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## 6. Funding Scheme for Establishment of Millets Processing Unit

### **Abstract:**

*In the pursuit of transforming agricultural landscapes and fostering sustainable food systems, India stands at the forefront of a visionary movement focused on millet processing. While challenges, including machinery inefficiencies and gluten-free product diversification, underscore the complexity of this endeavor, strategic national initiatives such as INSIMP, PLISFPI, and PMFME are shaping a comprehensive response. These schemes not only address immediate processing issues but also signal a paradigm shift in the perception and utilization of millets.*

*The establishment of incubators like Nutrihub-TBI and Centers of Excellence on millets signifies a commitment to technological innovation and scalability, creating an ecosystem where startups and research institutions collaborate for transformative outcomes. Regional commitments, exemplified by Rajasthan's Centre of Excellence, amplify the momentum towards large-scale millet promotion. Against the backdrop of the International Year of Millets 2023, India's dedication to global millet prominence is evident, highlighting these ancient grains as key players in sustainable food movements worldwide. The budgetary allocations further solidify this commitment, fostering domestic millet production and supporting start-ups, creating a robust framework for quality maintenance and quantity increase in millet processing. As millets reclaim their status as nutritional powerhouses, the journey towards establishing millet processing units emerges not just as an economic pursuit but as a holistic commitment to revitalizing agriculture, preserving biodiversity, and securing the nutritional well-being of communities on a global scale.*

### **Keywords:**

*Millet Processing, Indian Agricultural Initiatives, National Schemes, Technological Innovation in Agriculture, International Year of Millets 2023.*

### **6.1 Introduction:**

Global food security has been increasingly narrowing down to a handful of crops. Just three grains, maize, wheat and rice meet over 50% of the global requirement for proteins and calories. Only 150 crops are commercialized on a significant global scale, while humankind over time, had used more than 7,000 edible species.

The narrowing base of global food security is limiting livelihood options for the rural poor, particularly in marginal areas. Addressing their needs requires that we broaden the focus of research and development to include a much wider range of crop species, as one of the options. Minor millets, a group of small-grained grass cereals, are of importance as food and fodder in the semi-arid regions of the world (Mall *et al*, 2016) Millets are the most viable option in the dryland conditions as they require minimum water and can withstand in adverse weather conditions. These crops were cultivated in wide ranges of climatic

conditions and marginal conditions of soil and moisture. In India, minor millets have traditionally been cultivated in the drylands from ancient times, predominantly by poor and marginal farmers and in many cases by tribal communities.



**Figure 6.1: Scheme for Formalization of Micro Food Processing Enterprises**

Difficulty in processing is the key challenge that hinders consumer demand and upscaling potential for minor millets. Several interventions can be made to facilitate access by value chain actors to processing plants on the one end and by consumers to processed millet products on the other. The lack of suitable processing units close to millet fields forces local producers to take their produce to distant places. More specifically, there is a critical need to optimize technology for de-hulling of different small millet species, which have different seed sizes. More research is needed for improving the separation mechanism in hullers to reduce removal of grits and other usable materials along with the husk. Improving the sieving efficiency of graders is also needed. Large-scale equipment is available for this operation but equipment tailored for the community level and the small and medium enterprise level is needed and would be most relevant for supporting development of farmer enterprises.

In the intricate tapestry of global agriculture, where vast swaths of land are dedicated to the cultivation of a limited set of crops, the narrative of food security is at a crossroads. This chapter delves into the profound challenges and transformative opportunities inherent in the establishment of millet processing units—a nuanced exploration that extends far beyond the boundaries of sustenance to touch upon economic development, environmental sustainability, and the preservation of cultural agricultural heritage. Our world, with its burgeoning population, has come to rely heavily on just three grains—maize, wheat, and rice—to satiate over 50% of the global requirement for proteins and calories. The dominance of these crops, while instrumental in addressing hunger on a massive scale, has inadvertently contributed to the narrowing of agricultural diversity. In a historical context, humankind has cultivated and consumed more than 7,000 edible species, each carrying a unique genetic and nutritional heritage. The stark contrast between the richness of our

agricultural history and the modern-day reliance on a handful of crops underscores the urgent need to reassess our approach to food security. In the midst of this paradigm, minor millets emerge as a group of small-grained grass cereals that hold significant promise, particularly in semi-arid regions around the world. Traditionally cultivated in the drylands of India, these millets—sorghum, finger millet, pearl millet, foxtail millet, proso millet, and barnyard millet—have demonstrated remarkable resilience to adverse weather conditions. Their ability to thrive with minimal water requirements positions them as a sustainable alternative in the face of climate change and water scarcity, offering a lifeline for marginalized farmers and tribal communities.

However, the latent potential of minor millets faces a considerable bottleneck in the form of processing challenges. The efficiency of current machinery in millet processing is marred by factors such as low recovery rates, morphological differences among millet species, and the cumbersome task of husk separation. To fully realize the benefits of minor millets, a concerted effort is required to optimize processing technologies, enhance de-hulling mechanisms, and develop equipment tailored for community-level and small to medium-sized enterprises.

Challenges in millet processing extend beyond machinery inefficiencies. Issues such as the gelatinization of starch, lack of comprehensive data on processing technologies' impact on nutritional characteristics, and the exploration of physiologically active bio compounds in millets add layers of complexity to the quest for efficient and sustainable millet processing.

Recognizing the significance of minor millets in ensuring global food security, various initiatives and schemes have been implemented at the national and state levels in India. The "Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP)," launched in 2012 as part of the Rashtriya Krishi Vikas Yojana (RKVY), allocates funds to advance millet harvest technology and increase productivity in inefficient areas.

The Production Linked Incentive Scheme for Food Processing Industry (PLISFPI) incentivizes the manufacturing of millet-based foods and other major food product segments. The Pradhan Mantri Formalization of Micro food processing Enterprises (PMFME) scheme focuses on enhancing the competitiveness of microenterprises in the food processing industry, supporting Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), and Producers Cooperatives. State-level efforts adopting the One District One Product (ODOP) approach, as seen in Karnataka (Davanagere) and Telangana (Mahbubnagar), aim to leverage the benefits of millets at a regional level. The establishment of the Nutrihub-Technology Business Incubator (TBI) in 2017 at ICAR- IIMR, Hyderabad, with financial support from DST and RKVY-RAFTAAR, showcases a commitment to nurturing millet-based startups with technology support, mentoring, capacity building, financial support, marketing facilitation, and infrastructure support (Sood *et al.*, 2023).

Additionally, Centers of Excellence on millets have been established in various regions to develop and disseminate value-added technologies. With the recent announcement of a Centre of Excellence on millets in Rajasthan and budgetary allocations for post-harvest value addition, consumption, branding of millet products, funds for start-ups, and support for Farmer Producer Organizations, the momentum for millet promotion continues to grow.

Recognizing the potential of millet processing units as engines of economic growth and instruments of sustainable agriculture, this chapter will explore the multifaceted landscape of challenges, initiatives, and funding opportunities surrounding the establishment of millet processing units. From technological advancements to policy interventions, community participation, and the role of various stakeholders, we aim to illuminate the path towards a resilient, diverse, and secure global food future. The pages that follow will navigate through the intricacies of millet processing, delving into the technical nuances, policy frameworks, and community-driven endeavors that collectively shape the narrative of millets as a cornerstone of sustainable agriculture and food security.

## **6.2 Challenges in Millet Processing:**

### **A. Low Machinery Efficiency:**

The existing millet processing machinery exhibits suboptimal efficiency, recovering only 70–80% of the grain, leaving a significant portion as un-hulled or broken grains. This inefficiency poses a direct challenge to maximizing the yield and economic viability of millet processing.

### **B. Diverse Morphological Features:**

Millets encompass a variety of species, each with distinct morphological features such as size, shape, husk content, and nature. The inadequacy of a one-size-fits-all dehuller unit complicates processing, necessitating tailored solutions to accommodate the diversity in millet characteristics.

### **C. Husk Separation Challenges:**

The process of separating husk from millets poses logistical challenges, leading to spillage and contamination throughout the working station. This issue not only compromises the quality of the final hulled output but also increases the operational complexities and costs.

### **D. Impeller Speed Impact:**

The efficiency of millet de-hulling is significantly influenced by impeller speed. Lack of control over the working speed of machines hampers the precision required for optimal de-hulling, necessitating the incorporation of mechanisms to regulate impeller speeds for improved processing outcomes.

### **E. Gluten Absence and Product Diversification:**

Millets, devoid of gluten, present a challenge in the production of certain products like bread and buns. While hydrothermal treatment and extrusion are employed for value addition, achieving the desired texture and structure in gluten-free products remains a persistent challenge, particularly when attempting to create 100% millet-based alternatives.

## **F. Data Deficiency on Processing Effects:**

The absence of comprehensive data on the impact of various processing technologies on the nutritional characteristics of millets poses a hindrance. A lack of a well-defined framework for identifying the best processing technologies restricts efforts to enhance nutrient availability and reduce anti-nutritional contents, impeding progress in optimizing millet processing.

## **G. Exploration of Physiologically Active Compounds:**

A notable challenge lies in the limited understanding of physiologically active bio compounds in millets, both in their raw state and after processing. Polyphenols, antioxidant capacity, and the exploration of medical benefits, such as anti-inflammatory properties, remain areas where comprehensive research is needed to unlock the full potential of millets as prebiotic and probiotic sources.

## **6.3 Important Initiatives and Schemes Undertaken to Promote Production Processing and Value Addition of Millets in India:**

India has undertaken several crucial initiatives and schemes to promote the production, processing, and value addition of millets, recognizing their significance in ensuring nutritional security, economic development, and sustainable agriculture.

These initiatives encompass a comprehensive approach, involving technological advancements, financial support, and integration with supply chains.

### **A. Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP):**

Launched in 2012 under the Rashtriya Krishi Vikas Yojana (RKVY), INSIMP allocated Rs. 300 crores to advance equipment and technology related to millet harvest (Rao *et al.*, 2021)

The scheme aimed to showcase improved production and post-harvest technologies to catalyze increased millet production. It also emphasized processing and value addition techniques to generate consumer demand for millet-based food products.

### **B. Production Linked Incentive Scheme for Food Processing Industry (PLISFPI):**

This scheme focuses on creating global food manufacturing champions, promoting Indian food product brands, increasing employment opportunities, ensuring remunerative prices for farm produce, and incentivizing the manufacturing of major food product segments.

Millet-based foods fall under the incentivized categories, and support is extended for branding and marketing to foster the emergence of strong Indian brands.

### **C. Pradhan Mantri Formalization of Micro Food Processing Enterprises (PMFME) Scheme:**

Launched under the Atmanirbhar Bharat Abhiyan, PMFME is implemented in 35 States and Union Territories. It aims to enhance the competitiveness of existing micro food processing enterprises, promote formalization of the sector, and support Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), and Producers Cooperatives along their entire value chain. The scheme adopts the One District One Product (ODOP) approach, with millets being part of the ODOP scheme in specific regions like Davanagere (Karnataka) and Mahbubnagar (Telangana).

### **D. Nutrihub-Technology Business Incubator (TBI):**

Established in 2017 at ICAR-IIMR, Hyderabad, Nutrihub-TBI aims to strengthen and support the millet-based startup ecosystem. With financial support from DST and RKVY-RAFTAAR, it provides technology support, mentoring, capacity building, financial support, marketing facilitation, and infrastructure support for more than 200 millet-based startups involved in manufacturing value-added products through various processing lines.

### **E. Centers of Excellence (CoE) on Millets:**

The Department of Agriculture and Farmers' Welfare has supported the establishment of three CoEs on millets at IIMR, Hyderabad; CCSHAU, Hisar; and UAS, Bengaluru. These CoEs have developed numerous value-added technologies, including processing machinery standardization and retrofits. IIMR, in particular, has contributed significantly with 70 plus value-added technologies and processing machineries.

### **F. Centre of Excellence on Millets in Rajasthan:**

The recent budget announcement by the state of Rajasthan includes the establishment of a Centre of Excellence on millets, encompassing around 100 millet processing plants. This signifies a commitment to promoting millet cultivation, processing, and value addition on a large scale.

### **G. Budgetary Allocations for Millet Promotion:**

The allocation of funds for post-harvest value addition, consumption, branding of millet products, support for start-ups in agriculture and rural enterprises, and assistance to FPOs underscores the commitment to boosting domestic millet production. These efforts align with the global focus on millets in the wake of the International Year of Millets 2023 (IYoM). In addition to these national initiatives, specific agencies and schemes can be instrumental in promoting the establishment of millet processing units in new areas, such as Jammu and Kashmir. The Mission for Integrated Development of Horticulture (MIDH), Rashtriya Krishi Vikas Yojana (RKVY), Project Development and Management Consultant (PDMC), Pradhan Mantri Kisan SAMPADA Yojana (PMKSY), Capital Expenditure (CAPEX), National Food Security Mission (NFSM), and National Bank for Agriculture and

Rural Development (NABARD) offer avenues for financial support, technology adoption, and infrastructure development.

As these initiatives converge, they hold the potential to not only maintain the quality of millet processing but also increase the quantity, ensuring outstanding quality and contributing to the broader goals of nutritional security, economic growth, and sustainable agriculture. The synergy between policy interventions, technological innovations, and financial support forms a robust framework for the establishment and flourishing of millet processing units across the nation. The commitment is further accentuated by budgetary allocations that span post-harvest value addition, consumption, branding, and support for start-ups, creating a comprehensive framework for fostering domestic millet production. This financial support aligns with the global narrative, emphasizing the need for diversified, resilient, and nutrient-rich food systems. The convergence of these efforts not only addresses immediate challenges but also sets the stage for the maintenance of quality and an increase in the quantity of millet processing, signifying a transformative commitment to a resilient, sustainable, and nourished future.

**Table 6.1: Common Application form for Funding to Establish Millets Processing Unit**

Particular	Mandatory or optional (M or O)	Detail
Name of Applicant or Primary applicant (in case of SHG/Cooperative/FPO/Institution etc.)	M	Text field
Father's Name	M	Text field
Aadhar No.	M	Numeric
Registration no and registering authority (for SHG/Coop/FPO/Institutions etc.)	O	Text plus upload fields
Strength of SHG/FPO/Coop etc.	M	Numeric
Email Id	O	Email field
Telephone No.	M	Tel field
Bank Account Detail	M	(Select Bank, Branch etc. from drop down box) and put account number in numeric field
Whether bank loan required	M	Yes/No
PAN No.	M	AN field plus upload field
GST No. if applicable	O	AN field plus upload field
District	M	
Zone	M	
Tehsil	M	
Subdivision	M	
Block	M	

Particular	Mandatory or optional (M or O)	Detail
Land record	M	Upload
Type of Irrigation Infrastructure required	M	Text
Specification	M	Text
Cost as per proforma bill	M	Numeric
Additional information, if any	O	

#### 6.4 Conclusion:

In conclusion, the journey towards establishing millet processing units in India is a dynamic and multifaceted endeavor, marked by both challenges and strategic initiatives. These schemes not only target immediate issues in millet processing but also aim to bring about a paradigm shift in the perception and utilization of these ancient grains. The establishment of incubators, such as Nutrihub-TBI, and the creation of Centers of Excellence on millets exemplify a commitment to technological innovation and scalability, fostering an ecosystem where startups and research institutions collaborate to unlock the full potential of millet processing. Moreover, recent state-level commitments, as seen in Rajasthan's announcement of a Centre of Excellence with numerous processing plants, underscore the growing momentum towards large-scale millet promotion. This regional focus, coupled with national initiatives, sets the stage for a synergistic approach to address challenges at both micro and macro levels. The significance of millets in global initiatives, particularly during the International Year of Millets 2023, highlights India's dedication to positioning these grains at the forefront of the global sustainable food movement.

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