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Constraints faced by farmers in adopting recommended practices for millet cultivation in the Bundelkhand Region, Uttar Pradesh

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Abstract

This study examines constraints faced by farmers in adopting recommended millet cultivation practices in the Bundelkhand region of Uttar Pradesh, India. Data were collected from 240 millet farmers across 12 villages in Banda and Chitrakoot districts using a structured interview schedule and simple random sampling. Constraints were assessed on a three-point continuum (strongly agree, agree, disagree) and ranked using Garrett's mean score. Major constraints include the unavailability of healthy, disease-free seeds (GMS = 68.97), limited knowledge of insect and disease control measures (GMS = 58.97), unreliable electricity and labor availability (GMS = 59.39), low millet prices compared to rice and wheat (GMS = 59.68), and inadequate local marketing facilities (GMS = 59.80). These findings highlight the need for improved seed supply systems, enhanced extension services, and better market infrastructure to promote millet cultivation in the region.

Keywords: Millets, adoption, constraints

Introduction

Millets, small-grained cereal crops, are vital for food security and sustainable agriculture in semi-arid regions due to their resilience to drought and high nutritional value (Tomar & Singh, 2017) [15]. Globally, millets such as pearl millet (*Pennisetum glaucum*), sorghum (*Sorghum bicolor*), finger millet (*Eleusine coracana*), and others are cultivated in diverse agroecosystems, particularly in Asia and Africa (Negi et al., 2017) [8]. Pearl millet, a staple in semi-arid regions, is highly drought-resistant and nutritionally superior to wheat, rice, and maize, offering high protein, vitamins, essential amino acids, and micronutrients like iron and zinc. Sorghum provides substantial carbohydrates (72.6%), protein (10.4%), and energy (349 kcal/100g), with additional health benefits including antioxidant and anti-inflammatory properties.

India, the world's largest millet producer, accounted for over 18% of global production in 2022 (APEDA, 2023). In Uttar Pradesh, pearl millet and sorghum are key crops, with cultivation areas of 10.10 lakh hectares (21.95 lakh tonnes) and 2.89 lakh hectares (4.62 lakh tonnes) in 2023-24, respectively. Despite their importance, millet farmers face significant barriers to adopting recommended cultivation practices, limiting productivity and economic returns. This study investigates these constraints in the Bundelkhand region, a major millet-producing area, to inform targeted interventions for sustainable agricultural development.

Methodology

This study was conducted in the Bundelkhand region of Uttar Pradesh, focusing on Banda and Chitrakoot districts due to their high millet production. Two blocks from each district were purposively selected, and three villages per block were chosen using simple random sampling, resulting in 12 villages. From each village, 20 millet farmers were randomly selected, yielding a total sample of 240

respondents. Data were collected through structured interviews using a schedule comprising 25 constraints grouped into five dimensions: input, technological, financial, market-related, and general constraints. Responses were recorded on a three-point continuum (strongly agree = 3, agree = 2, disagree = 1) and analysed using Garrett's ranking method to compute mean scores and assign ranks.

Results and Discussion

All the constraints under five major dimensions were studied, the garret mean score and ranking order for each constraint were computed.

Table 1: Input Constraints in Adopting Recommended Millet Cultivation Practices

S. No.	Statements	GMS	Ranks
1.	Unavailability of healthy and disease free seeds from Government/Private sale centre.	68.97	I
2.	Supply of inferior quality seeds by Government /private sale centre.	62.29	IV
3.	High prices of new verities seeds of millet	58.14	V
4.	Unavailability of quality manure and fertilizers at Government/private sale centre.	66.85	II
5.	Unavailability of Government/private sale centre for diseases and insects control.	66.16	III

Table 1 showed that the unavailability of healthy, disease-free seeds (GMS = 68.97) was the most significant input constraint, reflecting inadequate supply chains for quality planting materials. Limited access to manure, fertilizers, and pest control resources further hinders adoption, consistent with findings by Jalu et al. (2022) [3].

Table 2: Technological Constraints in Adopting Recommended Millet Cultivation Practices

S. No.	Statements	GMS	Ranks
1.	Lack of knowledge about control measures of insects/diseases.	58.97	I
2.	Lack of knowledge about the use of bio-pesticides/fungicides.	58.87	II
3.	Lack of knowledge about the Crop rotation	58.64	III
4.	Lack of knowledge about balance use of fertilizers	58.29	IV
5.	Less number of Agriculture Research/ training centres for awareness of technological know	53.72	V

Technological constraints primarily stem from limited knowledge of pest and disease management (GMS = 58.97), exacerbated by insufficient extension services and training centres, aligning with Khuvung et al. (2022) [4].

Table 3: Financial Constraints in Adopting Recommended Millet Cultivation Practices

S. No.	Statements	GMS	Ranks
1.	Delayed payment from whole seller/dealers.	57.35	III
2.	Difficulty in borrowing loans from government agencies.	55.12	V
3.	Lack of Govt. initiatives for funding of loans and granting of subsidies	56.41	IV
4.	High charges of labour as well as inputs.	58.02	II
5.	Untimely availability of electricity and labour.	59.39	I

Unreliable electricity and labor availability (GMS = 59.39) significantly impede millet cultivation, compounded by high input costs and delayed payments, as noted by Melkeri et al. (2020) [6].

Table 4: Market-Related Constraints in Adopting Recommended Millet Cultivation Practices

S. No.	Statements	GMS	Ranks
1.	Poor marketing channel.	58.29	IV
2.	Higher interference of middle men during the marketing.	59.10	II
3.	Millets price has lack in the local as well as, distance markets like rice, and wheat.	59.68	I
4.	Government market located on large distance.	58.75	III
5.	Exploitation harassment by the middle men during marketing.	58.02	V

Low millet prices (GMS = 59.68) and middlemen interference deter farmers, highlighting the need for improved market access, as supported by Shasani et al. (2020) [11].

Table 5: General Constraints in Adopting Recommended Millet Cultivation Practices

S. No.	Statements	GMS	Ranks
1.	Insufficient training programmes organized by Govt. Department for technical knowhow of millets cultivation	56.72	IV
2.	High charges of irrigation	57.75	III
3.	Good marketing facilities are not available in local market.	59.80	I
4.	Problem of erratic supply of electricity.	59.18	II
5.	Millets cultivation related information is not available at proper time.	55	V

The lack of local marketing facilities (GMS = 59.80) and erratic electricity supply are critical barriers, underscoring the need for infrastructure improvements (Pradhan et al., 2022) [9].

Conclusion

This study highlights critical barriers to adopting recommended millet cultivation practices in the Bundelkhand region, including unavailability of quality seeds, limited knowledge of pest management, unreliable electricity and labour, low market prices, and inadequate marketing facilities. To address these, policymakers and extension services should prioritize establishing local seed and input supply centres, enhancing farmer training programs, improving electricity and irrigation infrastructure, and developing robust marketing channels to ensure fair prices. These interventions can boost millet productivity, enhance farmer livelihoods, and strengthen food security in the region.

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