Issues, challenges and opportunities: insights from feedback survey of millet industries and entrepreneurs

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1. Introduction

The study captures "perspectives of the millets based industries and entrepreneurs" aiming to provide valuable inputs for S&T and policy decision making in millet sector.

In recent years, there is a growing consumer awareness of the economic, environmental, and nutritional advantages of eating millets (Shah et al., 2021). Additionally, a number of initiatives have been made by international organizations and representatives to increase millet consumption (Chera, 2017). Thus, the market for millet-based products has seen a surge in entrepreneurship interest. In India, products made from millet are becoming more popular, and the number of business entrepreneurs in the organized sector has increased significantly. However, food entrepreneurs face several issues and challenges that have prevented their actual growth from being as high as anticipated, calling for more research. While many studies have been previously done on entrepreneurs and their traits, however, these are not focused on food entrepreneurs, particularly issues and challenges in context with millets.

There appears to be a lack of substantial research on millet entrepreneurship bulletin-2023-01-05.pdf (niscpr.res.in). Furthermore, knowledge of the Indian millet market as it exists today, as well as the possibilities and obstacles faced by millet entrepreneurs, is still growing. Academic studies have not received much attention from the view point of practitioner-

based studies on millet food industries. Closely addressing this gap would help us gain a more complete and all-encompassing insight of the Indian millet market and consumer trends. The current study aims to fill this gap, providing possibly solutions to address the issues and challenges in millet sector. A semi-structured in-depth interviews were conducted with 62 millet industries/entrepreneurs. The present study provides an overview of various possibilities and obstacles faced by Indian millet entrepreneurs confront.

The United Nations General Assembly, during its 75th session in March 2021, proclaimed 2023 as the International Year of Millets (IYM 2023). This declaration represents a significant milestone in acknowledging the vast potential of millets in fostering sustainable food systems, ensuring food security, and combating malnutrition globally. Millets have garnered significant recognition due to their alignment with multiple UN Sustainable Development Goals (SDGs), prompting the Government of India (GoI) to prioritize their cultivation. These goals include SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 17 (Partnerships for the Goals).

2. Methodology

A combination of survey questionnaires and semi-structured interviews was employed to precisely gather data for both qualitative and quantitative analyses in the study. Total 62 different millet industries were identified using purposive sampling. Feedback survey of the industries was conducted in bilingual mode both in Hindi and English (n = 62) based on the participant's preference and convenience. In the surveyed sample of 62 millet industry firms, there were 15 female entrepreneurs, accounting for 24.19% of the total. This data indicated that women representation was significant in this specific industry segment. Interviews and surveys were conducted in person (38), over the phone (7), and online (17), depending on participant convenience and preference. Every piece of information was captured with consent. The study provides insights of the opportunities, obstacles encountered, and strategies employed, exploring the possibilities and challenges faced by millet businesses.

3. Demographic mapping of field visit firms

About 15 states were surveyed, encompassing a total of 62 millet industries/entrepreneurs. Among these states, Maharashtra, Delhi, Karnataka, and Uttar Pradesh emerged as major hubs for millet production and processing, while Bihar, Chhattisgarh, Madhya Pradesh, and Andhra Pradesh were identified as minor millet industry states.

The findings from the research analysis are presented in the following section

1. Profile of the interviewees

Of the 62 millet industry firms covered under field survey, 15 were female entrepreneurs, while 47 were male. This data underscores a male-dominated landscape in millet entrepreneurship, with women comprising a significant but smaller proportion of the total industries/entrepreneurs. A significant number of firms, 22 in total, invested more than 30 lakh INR annually in producing millet-based food products. Following, 18 firms invested less than 5 lakh INR each year and minimum two firms each invested in the ranges of 10 to 15 lakh INR and 25 to 30 lakh INR annually. Table 1 describes the descriptive profile of the interviewees showing details of the ages, state, establishment, annual investment, profit and other details.

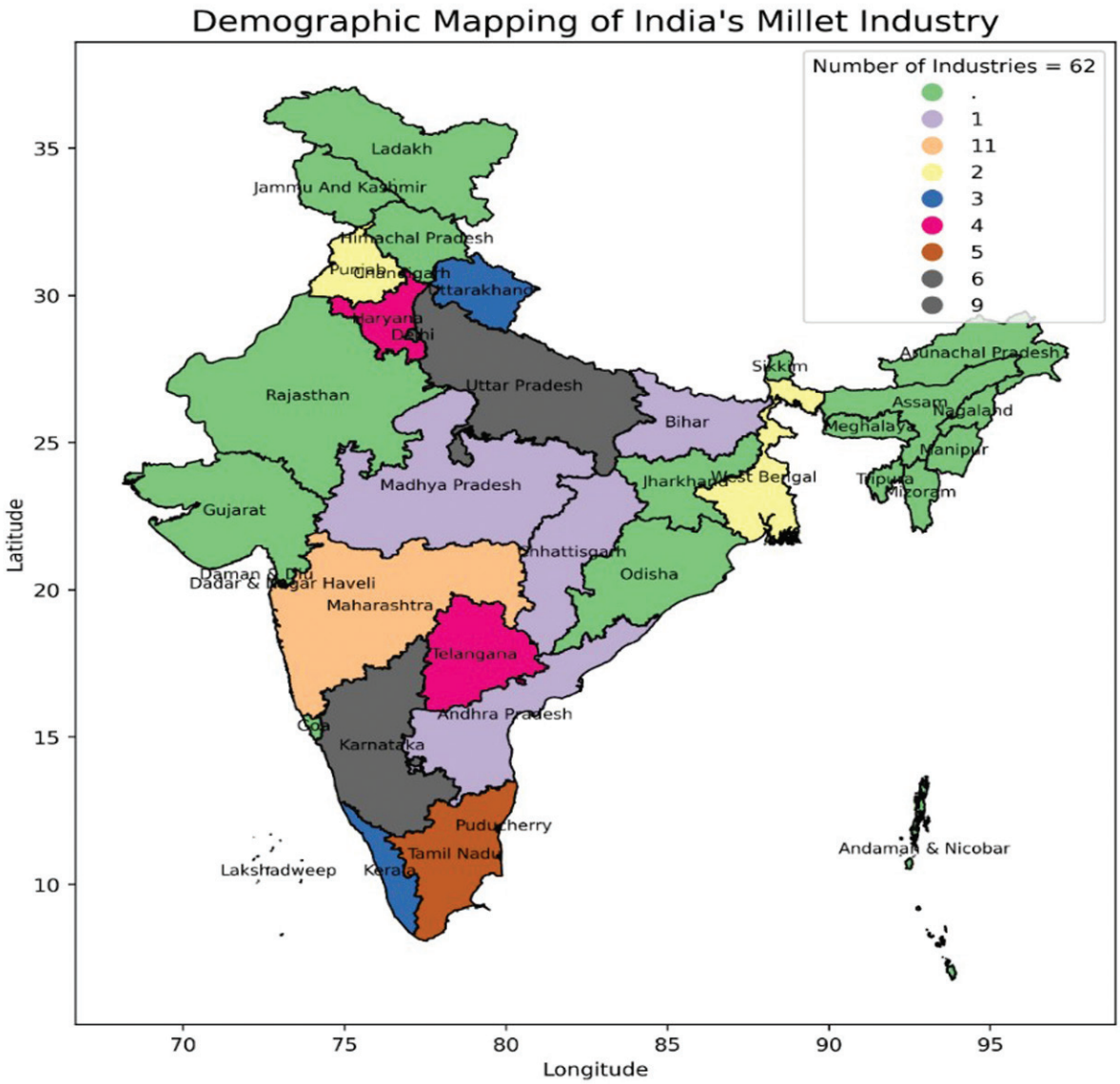

Figure 1. Demographic mapping of India's millet industry that were covered under field survey (Source: Own survey)

Table 1: Descriptive profile of the interviewees (Source: Own survey)

Response of the Industry/ entrepreneurs	Gender	Age	State	Establishment year	Annual Investment	Profit	Description
R1	Female	32	Delhi	2021	> 30 lac	16-30 %	Millet processing, store, outlet
R2	Male	38	Haryana	2022	< 5 lac	0-15 %	Export
R3	Male	35	Haryana	2021	< 5 lac	16-30 %	Export
R4	Male	42	Delhi	2023	< 5 lac	16-30 %	Millet processing, shop
R5	Female	42	Delhi	2023	< 5 lac	31-45 %	Shop
R6	Male	32	Delhi	2013	20-25 lac	0-15 %	Shop
R7	Female	34	Uttarakhand	2020	> 30 lac	16-30 %	Millet processing, store, outlet
R8	Male	45	Karnataka	2000	25-30 lac	16-30 %	Millet processing, store, outlet

Response of the Industry/ entrepreneurs	Gender	Age	State	Establishment year	Annual Investment	Profit	Description
R9	Male	50	Maharashtra	2017	15-20 lac	0-15 %	Millet processing, Ware houses, stores/ shops
R10	Male	45	Uttar Pradesh	2019	10- 15 lac	16-30 %	Millet processing, shop
R11	Male	24	Maharashtra	2022	15-20 lac	16-30 %	Millet processing
R12	Female	40	Uttar Pradesh	2018	20-25 lac	0-15 %	Millet processing
R13	Male	24	Haryana	2022	20-25 lac	16-30 %	Millet manufacture
R14	Male	27	Tamil Nadu	2014	25-30 lac	31-45 %	Millet processing, Farmer producing organization
R15	Male	35	Tamil Nadu	2009	> 30 lac	16-30 %	Millet processing, export, marketing
R16	Male	25	Maharashtra	2014	> 30 lac	0-15 %	Millet processing, shop
R17	Female	38	Kerala	2023	> 30 lac	16-30 %	Millet processing, shop
R18	Male	44	Maharashtra	2012	> 30 lac	0-15 %	Millet manufacture
R19	Male	34	Karnataka	2011	> 30 lac	0-15 %	Millet processing,
R20	Male	34	Bihar	2014	5- 10 lac	16-30 %	Millet cookies manufacture
R21	Male	52	Punjab	2002	< 5 lac	16-30 %	Millet manufacture
R22	Male	50	Uttar Pradesh	2021	< 5 lac	0-15 %	Trader and supplier
R23	Male	26	Karnataka	2014	> 30 lac	16-30 %	Millet processing, organic products
R24	Male	41	Uttar Pradesh	2020	< 5 lac	16-30 %	Millet processing, Restaurant & cafe
R25	Male	35	Uttarakhand	2015	< 5 lac	16-30 %	Millet processing, supplier
R26	Male	40	Karnataka	2020	> 30 lac	0-15 %	Millet processing,
R27	Female	40	Delhi	2021	< 5 lac	0-15 %	Millet processing – only milling
R28	Male	35	Telangana	2010	5- 10 lac	16-30 %	Millet processing
R29	Male	38	Kolkata	1974	> 30 lac	16-30 %	Millet processing, distributer
R30	Male	42	Maharashtra	2007	> 30 lac	16-30 %	Millet processing
R31	Female	45	Maharashtra	2020	> 30 lac	16-30 %	Millet processing, outlets
R32	Female	35	Uttar Pradesh	2018	5- 10 lac	16-30 %	Millet processing, shops, marketing
R33	Male	56	Punjab	2016	< 5 lac	31-45 %	Millet processing – only milling
R34	Male	36	Delhi	2021	< 5 lac	16-30 %	Millet processing, shops
R35	Male	23	Chhattisgarh	2022	< 5 lac	16-30 %	Millet processing, shops, marketing
R36	Male	28	Kerala	2020	5- 10 lac	0-15 %	Millet processing
R37	Female	45	Delhi	2019	15-20 lac	41-60 %	Millet processing
R38	Female	35	Maharashtra	2021	> 30 lac	31-45 %	Millet processing
R39	Male	34	Maharashtra	2020	< 5 lac	16-30 %	Millet processing
R40	Female	33	Maharashtra	1998	< 5 lac	0-15 %	Millet processing, shop
R41	Male	35	Tamil Nadu	2021	< 5 lac	16-30 %	Millet processing, shop
R42	Male	38	Delhi	2019	< 5 lac	16-30 %	Millet processing, shop
R43	Male	42	Maharashtra	1982	5- 10 lac	0-15 %	Millet processing,
R44	Female	38	Tamil Nadu	2012	< 5 lac	16-30 %	Millet processing, organic
R45	Male	42	Karnataka	2005	> 30 lac	16-30 %	Millet processing
R46	Male	43	Delhi	1986	> 30 lac	16-30 %	Millet processing, distributor
R47	Male	35	Karnataka	2015	5- 10 lac	16-30 %	Millet processing, shop
R48	Male	35	Andhra Pradesh	2018	5- 10 lac	16-30 %	Millet processing
R49	Male	29	Uttar Pradesh	2022	5- 10 lac	0-15 %	Millet processing – only milling
R50	Male	38	Telangana	2019	5- 10 lac	16-30 %	Millet processing, rural women entrepreneur

Response of the Industry/ entrepreneurs	Gender	Age	State	Establishment year	Annual Investment	Profit	Description
R51	Male	35	Kerala	2013	5- 10 lac	16-30 %	Millet processing
R52	Female	36	Telangana	2020	5- 10 lac	16-30 %	Millet processing, outlet
R53	Female	38	Haryana	2021	> 30 lac	16-30 %	Millet processing, distributer
R54	Male	32	Tamil Nadu	2015	5- 10 lac	16-30 %	Millet processing
R55	Male	34	Karnataka	2021	< 5 lac	16-30 %	Millet processing, organic
R56	Male	37	Maharashtra	1989	> 30 lac	16-30 %	Millet manufacturer
R57	Male	38	Karnataka	2020	> 30 lac	16-30 %	Millet processing, farmer-producing organization
R58	Male	39	Madhya Pradesh	2015	> 30 lac	0-15 %	Millet processing
R59	Male	35	Uttarakhand	2018	> 30 lac	16-30 %	Millet processing, organic
R60	Female	35	Karnataka	2021	10- 15 lac	16-30 %	Millet processing
R61	Male	34	Kolkata	2018	> 30 lac	16-30 %	Millet processing, exporter, organic
R62	Male	38	Telangana	2020	> 30 lac	16-30 %	Millet processing

2. Raw material procurement

Of the 62 millet industries covered under field survey, revealed varied raw material procurement sources. Majority of them procured raw materials from local farmers & online markets (22.58%) followed by local farmers alone (20.97%) and a smaller proportion (1.61%) represented a mix of local farmers and other sources. Figure 2 demonstrates raw material procurement sources used by the millet industries/entrepreneurs.

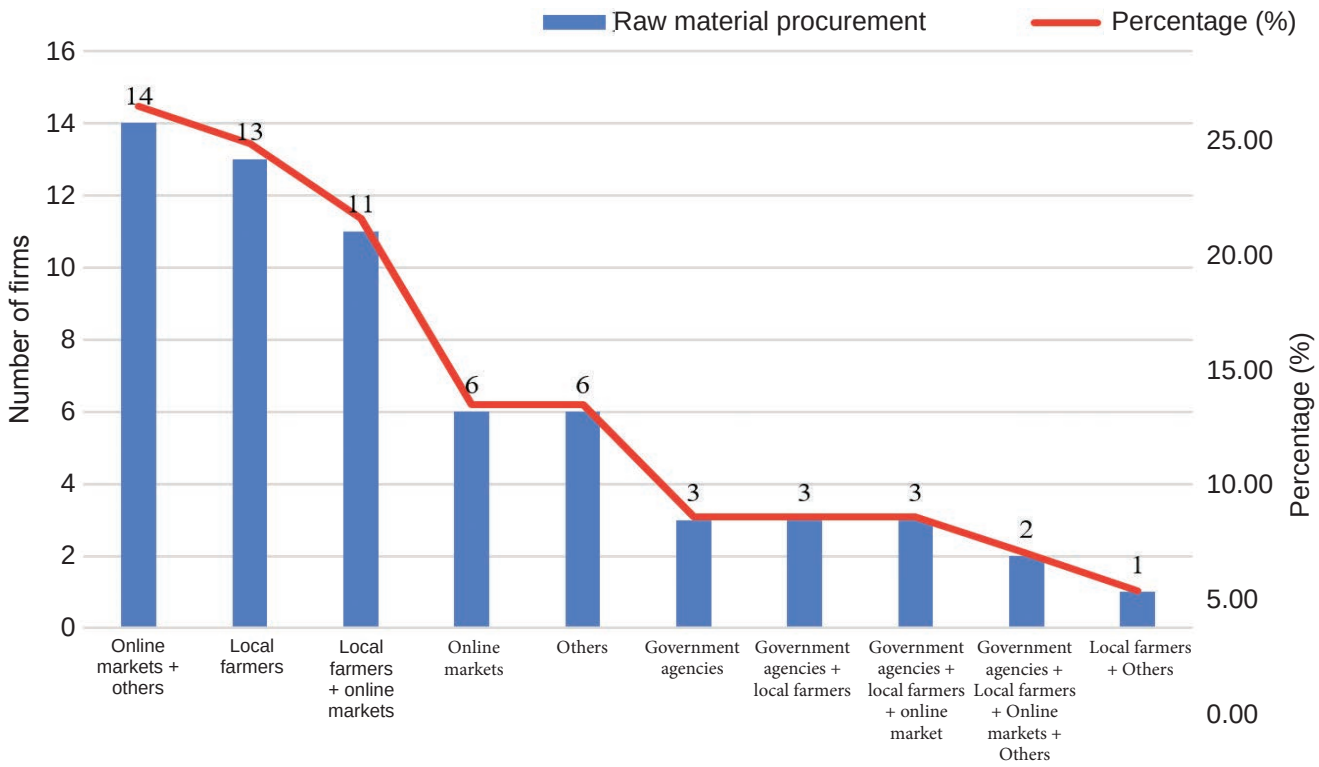

Figure 2. Raw material procurement sources used by the millet industries/entrepreneurs. (Source: Own survey)

3. Scenario of millet products in the market

Based on market data analysis, millet-based products showed varying levels of acceptance and its potential across different categories. Ready-to-eat products represented readily acceptable with 77.42%, followed by ready-to-cook products with 72.58%, while raw products with 62.90%. These categories also represented high selling values, with ready-to-eat products at 83.87%, ready-to-cook products at 74.19%, while raw products at 61.29%, revealing lower selling value. Overall, millet products hold significant potential for growth, with a products potential of 74.19% for ready-to-eat products, 67.74% for ready-to-cook products, 56.45% for raw products. Overall, the data indicates room for market expansion and development strategies to enhance their appeal and value.

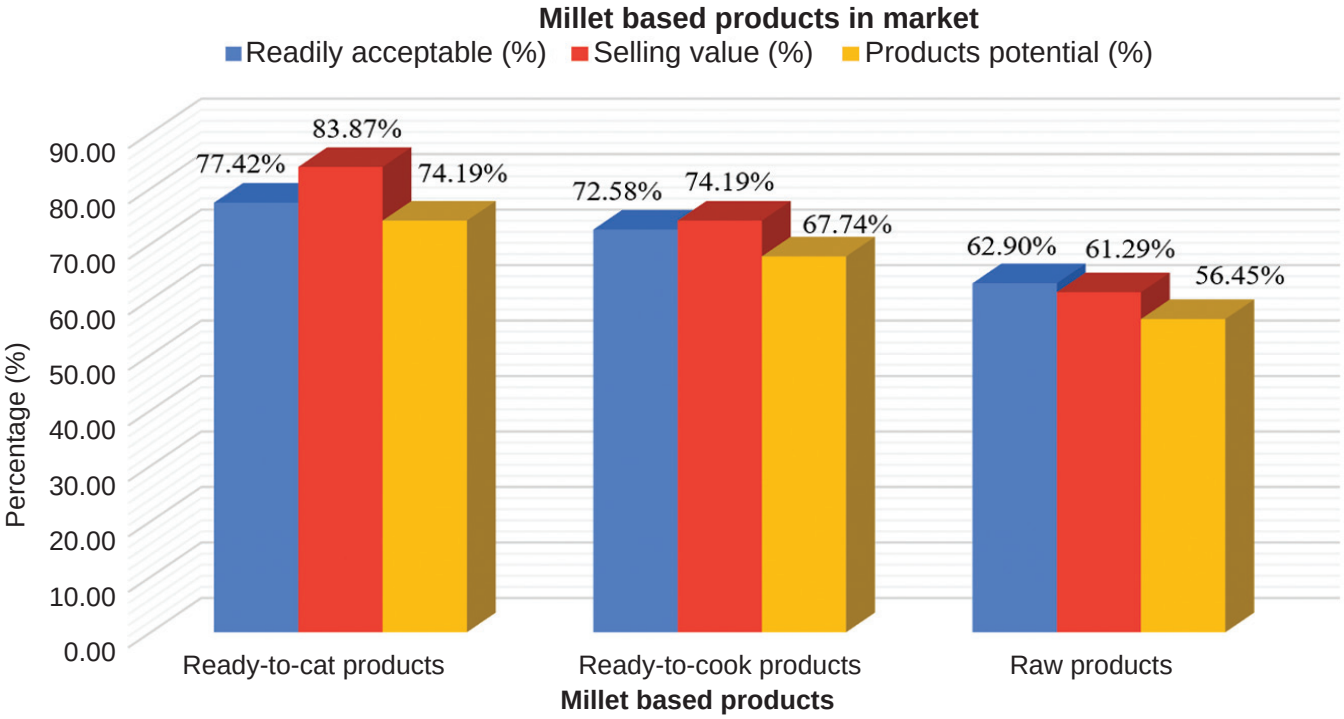

Figure 3. Millets based products in market as readily acceptable, selling value and products potential (Source: Own survey).

4. Perceptions of Millet Industries: A survey of 62 firms across three key areas

4.1 Indian Government's initiatives for development of millet-based value added products, and subsidizing technology status of millets industries

Figure 4. represents the responses of the industries/entrepreneurs towards Indian Government's initiatives for development of millet-based value added products, and subsidizing technology status of millets industries. Based on the survey of 62 millet industry stakeholders, it was found that the Indian Government's initiatives for the development of millet-based value-added products are perceived with varying degrees of satisfaction. The Indian Government's initiatives for developing millet-based value-added products received mixed feedback responses. The maximum number of respondents (52) expressed satisfaction, while only 2 reported, being highly dissatisfied.

The status of subsidizing technology for millet industries elicited diverse feedbacks. Maximum respondents (49) reported being satisfied, with 4 expressing high satisfaction level. However, 2 remained neutral, while 3 and 4 respondents were dissatisfied and highly dissatisfied, respectively, indicating varying levels of approval and concern regarding this initiative.

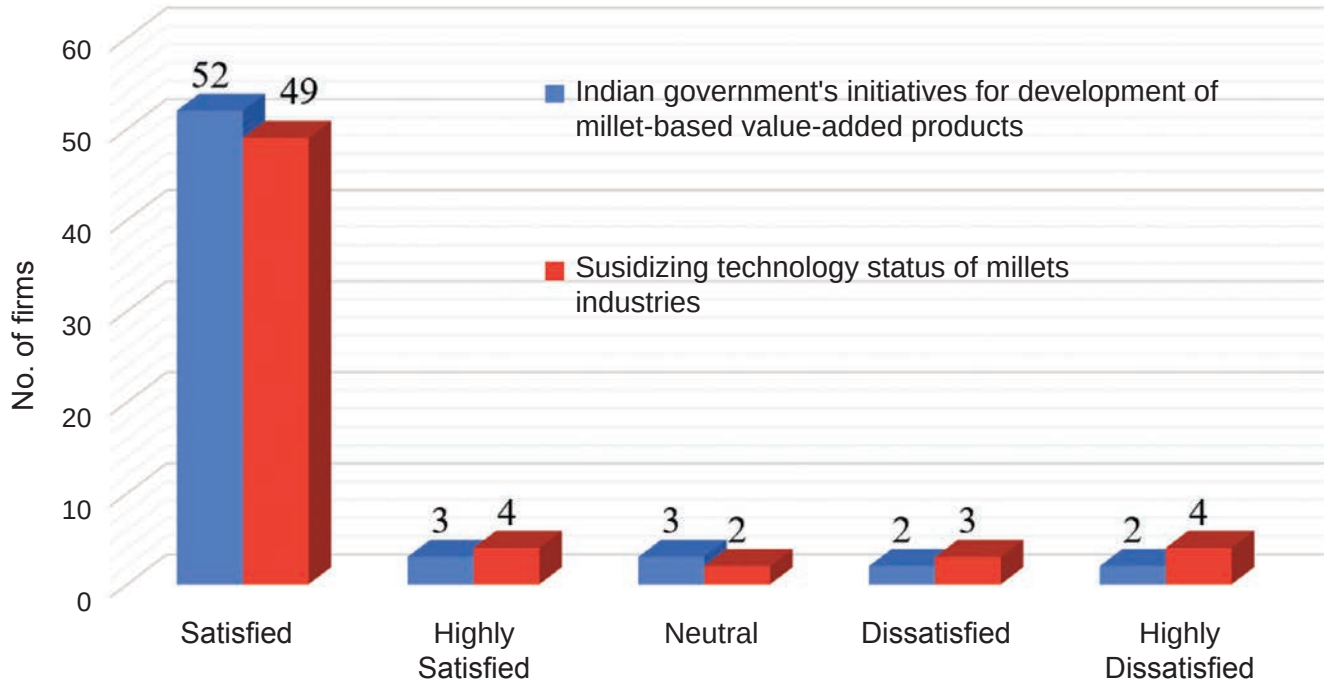

Figure 4. Indian Government's initiatives for development of millet-based value added products, and subsidizing technology status of millets industries (Source: Own survey).

4.2 Current financial market value of millets

Figure 5. reveals that 49 firms, accounting for 79.03% of respondents, consider millets to be fairly valued in the current financial market. Following, 12 firms (19.36%) believe millets are undervalued.

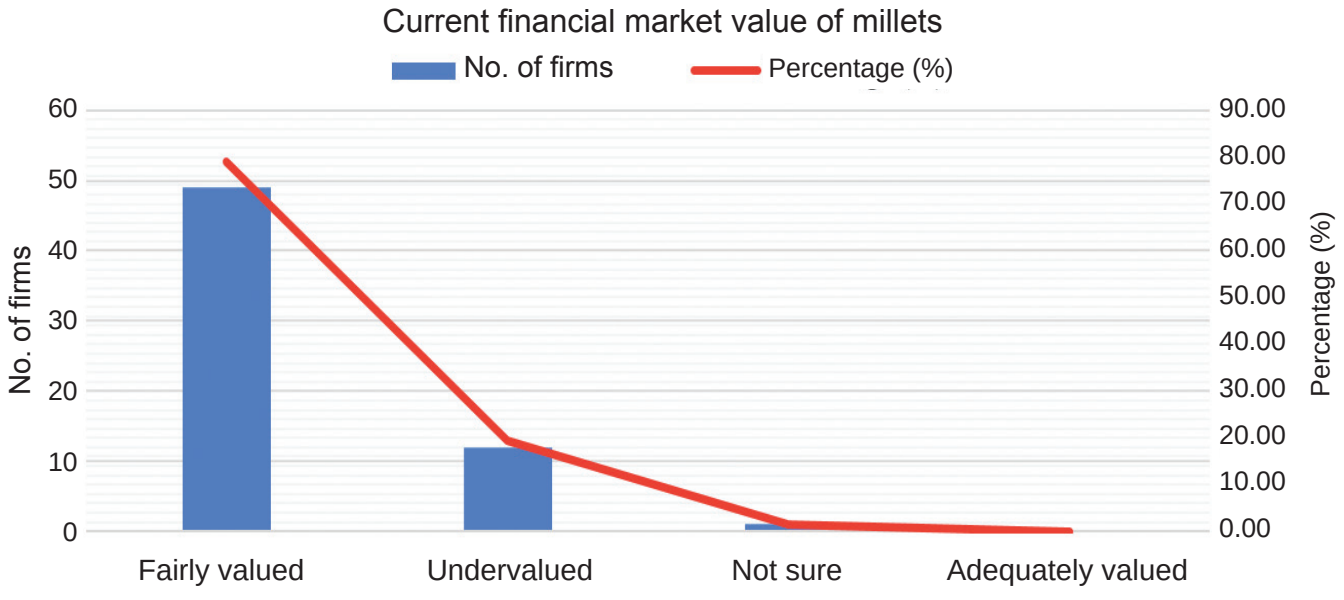

Figure 5. Current financial market value of millets (Source: Own survey).

5. Millet-based products potential buyer sources

The potential buyers for millet products are diverse, with maximum (local vendors + retailers and supermarkets) constituting the majority at 16.13%. This is followed by (local vendors + retailers and supermarkets + government bodies/agencies + exporters) at 14.52%. Additionally, (local vendors + retailers, supermarkets + government bodies/agencies + exporters + hotels/restaurants) at 11.29% of potential buyers.

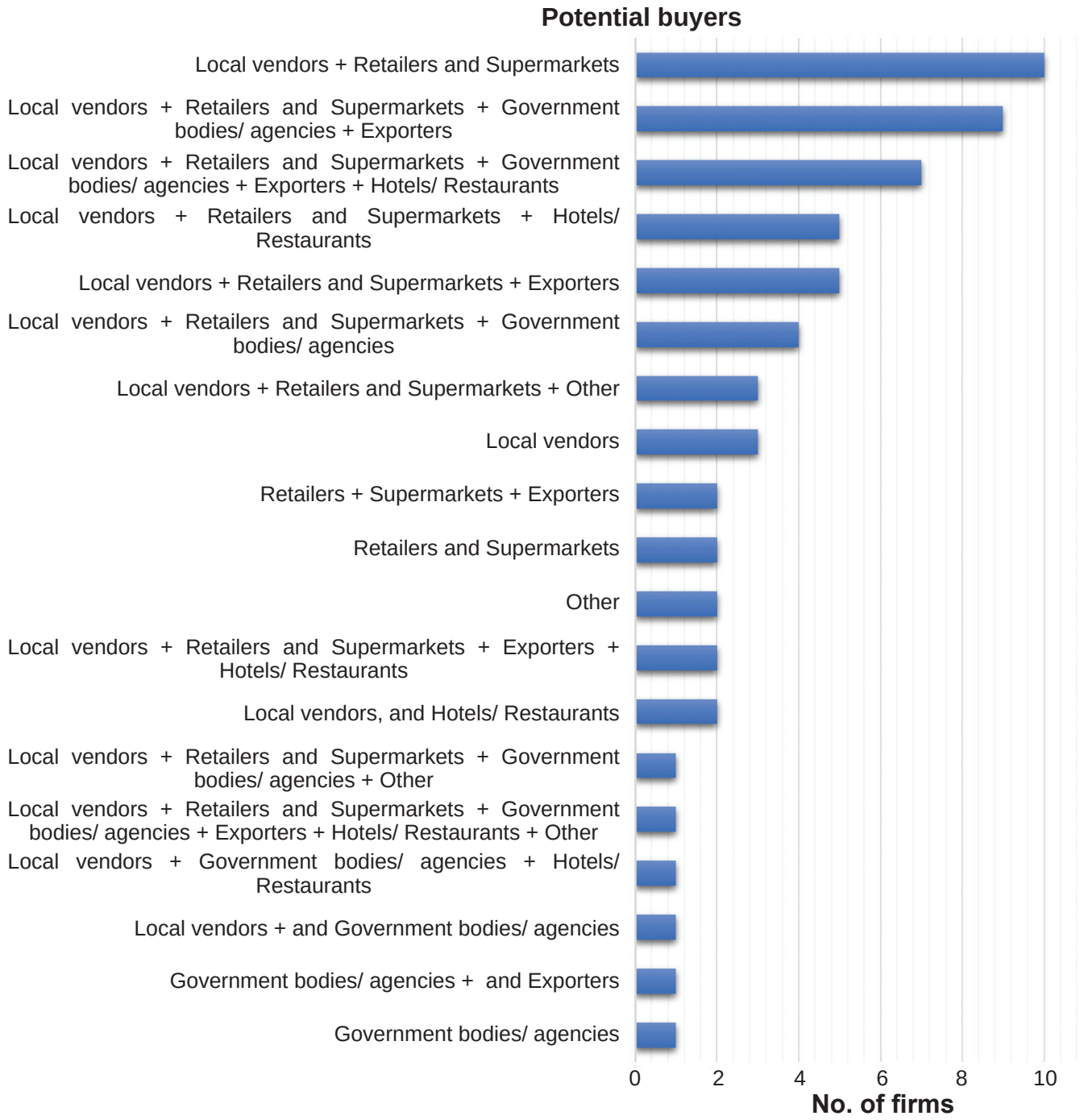

Figure 6. Millet-based products potential buyer sources (Source: Own survey).

6. Challenges faced by millet businesses on expansion

Figure 7. demonstrates various challenges faced by millet businesses on expansion, as revealed by the feedback responses of the total 62 industries/entrepreneurs covered under field survey

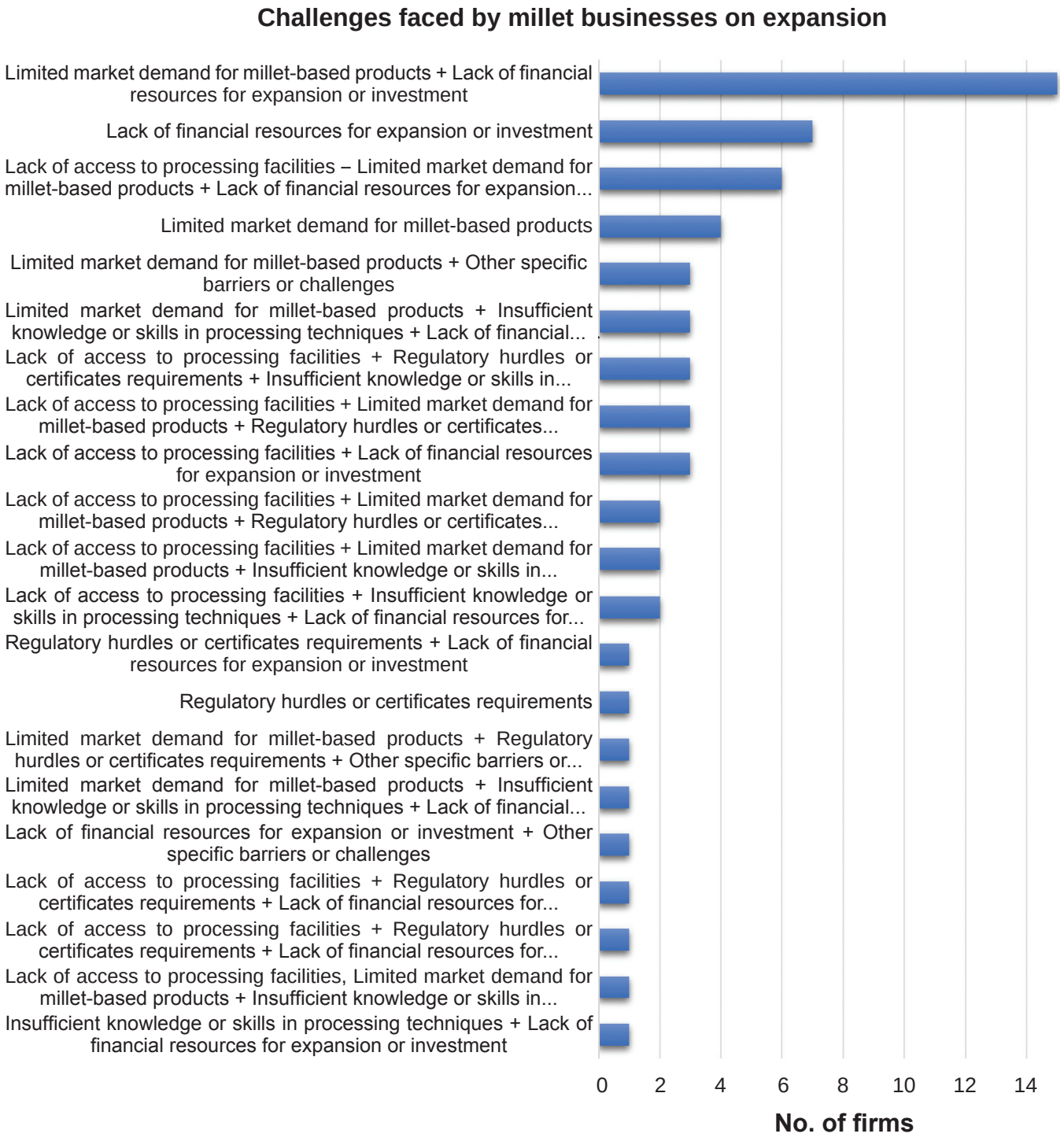

Figure 7. Challenges faced by millet businesses on expansion (Source: Own survey).

7. Challenges in Millet Entrepreneurship

The study explored the perspectives of millet entrepreneurs operating within the Indian millet market, aiming to uncover insights into the opportunities available, challenges faced, and strategies employed. Employing a narrative approach and survey, the study delved into the tactics utilized by millet entrepreneurs to navigate and surmount various obstacles.

7.1 Female entrepreneurs' obstacles

Female entrepreneurs in the millet sector face barriers due to limited access to resources and gender biases. Targeted interventions are necessary to provide them with training, financial support, and market opportunities, essential for sustainable agriculture and food security.

7.2 Insufficient awareness

Creating consumer demand for millets is the main obstacle in the Indian market, largely due to limited awareness about its nutritional, ecological, and financial benefits. India's diverse geography and culture pose challenges for entrepreneurs in deciding product packaging and promotion strategies, despite some local language awareness of millet varieties.

7.3 No, Incubations Hubs

Incubation hubs play a vital role in fostering innovation, particularly in agriculture and food production. Millets, recognized for their nutritional richness and adaptability, are gaining prominence as sustainable food options. Dedicated millet incubation hubs offer essential resources like mentorship and funding, nurturing startups involved in millet farming, processing, and product development. These hubs drive entrepreneurship, market diversification, and advancements in millet cultivation and processing technologies, contributing to food security and nutrition. For the latest updates, it's recommended to refer to current sources on initiatives like "No, Incubation Hubs" and developments in the millet industry.

7.4 Market linkage obstacles

Market linkage obstacles, such as limited awareness and inadequate infrastructure, hinder the millet sector, resulting in price volatility and reduced profitability for farmers. Addressing these challenges requires efforts to enhance market awareness, improve transportation networks, and establish reliable supply chains, vital for promoting economic growth and highlighting millet's nutritional benefits in the broader food market.

7.5 Infestation problems

Infestation issues, including pests like rats, birds, and cockroaches, threaten millet industries, especially in open warehouse settings, leading to contamination and quality degradation. Rigorous pest control, maintaining storage hygiene, and using enclosed storage are crucial to mitigate infestation challenges, safeguarding millet product quality and minimizing economic losses.

7.6 Mixing of grains

Mixing issues in millet industries threaten product quality and integrity, as contamination from different grains during processing or storage can lead to inconsistencies in flavor, texture, and nutrition, affecting consumer satisfaction. Stringent quality control, segregation protocols, and advanced processing technologies are vital to prevent mixing problems. By addressing these obstacles, the industry can uphold product standards, maintain consumer confidence, and preserve the unique qualities of various millet varieties.

7.7 Funding problems

Funding challenges hinder millet industries, limiting their growth and competitiveness. Insufficient financial support affects farming, processing, and marketing operations, impeding technological advancements and expansion efforts. Traditional financial institutions may view millet ventures as risky, further complicating funding acquisition. Targeted financial support, government incentives, and private collaborations are needed to overcome these challenges. Establishing specialized funds and raising awareness about millet's benefits can attract investment and promote sustainability. By addressing funding obstacles, millet industries can enhance competitiveness, contribute to economic development, and promote nutritious food choices.

7.8 Limited market demand

Limited market demand for millets persists due to consumer unawareness and preference for mainstream grains, despite their nutritional benefits and sustainability. Targeted marketing, educational campaigns, and product innovation are essential to change perceptions and stimulate increased demand for millets, fostering market growth.

7.9 Insufficient knowledge or skills in processing techniques

Insufficient processing knowledge and skills hinder millet industries, impacting product quality and efficiency. Inadequate training and awareness about modern techniques hamper production enhancement and waste reduction efforts. Targeted educational programs and industry-wide training are essential to address these obstacles, enabling professionals to improve productivity and competitiveness, fostering sustainable growth.

8. Policy Recommendations based on the survey findings and Interviews:

- Millet start-ups to receive personalized guidance and support, with clear and specific hand- holding strategies.
- Transparent and viable Farmer Producer Organizations (FPOs) to ensure fair prices for millet farmers.
- Mandate accurate labelling for millet products, encompassing comprehensive nutritional information and compliance with regulatory standards.
- Need to implement carbon credit allocation for millet cultivation, ensuring sustainability through productivity enhancement, market linkage, and providing ecological compensation to farmers.
- Need to launch comprehensive educational campaigns to increase consumer awareness about the nutritional, environmental, and financial benefits of millets through collaboration with health organizations, schools, and media outlets for effective dissemination.
- Establishment of specialized incubation hubs needed to foster innovation and entrepreneurship in the millet sector.
- Implement of gender-focused support programs needed to tackle challenges encountered by female entrepreneurs in the millet industry.
- Establishment of standardized quality control protocols needed to maintain the integrity of millet products, preventing grain mixing, and implement monitoring alongside certification mechanisms to uphold consistent quality standards across the supply chain.
- Enhancements in the value chain are needed to improve the efficiency and effectiveness of millet promotion initiatives.
- Training programs and capacity-building initiatives needed to enhance millet entrepreneurs.

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