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Constraints faced by the farmers in black gram production and marketing in Bhilwara district of Rajasthan

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Abstract
The study, based on primary data from 80 randomly selected farmers across selected Gram Panchayats of Shahpura and Asind tehsils in Bhilwara district during the agricultural year 2024-25, aimed to identify key constraints in black gram production and marketing using Garrett's ranking technique. Farmers were categorized by farm size, and data were collected through structured interviews. Major production constraints included damage by animals (highest Garrett score of 63.84), high input costs, weed problems, labour shortage, pest attacks, and poor soil fertility. Marketing constraints were led by dependence on middlemen (Garrett score 64.78), followed by market price fluctuations, high transportation costs, malpractices, and limited awareness of schemes. Other significant challenges were poor access to storage, distant mandis, and lack of market intelligence. The findings highlight the need for infrastructure development, training, direct market access, input support, and improved extension services to enhance black gram productivity and profitability in the region.

Keywords: Garrett ranking technique, sample farmers, production constraints and marketing constraints

Introduction
Black gram (*Vigna mungo* L.), commonly known as URD bean or mash, belongs to the Fabaceae family and is one of the most important short-duration pulse crops. India is its center of origin and the largest global producer, contributing around 70% of the world's production, followed by Myanmar and Pakistan. It is cultivated mainly in the Kharif season (80%), and to a lesser extent in Rabi season (20%), across diverse agro-climatic zones. Black gram is grown for its dry beans, fodder, and green manuring, and is also intercropped or grown after paddy in semi-irrigated and dryland conditions. It improves soil fertility by fixing atmospheric nitrogen (about 42 kg/ha/year). The crop matures in 65-80 days, requires 350-400 mm rainfall, and is sensitive to heavy moisture. In 2023-24, India produced approximately 2 million tonnes from 4 million hectares, with an average yield of 598 kg/ha. Rajasthan, the third-largest producer, had 3.18 lakh hectares and 1.73 lakh tonnes, with Bundi, Tonk, and Bhilwara being leading districts. Black gram is rich in protein (24%), carbohydrates (59.6%), calcium, phosphorus, and iron, making it nutritionally significant, especially when combined with cereals like rice. It is widely used in Indian cuisine (dal, idli, dosa, vada), and also serves as quality fodder for livestock.

Materials and Methods
The study was conducted using primary data gathered from 4-gram panchayats in Shahpura tehsil, 2-gram panchayats in Asind tehsil, and 2-gram panchayats in Shahpura tehsil, each of which had 20 farms chosen at random. These tehsils were deliberately picked because, in comparison to other blocks in the vicinity that cultivate black gram, they cover a larger area under cultivation. Next, 80 farmers were chosen at random to make up the sample.

The farms were divided into four groups: Small (<0.9 ha), Medium (0.91-2.2 ha), and Large (>2.21 ha). The agricultural year 2024–2025 served as the study's reference year. The necessary information was gathered from the sample farmers using a pre-tested schedule and questionnaires given during in-person interviews to investigate the limitations they faced on different levels. The data on the various production and marketing limitations that the farms encountered were used to produce frequency tables, and percentages for each item were shown.

Assessing constraints through Garrett's ranking technique
Garrett's ranking method was applied to examine the challenges faced by black gram farmers. Constrains were grouped into production and marketing. The percentage position was turned into scores using the table provided by Garrett and Woodworth (1969). These ranks were then converted into score values using the following formula.

$$\text{Per centage position} = \frac{100\,(\text{Rij} - 0.50)}{\text{Nj}}$$

Where,
R_{ij} = Rank given for the i^{th} constraint (i=1,2,3…. n) by the j^{th} farmer (j= 1,2,3…. n)
N_j = Number of constraints ranked by the j^{th} individual farmer.

Results and Discussion
Constraints faced by farmers in production of black gram: The constraints encountered by farmers in the production of black gram, as presented in Table 1, reveal several critical challenges affecting productivity. Among these, damage caused by animals in the fields emerged as the most serious constraint, with the highest Garrett score of 63.84, indicating its severe impact on black gram cultivation. This was followed by the high cost of inputs (Garrett score 58.49) and the weed problem (Garrett score 54.66), both of which significantly hinder effective crop management. The non-availability of labour during the peak harvesting season was another major constraint, with a Garrett score of 50.70, affecting harvest efficiency.
Other notable limitations included pest and disease attacks (Garrett score 50.18) and lack of soil fertility (Garrett score 46.86), which contribute to yield variability. Farmers also reported limited access to quality inputs (Garrett score 45.79) and a lack of knowledge about recommended cultivation practices (Garrett score 43.50), indicating the need for better extension services and training. Additional concerns such as the lack of quality seeds (Garrett score 40.09) and lack of access to modern agricultural machinery and equipment (Garrett score 37.68) reflect structural barriers that limit the adoption of improved technology. These issues reflect both structural and knowledge-based barriers that limit the productivity potential of the crop. These findings highlight the need for a holistic approach involving better access to inputs and machinery, improved irrigation infrastructure, farmer training programs and strategies to mitigate crop losses caused by wildlife. Addressing these constraints would help enhance black gram cultivation and build farm-level resilience in the region.

Table 1: Constraints faced by farmers in production of Black gram in Bhilwara

S. No.	Production Constraints	Garrett Score	Ranks
1	Weed problem	54.66	III
2	Limited access to quality inputs	45.79	VII
3	Damage caused by animals in fields	63.84	**I**
4	Pest and disease attacks	50.18	V
5	Lack of soil fertility	46.86	VI
6	Lack of access to modern agricultural machinery and equipment	37.68	X
7	High cost of inputs	58.49	II
8	Non-availability of labour at peak harvesting season	50.7	IV
9	Lack of quality seeds	40.09	IX
10	Lack of knowledge about cultivation practices of Black gram	43.5	VIII

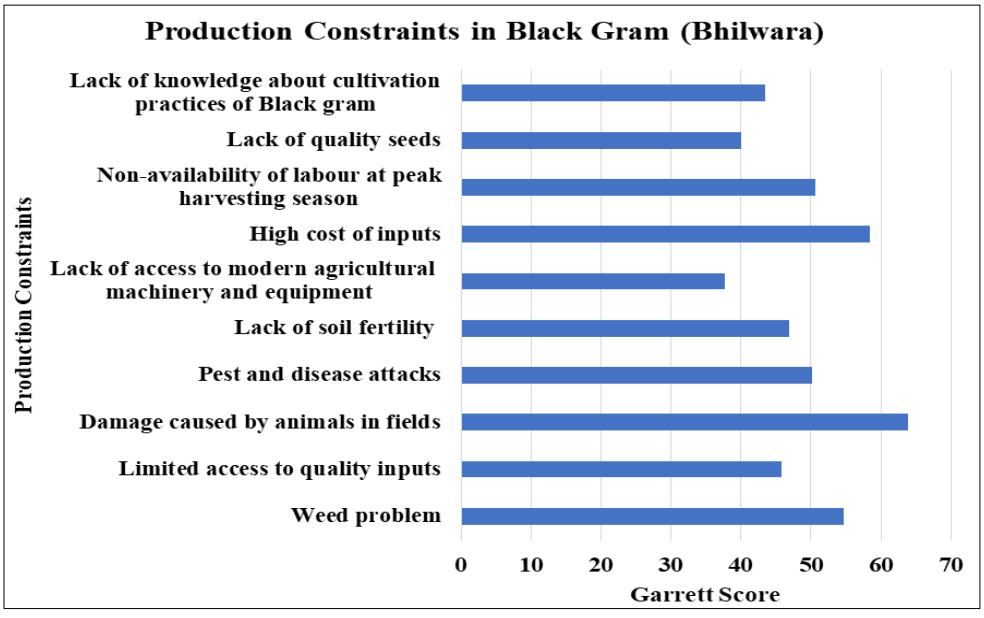

Fig 1: Production constraints in black gram cultivation in Bhilwara District

Constraints faced by farmers in marketing of black gram

The marketing constraints faced by black gram farmers, as outlined in Table 2, reveal a series of serious challenges affecting both income and market accessibility. The most prominent issue reported by farmers is their dependence on middlemen, which ranked first with the highest Garrett score of 64.78, reflecting a major limitation on their bargaining capacity and overall profitability.

This is followed by the fluctuation in black gram market rates (Garrett score 58.84), which contributes significantly to income instability. The high marketing cost and transportation charges (Garrett score 54.14) highlighting the financial burden of accessing distant markets. Malpractices by middlemen (Garrett score 50.41) pointing to unethical trade practices that further disadvantage farmers. The limited awareness of government schemes and subsidies (Garrett score 49.69) indicating that many farmers are unable to benefit from available institutional support due to lack of information. Infrastructure-related challenges are also prominent. These include the distant location of mandis (Garrett score 46.58), low prices during the harvesting period (Garrett score 45.94), lack of transport facilities (Garrett score 42.76) and lack of storage facilities (Garrett score 40.83). These constraints hinder farmers' ability to store and transport their produce effectively, forcing them to sell under distress. Finally, the lack of market intelligence (Garrett score 37.84) restricts timely and informed decision-making, leaving farmers vulnerable to price exploitation.

These constraints collectively underscore the need for investment in rural infrastructure, better regulatory oversight of market intermediaries, promotion of direct marketing platforms, and stronger agricultural extension services to empower farmers with timely information, logistical support, and improved market access.

Table 2: Constraints faced by farmers in marketing of black gram in Bhilwara

S. No.	Marketing Constraints	Garrett score	Ranks
1	Malpractices by middlemen	50.41	IV
2	Lack of market intelligence	37.84	X
3	High Marketing cost/transportation charge	54.14	III
4	Limited awareness of government schemes and subsidies	49.69	V
5	Lack of transport facility	42.76	VIII
6	Distant location of mandi	46.58	VI
7	Fluctuation in market rate of Black gram	58.84	II
8	Low price during harvesting period	45.94	VII
9	Dependence on middlemen	64.78	I
10	Lack of storage facility	40.83	IX

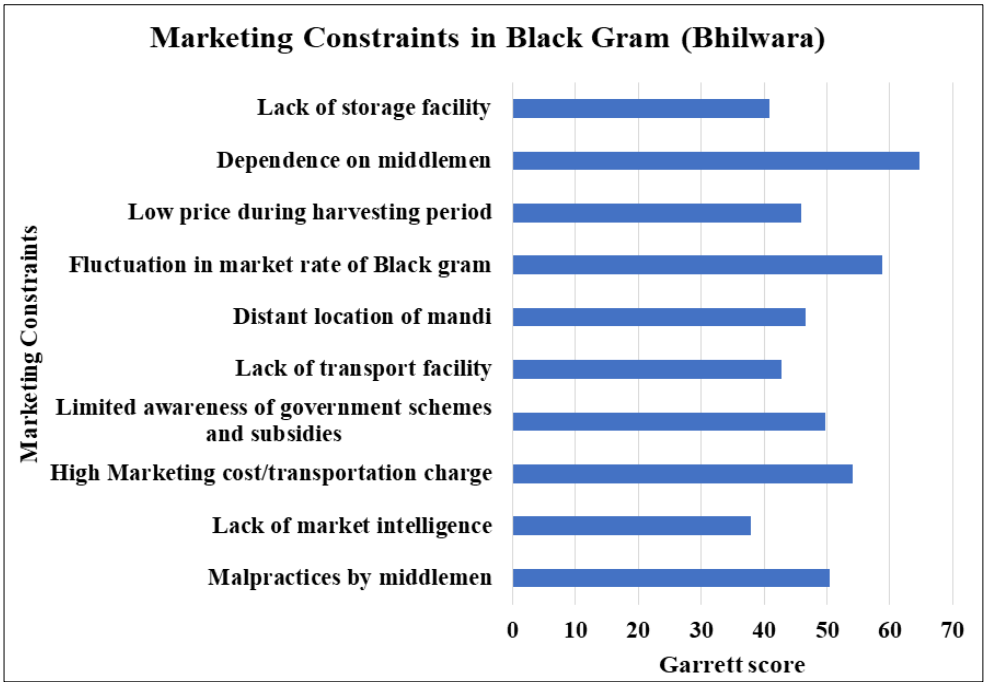

Fig 2: Marketing constraints in black gram cultivation in Bhilwara District

Conclusion

The study identified key constraints in both production and marketing of black gram in Bhilwara district. In production, damage by animals, high input costs, weed problems, and labor shortages were the most critical issues, limiting yield and efficiency. In marketing, farmers faced major challenges due to dependence on middlemen, price fluctuations, high transport costs, and poor access to market infrastructure and information. Addressing these issues through better input supply, training, rural infrastructure, and direct marketing support is essential to improve black gram cultivation and farmers' income in the region.

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