

Millet-Based Entrepreneurial Model: Linking Farmers to Markets through Value Chain Innovation Entrepreneurial Ecosystem"

1. Summary of the product/technology (maximum of 200 words)

Conceptual framework

- **Problem Identification:** Smallholder farmers and rural youth face low profitability in millet farming due to poor market linkage, limited processing facilities, and lack of entrepreneurial skills. Traditional practices yield low returns, discouraging youth involvement and underutilizing millets' potential for nutrition, income, and climate resilience.
- **Technological Intervention:** The intervention includes millet processing units (dehullers, grinders, roasters), skill-based training modules, and entrepreneurship development support. These technologies enable value addition, reduce post-harvest losses, improve shelf life, and link farmers with consumer markets, transforming millets into marketable products like flours, snacks, and health mixes.
- **Design Features:** The model integrates on-farm production with processing, branding, and marketing. It emphasizes youth-led micro-enterprises, cluster-based operations, and low-cost, scalable machinery. Business incubation, financial linkage, and digital promotion tools are embedded to ensure sustainability and replicability across rural millet-growing regions.
- **Implementation Environment:** Implemented under the ARYA project through KVKs in millet-prone areas, the model leverages local youth participation, existing FPOs, and convergence with state schemes. It ensures community ownership, institutional support, and market connectivity in both tribal and non-tribal agro-ecological zones with high millet potential.

Summary:

In celebration of the **International Year of Millets 2023**, Krishi Vigyan Kendra (KVK), Piprakothi took significant steps toward the production and promotion of millet-based value-added products for nutritional and economic empowerment. The KVK's Food Processing Unit developed a series of gluten-free, nutrient-rich products including **Rajendra Pusa Bajra Biscuit, Rajendra Pusa Madua Biscuit, Rajendra Pusa Sanwa Biscuit, Rajendra Pusa Jowar Namkeen, and Rajendra Pusa Madua Ladoo**. These healthy alternatives to market-

	available biscuits and snacks were developed to utilize local millet varieties and promote better dietary practices. The unit secured FSSAI License No. 104230700000279, ensuring regulatory compliance and enhancing consumer trust. To disseminate this technology at the grassroots level, KVK Piprakothi adopted a decentralized model focusing on the mobilization and skill development of farm women and SHGs. Through 48 training programs, a total of 1177 beneficiaries were trained in millet value addition techniques. This initiative not only improved the livelihood opportunities of rural women but also created awareness about the commercial potential of millets. By combining scientific processing, entrepreneurship development, and local resource utilization, the model presents a sustainable approach for promoting millets and enhancing rural incomes. (Annexure I)
2. Is it a new technology? (Yes/No). If no, provide the details of the technology modified	Yes, this constitutes a new technology as it integrates scientific millet processing, value addition, and decentralized entrepreneurship development. The innovation lies in the formulation of region-specific, nutritionally enhanced millet-based products, establishment of a certified (FSSAI-approved) processing unit at KVK level, and systematic capacity building of farm women and SHGs for enterprise creation.
3. IPR involved, if any (Patent/Copyright/ Industrial Design Registration/ Variety/ germplasm registration). Provide Filed/ Granted number	Yes, Food Processing Unit of KVK had obtained FSSAI license No 104230700000279. (Annexure-VI)
4. Validation procedure followed (within Institute, collaborators, multilocation/multi-site testing)	The validation of the Millet Value Chain Entrepreneurship Model at KVK, Piprakothi was carried out through the following structured steps: • Selection of raw materials: Locally available millet varieties like bajra, madua, sanwa, and jowar were identified based on adaptability and nutritional value. • Standardization of processing techniques: Scientific protocols for cleaning, drying, roasting, milling, and formulation were followed using small-scale processing equipment installed at the KVK Food Processing Unit. • Product development: Value-added products such as Rajendra Pusa Bajra Biscuit, Madua Biscuit, Sanwa Biscuit, Jowar

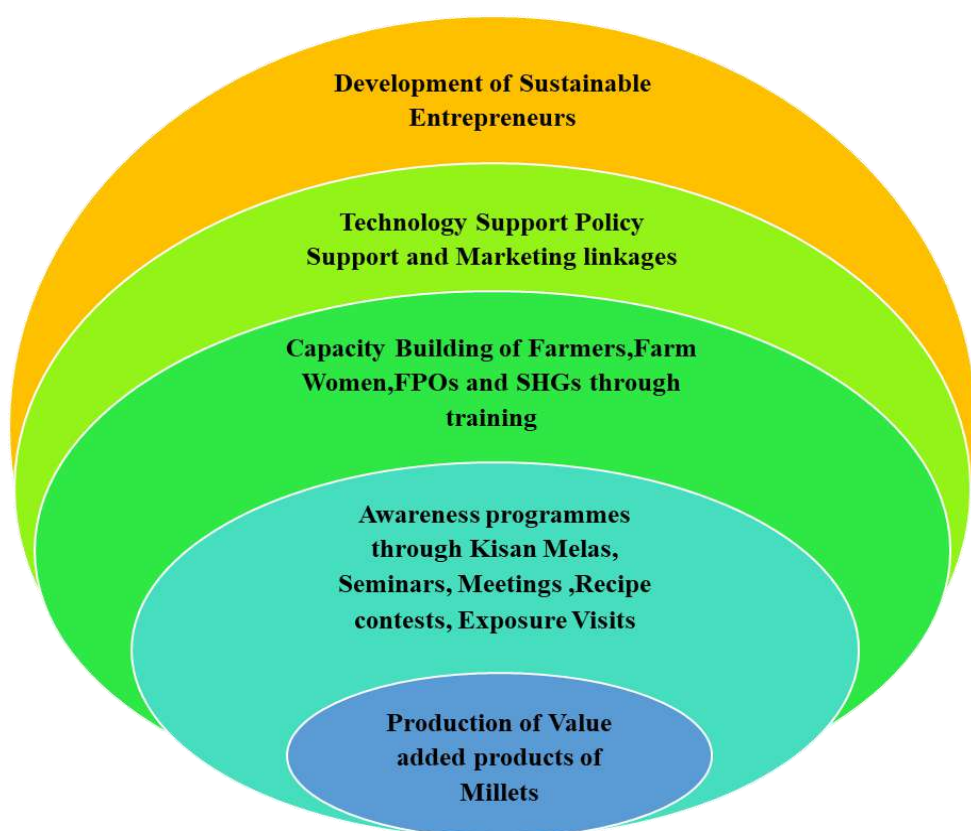
	Namkeen, and Madua Ladoo were formulated and optimized for texture, taste, and shelf life. • Sensory and consumer evaluation: Organoleptic testing was conducted with SHG members and farm families to assess product acceptability. Feedback was used to refine formulations. • Food safety compliance: The processing unit was awarded FSSAI License No. 104230700000279, confirming adherence to food safety and quality standards. • Market validation: The products were test-marketed at local exhibitions and KVK events to assess market response, pricing, and scalability, thereby validating the entrepreneurship model for its feasibility, acceptability, and income-generating potential at the grassroots level through active participation, hands-on training, and feedback from farm women and SHG members.
5. Brief description of research output/technology:	Need for the Technology: Millet, though rich in nutrients and climate-resilient, remain underutilized due to limited processing, poor consumer awareness, and low market value. Rural communities, particularly women and youth, lack access to scientific knowledge and infrastructure for value addition, leading to missed opportunities for income generation and nutrition enhancement. Technological Intervention: Bora Bandh To address this gap, Krishi Vigyan Kendra, Piprakothi, under the ARYA project, developed a decentralized millet value chain model integrating production, processing, and entrepreneurship. The intervention included the establishment of a Food Processing Unit equipped with low-cost machinery for millet-based product development (biscuits, namkeen, laddoos), formulation standardization, branding, and food safety certification (FSSAI License No. 104230700000279). Functionality and Benefits The technology enables farm-level processing, reduces post-harvest losses, and enhances product shelf life. It empowers rural women and SHGs through capacity building and enterprise creation. The model improves livelihoods by offering market-ready, gluten-free, and nutritious products. Its successful implementation validated economic viability, scalability, and social acceptability, making it a replicable solution for promoting millet-based micro-enterprises in rural India.

a. Objective of the product/ technology	The primary objective of the Millet Value Chain technology is to promote value addition, improve nutrition, and enhance rural incomes through decentralized, women-led millet processing units. It aims to: • To promote value-added millet products for improved nutrition and increased income of farmers and farm women. • To develop rural entrepreneurship through certified millet processing and skill-based training. • To scale the technology via FPOs, SHGs, and Jeevika for wider adoption.
b. Detailed methodology of the proposed product/technology	A. Baseline Survey and Problem Identification • A preliminary assessment was conducted by the scientists of KVK, Piprakothi to understand the challenges faced by millet-growing farm families and SHG members. • The survey revealed that despite millet being a traditional crop, farmers lacked awareness and infrastructure for processing and value addition. • Low market demand, absence of certified processing units, and limited entrepreneurial exposure restricted income generation. • Farm women expressed keen interest in adopting millet value addition if proper training, equipment, and market linkages were provided. B. Awareness and Capacity Building (Annexure- I Table 1, pp 18-19) • Interactions and meetings were conducted with farm women, SHGs, and local stakeholders to introduce the concept of millet-based value addition and entrepreneurship. • Over a span of two years (2022–2024), KVK Piprakothi implemented extensive capacity-building initiatives to promote millet value addition and rural entrepreneurship. The focus areas included millet processing, hygiene, packaging, branding, and enterprise management to enhance skill development and confidence among stakeholders. The efforts comprised 10 awareness programmes reaching 1,797 participants, 48 training sessions engaging 1,177 participants, and 18 exposure visits involving 2,743 participants from other districts, facilitating knowledge exchange and wider adoption of millet-based enterprises.

- Participants showed high enthusiasm and actively engaged in hands-on training, demonstrating strong interest and ownership in establishing millet-based micro-enterprises.

C. Millet Value Entrepreneurship Model

- The Millet Value Chain Entrepreneurship Model follows a layered approach beginning with the production of value-added millet products, progressing through awareness programs, capacity building, and technology support with marketing linkages, ultimately leading to the development of sustainable rural entrepreneurs. This integrated model ensures both nutritional security and economic empowerment for farmers and SHGs.



D. Standardized Protocol for Preparation of Millet-Based Value-Added Products

The value-added millet-based products are scientifically prepared at the Food Processing Unit of Krishi Vigyan Kendra, Piprakothi, following a standardized and well-defined methodology. The millets used are cleaned, graded, and processed in-house to extract fine flour, ensuring quality and hygiene at each step. Specific formulations have been developed for each product, with precise ingredient ratios standardized for one kilogram of the final product. The detailed process flow for

preparation, including mixing, shaping, baking/frying, cooling, and

Rajendra Pusa
Gur Bajra
Biscuit

• Bajra Flour-400 g,Ghee-250 g,Baking Powder-10 g,Baking Soda-5 g,Cardamom Powder-5 g,Dried Coconut-60g, Jaggery-200 g,Cashew Nut-50g

Rajendra Pusa
Madua Biscuit

•Ragi Flour-300 g,Whole Wheat flour-300 g,Ghee-250 g,Baking Powder-10 g,Baking Soda-5 g, Cardamom Powder-5 gJaggery-200 g,Cashew Nut-50g,Sesame Seeds-20 g

Rajendra Pusa
Sanwa Biscuit

•Barnyard Flour-300 g,Whole Wheat flour-350 g,Ghee-250 g,Baking Powder-10 g,Baking Soda-5 g, Cardamom Powder-5 g,Jaggery-200 g,Sesame Seeds-20 g

Rajendra Pusa
Jowar Namkeen

•Jowar flour-650 g,Besan-300 g,Salt,Refined Oil,Chilly Powder-16 g,Turmeric Powder-16 g,Black Pepper powder-10 g

Rajendra Pusa
Madua Ladoo

•Ragi Flour-600 g,Ghee-100 g,Jaggery-250 g,Cashewnut-50 g,Cardamom Powder-5 g

packaging, is outlined below to ensure consistency, nutritional value, and consumer acceptability

E. Process of Preparing Millet Value-Added Products

- **Rajendra Pusa Gur Bajra Biscuit**

Sieve all the dry ingredients, Bajra Flour, Jaggery, Baking Powder, Baking Soda and Dried Coconut



Melt the clarified butter (i.e., Ghee) and pour it over the mixture.



Boil the jaggery in water and pour it over the mixture, adjusting the consistency of the mixture



Preheat the oven to 170°C. Shape the cookies and place a cashew on top of each cookie.



Bake the cookies for half an hour, and when firm, take the cookies out.

- **Rajendra Pusa Madua Biscuit**

Dry roast the Ragi flour.



Sieve all the dry ingredients like roasted Ragi flour, Whole wheat flour, Jaggery, Baking Powder, and Baking Soda.



Melt the clarified butter (i.e., Ghee) and pour it over the mixture.



Boil the jaggery in water and pour it over the mixture, adjusting the consistency of the mixture.



Preheat the oven to 170°C. Shape the cookies and place a cashew on top of each cookie.

- **Rajendra Pusa Sanwa Biscuit**

Sieve all the dry ingredients like Sanwa Flour, Jaggery, Baking Powder, Baking Soda and Dried Coconut



Melt the clarified butter (i.e., Ghee) and pour it over the mixture.



Boil the jaggery in water and pour it over the mixture, adjusting the consistency of the mixture



Preheat the oven to 170°C. Shape the cookies and place a cashew on top of each cookie.



Bake the cookies for half an hour, and when firm, take the cookies out.

- **Rajendra Pusa Jowar Namkeen**

Mix all the ingredients : Jowar Flour, Besan, Chilly Powder, Turmeric Powder, Black Pepper Powder along with water.



Adjust the consistency to make a semi hard dough



Heat refined oil up to 200°C



Put the dough in the Sev Maker and leave the strands in the hot oil.



Fry the strands in the oil until crispy.

- **Rajendra Pusa Madua Ladoo**

Dry roast the ragi flour until it releases a nutty aroma.



Mix the roasted ragi flour with cardamom powder, chopped cashew nuts, jaggery, and melted ghee.



Combine the ingredients thoroughly, then shape the mixture into ladoos using hands greased with ghee

F. Licensing of the value-added products of Millets (Annexure VI)

- To ensure quality, safety, and regulatory compliance, the value-added millet products developed at the Food Processing Unit of KVK Piprakothi were brought under the ambit of the Food Safety and Standards Authority of India (FSSAI). The unit successfully obtained FSSAI License No. 104230700000279, following strict adherence to food safety norms, including hygiene practices, standardized formulations, and proper labeling and packaging procedures. This certification ensures that all products meet national food safety standards, making them suitable for public distribution and commercial sale.
- Licensing played a crucial role in enhancing consumer trust and expanding the market reach of these millet-based products. It enabled the products to be showcased and sold legally at agricultural exhibitions, haats, and retail outlets. Moreover, the FSSAI license facilitated the formalization of micro-enterprises run by farm women and SHG members, strengthening their entrepreneurial potential. This step not only added value to millets but also contributed to rural livelihood development through safe and certified food processing.

G. Decentralized Model for promotion of millet-based value-added products

- The decentralized model for promoting millet-based value-added products, implemented by KVK Piprakothi, focuses on empowering farm women and SHGs at the village level. With over 82% women participation, the model actively engaged 7 Self-Help Groups

(SHGs) and 3 Farmer Producer Organizations (FPOs) in millet processing and enterprise development. By establishing small-scale processing units locally and providing hands-on training, the model ensures low-cost, accessible production of millet-based products. It encourages self-reliance, reduces post-harvest losses, and adds market value to traditional crops.

H. Outcome and Significance

- The model leverages local resources, FSSAI certification, and institutional support to create sustainable micro-enterprises, promoting both income generation and nutritional security. Innovative women entrepreneurs such as Mrs. Sabya Devi (Bahadurpur, Areraj), Mrs. Lovely Devi (Mehsi), and Ms. Asha Chaudhary (Mehsi) from East Champaran have emerged as successful role models in millet value addition. This inclusive approach strengthens rural livelihoods and showcases the potential of women-led millet enterprises at the grassroots level.

I. Providing technological backstopping to the SHGs and FPOs involved in “Production of Value-added products of Millets” and Creating Marketing Linkages

- KVK Piprakothi has been instrumental in providing continuous technological backstopping to SHGs, FPOs, and Jeevika didis engaged in the production of millet-based value-added products, particularly biscuits and ladoos. Through regular field visits, hands-on demonstrations, and expert consultations, these groups receive guidance on improved processing methods, product formulation, hygiene protocols, packaging techniques, and compliance with FSSAI standards. This support ensures quality consistency, enhances shelf life, and boosts consumer confidence in locally made millet products.
- In parallel, KVK Piprakothi actively facilitates market linkages for these rural entrepreneurs by connecting them with exhibitions, buyer-seller meets, local retailers, and institutional markets. Efforts are also made to promote branding and visibility of the products, enabling wider reach and better price realization. This dual approach of technical guidance and market access strengthens the millet value chain, ensures economic sustainability of SHG and FPO-led enterprises, and promotes women-led entrepreneurship in rural areas.

c. Yield/productivity gain	The millet value chain model led by KVK Piprakothi has demonstrated significant yield and productivity gains across agricultural, economic, and social dimensions. Through integrated interventions—from field to fork—this approach holds strong potential for scalable, sustainable rural development in millet-growing regions. Primary Yield Improvements Through on-field demonstrations and training by KVK Piprakothi, improved agronomic practices such as line sowing, seed treatment, and nutrient management led to a 15–25% increase in millet grain yield. Adoption of climate-resilient millet varieties in rainfed areas ensured better productivity on marginal lands. These interventions helped optimize land use and enhanced cropping intensity, contributing to higher farm-level output and availability of raw material for further value addition. Processing Efficiency and Product Yield Scientific post-harvest handling, including drying, grading, and milling of millets at the KVK Food Processing Unit, enhanced processing efficiency. The flour extraction rate improved by 10–15%, yielding 800–850 grams of usable flour per kg of raw millet. This refined flour served as the base for consistent production of biscuits, ladoos, and snacks. Streamlined processes ensured minimal losses, better product quality, and increased output from the same quantity of raw material. Economic Potential of Millet Value Addition The data highlights significant value addition in millet-based products, with processed items fetching 3 to 6 times higher prices than raw millets. For example, Rajendra Pusa Gur Bajra Biscuit, made from Bajra, is sold at Rs. 800/kg, reflecting a remarkable increase. Similarly, other products like Rajendra Pusa Madua Ladoo and Jowar Namkeen also show consistent value gains. This demonstrates the economic viability and income-enhancing potential of value addition. It encourages rural women, SHGs, and FPOs to adopt millet processing as a sustainable livelihood enterprise, promoting both nutritional security and entrepreneurship at the grassroots level. (Annexure I Table 2) Economic Yield and Income Gain By converting raw millets into high-value products, economic returns per unit increased significantly. While raw millet fetched ₹25–30/kg, the processed products like biscuits and ladoos were marketed at ₹250–300/kg. This resulted in a net income increase of 40–60% for rural women
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	entrepreneurs. Value addition also reduced wastage and provided market-ready, shelf-stable products that met both local demand and urban health-conscious consumer segments, thus creating sustainable income avenues. Employment and Time Efficiency Gains The decentralized processing model supported livelihood creation for 4–5 women per unit, especially within 7 SHGs and 3 FPOs. Semi-automated machinery minimized manual effort and improved output efficiency by 30%, allowing higher volumes to be processed daily. Training in business operations and time management further improved productivity. The model provided consistent part-time or full-time employment, empowering rural women with skills, income, and recognition within their communities. Nutritional and Social Impact Millet products like Rajendra Pusa Bajra Biscuit and Madua Ladoo are rich in iron, calcium, and fiber, promoting dietary diversity and reducing nutrition-related deficiencies. Over 82% women participation ensured inclusive growth, with entrepreneurs like Mrs. Sabya Devi, Mrs. Lovely Devi, and Asha Chaudhary emerging as local role models. The initiative strengthened SHG networks and elevated the role of women in agribusiness, creating ripple effects in nutrition awareness and rural empowerment.
d. Saving of water, labour, time and energy	• Labour Saving: Mechanization reduced the manual workload of SHG members by up to 50%, especially in milling, mixing, and shaping tasks. • Time Saving: The introduction of processing units halved the time required for production, enabling faster batch turnover. • Energy Saving: Use of energy-efficient and solar-powered equipment decreased overall energy consumption by 20–25%, lowering operational costs. • Improved Efficiency: Integrated processing systems streamlined operations, reducing delays and optimizing use of human and mechanical resources.
e. Conservation of soil	NA
f. Capacity	• Processing Capacity: Each decentralized unit has the capacity to process approximately 20–25 kg of millet flour per day, supporting small-scale commercial production efficiently.

	• Production Output: SHG-led units produce an average of 8 –10 kg of finished value-added products daily, including biscuits, ladoos, and namkeen, catering to local market demands. • Workforce Capacity: Each unit involves approx. 10 trained SHG members, enabling effective division of tasks such as cleaning, grinding, mixing, shaping, baking, and packaging. • Scalability: The entrepreneurship model follows a modular and replicable design, making it adaptable across other rural areas with minimal capital and infrastructure requirements.
g. Efficiency	The millet-based value-added products demonstrate high shelf-life efficiency, remaining safe and consumable for up to six months from the date of production under proper storage conditions. This extended shelf stability enhances marketability and reduces post-production losses. Additionally, the products meet all food safety and quality standards, having obtained FSSAI certification (Licence No. 104230700000279). This ensures consumer trust, regulatory compliance, and ease of scaling for commercial distribution. The standardized processing methodology followed at KVK Piprakothi contributes to consistency in product quality, operational efficiency, and long-term viability of the entrepreneurship model.
h. Cost effectiveness including B:C ratio (Annexure- I)	• Millet-based value-added products fetch 3–6 times higher prices than raw grains. For instance, Rajendra Pusa Gur Bajra Biscuit sells at ₹800/kg. Products like Madua Ladoo and Jowar Namkeen show similar gains, highlighting strong income potential and encouraging SHGs and women entrepreneurs to adopt millet processing for sustainable livelihoods. • The data reveals the economic viability of millet-based value addition through small-scale processing enterprises. The benefit-cost (B:C) ratios for various millet products range from 1.52 to 2.66, demonstrating substantial profitability. This implies that for every rupee invested, the return ranges from ₹1.52 to ₹2.66, depending on the product and scale of operation. • Among the products analyzed, the highest B:C ratio of 2.66 was observed in Bajra-based biscuits, followed by Madua ladoo (2.00), Sanwa biscuits (1.80), and Jowar namkeen (1.52). These figures confirm the commercial potential of millet processing.

	Moreover, the enterprises benefit from extended shelf life (3–6 months), quality assurance through FSSAI certification (License No. 104230700000279), and significant consumer demand due to growing awareness of millets' nutritional value. This supports the promotion of millet processing as a sustainable livelihood model, particularly for SHGs, women entrepreneurs, and FPOs.
i. Uniqueness of the technology in comparison to existing ones	The uniqueness of the millet value addition model lies in its multi-dimensional benefits as a low-cost, community-driven, and nutrition-focused intervention, making it a sustainable and income-generating alternative to conventional grain processing approaches. 1. Cost-Effectiveness and Use of Indigenous Materials: Utilizes locally available millets such as Bajra, Madua, and Jowar to produce affordable, high-value products, reducing dependence on costly external inputs. 2. Community-Led Implementation: Strong involvement of rural Self-Help Groups (SHGs), Farmer Producer Organizations (FPOs), and women entrepreneurs makes the model inclusive and participatory. 3. Nutritional and Climate Resilience: Promotes consumption of nutrient-rich millets, supporting food security and adapting to climate variability in dryland regions. 4. Policy Support and Scalability: Aligned with International Year of Millets (IYoM 2023), PM-FME, and FSSAI regulations, the model is replicable across agro-ecological zones for wider adoption. 5. Nutritional Information of the value-added millet products in comparison with market available biscuits (Annexure I) 6. Impact of value-added products of millets on income generation of the entrepreneurs based (Annexure I)
j. Passport data of the product/technology (Annexure-I Table 3, pp 22-24)	Name of the Technology/Product: <i>Millet-Based Value Addition Entrepreneurship Model</i> Developed by: Krishi Vigyan Kendra (KVK), Piprakothi, East Champaran, Bihar Source Institution: ICAR-ATARI, Zone IV, Patna Year of Development: 2022-23 Location of Validation: Villages across East Champaran, Bihar (including Bahadurpur, Mehshi, Areraj)

	Target Group: Rural farm women, SHGs, FPOs, and micro-entrepreneurs Technology Components: Millet processing (cleaning, grading, flour extraction), recipe formulation, FSSAI-compliant packaging, labeling, and marketing support End Products: Rajendra Pusa Bajra Biscuit, Madua Ladoo, Jowar Namkeen Licensing/Certification: FSSAI Licensed (Lic. No. 104230700000279) Commercial Viability: Value-added products priced 3–6x higher than raw millets; BC Ratio > 2.5 Scalability: Highly replicable through SHGs and FPOs under decentralized processing models
12. Details of relevant data generated during the development/validation	- During the validation of the millet value addition model, data were generated on processing efficiency, shelf life, consumer acceptability, and cost economics. Products retained quality for up to six months and met FSSAI standards, ensuring safety and compliance. - Economic analysis revealed a benefit-cost ratio exceeding 2.5. Value-added products fetched 3–6 times higher prices than raw millets, affirming their commercial viability and potential for rural livelihood generation.
13. Proposed stakeholders	The millet value addition model promotes sustainable livelihoods, nutritional security, and rural entrepreneurship through decentralized processing and community-led initiatives. It fosters income generation, women's empowerment, and agri-based enterprise development by leveraging local resources and capacity-building. Alignment with Key Government Schemes This model aligns with various national and state initiatives focused on nutrition, women empowerment, and rural enterprise: - National Food Security Mission (NFSM) – Inclusion of millets under the nutri-cereals component - ARYA Project (ICAR) – Promotion of agro-based startups by rural youth in millet value addition

	• National Rural Livelihood Mission (NRLM) – Support to SHGs and women-led enterprises • POSHAN Abhiyan – Promoting millets for combating malnutrition • One District One Product (ODOP) – Branding and marketing of millet-based products • Startup India / Stand-Up India – Support for rural women entrepreneurs • FSSAI’s Eat Right India Movement – Ensuring quality and safe food products Proposed Stakeholders • Krishi Vigyan Kendras (KVKs) and ICAR Institutes – Technology support, training, and handholding • State Agriculture & Rural Development Departments – Policy implementation and enterprise facilitation • SHGs, Women Collectives & FPOs – Ownership of processing units and marketing networks • District Administration & JEEViKA (Bihar) – Mobilization, convergence, and upscaling • Women Entrepreneurs and Youth – Local champions in product innovation and marketing • Food Safety and Standards Authority of India (FSSAI) – Licensing and food safety compliance • NGOs and Development Agencies – Capacity building and linkage creation • Private Sector (Retail, E-commerce, Agri-Food SMEs) – Market linkage, branding, and product diversification • Research & Academic Institutions – Data collection, monitoring, and impact evaluation
14. Commercial potential, if any	This technology provides a scalable and replicable solution for enhancing rural livelihoods, improving nutrition, and creating value chains for underutilized millets. Its decentralized, low-cost model and strong community ownership make it a commercially viable enterprise in tribal, rainfed, and low-income regions.

	Scalability and Adaptability: The model is highly adaptable across agro-climatic zones and requires minimal infrastructure. It supports small-scale, village-level processing units, making it suitable for widespread replication among SHGs and FPOs with low capital investment. Livelihood and Enterprise Generation: By converting low-cost millets into high-value products like biscuits, laddoos, and namkeen, the model enhances farm income 3–6 times. It generates micro-enterprises in processing, packaging, and retailing, empowering women and rural youth and engaging 7 SHGs and 3 FPOs under the ARYA project. Convergence and Funding Potential: The model aligns with national schemes such as NFSM, NRLM, POSHAN Abhiyaan, ODOP, and ARYA. It offers strong scope for funding through government programs, CSR, and agri-entrepreneurship missions. Innovation and Start-up Ecosystem: Millet-based processing units create opportunities for rural start-ups offering branded products, food innovation, mobile processing units, and marketing platforms. FSSAI certification (License No. 104230700000279) further enhances product credibility and marketability, encouraging innovation in the millets sector.
15. Publications/photos/video clipping, if any	Publications: • Scientific Report: 01 (Annexure – II) i. Rai, A., Rajput, J., Singh, AK., Singh, SK., Rai S., and Anirudh T, (2022). Millets for Food and Nutritional Security. <i>Food and Scientific Reports</i>, Vol 4, Issue 3,4(2), pp 37-42 • Success Story: 01 (Annexure – III) • Popular Article: 01 (Annexure – IV) i. “राजेंद्र कौनी -1 है कंगनी की उत्कृष्ट किस्म” , आशीष राय, सतीश कुमार सिंह , अरविन्द कुमार सिंह और अंशु गंगवार , खेती ,May 2024 edition ISO 9001:2015 edition • Book Chapters: 04 (Annexure – V) i. बदलते मौसम में किसानों के लिए श्री अन्न एक उत्तम विकल्प S. K. Singh, M. S. S. Reddi, A. K. Singh, A. Rai Unnat Takniki Atm Nirbhar Kisan ISBN-978-81-925875-4-7, 2023, Volume 2, Page No-27-30, Published by Parmar Publishers and Distributors. ii. पोषक अनाज : मंडुआ (एल्यूमीन कोराकाना) ,P.P. Panda , A. K. Singh, N. B. Chanu, N. Pareek, S. T. Kapil, G.K. Padhi, N. Kumari, M.

	Kumar, A. Kumar Unnat Takniki Atm Nirbhar Kisan ISBN-978-81-925875-4-7, 2023 Volume 2 , Page No- 54-60, Published by Parmar Publishers and Distributors. iii. श्री अन्न मंडुआ: एक “अनिश्चित” भविष्य के लिए एक “निश्चित” फसल , S. Kumar, A. K. Singh, P.P. Panda, A. Kumar , A.Rai, A.Gangwar, M.Kumar, G.K Padhi, N. B. Chanu, N. Pareek, S. T. Kapil, S Sindhu, Unnat Takniki Atm Nirbhar Kisan ISBN-978-81-925875-4-7, 2024, Volume 3, 103-109, Published by Parmar Publishers and Distributors. iv. मूल्य संवर्धन: कृषि क्षेत्र में वरदान P.P. Panda , A. K. Singh, G.K. Padhi, N. B. Chanu, N. Pareek, M. Kumar, S. T. Kapil, N. Kumari, A. Kumar and S.Kumar , Unnat Takniki Atm Nirbhar Kisan , ISBN: 981-81-896021-7-3 ,2024, Volume :3 ,156-162, Published by Parmar Publishers and Distributors. Appreciation letter: 02 (Annexure – VII) Awards Received: 10 (Annexure –VIII) Activity Photos: Approx. 25 (Annexure – IX) pp 45 Newspaper clippings: 04 (Annexure – X)
16. Any other information not covered above	• Skill Development under ARYA: A 15-day skill development programme on “Value Addition of Millets” was organized under the ARYA project during Poshan Maah (September 2024) as part of the 100-day action plan, targeting women from SHGs. • Exposure Visits: Six inter-district exposure visits were conducted for Jeevika didis at the Food Processing Unit of KVK Piprakothi, benefiting 154 farm women through experiential learning and knowledge sharing. • Enterprises in Continuation: The following SHGs trained under ARYA are actively engaged in millet-based product development: a. <i>Puja Agri Products Limited</i> b. <i>Maharani Swayam Sahayak Samuh</i> c. <i>Saraswati Swayam Sahayak Samuh</i> d. <i>Bajrang Samuh</i>

	• Emerging Women Entrepreneurs: Notable individual entrepreneurs in millet value addition include: Mrs. Sabya Devi, Bahadurpur, Areraj, East Champaran Mrs. Lovely Devi, Mehsi, East Champaran Ms. Asha Chaudhary Mehsi, East Champaran These interventions reflect the sustainable impact of capacity building and support for value chain development under ARYA.
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ANNEXURE DETAILS

SN	Content	ANNEXURE
1.	Details of extension programmes, Comparative Pricing of Raw Millet Grains, Flour, and Processed Value-Added Products, Economic Analysis of Rajendra Pusa Value-Added Millet Products, Nutritional Information of the value-added millet products in comparison with market available biscuits, Impact of value-added products of millets on income generation	I
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Table-1: Details of **EXTENSION PROGRAMMES** conducted for awareness creation**Table 1.1 Training Programs organized**

Trainings Programmes Organized: 48

No of beneficiaries: 1177

Training Programs organized	No of trainings	No of beneficiaries
Practising Farmers training imparted to the farm women on preparation of millet-based products from (2022 -till date)	23	547
Training on Preparation of Millets products for children was organized by SMS- Home Science, KVK, Piprakothi at Kuria Village, Chakia block for celebration of National Nutrition Month in International Year of Millets i. e 2023	12	214
Training provided to Jeevika Didi's	6	164
15 days skill training under ARYA on "Value Addition of Millets" was commenced by KVK Piprakothi in compliance to 100 days action plan and training was imparted to women of SHG groups on eve of Poshan Mah i. e September 2024.	1	36
Preparation of millet-based biscuits and incorporating them in schedule of the RAWWE and RHWE students(2022-2024)	6	216
Total	48	1177

Table 1.2 Awareness Programmes Organized

No of Awareness programmes: 10

No of beneficiaries: 1797

Programmes	No of beneficiaries
FSSAI licensed value added products of millets i.e Rajendra Pusa Gur Bajra Biscuit, Rajendra Pusa Madua Biscuit,Rajendra Pusa Sanwa Biscuit,Rajendra Pusa Jowar Namkeen and Rajendra Pusa Madua Ladoo were launched on inaugural day of "Atma nirbhar Krishi sah Baghbani Vistar evam Pashudhan Kalyan Mela-2024" in virtual presence of Shri Radha Mohan Singh sir, Hon'ble Member of Parliament, Motihari and Ex Minister of Agriculture and Farmers Welfare and with gracious presence of Dr Neelam Patel, Senior Advisor(Agriculture),NITI Aayog, Hon'ble Vice Chancellor, DRPCAUI, Pusa, Dr P S Pandey Sir. (2024)	1263(Women) termed as Mahila Kisan Mela
Awareness program on Importance of millets was conducted at KVK Piprakothi by participation farmers in Global Millets Conference on 18th March, 2023 addressed by Hon'ble Prime Minister in virtual mode.	128
Exhibition on various crop produce under natural farming practices along with processed products of different types of millets were displayed under Mission Life Programme conducted at KVK Piprakothi. 2023)	98
One day awareness campaign on "Millets for sustainable agriculture" was conducted under mission Life programme at village – Semra, East Champaran in due participation of farmers by KVK Piprakothi team (2023).	44
One day seminar on "Natural farming practices in crop production and Value addition of Millets" and lectures were delivered on value addition of millets in International Year of Millets i.e 2023.	78
Three days training on "Recipes development of Millets" for Sashastra Seema Troops of 6 battalions for the inclusion of Millets recipes in their daily diet chart was conducted by SMS- Home Science at KVK, Piprakothi in International Year of Millets i.e 2023.	66
Millet recipe contest was organized by KVK, Piprakothi among women in different villages of East Champaran such as Ramgarh-Mahuawa, Jamunia, Piprakothi etc in International Year of Millets i.e 2023.	78
Promotion of "Millet based value added products" was conducted through imparting training to the farm women on Poshan Mah by SMS Home Science in presence of Senior Scientist and Head, KVK Piprakothi and Shri Vikash Kumar, ADH East Champaran in September 2024.	42
Total	1770

Table-2: Comparative Pricing of Raw Millet Grains, Flour, and Processed Value-Added Products

Value added Product	Price of the millet Grains (Rs/kg)	Price of the millet Flour (Rs/kg)	Price of the processed products (Rs/kg)
Rajendra Pusa Gur Bajra Biscuit	42	140	800
Rajendra Pusa Madua Biscuit	55	120	600
Rajendra Pusa Sanwa Biscuit	120	200	600
Rajendra Pusa Jowar Namkeen	60	120	400
Rajendra Pusa Madua Ladoo	55	120	500

Table-3: Economic Analysis of Rajendra Pusa Value-Added Millet Products

Value added Product	Cost of Production (Rs/q)	Gross Return (Rs/q)	B:C Ratio
Rajendra Pusa Gur Bajra Biscuit	37,095	80,000	2.15
Rajendra Pusa Madua Biscuit	36,790	60,000	1.63
Rajendra Pusa Sanwa Biscuit	33,945	60,000	1.76
Rajendra Pusa Jowar Namkeen	16716	40000	2.39
Rajendra Pusa Madua Ladoo	32494	50000	1.53

Table-4: Nutritional Information of the value-added millet products in comparison with market available biscuits

Amount of nutrition per 100 gm	Rajendra Pusa Gur Bajra Biscuit	Rajendra Pusa Madua Biscuit	Rajendra Pusa Sanwa Biscuit	Rajendra Pusa Madua Ladoo	Market Available Refined Flour Biscuits
Protein(g)	6.58	6.095	6.064	5.14	6.5
Total fat(g)	35.829	19.44	20.831	5.92	12.5
Carbohydrate(g)	49.912	64.164	62.224	71.81	78.2
Calcium(mg)	68.45	81.215	35.57	247.5	-
Iron(mg)	4.72	1.951	2.423	3.32	-
Sodium(mg)	-	-	-	-	296
Dietary Fibre	4.8	14.4	29.4	21.6	-
Energy (Kcal)	544.865	457.785	459.625	542.82	451

Table-5: Impact of value-added products of millets on income generation

Value added product	Increase in Income of the entrepreneurs(%)
Rajendra Pusa Gur Bajra Biscuit	161.30
Rajendra Pusa Madua Biscuit	102.71
Rajendra Pusa Sanwa Biscuit	127.55
Rajendra Pusa Jowar Namkeen	141.66
Rajendra Pusa Madua Ladoo	70.79



Popular Article

Millets for Food and Nutritional Security

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ABSTRACT

Millets are a group of small-seeded cereal grains that are highly nutritious and drought-tolerant. They have been traditionally grown and consumed in many parts of the world, particularly in Asia and Africa. However, in recent years, there has been a decline in millet cultivation and consumption due to the shift towards more profitable and higher-yielding crops. This shift has led to a decrease in food and nutritional security for many communities that rely on millets for their livelihoods and food security. This paper aims to highlight the importance of millets for food and nutritional security and the potential benefits of promoting their cultivation and consumption. It will discuss the nutritional properties of millets, and their role in improving food security and reducing poverty. Additionally, the paper will also discuss the challenges and opportunities in promoting millet cultivation and consumption, and the need for policies and interventions to support the sustainable development of the millet sector. Millets are rich source of protein, fibre, micronutrients and vitamins besides energy and can contribute to the alleviation of iron (Fe), zinc (Zn) and protein malnutrition affecting women and preschool children. Proso Millets are known for drought tolerance and grown well in where soil, climate and other conditions are less favourable. The potential of millets is not yet exploited properly in India.

Keywords: Millets, Food, Nutrition, Health



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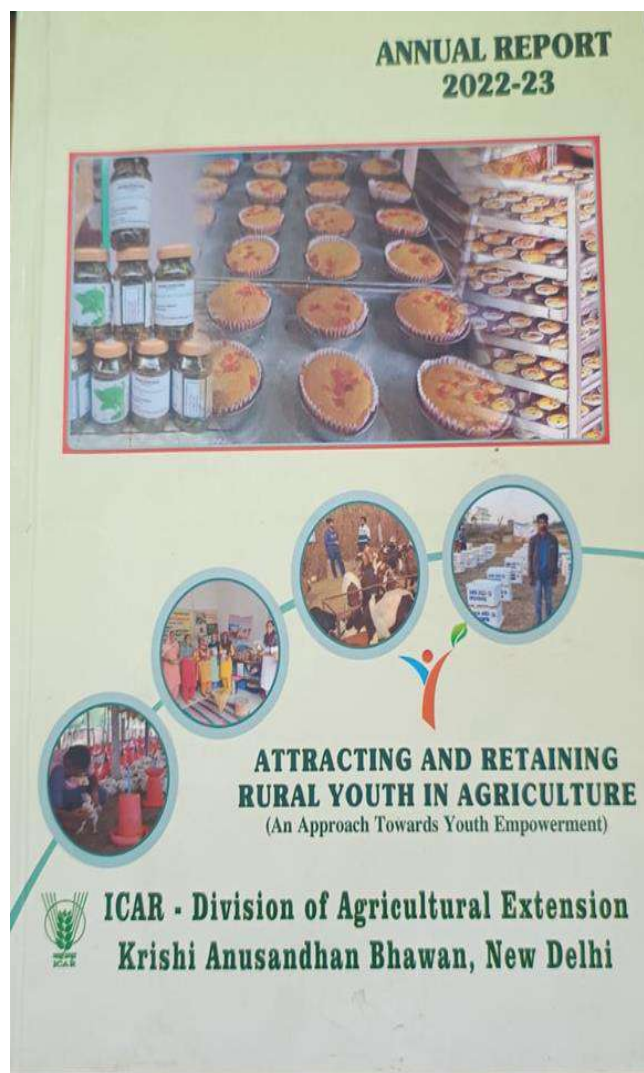
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Introduction

Millets, a family of cereal grasses, are annuals that produce extremely small seeds and flourish in the dry conditions typical of the peripheries of the world's temperate, subtropical, and tropical biomes. Cereal grains were the first plants cultivated for human consumption, and today their cultivation spans 131 nations. Millets are a staple food for the 59 million people who live in Asia and Africa. The first crops grown specifically for human consumption were cereal grains. As defined by the Food and Agriculture Organization, millet is "a group of annual grasses with small seeds that are farmed for their grain mostly on marginal lands in dry regions in temperate, subtropical, and tropical nations." *Ragi* (Finger millet), *Jowar* (sorghum), *Sama* (Little millet), *Bajra* (Pearl millet), and *Variga* (Proso millet) are only some of the millets that may be found in India (Fig. 1).

After India's request in 2018, the United Nations General Assembly proclaimed 2023 as the International Year of Millets. India's appeal was supported by the FAO (Food and Agriculture Organization). This was approved by a United Nations resolution that India submitted and that over 70 other countries voted in favour of.



Entrepreneur Success Story

ICAR - ARYA

Name of Entrepreneur : Mrs. Sabhya Devi
Address : Vill- Bathna, Block-Areraj, East Champaran
Age : 31 Yr.
Education : Intermediate

Impact analysis:

Particulars	Before start of ARYA	After adoption of ARYA (2022)
Name of enterprise	Processing (Kufri Ashoka)	Food Processing (Kufri Chipsona)
Size of enterprises (No. of bags/ beehives /fingerlings/ area etc.)	50 sq m	100 sq m
Individual Group	Gas stove, Gas Oven, Utensils	Potato Slicer, Potato Peeler, Boiler
Production (kg/No.)	Group	Group
Cost of Production /unit (Rs.)	2.26	18.4
Gross income (Rs. /year)	46,400	1,62,300
Net income (Rs. /year)	95,860	2,76,540
Marketing	49,460	1,14,240
Name of enterprise	Local Market	Different blocks including local market
No. of functional unit at start	: 01	
No. of functional unit at present	: 01	

Write up in brief:
 Sabhya Devi, was previously doing processing and value addition traditionally. During 2022 she along with group members received training of processing and value addition from KVK Piprakothi under ARYA project. She able to learn many new technical skills about slicing, peeling and frying and support of equipment like potato Peeler machine, potato slicer and potato variety Kufri Chipsona by KVK along with marketing tricks. Earlier she used to make pappads and ladoos but later with the help of the critical inputs they started making potato and banana chips. She earns a net income of Rs. 1,14,240/- on a yearly basis.

Activity related photograph:

View of Potato Chips Making

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खेती

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आई किसान

होने चाहिए) खेत में एक जुलुस मृग पलटने वाले हल से हल दो जुलाई कस्टोमैडर से करती चाहिए।

बीज दर एवं बोने की विधि

इसकी अच्छी पैदावार के लिए 4-6 कि.ग्र./हेक्टर बीज की आवश्यकता पड़ती है। बुआई को योर्टाहित से या हल के पीछे पंक्ति में बीज गिरकर बिछा जा सकता है। पंक्ति से पंक्ति की दूरी 22.5 से.मी. एवं बीजों से बीजों की दूरी 7.5 से.मी. होती चाहिए।

सुआई

इसके बोने का उपयुक्त समय मई से जुलाई महीने का होता है।

खाद एवं उर्वरक

इसकी अच्छी उपज के लिए 40 कि.ग्र. नाइट्रोजन, 20 कि.ग्र. फॉस्फोरस एवं 20 कि.ग्र. पोटाश प्रति हेक्टर की दर से उपलब्ध करना चाहिए। आधे भाग नाइट्रोजन को तथा पूरी मात्रा गुल कोपेस्ट एवं पोटाश को, फसल की बुआई करते समय बीज के पास से 4-5 से.मी. की दूरी पर बूझ बनाकर डालनी चाहिए। इसके अलावा इन क्षेत्रों में छिड़ककर मृदा में मिलाने चाहिए। जैविक एवं रासायनिक दोनों ही प्रकार की खाद इसके लिए उपयुक्त होती है। बुआई से पूर्व 100 कि.ग्र./हेक्टर पोषक की खाद देना लाभदायक है। नाइट्रोजन की एक चौथाई मात्रा बुआई के 30 दिनों बाद एवं शेष एक चौथाई मात्रा का बुआई के 50 दिनों बाद खड़ी फसल में छिड़कना करना चाहिए। नाइट्रोजन का प्रयोग वर्षा होने के बाद या हल्की सिंचाई के बाद करना चाहिए।

सिंचाई

यह वर्षा आधीत फसल है। इसमें प्रायः सिंचाई की आवश्यकता नहीं पड़ती है। वर्षा न होने पर दो हल्की सिंचाई की जा सकती है। पहली सिंचाई बुआई के 30 दिनों बाद एवं दूसरी सिंचाई बुआई के 50 दिनों बाद करनी चाहिए।

गिराई-गुड़ाई

बीज बोने के 20 दिनों बाद पलटो बार गिराई-गुड़ाई की जाती है। पंक्तियों में फसल बोने पर गिराई-गुड़ाई हल का हौंटा की जाती है। कुल मिलाकर दो गिराई-गुड़ाई पर्याप्त होती है।

पीछा संरक्षण

राजेन्द्र कौनी-1 में रोग एवं कीटों द्वारा कोई नुकसान नहीं होता है। इस कारण इसमें पीछा संरक्षण की आवश्यकता नहीं पड़ती है।

राजेन्द्र कौनी-1 है कंगनी की उत्कृष्ट किस्म

आशीष राय*, रवीश कुमार सिंह**, अरविन्द कुमार सिंह*** और अंशु गंगवार****

44 किसान को किसान एक बार फिर श्रीअन्न की खेती की ओर लौटने लगे हैं। इस कटौती में गांधी और खटौड़ में श्रीअन्न की फसल भी लहराएंगी। बीजे बर्ष, बीजेके परतीनी इला राजेन्द्र कौनी-1 का परीक्षण किया गया। अब से बीजे-बाद दशक पूर्व जिले के किसान बड़ी मात्रा में श्रीअन्न की खेती करते थे। उस समय बाजार उपलब्ध नहीं होने के कारण किसान इसकी खेती से विमुख हो गए। अब जब सरकार श्रीअन्न की खेती को बढ़ावा देने में जुटी है, तो किसान भी उत्साहक हुए हैं। राजेन्द्र कौनी-1 कंगनी की एक किस्म है। इसकी खेती में खाद व पानी की कम आवश्यकता पड़ती है एवं यह कम समय में पकने वाली फसल है, जो 80 दिनों में तैयार हो जाती है। 44

राजेन्द्र कौनी-1, कंगनी की यह किस्म किसानों के लिए उत्कृष्ट फसल के रूप में देखी जाने लगी है। कम समय में तैयार होने वाली यह फसल पोषण में भरपूर है। इसे आसरा में शामिल कर मिश्र खाद्य तैयार सकते हैं। कुचक इसका आसरा से उत्पादन कर सकते हैं।

खेत का धवन एवं तैयारी

इसकी अच्छी पैदावार के लिए इनकी योग्य मृदा वाली भूमि सर्वोत्तम रहती है। यह योग्य मृदा में जहां जल निकास का अच्छा

प्रबंध हो, पानी प्रसार से ठीक हो सकती है। इसे प्रसार मृदा में ही उगाया जा सकता है। मृदा में गनी धारण करने की अच्छी क्षमता

एकेश कौनी-1 को बीजब वल्लि किसान खेती • मई 2024 • 23



उन्नत तकनीकी : आत्मनिर्भर किसान


















डॉ राजेंद्र प्रसाद केन्द्रीय कृषि विश्वविद्यालय, पूसा, समस्तीपुर, बिहार
 कृषि विज्ञान केंद्र, पिपराकोटी, पूर्वी चम्पारण-1
 कृषि विज्ञान केंद्र, परसोनी, पूर्वी चम्पारण-11
 प्रसार शिवा भिदेरालय, पूसा, समस्तीपुर, बिहार

अध्याय-8

पोषक अनाज : मंडुआ (एल्यूमीन कोराकाना)

प्रज्ञा प्रियदर्शनी पंडा¹, अरविन्द कुमार सिंह¹, एन. बी. चनु², गायत्री कुमारी पांडी¹, नेहा पारीक¹, शीर्षत तेजस्विनी कपिल¹, नीलम कुमारी¹, आनंद कुमार¹ एवं मनीष कुमार¹
¹कृषि विज्ञान केंद्र, पीपराकोटी

²सामुदायिक विज्ञान महाविद्यालय, पूसा

डॉ० राजेंद्र प्रसाद, केन्द्रीय कृषि विश्वविद्यालय, पूसा, समस्तीपुर, बिहार

परिचय

इसे फिंगर बाजरा, अफ्रीकी फिंगर बाजरा, लाल बाजरा और रागी के रूप में जाना जाता है, घरेलू उद्देश्य के लिए इस्तेमाल किया जाने वाला सबसे पुराना भोजन और पहला अनाज है। फिंगर बाजरा मूल रूप से इथियोपियाई हाइलैंड्स का मूल है और लगभग 4000 साल पहले भारत में पेश किया गया था। इन्हें शुष्क मौसम में उगाया जा सकता है; यह गंभीर सूखे की स्थिति का सामना कर सकता है और उच्च ऊँचाई के अनुकूल हो सकता है। ये कम अवधि के होते हैं, 65 दिनों में कम से कम कटौत के लिए तैयार होते हैं और पूरे साल आसानी से उगाए जा सकते हैं। यह सभी मोटे अनाजों के बीच अधिक उगाई जाने वाली फसल है। यह अन्य सभी अनाजों की तुलना में प्रोटीन और खनिजों का समृद्ध स्रोत है। इसमें महत्वपूर्ण अमीनो एसिड होते हैं। इसमें कैल्शियम (344 मिलीग्राम) और फोस्फोरस (408 मिलीग्राम) की मात्रा सबसे अधिक होती है। यह कम हीमोग्लोबिन स्तर वाले व्यक्तियों के लिए फायदेमंद है क्योंकि यह आयरन का अच्छा स्रोत है।



भूमि की तैयारी

इसे विभिन्न प्रकार की मिट्टी में उगाया जा सकता है। अच्छी जल निकासी वाली काली मिट्टी को भी खेती के लिए उपयुक्त माना जाता है क्योंकि यह फसल कुछ हद तक जल भरव के लिए टिकाऊ होती है। मंडुआ की खेती के लिए जल भरव की समस्या वाली मिट्टी का उपयोग नहीं किया जाना चाहिए। मंडुआ की खेती के लिए साधारणतः तीन जुताई की जरूरत पड़ती है। खेत की पहली जुताई मोल्डबोर्ड हल से एवं दूसरी तथा तीसरी जुताई बैरा हल से करके मिट्टी को धुरधुरी कर लें। गोबर की मद्दी खाद या कम्पोस्ट (सम्भवतः बोवाई के तीन-चार सप्ताह पहले) लगभग 10 बिन्टल प्रति हेक्टेयर की दर से खेत में बिखेर दें ताकि वर्षा के पानी का जमाव खेत में कहीं भी न हो पावे।



उन्नत तकनीकी : आत्मनिर्भर किसान


















डॉ राजेंद्र प्रसाद केन्द्रीय कृषि विश्वविद्यालय, पूसा, समस्तीपुर, बिहार

कृषि विज्ञान केंद्र, पिपराकोठी, पूर्वी चम्पारण-1
कृषि विज्ञान केंद्र, परसौनी, पूर्वी चम्पारण-1
प्रसार शिक्षा निदेशालय, पूसा, समस्तीपुर, बिहार

अध्याप-20

श्री अन्न मंडुआ: एक "अनिश्चित" भविष्य के लिए एक "निश्चित" फसल

सुरज कुमार, अरविन्द कुमार सिंह, प्रज्ञा प्रियदर्शिनी पंडा, आनंद कुमार,
आशीष कुमार राय, अंशु मंगवार, मनीष कुमार, गायत्री कुमारी पांडी,
एन.बी. चानू, नेहा पारीक, शीर्षत तेजस्विनी कपिल, संस्कृति सिन्धु
कृषि विज्ञान केंद्र, पिपराकोठी
डॉ. राजेंद्र प्रसाद केन्द्रीय कृषि विश्वविद्यालय, पूसा, बिहार
बिहार कृषि विश्वविद्यालय, भागलपुर, सबौर

परिचय

मंडुआ (रागी) में कैल्शियम की मात्रा सर्वाधिक पायी जाती है जिसका उपयोग करने पर हड्डियाँ मजबूत होती हैं। रागी बच्चों एवं बूढ़ों के लिये उत्तम आहार हो सकता है। प्रोटीन, वसा, रेखा व कार्बोहाइड्रेट्स इन फसलों में प्रचुर मात्रा में पाये जाते हैं। महत्वपूर्ण विटामिन्स जैसे थायमीन, रियोफ्लेविन, नियासिन एवं आवश्यक अमीनो अम्ल की प्रचुर मात्रा पायी जाती है जोकि विभिन्न शारीरिक क्रियाओं के लिये आवश्यक होते हैं। रागी युक्त आहार कम ग्लाइसेमिक इंडेक्स वाला होता है। कैल्शियम व अन्य खनिज तत्वों की प्रचुर मात्रा होने के कारण ओस्टियोपोरोसिस से संबंधित बीमारियाँ तथा बच्चों के आहार (बेबी फूड) हेतु विशेष रूप से लाभदायक होता है। इसे फिंगर बाजरा, अक्षीकी फिंगर बाजरा, लाल बाजरा और रागी के रूप में जाना जाता है, धरेलू उद्देश्य के लिए इस्तेमाल किया जाने वाला सबसे पुराना मोजन और पहला अनाज है। फिंगर बाजरा मूल रूप से इथियोपियाई हाइलैंड्स का मूल है और लगभग 4000 साल पहले भारत में पेश किया गया था। इन्हें शुष्क मौसम में उगाया जा सकता है। रागी सूखे की स्थिति का सामना कर सकता है और उच्च ऊँचाई के अनुकूल हो सकता है। ये कम अवधि के होते हैं, 65 दिनों में कम से कम कटाई के लिए तैयार होते हैं और पूरे साल आसानी से उगाए जा सकते हैं। यह सभी मोटे अनाजों के बीच अत्यधिक उगाई जाने वाली फसल है। यह अन्य सभी अनाजों की तुलना में प्रोटीन और खनिजों का समृद्ध स्रोत है। इसमें महत्वपूर्ण अमीनो एसिड होते हैं। इसमें कैल्शियम (344 मिलीग्राम) और फोस्फोरस (408 मिलीग्राम) की मात्रा सबसे अधिक होती है। यह कम हीमोग्लोबिन स्तर वाले व्यक्तियों के लिए फायदेमंद है क्योंकि यह आयरन का अच्छा स्रोत है।

भूमि की तैयारी

- इसे विभिन्न प्रकार की मिट्टी में उगाया जा सकता है, जिसमें समृद्ध दोमट से लेकर अच्छे कार्बनिक पदार्थ वाली खराब उथली ऊपरी भूमि शामिल है।

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उत्तराखण्ड की आत्मनिर्भर किसान
पूसा समस्तीपुर, 2024



उन्नत तकनीकी : आत्मनिर्भर किसान



डॉ राजेंद्र प्रसाद केन्द्रीय कृषि विश्वविद्यालय, पूसा, समस्तीपुर, बिहार

कृषि विद्यालय केंद्र, पिपराकोटी, पूर्वी चम्पारण-1

कृषि विद्यालय केंद्र, परसोनी, पूर्वी चम्पारण-11

प्रसार शिवा निदेशालय, पूसा, समस्तीपुर, बिहार

अध्याय-30

मूल्य संवर्धन : कृषि क्षेत्र में बरदान

प्रज्ञा प्रियदर्शिनी पंडा, अरविन्द कुमार सिंह, गायत्री कुमारी पाद्री, एन.बी. चानू,
नेहा पारीक, मनीष कुमार, शीर्षत तेजस्विनी कपिल, नीलम कुमारी,
आनंद कुमार एवं सूरज कुमार
'कृषि विज्ञान केंद्र, पिपराकोटी
'सामुदायिक विज्ञान महाविद्यालय, पूसा
डॉ. राजेंद्र प्रसाद केन्द्रीय कृषि विश्वविद्यालय, पूसा
'बिहार कृषि विश्वविद्यालय, सबौर, भागलपुर

कृषि उत्पाद का मूल्य संवर्धन:

कृषि भारतीय अर्थव्यवस्था की रीढ़ है और मले ही पिछले 60 वर्षों में बड़े पैमाने पर औद्योगीकरण हुआ है, कृषि अभी भी महत्वपूर्ण स्थान रखती है। कृषि हमें कम्पेडिशन खाद्य सुरक्षा प्रदान करने में सक्षम है, लेकिन फिर भी पोषण सुरक्षा प्रदान करने में विफल रही है।

मूल्यवर्धन पोषण सुरक्षा के महत्वपूर्ण घटकों में से एक है। कभी-कभी अधिशेष उत्पादन बाजार में उपज की कम कीमत का कारण होता है। समस्या को हल करने का एक तरीका फसल विविधीकरण है जो एक व्यवहार्य बाजार प्रणाली के लिए जिम्मेदार है, अधिक कमाने का अवसर पैदा करता है और साथ ही पोषण सुरक्षा की दिशा में एक मजबूत कदम है।

मूल्य वर्धित कृषि का तात्पर्य विशेष उत्पादन प्रक्रिया के माध्यम से किसी वस्तु के आर्थिक मूल्य में वृद्धि करना भी हो सकता है, उदाहरण के लिए, जैविक उत्पाद, या क्षेत्रीय ब्रांडेड उत्पादों के माध्यम से जो उपभोक्ता अपील और समान लेकिन विनोदित उत्पादों पर प्रीमियम का भुगतान करने की इच्छा को बढ़ाते हैं। कुछ लोग मूल्यवर्धित कृषिको एक महत्वपूर्ण ग्रामीण विकास रणनीति मानते हैं।

छोटे पैमाने की प्रसंस्करण इकाई, जैविक खाद्य प्रसंस्करण, गैर-पारंपरिक फसल उत्पादन, कृषि-पर्यटन और जैव-ईंधन विकास विभिन्न मूल्य वर्धित परियोजनाओं के उदाहरण हैं जिन्होंने कुछ ग्रामीण क्षेत्रों में नए रोजगार पैदा किए हैं।

कृषि में आजकल खाद्य प्रसंस्करण से अच्छी आमदनी लिया जा सकता है क्योंकि धीरे-धीरे भारतीय समाज व्यावसायिकता की ओर आकर्षित हो रहा है। युवा पीढ़ी अब कृषि की ओर कम और बहुराष्ट्रीय कंपनियां में अपना भविष्य अधिक खोजती है। अतः आवश्यकता, और आमदानी दोनों परिवर्तित हो रहे हैं। किसान नाइसों के लिए यह सुनहरा मौका है जब प्रसंस्करण और मूल्य संवर्धित उत्पादों की मांग बाजार में बढ़ रही है तो अपने कृषि उत्पादों का प्रसंस्करण कर के ऊँचे दानों में बेच सकते हैं।



उन्नत तकनीकी : आत्मनिर्भर किसान

अरविन्द कुमार सिंह
रामबाबू शर्मा
मायत्री कुमारी पायी
नेहा पारीक
मनीष कुमार

आनन्द कुमार
आशीष राय
शीर्षत तेजस्विनी कपिल
एन.बी. बनू
प्रकाश प्रियदर्शनी पंडा
अंशु मंगसार










डॉ. राजेन्द्र प्रसाद केंद्रीय कृषि विश्वविद्यालय, पुरा, समस्तीपुर, बिहार- 848125

अध्याय-3

बदलते मौसम में किसानों के लिए श्री अन्न एक उत्तम विकल्प

सतीश कुमार सिंह¹, एम एस साई रेड्डी², अरविन्द कुमार सिंह³ एवं आशीष राय⁴
¹पौधा प्रजनन विभाग, डा० राजेन्द्र प्रसाद केंद्रीय कृषि विश्वविद्यालय, पुरा
²कृषि विज्ञान केंद्र, परासी में पूर्वी घम्वारण-III, बिहार
³डा० राजेन्द्र प्रसाद, केंद्रीय कृषि विश्वविद्यालय, पुरा, समस्तीपुर, बिहार

मोटे या लघु धान्य या कदन्न या मिलेट को आम भाषा में मौदा अनाज कहा जाता है। इस समूह में छोटे-छोटे परन्तु पौष्टिक दाने वाली कई फसलें शामिल हैं। ये सभी धान्य फसलों की तरह ग्रेमनी परिवार के सदस्य हैं। इनके पोषक गुण चावल एवं गेहूं से उत्तमतर पाये गये हैं इनके दानों में प्रोटीन फाईबराइडेट, वसा तथा प्रचुर मात्रा में खनिज पाये जाते हैं। आयरन, कैल्शियम, कॉस्मोरस, जिंक विटामिन 'ए' एवं 'बी' भी अन्य सभी धान्य फसलों से ज्यादा मात्रा में पाये जाते हैं। इनमें लाइसिन नामक अमीनो अम्ल प्रचुर मात्रा में पाया जाता है जो कि मानव पोषण के लिए अति आवश्यक होता है। इनके अंकुरित बीजों से मानव बनाते हैं जो कि शिशु आहार तैयार करने के काम आता है। इसमें अधिक मात्रा में रेशा पाया जाता है जिससे यह मधुमेह के रोगियों के लिए ये उत्तम आहार है। दाने का प्रयोग मोजन एवं औद्योगिक रूप में भी किया जाता है। दाने को पीसकर आटा तैयार करके रोटी बनायी जाती है और दाने को चबाकर कर भी खाया जाता है। दाने से उत्तम गुणों वाली भाराब भी तैयार की जाती है। पहाड़ी क्षेत्रों के लोगों का यह मूल मोजन है इससे कैक, बिस्कुट, पुडिंग व मिठाईयाँ आदि बनाये जाते हैं। इस फसलों की खेती से दाने के साथ-साथ जानवरों के लिए चारा भी प्राप्त होता है। वर्तमान समय में लघु धान्य समूह के फसलों का क्षेत्रफल बिहार में बहुत कम हो गया है यह लगभग दस हजार हैक्टेयर है, जिसे बढ़ाने की आवश्यकता है। लघु धान्य समूह के फसलों में से बिहार में लगाये जाने वाले मुड़वा, साबा, कोनी एवं बीना है। मुड़वा, साबा एवं कोनी मुख्यतः खरीक में तथा बीना गरमा में लगाया जाता है। प्रतिकूल परिस्थितियों से लड़ने की अपार क्षमता मिलेट में होता है जिससे इन फसलों को योद्धा अनाज भी कहा जा सकता है। आज के समय में जबकि वर्षा कम एवं असमान्य हो रही है, तापमान ज्यादा हो रही है, कदन्न फसलें लगाये जा सकते हैं क्योंकि कदन्न फसलों में प्रतिकूल परिस्थितियों से लड़ने की अपार क्षमता है जो निम्न प्रकार है:

- ➔ कदन्न फसलें किसी भी प्रकार के मृदा में उगायी जा सकती हैं। इन्हें कंकरीली, पथरीली, दोआब एवं उरार मृदा में भी उगाया जा सकता है।
- ➔ कदन्न फसलें खरीफ में उगायी जाती हैं जिसमें सिंचाई की आवश्यकता बहुत ही कम होती है।
- ➔ कदन्न फसलों में अन्य फसलों के अपेक्षा चर्वरको की आवश्यकता आधे से भी कम होती है।
- ➔ कदन्न फसलों में रोग एवं कीटों द्वारा बहुत ही कम नुकसान होता है तथा मण्डारण के दौरान कोई नुकसान नहीं होता है।

Annexure-VI



Form C
Government of Bihar
Department Of Health and Family Welfare
Food Safety and Standards Authority of India
License under FSS Act, 2006



अनुज्ञापि संख्या / License Number: 10423070000279

1. Name & Registered Office address of Licensee / अनुज्ञापित के पंजीकृत कार्यालय का नाम और पता:

2. Address of Authorized Premises / प्राधिकृत परिसर का पता:

3. Kind of Business / कारोबार का प्रकार:

4. Dairy Business Details / डेयरी कारोबार विवरण हेतु:

5. Category of License / अनुज्ञापि का वर्ग:

FOOD PROCESSING UNIT, KRISHI VIGYAN KENDRA, DRPCAUI
 KRISHI VIGYAN KENDRA, VILL-PIPRAKOTHI, BLOCK-PIPRAKOTHI, Purba Champaran, Bihar-845429

KRISHI VIGYAN KENDRA, VIII-PIPRAKOTHI, BLOCK-PIPRAKOTHI, Areraj, Purba Champaran, Bihar-845429

Manufacturer - General Manufacturing
 Trade/Retail - Distributor
 Trade/Retail - Retailer

No

State License

This license is granted under and is subject to the provisions of FSS Act, 2006 all of which must be complied with by the licensee. / यह अनुज्ञापि कक्षा संख्या और पालन अधिनियम, 2006 के अंतर्गत अनुज्ञापि की गई है और यह अधिनियम के प्रावधानों के अनुरूप है जिसका अनुज्ञापित द्वारा कठन पालन किया जाना चाहिए।

Place / स्थान: Purba Champaran

Issued On / दिनांक: 30-08-2023 (New License)

Valid Upto: / वैधता: 29-08-2024 (For details, refer Annexure)

Designated Officer

Date: 30-08-2023 15:15:51

User Id: 100593

Verified through Mobile: 9900000022

License Grant on: 30-08-2023 11:13:18

License Issued On: 30-08-2023 15:15:51



Form C
Government of Bihar
Department Of Health and Family Welfare
Food Safety and Standards Authority of India
License under FSS Act, 2006



अनुज्ञापि संख्या / License Number: 10423070000279

Product Annexure

Kind Of Business: Manufacturer - General Manufacturing

Production Capacity(MT / Day): 1

Sl.No.	Food Category	Sub-Food Category	Product	Kind of Business
1	05 - Confectionery	05.2 - Confectionery including hard and soft candy, nougats, etc. other than food categories 5.1, 5.3, and 5.4	Sugar boiled confectionery (Soft Candy) [05.2.2]	Manufacturer - General Manufacturing
2	07 - Bakery products	07.2 - Fine bakery wares (sweet, salty, savoury) and mixes	Biscuit [07.2.1]	Manufacturer - General Manufacturing
3	06 - Cereals and cereal products, derived from cereal grains, from roots and tubers, pulses, legumes and pith or soft core of palm tree, excluding bakery wares of food category 7.0	06.2 - Flours and starches (including soybean powder)	Mixed Millet Flour [6.2.1]	Manufacturer - General Manufacturing
4	06 - Cereals and cereal products, derived from cereal grains, from roots and tubers, pulses, legumes and pith or soft core of palm tree, excluding bakery wares of food category 7.0	06.2 - Flours and starches (including soybean powder)	Wheat Flour (Atta) and Resultant Wheat Flour (Resultant Atta) [06.2.1]	Manufacturer - General Manufacturing
5	06 - Cereals and cereal products, derived from cereal grains, from roots and tubers, pulses, legumes and pith or soft core of palm tree, excluding bakery wares of food category 7.0	06.2 - Flours and starches (including soybean powder)	Besan [06.2.1]	Manufacturer - General Manufacturing

राधा मोहन सिंह
संसद सदस्य (लोक सभा)
सभापति
स्वास्थ्य संबंधी स्थायी समिति
सदस्य
रेल मंत्रालय परामर्शदात्री समिति
पूर्व केन्द्रीय कृषि मंत्री, भारत सरकार



संघीय लोक

Radha Mohan Singh
Member of Parliament
Chairperson
Standing Committee on Defence
Member
Consultative Committee on Ministry of Railways
Former Agriculture Minister, Govt. of India
दिनांक 11 जनवरी, 2025

प्रशंसा पत्र

कृषि विज्ञान केंद्र, पिपराकोठी जिले के किसानों के उत्थान के लिए लगातार प्रयासरत रहा है। आपका प्रयास न केवल पारंपरिक खाद्य प्रणालियों को पुनर्जीवित कर रही है, बल्कि टिकाऊ कृषि और ग्रामीण आजीविका में भी महत्वपूर्ण योगदान दे रही है। इसी दिशा में, आपके द्वारा श्री अन्न के मूल्य संवर्धन को बढ़ावा देने और मजबूत करने में कृषि विज्ञान केंद्र (KVK) का सराहनीय प्रयास प्रशंसनीय है।

मुझे यह जानकारी अपार हर्ष हो रहा है कि के.वी.के. के द्वारा श्री अन्न के खेती पर जोर दिया जा रहा है एवं श्री अन्न के मूल्य संवर्धन पर ध्यान केंद्रित करते हुए, इसके परिसर में स्थापित खाद्य प्रसंस्करण इकाई में 57 प्रकार के उत्पादों जैसे राजेन्द्र पूसा बाजरा बिस्किट, राजेन्द्र पूसा महुआ बिस्किट, राजेन्द्र पूसा संता बिस्किट, राजेन्द्र पूसा ज्वार नमकीन, राजेन्द्र पूसा महुआ लाडू इत्यादि मूल्यवर्धित उत्पादों को बनाया जा रहा है एवं इन उत्पादों को बनाने के विषय पर प्रशिक्षण कार्यक्रमों के माध्यम से किसानों, कृषि उत्पादक संगठनों और स्वयं सहायता समूहों को प्रशिक्षित किया जा रहा है। के.वी.के. द्वारा विकसित श्री अन्न मूल्य श्रृंखला उद्यमिता मॉडल ने कई कृषि उत्पादक संगठनों और स्वयं सहायता समूहों को सशक्त बनाने की दिशा में अकल्पनीय योगदान दिया है।

आपके कार्यों ने किसानों और महिलाओं के बीच श्री अन्न के पोषण और स्वास्थ्य लाभों को लोकप्रिय बनाने में भी महत्वपूर्ण भूमिका निभाई है, जिससे उन्हें दैनिक जीवन के आहार में किसी ना किसी रूप में शामिल किया जा रहा है। आपका यह प्रयास सतत खाद्य प्रणालियों पर वैश्विक जोर के अनुरूप भारत सरकार की पहल के साथ पूरी तरह सामंजस्य स्थापित कर रहा है।

के.वी.के. द्वारा एक मजबूत बाजरा मूल्य श्रृंखला बनाने में प्रदर्शित समर्पण और दूरदर्शिता अत्यधिक प्रशंसा के योग्य है। आपके सहयोग से न केवल किसानों की आर्थिक स्थिति में सुधार हुआ है, बल्कि पारिस्थितिक संतुलन और खाद्य सुरक्षा में भी योगदान मिला है। कृपया अपनी टीम को उनकी कड़ी मेहनत और प्रतिबद्धता के लिए मेरा आभार व्यक्त करें। मुझे विश्वास है कि के.वी.के. किसानों के बीच सकारात्मक प्रभाव डालना जारी रखेगा और उनको को भी ऐसा करने के लिए प्रेरित करेगा।

आपके अमूल्य योगदान के लिए एक बार फिर धन्यवाद।

(राधा मोहन सिंह)
(राधा मोहन सिंह)

OFFICE, DISTRICT AGRICULTURE OFFICER,
EAST CHAMPARAN, MOTIHARI

Joint Agriculture Campus, Chhatauni, Motihari – 845401

Mobile No – 9431818741

E-Mail Id – dao-mot-bih@nic.in

Memo No.36.....

Date 02.01.2025

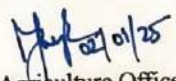
Certificate of Appreciation

I am writing to express my sincere appreciation for your remarkable efforts of Krishi Vigyan Kendra, Piprakothi in successfully implementing the **Millet Value Chain Entrepreneurship Model** in this district at the outset of 'International Year of Millets'. Your dedication to the production and promotion of millet-based value-added products has not only showcased the nutritional benefits of millets but has also created a significant impact on socio-economic framework of the farmers and farm women in the East Champaran district.

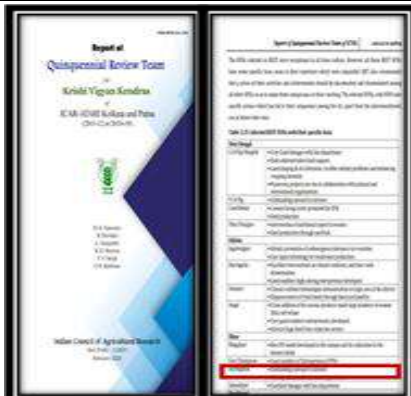
This decentralized millet value chain model inculcated the production, promotion and development of the skills in the field of value-added products of millets through the Food Processing Unit of KVK Piprakothi. The Food Processing Unit of KVK Piprakothi acts as a skill development hub for the entire district and stands as a pioneer for production and promotion of millet-based value-added products. It has also obtained FSSAI License for 57 value-added products.

I would also like to emphasize the important role this Millet Value Chain Entrepreneurship Model has played in enhancing the livelihoods of farm women in our district. By providing them with a means to generate income, your initiatives have created higher returns and improved the overall quality of life for many families. The successful mobilization and training of the farmers, farm-women, SHGs, FPOS and the Jeevika personnel of East Champaran district has led to development of successful entrepreneurs which is truly inspiring.

Thank you once again for your outstanding contributions and efforts toward creating a healthier and sustainable community through the Millet Value Chain Entrepreneurship Model. Your work is an exemplary demonstration of innovation, dedication, and impactful change, and I look forward to seeing the continued success of your initiatives in East Champaran.


District Agriculture Officer
East Champaran, Motihari

Annexure-VIII

Awards received	Year	Photo
Pandit Deen Dayal Upadhyay Rashtriya Krishi Vigyan Protsahan Puraskar 2016-17 (Zonal) by ICAR	2017	
Recognition by QRT team for establishment of good numbers of Entrepreneurs & FPOs	2019	
Pandit Deen Dayal Upadhyay Rashtriya Krishi Vigyan Protshahan Puraskar” (National), ICAR, New Delhi	2021	

Certificate of Honour for best work in ARYA project, ICAR-ATARI, Zone-IV, Patna, Bihar	2022	
Sarvottam Krishi Vigyan Kendra Purasakar, RPCAU, Pusa, Samastipur, Bihar, 2022	2022	
Best performer award under the category Fund Mobilization (Convergence)-2022 during VIth Annual Zonal Workshop of KVKs at RKMA, Ranchi by ICAR-ATARI Zone-IV, Patna, Bihar	2023	
News Nation Excellence Awards during News Nation Conclave at Motihari, East Champaran, Bihar	2023	

4 farmers awarded as Millionaire farmer by ICAR 1.Rajesh Yadav 2.Ravindra Singh 3.Zainab Begum (Mushroom Value Addition) 4.Dheeraj Mishra	2023	
Third Position in Best Stall Award for KVKs at Kishan Mela, DRPCAUI, Pusa	2025	
Best Stall Award at First National Seminar on Agri-diversification and Eco-Regional Farming organized by ICAR-MGIFRI	2025	

Annexure-IX



Training Programmes Organized



Different millet-based recipes presented in the millet contest



Preparation of millet-based biscuits



Glimpse of Visit of different dignitaries and farmers to Food Processing Unit



Glimpse of Promotion of the products in different Kisan Melas and gatherings

