days of sowing the plants were pruned and plant to plant distance was 15-20 cm.

#### Weeding

Weeding was ensured in the field in the third-fourth week after sowing. According to the need, the second weeding was done after 15 days.

#### **Manures and Fertilizers**

To get more production from the organic farming of millet and to increase the amount of organic matter in the soil, 9 tons of cow dung manure or 4.5 tons of vermin compost, 4 tons of organic residue manure, 6 kg of Azotobacter and 6 kg of PCB bio-fertilizer per hectare was applied before sowing.

#### **Irrigation**

Due to the low water demand for this crop, rain-fed farming was done. Due to no additional water demand, two irrigations were saved.

#### **Economic benefits**

With cost reduction through agro-ecology technology, bio-fortified variety Dhanshakti gave 60 quintals per hectare.

Gopal Kunwar showed the path to others to adopt bio-fortified millet seeds by being on of the first to adopt it.

#### Case Study 2: Bajra Cookies





Geeta Devi of Keru village lived a life full of struggle since childhood. She is a landless farmer and has been dependent on wage labour for running her house.

When Rajeevika started forming SHGs in her village, she decided to join the Chamunda Mata group. Very soon their group got stabilized and started holding four meetings a month. They opened a bank account and started saving money in that account. As the group was doing well, they received the initial installment of Rs.15,000 as a revolving fund.

In the meantime, Geeta attended training on baking millet products with the help of RSETI. After the training, she took a loan from the group and started making millet biscuits to aid her income. With the help of Rajeevika she could showcase her products at different fares in the Jodhpur district and started having good profits out of it.

#### Rajasthan – Government's initiatives for promotion of the millets

The main reason for the non-popularity of millet is that millet flour and products made from it spoil quickly due to the excess fat found in millet. Therefore, to keep the millet flour safe for a long time, the Rajasthan government initiated the blanching technique. In this technique, Bajra is tied in a cloth bag and immersed in boiling water for 1-2 minutes and subsequently immersed in cold water. After that, the Bajra is dried in the sun. The adverse effects of the enzymes are stopped and millet flour can be preserved for a long time.

Millet roti, khichdi, rabri and churma etc. are made by the women of rural areas. Whereas in the cities the people don't know the recipes so millet dishes are not very popular. Generally, if Bajra is used in dishes that are made from other grains (wheat) in homes, then the nutrients of the dishes will also increase which can help in stemming the malnutrition issue. So the Government of Rajasthan has taken a lot of steps to popularize millet recipes among the urban communities through camps, fairs, etc.

The government has also initiated cluster demonstrations of bio-fortified millets to increase the nutrition status of the rural communities.

#### Rajasthan's Special:

Rajasthani bajre ki raab / raabdi / rabri recipe

Bajre ki raab is a traditional drink of Rajasthan made with pearl millet flour and yogurt. It is very nutritious. Raab is served warm in winter and cold in summer There is also a sweet version of Raab that has jaggery, ghee, and nuts.



#### Ingredients

Bajra flour .... 2 tbsps Yogurt ......... 1/2 cup Ajwain ........ 1/8 th tsp Cumin seeds ... 1/8 tsp Salt ....... to taste Roasted cumin powder.. 1 pinch

#### Instructions

- 1. Whisk the yogurt with 2 cups of water. Add salt, cumin, and ajwain seeds. Now blend in the Bajra flour and whisk it well to avoid any lumps.
- 2.Place a pan on the gas. Pour the liquid into it.
- 3.Keep stirring for 5-7 minutes until it thickens.

- 4. Now add 1 more cup of water and continue to stir on a low flame. The flour has to be cooked properly so that there is no raw taste. When you get the desired consistency remove from the gas.
- 5. Pour it into the serving glass and sprinkle a pinch of roasted cumin powder.

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### Small Grains and Infinite Benefits CHIDURALA SRINIVAS, CH. NAVEEN KUMAR, K. SOUJANYA









#### Millets - Telangana Context

Telangana is characterized by dryland agriculture that requires synergy between cropping patterns and dietary choices. Once upon a time, Telangana's staple food was much like its terrain – hardy, earthy, and robust with flavor. Telangana is the land of jowar, bajra, fox tail millet, kodo millet, brown top millet, and small millet. "About 95 percent of millets produced in Telangana comprise jowar, ragi, and bajra and minor millets form just 5 percent.

#### Area under millets in million ha (2021-22)

Crop	Kharif	Rabi	Total
Jowar	0.62	0.28	0.9
Bajra	0.03	0.14	0.17
Ragi	0.01	NA	0.01
Small			
Millets	0.01	NA	0.01

#### Production of millets in kg per ha (2021-22)

Crop	Kharif	Rabi	Average
Jowar	881	1190	977
Bajra	869	869	869
Ragi	1159	1152	1157
Small			
Millets	798	798	798

#### Why millets?

Millet is a climate-resilient crop. It requires less water and other inputs as compared to the other cereal crops. It grows in marginal soils with low fertility. It provides good-quality fodder. Millet grains are rich in protein, iron, vitamins, and minerals. They are gluten-free with high fiber. They are tolerant of drought. Millets can be used as poultry feed. They can be grown in rain-fed conditions therefore very suitable for Telengana's climate and context.

#### Types of millets growing in different districts of Telangana State:

- 1. Komram Bheem Asifabad district: jowar and bajra
- 2. Mahabubnagar district: jowar, finger millet and foxtail millets
- 3. Sangareddy district: jowar, finger millet and korralu
- 4. Vikarabad district: jowar, bajra, finger millet and korralu
- 5. Medak district: jowar

#### Current interventions of government for millet promotion

- 1. Supplying the millet products to Aanganwadis in Komram Bheem Asifabad, Manchiryal, Adilabad, and Nirmal districts.
- 2. Coordinating with line departments and NGOs to increase the area of millet.
- 3. Conducting awareness programs on nutritional values to poor women, mainly adolescent girls, pregnant women, etc.
- 4. Preparing millet biscuits, laddu & murukku, etc., and giving wide publicity to the public and also selling the products in the exhibitions and melas.
- 5. Establishing the primary and secondary processing units under PMFME to promote the millet products.

#### Possible Collaborations/ Partnerships

- Setting up of millet processing units by tapping Rurban funds and convergence with TRICOR for funds in Tribal areas.
- Establishing market linkages by entering partnerships with MRTs and NGOs
- · Availing technical support from the millet research station, Agriculture department
- Millet entrepreneurs' promotion through PMFME and in convergence with the food processing society.
- Farmer Producer Organizations (FPOs) to strengthen value chains.

#### SERP's contribution to the promotion of millet in Telangana

Telangana state SERP has Promoted 56 FPCs, out of which 5 FPCs are exclusively for millet they are located at Medak, Vikarabad, Bhupalapally, Asifabad, and Mahabubnagar. The major millet they deal with are jowar, kodo millet, little millet, bajra, and finger millet, etc.

The following services are being provided to millet farmers through FPCs:

- Quality Input supply
- Extension Support for transferring of best package of practices
- Marketing Support for millet
- Value Addition services (Primary Processing, Secondary Processing)
- Convergence with Line departments
- Training on better agriculture practices
- Exposure visits to Millet farmers

### Case Study 1: Adopting sustainable business interventions – addressing malnutrition in tribal communities in Asifabad district, Telangana.

India's tribal people continue to remain the most nutritionally deprived social group in the country. It is undeniable that their deprivation is influenced by a lot of factors ranging from poverty and hunger due to poor reach and quality of essential food and nutrition during critical periods of life and geographical remoteness. Lack of access to healthcare, poor communication, and traditional beliefs and customs aggravate the situation.

On the brighter scheme of things, the tribals of Telangana are blessed with crops that are considered to be 'superfoods' when it comes to their rich nutritional value. These include crops such as sorghum, millet, groundnut, and red gram. These crops qualify as a good source of some very important nutrients, including copper, manganese, phosphorus, and magnesium. Despite the extraordinary nutritional qualities of these crops, the farmers have not shown interest to grow them on account of poor price realization, market reach, and the non-existence of an alternative value chain. To counter this, market support, value addition, and promotional activity are necessary for arresting the further decline in not only cultivation but also consumption.

Asifabad is one the tribal populated district in the state of Telangana, known for cultivating raagulu, bajra, korralu, and saamalu in mixed cropping patterns by around 6000 farmers

on 10000 acres. The government of Telangana implementing various interventions to eradicate malnutrition among the tribal communities in Asifabad. ITDA-

processing units to enhance household selfconsumption and income opportunities in the Saleguda village, Asifabad block. Through this intervention, tribal Joint Liability Groups produced 100 tons of processed food



such as jowar mix, multigrain mix, and sweet meal using locally grown millets. These products are being consumed at the household level and supplied to various village Aanganwadi centers. These products are also supplied to Aanganwadi centers in four neighboring districts through ITDA.

Furthermore, additional marketing support has been provided to JLG through Dhanalakshmi Rebbana Farmer Producer Company Limited and achieved Rs.60 lakh business turnover during the FY 2021-22. These linkages safeguarded children's health and improved income opportunities in the area of Asifabad.



### Case study 2: Gandeed Farmer Producer Company – A linkage between Producers and Consumers on Millet Products

Gandeed Women Farmers Producer Company Limited is located in the district of Mahabubnagar. There are 726 member shareholders in the FPC. Most of these farmers were cultivating jowar, little, foxtail, and kodo millets. As the net income received from the cultivation of millet was very meager, farmers were getting demotivated and looking for crop change. To prevent it, value addition to millet and income enhancement through the marketing of millet products was proposed in this FPC.

Seed Distribution to the Farmers



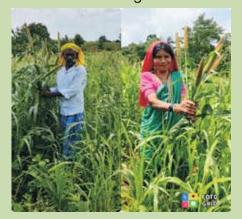
**Snacks Preparation** 



Roti making Machine



Harvesting time



Final product (Jowar Roti)



Seed Distribution to the Farmers



Plan was made to support the millet growers across value chain stages. Interventions were made to connect member shareholders with technical institutions and not-for-profit organizations. Breeder seed was distributed with the support Indian Institute of Millet Research (IIMR) to fulfill the gaps on the production side. The millet processing unit was established with the support of Rurban funds. FPC hired women from local SHGs and processed jowar, little, and kodo millets.

Swayamshakthi Agri foundation is a technical support agency that provided training to SHG women with the support of IIMR. Thus, FPC produced various snacks jowar roti, millet murukulu, millet laddu, millet cakes, millet cookies, and vacuum packed processed rice of millets. These products are sold to food business operators and in 2021-22 the FPC achieved Rs. 5 lakh turnover.

#### **Policy Recommendations**

- Millet-based nutritional products should be supplied to Anganwadi centers and educational institutions under midday meals.
- Crop diversification cropping systems should be adopted and necessary seed support should be provided by ICAR institutions.
- Women-based enterprises should be promoted through the convergence of multiple schemes.
- Declaration of Millet villages should be done based on the high production of millets.
- To sensitize the farmers' village-level skits should be conducted, short film documentaries should be shown and millet recipe books should be distributed.
- Fairs should be conducted for marketing millet products.
- Competitive Minimum Support Price (MSP) should be provided for millet crops.



## Strategy Note for Expansion of Millets Area and Promoting Local Millet Value Chain though DAY – NRLM

JAYARAM KILLI AND RAMAN WADHWA

DAY NRLM believes Millets are very important for small and marginal farmers in dry-lands and rain fed areas. Millets play a key role in providing sustainable livelihoods in the era of climate change for the small, marginal and women farmers. DAY – NRLM promotes millet in a comprehensive manner to provide livelihoods, nutritional security for households and fodder security for livestock. Millets are climate resilient crops, and they may play an important role in reducing greenhouse gas by mitigating emission of nitrous oxide (N2O) into the environment.

Millets can grow on poor soils with little or no inputs, are resistant or tolerant to many crop diseases and pests and can survive adverse climatic conditions. The genetic diversity of millets offer opportunities for economic development through income generating activities in the food sector or on niche markets for specific professional applications (therapeutics, pharmaceuticals, specialty chemistry).

Millets grow in harsh environment where other crops grow or yield poorly. They can be grown with limited water resources compared to rice, wheat or maize. Some varieties can withstand high humidity levels or can be exposed to high temperatures. Pearl millet can for instance grow up in critical drought conditions, others can be grown on very acidic soil conditions.

Further, DAY NRLM proposes to promote millets with following objectives:

- A. Nutritional security and dietary diversification for SHG members
- B. Millets as a tool for doubling of farmers income
- C. Promote crop diversification to achieve climate/ drought resilience
- D. An opportunity for local enterprises and business for FPOs
- E. Opportunity to create value added items, to place these products in niche market

DAY – NRLM is working with about 7.5 crore women SHG members through about 70 lakh SHGs across the country. One of the main objectives of the DAY – NRLM is to strengthen livelihoods of the SHG members. Since inception, NRLM has reached to 1.23 crore mahila Kisans who are SHG members through various farm livelihood interventions including agro ecological practices, livestock and NTFP based activities. DAY NRLM has given a lot of emphasis on building capacity and introduced improved practices to enhance productivity and reduce cost of production. A large pool of community resource persons (Krishi Sakhi, Pashu Sakhi, Van Sakhi etc.) or CRPs are being created at village level for transfer of technology and effective implementation of the practices promoted under farm livelihoods. The CRPs are envisaged to be the last mile delivery mechanism for building capacity of the community. So far 1,10, 883 CRPs have been deployed in the villages.

Besides, DAY NRLM has also recognized the market access issues of small and marginal farmers and has taken up various value chain promotion intervention for developing market linkakges by promotion of Producer Enterprises (PEs), Farmer Producer Organizations (FPOs) and Producer Groups (PGs). So far, a total of 1,05,000 PGs, 180 PEs have been established. Further, 100 FPOs are being established under 10,000 FPOs scheme of the Ministry of Agriculture and Farmer's Welfare.

Being focused on poor and the poorest, DAY NRLM has a large number of small and marginal farmers covered under farm livelihoods interventions. Many of these farmers are engaged in cultivation of millets, mostly under rain-fed conditions. So, CRPs may play an important role in promotion of millets through capacity building of SHG members at the village level.

The Mahila Kisan Sashaktikaran Pariyojna (MKSP) intervention of DAY – NRLM, lowers cost per unit area, increases productivity, increases disposable income for households, helps strengthen women's interest and confidence in pursuing agriculture as livelihood and getting recognized in their family as equals. Apart from the above, MKSP has made significant change in the use of new scientific knowledge and practices which are intended to revive age old traditional knowledge, recycle of biomass, restore soil fertility, seed improvement and sovereignty, plant protection and improved storage practices, technology intervention which are easy to adopt and scale up. MKSP outcome directly addresses 3 key Sustainable Development Goals (SDGs) namely - Zero Hunger, No Poverty, and Gender equality. MKSP is flexible and allows work on innovative activities to strengthen farm livelihoods of SHG members. Accordingly, MKSP may be an ideal platform for promotion of millets.

DAY-NRLM has developed a farm livelihood training and capacity building architecture to build social capital at village level. A three-tier vertically integrated training and capacity building architecture has been followed to minimize transmission loss of knowledge and skill. At the national level, domain experts are engaged as National Resource Persons (NRPs). The State resource pool consists of SRLM staff and external resource persons from relevant background. State Resource Persons (SRPs) are trained by NRPs. The third tier consists of best practitioner-farmers in either agriculture or livestock rearing. They are known as Community Resource Persons-Livelihoods (CRP-LH) and the SRLMs equip them to provide support to fellow Mahila Kisans through extension services. So, this institutional mechanism may be adopted for disseminating best practices in millets.

This pool of 108 National Resource Persons (NRPs) and 1380 State Resource Persons (SRPs) along with CRPs may be extensively used for transfer of technology, capacity building, mobilisation of farmers for area expansion of millets, promotion of millet-based enterprises, business planning and all other activities related to promotion of millets.

#### Area expansion of Millet cultivation

The data-based prediction by researchers at the Centre for Study of Science, Technology and Policy, Bengaluru has suggested that moving away from water-intensive crops, like rice and wheat can save the country 50 million tonnes of greenhouse gas emissions. Keeping in view of this, DAY NRLM will focus on shifting of high-water demanding crops like Paddy and Wheat to Millets in water stress areas.

For all millets there is a dramatic decrease in cultivated area: 80% for small millets, 46% for finger millet, 59% for sorghum, and 23% for pearl millet. Dramatic also is the decrease in total production of small millets, i.e., 76% for India.

Rajasthan, Maharashtra and Karnataka are the top most States for millets cultivation in the country with a share of 38%, 19% and 13% to total millets area. Maharashtra and Karnataka have the maximum area under sorghum while Rajasthan, Gujarat, Uttar Pradesh and Maharashtra have more area under pearl millet. Ragi/ finger millet has the maximum area in Karnataka, Tamil Nadu and Uttarakhand, besides Maharashtra. Small millets area is maximum in Madhya Pradesh, Uttarakhand and Chhattisgarh.

Following are the potential States for expansion of area under millets keeping in view the suitability of the agroclimatic conditions, existing traditional millet producing States and consumption patterns:

Millet	Possible States for area expansion		
Pearl millet	Rajasthan, Uttar Pradesh, Haryana, Gujarat, Maharashtra, Tamil Nadu		
Sorghum	Maharashtra, Karnataka, Madhya Pradesh, Andhra Pradesh, Tamil Nadu		
Finger millet	Karnataka, Uttarakhand, Tamil Nadu, Maharashtra, Andhra Pradesh		
Barnyard millet	Uttarakhand, Arunachal Pradesh, Nagaland, Madhya Pradesh, Uttar Pradesh, Tamil Nadu		
Little millet	Madhya Pradesh, Tamil Nadu, Karnataka, Chhattisgarh, Jharkhand		
Kodo millet	Madhya Pradesh, Chhattisgarh, Tamil Nadu, Maharashtra, Uttar Pradesh		
Foxtail / Italian millet	Andhra Pradesh, Karnataka, Arunachal Pradesh, Maharashtra, Rajasthan, Tamil Nadu		
Proso millet	Maharashtra, Bihar, Odisha, Rajasthan, Tamil Nadu		

As per the position paper on millets published by department of A&FW, following areas were earmarked for growing organic millets. DAY – NRLM may also consider these areas for promotion of organic millet through SHGs and their federations.

#### Organic millets-potential areas for earmarking:

#### 1. Small millets including finger millet:

- Uttarakhand hills: finger millet and barnyard millet
- · North-eastern states of Arunachal Pradesh, Sikkim, Nagaland and Meghalaya
- · Sonbhadra and Lalitpur districts of Uttar Pradesh
- Chhattisgarh and Madhya Pradesh tribal belt districts growing kodo millet and little millet
- Proso millet areas in Bihar
- · Western ghat zone of Gujarat and Maharashtra
- Vizianagaram and adjoining tribal belt of Andhra Pradesh and Odisha
- Central and South Interior Karnataka
- The tribal belt of Jharkhand
- Arid and semi-arid regions and hilly areas of Tamil Nadu and Kerala are favorable for the organic cultivation of millets

#### 2. Sorghum and pearl millet:

- Western dry zone of Rajasthan, arid regions of Haryana, Himachal Pradesh and Jammu
- · Tribal belt and Bundelkhand regions of Uttar Pradesh and Madhya Pradesh
- Arid southern districts of Maharashtra
- · Vizianagaram and adjoining tribal belt of Andhra Pradesh and Odisha
- Arid and semi-arid regions and hilly areas of Tamil Nadu

In the above States, SRLMs may be encouraged to submit proposals for expansion of area under Millets under MKSP and National Rural Economic Transformation (NRETP) project. The projects may be exclusively for shifting of high-water demanding crops to millets and varietal replacement for productivity enhancement of millets in the traditional millet growing areas.

#### One District One Product:

One District One Product (ODOP) approach is to reap the benefit of scale in terms of procurement of inputs, availing common services and marketing of products. ODOP scheme will provide the framework for value chain development and alignment of support infrastructure.

Following districts were identified for Millets. SRLMs may take the advantage of this scheme to promote Millets:

State	District	ODOP
Arunachal Pradesh	Tirap	Millet Based Products
Chhattisgarh	Sukma	Millet Based Products (Jowar, Kodo-Kutki)
Gujarat	Dang	Finger Millet (Ragi) based products
Gujarat	Тарі	Sorghum Based Products
J & K	Poonch	Millet Based Products
Karnataka	Davanagere	Millet Based Products
Madhya Pradesh	Balaghat	Kodo-Kutki
Madhya Pradesh	Bhind	Bajra
Madhya Pradesh	Dindori	Kodo-Kutki
Madhya Pradesh	Mandla	Kodo-Kutki
Odisha	Malkangiri	Millet Based Products
Odisha	Nuapada	Millet Based Products
Tamil Nadu	Dharmapuri	Millet Based Products (except Maize)
Tamil Nadu	Virudhunagar	Millet Based Products (except Maize)
Telangana	Komaram Bheem	Millet Based Products
Telangana	Mahabubnagar	Millet Based Products

Trend Analysis and crop systems mapping exercises will be done by village level federations with assistance of block level livelihoods staff and Community resource persons and explore where millets were previously cultivated and farmers have shifted to other crops and assess possibility of gaining those lost spaces. Following are the scope for integrating Millets:

- o Intercrops
- o Marginal upland areas
- o Low yielding borewells
- o Rice fallows
- o As Contingency crops
- o In navadhanya system (as border crops and main crops and inter-crops)
- o Any other as per local situations.

Awareness campaigns will be taken up on the importance of millets for nutritional security, the crops potential for adaptation and mitigation of climate change among the SHG members. The comparative economics of millet cultivation will be discussed with SHG members during their meetings and also through Farmer Field Schools. Community Resource Persons (Krishi Sakhis) will be identified for promotion of millet cultivation and they will be deployed in the identified regions. Capacity building manuals on Package of Practices of Millets, Farmer Field Schools on Millets and IEC material on importance of millet cultivation will be developed for wider circulation. DAY NRLM will conduct dedicated programmes with proper training and capacity-building initiatives that urge farmers to move away from loss-making crops toward diversification via millets.

#### **II.Productivity Enhancement of Millets:**

#### **Production and Productivity constraints:**

#### **Productivity Enhancement:**

Productivity of millets can be increased by introducing improved varieties in traditional millet growing areas. Fortified millets may also be promoted to enhance the nutritional intake by the SHG members. DAY NRLM will collaborate with ICRISAT, IARI, IIMR etc. to access improved and fortified varieties of millets for Mahila Kisan/SHG members. In collaboration with these agencies DAY NRLM will organise capacity building program for SRLM staff and Community Resource Persons on Package of Practices for productivity enhancement, Agro ecological practices and value chain activities. Infrastructure facilities necessary for promotion of millets like Millet seed Banks and custom hiring centres / tool Banks will be promoted for timely supply of seeds and tool. Scope for Increasing productivity and reducing labour inputs/ costs:

#### A. Better Agronomic practices:

- Ensuring quality seed material (uniformity and appropriate duration)
- o Ensuring depth of sowing for better germination

- SRI + Guli methods with natural farming / agro ecological practices
- Multi-row sowing in place of single rows
- o Replacing manual labour in weeding with bullock labour
- Protective and/or supportive irrigation
- Adoption of SRI-GULI- Natural farming / AEP Integrated practices

#### B. Enhancing Value through Quality Harvest & Post-harvest:

Clean harvests and cleaning & grading at source (promotion of Graders and sieves during procurement)

#### III.Producer Enterprises/Groups for millet value chain development:

DAY – NRLM is promoting farmer producer enterprises with women farmers as member shareholders to take up value addition and marketing of millets and millet-based products in various parts of the country. Three such Producer Companies have been promoted with membership of 5,548 mahila kisans in Madhya Pradesh. These Producer Companies are providing multiple services to their member Mahila Kisans, from production to collective marketing. The services rendered by these producer companies include timely supply of quality seeds, custom hiring centres, value addition and collective marketing of the produce.

DAY – NRLM will continue to work with millet growers and expand its outreach to develop a strong presence of the farmer producer enterprises across the entire value chain of millets. DAY – NRLM plans to mobilise more than 1 Lakh millet producers into farmer producer enterprises (Including FPOs), so that the millet growers receive end to end support. Producer Groups will also be established to provide community of growers at village/small cluster levels.

Producer Enterprises will provide services to their member Mahila Kisans from the production to post harvest management. The services rendered by these producer organisations will include timely supply of quality seeds, custom hiring centres, primary processing and collective marketing of the produce. These Producer Organisations, wherever possible, will tie up with local research stations and KVKs for sourcing of seeds and extension activities. Millet centric FPOs will render following services to it's members:

- 1. Supply of quality seed materials: Quality seed material and supply of improved varieties play a key role in enhancing the productivity of millets.
- Extension services: FPOs will provide capacity building and advisory services to FPO members for better productivity and to reduce the cost of cultivation. Producer Organisations will organise Farmer Field Schools (FFS) on millets for capacity building.
- 3. Tool banks and custom hiring centres: Producer Organisations will establish tool Banks and custom hiring centres to cater to requirements for millet cultivation.
- 4. Primary processing and Procurement centres: Producer Organisations will

establish primary processing centres for cleaning, grading and marketing of millets. **5.Millet processing units:** This unit will do cleaning, destoning, grading and dehulling. This will help farmers to get their millet produce processed for their own consumption and local sales.

#### IV. Value chain interventions:

One of the key problems for millet consumption in rural areas is lack of processing facilities. DAY -NRLM will collaborate with Nutri hub of IIMR for promotion of enterprises around millet processing and value addition to millets. SRLMs will be encouraged to submit value chain development projects for Millets under NRETP, MKSP and innovative projects. The millets may be processed into millet rice and will sell in the village for local consumption in addition to marketing under different brands. Small scale processing units will be promoted for SHG women as millet enterprises to provide livelihoods and also to encourage local millet consumption. Hub and spoke models will be designed around processing units and millet cultivation areas for promotion of millet cultivation. Following value chain interventions will be promoted by DAY – NRLM:

- Productivity enhancement through varietal replacement and Agro ecological practices
- Cleaning, grading and primary processing
- o Market linkages
- Small Millet Processing units (SMPU)
- o Any other local specific intervention

#### **V.Promotion of millet entrepreneurs:**

SHG members who are running traditional food processing units like pickle making, papad making etc. can be encouraged to expand their business into millet-based food processing units, bakery units etc. Ragi cookies, *bajra* biscuits, jowar *namkeen, traditional delicacies like millet halwa, upma, jhunka and bhakri* are some popular millet-delicacies which can be prepared by SHG women. These SHG women may be provided special facilities to market their produce in local haats, mandis and SARAS exhibition etc. These SHG women will be trained on packaging and branding of their products, to reach niche markets as well. These women can collaborate with local hospitals, hotels, retail outlets etc. to market their produce. Local hotels run by SHG members shall also be trained on millet-based preparations. Recently Apollo hospital in Hyderabad signed an MoU with SHG members in Pastapur block in Sangareddy district of Telangana for providing millet-based recipes to their patients. Several such opportunities for enterprise development may be explored locally.

- o Millet hotels/ breakfast items: SHG members will be encouraged and provided financial assistance to run hotels to take up millet related items in their regular menus. This will provide livelihood opportunity in addition to increase the availability of millet-based food in the rural areas.
- o Millet bakeries: SHG women may take up preparation of cookies and other bakery

- items with millets
- o **Small Millet processing units:** SHG members will be provided with Small Millet Processing Units to convert millet grains into millet rice. They can also prepare ready to eat millet products for sale locally and in the nearby towns.

#### VI. Promotion of millet consumption among SHG members:

Keeping in view the importance of millets in nutrition, SHG members will be encouraged to add millets in their diet. Awareness campaigns may be organized on importance of dietary diversification through millets. IEC materials will be developed on the importance of millets for wider circulation among SHG members. Food melas with millet-based recipes will be organized to create awareness and introduce millet recipes to SHG members.

#### VII.Millets for promotion for fodder:

Millets are an important source of fodder. In dry-lands wherever tank beds are available DAY NRLM may promote Millet cultivation in tank beds after Kharif season to ensure fodder availability at the village level during summer season.

#### VIII. Partnership frame work:

DAY – NRLM has signed MOU with IIMR for technical support and incubation of millet-based enterprises. FDRVC which is a national support agency (NSO) for FDRVC has entered into MOU with 24 letter Mantra also for procurement of Millets from the Farmer Producer Organisations (FPOs) promoted by NRLM. DAY – NRLM under RISE hub initiative will work closely with start-ups and entrepreneurs for promotion of Millet Value Chain activities.

#### IX.Value chain studies:

DAY NRLM will undertake studies in collaboration with National Institute of Nutrition (NIN), IIMR, ICRISAT, FDRVC etc. on value chains of different millets. Value chain interventions will be promoted based on the findings of these studies.

### ACRONYMS

Acronyms	Definition	Acronyms	Definition
FAO	Food and Agriculture Organization	FAO	Food and Agriculture Organization
QU	Quality Unit	IYoM	International Year of Millet
CO2	Carbon dioxide	MoRD	Ministry of Rural Development
NRLM	National Rural Livelihood Mission	DAY-	Deendayal Antyodaya Yojana – National
SHG	Self Help Group	NRLM	Rural Livelihood Mission
IIMR	Indian Institutes of Millets Research	RF	Revolving Fund
FSSAI	Food Safety and Standards Authority of India	CIF	Climate Investment Fund
EDP	Entrepreneurship Development Programme	COE	Center of Excellence
APRIGP	Andhra Pradesh Rural Inclusive Growth Project	PDS	Public Distribution System
		SDGs	Sustainable Development Goals
SERP	Society for Elimination of Rural Poverty	Gol	Government of India
ANGRU	Acharya N. G. Ranga Agricultural University	BRLPS	Bihar Rural Livelihood Promotion Society
FPO	Farmer Producer Organization	FFS	Farmers Field School
NSSO	National Sample Survey Office	SMI	System of Millets Intensification
FCI	Food Corporation of India	VRPs	Village resource persons
PDS	Public Distribution System	CRPs	Community resource persons
KVK	Krishi Vigyan Kendra	VO	Village Organization
CHC	Customers Hiring Centers	NGO	Non-Government Organization
NTFP	Nontimber Forest Products	СВО	Community Based Organization
CLF	Cluster Level Federation	SWJPCL	Saharsa Women Jeevika Producer Company
MSP	Minimum Support Price		Ltd
UNGA	United Nations General Assembly	IIMR	Indian Institute of Millets Research
		PoPs	Package of Practices
		GoCG	Government of Chhattisgarh
		CGSRLM	Chhattisgarh State Rural Livelihood Mission

Acronyms	Definition	Acronyms	Definition
SRI	System of Rice Intensification	IEC	Information, Education, and Communication
SMI	Sample Matrix Inversion	KSRLPS	Karnataka State Rural Livelihood Promotion
ICDS	Integrated Child Development Scheme	NIKOD.	Society
APC	Agriculture Production Cluster	MKSP	Mahila Kisan Sashaktikaran Pariyojana
BMKPCL	Bhumgadi Mahila Krishak Producer	RARS	Regional Agriculture Research Station
	Company Ltd	NFSM	National Food Security Mission
PG	Producer Group	JLGs	Joint Liability Groups
NACOF	National Federation of Farmers'	СР	Corpus Fund
	Procurement, Processing and Retailing Cooperatives of India Ltd	MP	Madhya Pradesh
TRIFED	Ministry of Tribal Affairs	MPSRLM	Madhya Pradesh State Rural Livelihood Mission
TSA	Technical Support Agency	ASA	Action for Social Advancement
NSO	National Social Organization	FDRVC	
VMKS	Vikas Mahila Kshetra Sangh	FDRVC	Foundation for Development of Rural Value Chains
CEO	Chief Executive Officer	MDM	Mid Day Meal
IAS	Indian Administrative Services	NFSA	National Food Security Act
SRLM	State Rural Livelihood Mission	PMFME	Pradhan Mantri Micro Food Processing Scheme
NAU	Navsari Agricultural University	MODIN	
R&D	Research & Development	MSRLM- UMED	Maharashtra State Rural Livelihoods Mission
MoU	Memorandum of Understanding	AEP	Agroecological Practices
JSLSP	Jharkhand State Livelihood Support Programme	ОММ	Odisha Millets Mission
FPCs	Farmer Producer Companies	NCDS	Nabakrushna Choudhury Centre for Development Studies
CABIC	Community Agriculture Business Incubation	CSOs	Civil Society Organizations
NABARD	Center	OLM	Odisha Livelihood Mission
INADARU	National Bank for Agriculture and Rural Development	YCDA	Youth Council for Development Alternatives

Acronyma	Definition
Acronyms	
TDCCOL	Tribal Development Cooperative Corporation of Odisha Limited
SFSS	State Food Security Scheme
CSC	Community Seed Centre
CMSCs	Community-managed seed centers
СНС	Community Hiring Center
CHC	Custom Hiring Centers
SNP	Supplementary Nutrition Programme
FAQ	Fair Average Quality
KMS	Kharif Marketing Season
APEDA	Agricultural and Processed Food Products Export Development Authority
RGAVP	Rajasthan Grameen Ajeevika Vikas Parishad
RSETI	Rural Self Employment Training Institutes
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFNH	Institute of Food, Nutrition and Health
ITDA	Integrated Tribal Development Agency
SBI	State Bank of India
N2O	Nitrous oxide
PEs	Producer Enterprises
NRPs	National Resource Persons
CRP-LH	Community Resource Persons-Livelihoods
SRPs	State Resource Persons
NRETP	National Rural Economic Transformation Project

