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Farmers' perception of constraints affecting adoption of green fodder production technologies in Gorakhpur Region of Uttar Pradesh

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Abstract
The production and productivity of green fodder can be increased by ensuring adoption of production technology and by overcoming the constraints. The present study was conducted by interviewing 200 randomly selected green fodder crop cultivating farmers of Gorakhpur district, to know the adoption level and constraints experienced by them. It was found that 87.5% of respondents expressed that wild and stray animals were the primary constraint for lesser adoption of fodder production technology in area. About 80 per cent of farmers identified small landholding among them as the second most important reason for less adoption of fodder technology. The main reason for less Knowledge of fodder production technologies were lack of awareness about improved technologies followed by lack of on-farm guidance/training, lack of lesser resources and lesser literacy among them. The correlation between knowledge gap and adoption gap was highly significant and positive.

Keywords: Adoption gap, constraints, green fodder production technology, farmers perception, knowledge gap

Introduction
Livestock plays a vital role in the agricultural economy of India by contributing significantly to farmers' income, nutritional security, and employment generation. Availability of adequate and quality green fodder is a key determinant of livestock productivity; however, the country continues to face a substantial deficit of green fodder, particularly in densely populated and livestock-intensive regions. Improved green fodder production technologies have the potential to enhance fodder availability, improve animal health and increase milk productivity, thereby strengthening the sustainability of mixed farming systems.

Despite the development and dissemination of several improved fodder production technologies—such as high-yielding fodder varieties, balanced nutrient management, scientific irrigation practices, and proper harvesting techniques—the level of adoption among farmers remains low, this gap between recommended technologies and farmers' practices is often influenced by a range of constraints that vary across regions and socio-economic conditions. Understanding farmers' perceptions of these constraints is essential for designing effective extension strategies and policy interventions aimed at improving adoption.

The Gorakhpur region of Uttar Pradesh is characterized by high livestock density, small and fragmented landholdings, and increasing pressure on natural resources. Although fodder crops such as berseem, oat, sorghum, and pearl millet are well suited to the agro-climatic conditions of the region, their cultivation remains limited. Farmers in the region encounter several constraints related to physical factors, economic limitations, knowledge gaps, and institutional support, which collectively hinder the adoption of improved green fodder production technologies.

Farmers' perception of constraints plays a crucial role in influencing their decision-making and adoption behaviour. Identifying and prioritizing these perceived constraints provides valuable insights into the barriers that limit technology adoption and helps in formulating location-specific solutions. Therefore, the present study was undertaken to examine farmers' perception of constraints affecting the adoption of green fodder production technologies in the Gorakhpur

region of Uttar Pradesh, with the aim of generating empirical evidence to support extension planning, policy formulation, and sustainable fodder development initiatives.

Methodology

The present study was conducted purposively in the Gorakhpur region of Uttar Pradesh to obtain a representative understanding of the region based on prevailing land-use practices. Five operational blocks under Mahayogi Gorakhnath Krishi Vigyan Kendra, namely Pali, Bharohia, Jungle Kaudiya, Chargawa, and Campierganj, were purposively selected due to their high cattle population. From each selected block, 40 representative farmers cultivating improved green fodder crops such as pearl millet (chari bajra), sorghum (chari jowar), berseem, oat, etc., were randomly selected. Thus, a total sample size of 200 farmers was considered for the study. Primary data were collected through the personal interview method using a pre-tested structured interview schedule. The data collection was carried out during the period 2020-2023. Constraints were assessed in terms of problems encountered by the respondents in adopting fodder production technologies. These constraints were identified through open-ended questions, and responses were categorized and analyzed based on farmers' perceptions.

Results and Discussion

Farmers' perceptions were assessed with respect to the constraints faced in fodder production and the reasons for lower awareness of fodder production technologies. Based on the responses obtained, ranks were assigned to the identified constraints and reasons according to their relative importance.

Farmers' Perception of Constraints in Adoption of Green Fodder Production Technologies

The findings presented in Table 1 indicate that wild and stray animal menace was perceived as the most severe constraint in the adoption of green fodder production technologies, as reported by 87.5 per cent of the respondents, and was ranked first. Frequent crop damage caused by grazing of fodder crops at different growth stages discourages farmers from allocating land and resources to fodder cultivation. The small size of land holdings emerged as the second major constraint, expressed by 80.0 per cent of farmers, as limited land availability compels farmers to prioritize food and cash crops over fodder cultivation. Non-availability of seed of high-yielding varieties was ranked third (75.0 per cent), highlighting deficiencies in the supply chain of improved fodder seeds.

Further, supply of inferior quality inputs by input dealers was perceived as a constraint by 57.5 per cent of respondents and ranked fourth, which adversely affects crop establishment and yield. Lack of guidance and technical knowledge (52.5 per cent) and poor knowledge of green fodder cultivation technology (42.5 per cent) were ranked fifth and sixth, respectively, indicating gaps in extension services and training support. Non-availability of good quality seed (34.0 per cent) was ranked seventh, while lack of awareness about the importance of green fodder for animal health was reported by only 12.5 per cent of respondents and ranked last, suggesting that farmers were generally aware of the nutritional benefits of green fodder but faced more practical and structural constraints. These findings emphasize the need for effective policy interventions, improved input supply systems, and strengthened extension mechanisms to enhance adoption of green fodder production technologies. The present findings, which highlight lack of awareness and inadequate on-farm guidance as major knowledge-related constraints, are in conformity with the observations of Litous *et al*. (2010) [1], who reported that agricultural education and training programmes were insufficient in addressing farmers' specific knowledge requirements related to fodder production and livestock feeding technologies.

Table 1: Farmers' Perception of Constraints in Adoption of Green Fodder Production Technologies

S. No.	Constraints	Percentage (%)	Rank
1.	Wild and stray animals	87.5	I
2.	Small size of landholdings	80.0	II
3.	Non-availability of seed of high-yielding varieties	75.0	III
4.	Supply of inferior quality inputs by input dealers	57.5	IV
5.	Lack of guidance / technical knowledge	52.5	V
6.	Poor knowledge of green fodder cultivation technology	42.5	VI
7.	Non-availability of good quality seed	34.0	VII
8.	Lack of awareness about importance of green fodder for animal health	12.5	VIII

Economic Constraints Faced by Green Fodder Producers

The results presented in Table 2 reveal that economic factors play a crucial role in constraining the adoption of green fodder production technologies among farmers. The high cost of improved fodder seed emerged as the most severe economic constraint, as reported by 84.0 per cent of the respondents and ranked first. This was followed by the high cost of fertilizers and other agro inputs (80.0 per cent), which increases the overall cost of cultivation and discourages farmers from adopting recommended practices. High labour cost during sowing and harvesting operations was identified as the third major constraint by 76.0 per cent of farmers, reflecting the rising labour wages and scarcity of farm labour in the region.

Further, lack of timely availability of institutional credit was reported by 70.0 per cent of respondents, indicating limited access to affordable financial resources at critical stages of fodder cultivation. Low and fluctuating milk prices (68.0 per cent) also adversely affected farmers' investment capacity in fodder production, as reduced profitability from dairying lowers their willingness to adopt improved technologies. The absence of an organized market for green fodder (64.0 per cent) was another important constraint, limiting opportunities for surplus fodder sale. Additionally, inadequate capital among small and marginal farmers (60.0 per cent) and lack of subsidies and incentives for fodder crops (56.0 per cent) further restricted the adoption of improved fodder production technologies. These findings suggest that economic constraints significantly influence farmers' decision-making, emphasizing the need for policy support, input cost reduction, improved credit facilities, and incentive-based interventions to promote wider adoption of green fodder production technologies

Table 2: Economic Constraints Faced by Green Fodder Producers (n = 200)

S. No.	Economic Constraints	Frequency (No. of farmers)	Percentage (%)	Rank
1.	High cost of improved fodder seed	168	84.00	I
2.	High cost of fertilizers and agro-inputs	160	80.00	II
3.	High labour cost during sowing and harvesting	152	76.00	III
4.	Lack of timely availability of institutional credit	140	70.00	IV
5.	Low and fluctuating price of milk	136	68.00	V
6.	Absence of organized market for green fodder	128	64.00	VI
7.	Inadequate capital with small and marginal farmers	120	60.00	VII
8.	Lack of subsidies and incentives for fodder crops	112	56.00	VIII

Knowledge-Related Constraints Faced by Farmers in Adoption of Green Fodder Production Technologies

The data presented in Table 3 reveal that lack of awareness about improved technologies was the most prominent knowledge-related constraint perceived by green fodder growers, as reported by 92.5 per cent of the respondents and ranked first. This indicates insufficient dissemination of information regarding improved fodder production practices among farmers. The lack of on-farm guidance and training from organized bodies was reported by 89.0 per cent of respondents and ranked second, highlighting weak extension support and limited exposure to practical demonstrations and capacity-building programmes. Furthermore, limited availability of resources was perceived as a major constraint by 82.5 per cent of farmers and ranked third, restricting their ability to adopt improved technologies even when awareness existed. These findings suggest that knowledge gaps, coupled with inadequate extension services and resource limitations, significantly hinder the adoption of green fodder production technologies. Strengthening extension mechanisms, enhancing farmer training programmes, and ensuring access to necessary resources are therefore essential for improving adoption levels and reducing the knowledge gap among green fodder producers. Similar results were reported by Kumar, *et al.* (2020) [2], Nagaraj, *et al.* (2023) [3], Suman *et al.* (2017) [4] and Kumar *et al.* (2015) [5].

Table 3: Knowledge-Related Constraints Faced by Farmers in Adoption of Green Fodder Production Technologies

S. No.	Knowledge-related constraints	Frequency (No.)	Percentage (%)	Rank
1.	Lack of awareness about improved technologies	185	92.5	I
2.	Lack of on-farm guidance / training from organized bodies	178	89.0	II
3.	Lesser resources	165	82.5	III

Relationship between knowledge & adoption gap in fodder production technology

The results presented in Table 3 indicate that knowledge-related constraints significantly influenced the adoption of green fodder production technologies. A positive and highly significant relationship was observed between the knowledge gap and the adoption gap. The computed correlation coefficient ($r = 0.68$) indicated a strong positive association, suggesting that an increase in knowledge gap was accompanied by a corresponding increase in adoption gap. The relationship was found to be statistically significant at the 1 per cent level of probability ($p < 0.01$).

Among the knowledge-related constraints, lack of awareness about improved technologies was reported by 92.5 per cent of respondents and ranked first, contributing substantially to the knowledge gap and thereby limiting adoption of recommended practices. The lack of on-farm guidance and training from organized bodies (89.0 per cent, Rank II) further widened the gap by restricting farmers' practical exposure and skill development. In addition, limited resources (82.5 per cent, Rank III) constrained farmers from converting available knowledge into actual practice, even when partial awareness existed.

The significant positive correlation clearly indicates that improvement in farmers' knowledge through effective extension interventions, capacity-building programmes, and field demonstrations would directly reduce the adoption gap. These findings underscore the importance of strengthening extension services and ensuring timely support to enhance adoption of green fodder production technologies.

Conclusion

The present study revealed substantial gaps in the adoption of green fodder production technologies in the Gorakhpur region of Uttar Pradesh, primarily due to a combination of physical, economic, and knowledge-related constraints. Yield performance of improved fodder varieties, particularly berseem, demonstrated the potential of recommended technologies to enhance green fodder productivity and farmers' income when adopted under field conditions. However, the adoption of these technologies remained limited.

The major constraints perceived by farmers included the menace of stray cattle and wild animals, small landholdings, high cost of improved fodder seed and agro-inputs, lack of timely institutional credit, and inadequate market support for green fodder. Knowledge-related constraints such as lack of awareness about improved technologies, insufficient on-farm guidance and training, and limited resources further widened the adoption gap. The study established a positive and highly significant relationship between knowledge gap and adoption gap, indicating that inadequate knowledge is a key determinant of low adoption of fodder production technologies.

The findings emphasize the need for strengthening extension services through effective training programmes, frontline demonstrations and farmer-to-farmer dissemination to enhance awareness and technical knowledge. Policy interventions focusing on availability of quality seed, reduction in input costs, improved credit facilities, control of stray animals and provision of targeted subsidies for fodder crops are essential to promote wider adoption. Addressing these constraints holistically would contribute to sustainable green fodder production, improved livestock productivity, and enhanced livelihoods of farmers in the region.

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