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Understanding farmers' preferences and constraints in vegetable seed marketing in Durg district of Chhattisgarh

[1]Siddhanta Sandesh and [2]Hulas Pathak

[1]Student, MBA(ABM), College of agriculture, IGKV, Raipur, Chhattisgarh, India

[2]Professor and Head, Department of Agri-Business and Rural Management, College of agriculture, IGKV, Raipur, Chhattisgarh, India

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Corresponding Author: Siddhanta Sandesh

Abstract

The present study was carried out to identifying and analyzing farmers' preference in vegetable seed purchase, and eliciting the constraints faced by farmers and dealers and suggesting measures for improvement of the same in Durg district of Chhattisgarh during the period 2024-25. The study was conducted across 15 randomly selected villages from three blocks—Durg, Dhamdha, and Patan—with a total sample of 105 vegetable growers. The study further illustrated that most growers were middle-aged (59.04% aged 30–50 years), literacy rate (91.42%), and relied solely on farming (89.52%), with medium landholdings (38.10%). Farmers overwhelmingly preferred hybrid seeds (88.57%) over open-pollinated seeds (11.43%). VNR was identified as the most preferred brand, chosen by 21.19% of respondents, followed by other brands. Farmers prioritized seed quality, higher yield and past experience when selecting seeds. Key challenges identified among farmers included fear of crop failure (mean score 72.44), followed by others. Dealers struggled with intense competition (mean score 72.13) and delayed payments from farmers (mean score 65.13) followed by others. The study recommended promoting climate-resilient seed varieties, strengthening extension services, improving credit and insurance access, and enhancing dealer support.

Keywords: Vegetable seed marketing, farmers' preference, brand preference**,** constraints

Introduction

Seed serves as the fundamental and most essential component for sustainable agriculture. The effectiveness of all other inputs largely hinges on the quality of seeds. It is estimated that quality seeds alone contribute directly to about 15 to 20 percent of total production, depending on the crop. This contribution can be increased to as much as 45 percent with the effective management of other inputs.

India is the world's second-largest producer of vegetables, after China. Hybrids and open-pollinated variety derivatives account for 68.7% and 31.3% respectively, of the vegetable seed market in India, because hybrids are increasingly used in the production of vegetables. The Indian vegetable seed market is fragmented, with the top five companies accounting for 27.51%. The top participants in this market are Advanta Seeds - UPL, BASF SE, Maharashtra Hybrid Seeds Co., Syngenta Group, and VNR Seeds.

Farmers now prefer high-quality hybrid seed brands to ensure better crop yields. A decade ago, the majority of small and marginal farmers relied on traditional and local seed varieties for cultivation. However, due to drastic climate change and soil degradation, these varieties began producing lower-than-expected yields, often leaving farmers unable to cover production costs. The unpredictability of traditional seeds pushed farmers toward hybrid alternatives.

This study shows that quality seed was the most important input for sustainable agriculture and food security. Increasing demand for hybrid vegetable seeds, this research provided relevant insights to policymakers and seed industry through regional-focused analysis by spotlighting different types of marketing practices, preferences, and constraints, which offer directions for guiding policy and collaboration through stronger partnerships, income-based subsidies, crop insurance expansion, and improved extension services.

Materials and Methods

This section outlines the sampling strategy adopted for the present study. A multi-stage sampling method was used to ensure systematic and representative selection of the study area and respondents. The sampling procedure was carried out in four stages; each stage was guided by specific criteria relevant to the study objectives and the nature of the data required.

Sampling Methodology

Chhattisgarh is divided into 33 districts, each with varying levels of agricultural activity. For this study, Durg District was deliberately chosen because it leads the state in vegetable cultivation., with approximately 41.809 thousand hectares under vegetable farming and production of around 768.137 thousand metric tonnes. (Source: Directorate of Horticulture and Farm Forestry, 2023-24)) Durg District comprised three blocks—Durg, Dhamdha, and Patan, all of which were selected for this study to capture the region's

agricultural diversity. Dhamdha block is the largest, covering 888.34 km² or 39.7% of the district's area, followed by Patan block with 770.52 km² (34.4%) and Durg block with 579.14 km² (25.9%) (villageinfo.org, Census 2011). To ensure adequate representation from across the district, a total of 15 villages were selected—5 villages from each of the three blocks. From each of the selected villages, seven vegetable-growing farmers were chosen using a simple random sampling method, resulting in a total of 105 respondents across all 15 villages. This approach ensured that every eligible farmer had an equal chance of being included in the study.

Method of Data Collection

To achieve the objectives of the study, both primary and secondary data were systematically collected. This mixed-method approach allowed for triangulation of information, enhancing the reliability and validity of the findings. Primary Data were collected through personal interviews with 105 vegetable growers using a structured questionnaire designed to gather information on farmers' preferences in seed purchase and major constraints faced by respondents. Interactions, with 15 seed dealers provided valuable insights into the availability, popularity, and distribution of various vegetable seed brands in the study area.

Secondary data were obtained from reliable government sources, including the Directorate of Horticulture, Government of Chhattisgarh, the Census of India, and district-level agricultural and statistical handbooks. These data sources provided essential background information such as district-wise vegetable cultivation area, production trends, population statistics, and agro-climatic characteristics of the study region.

Data Analysis

Garrett's ranking technique was used to rank farmers' preferences and constraints, converting ranks into mean scores. Multiple response analysis was applied to analyze brand preferences, calculating response and case percentages.

Mean

$$Mean\ (\underline{x}) = \frac{\Sigma xi}{n}$$

Multiple response analysis

Two key measures were applied:

1. Response Percentage:

It shows how frequently each option was chosen relative to the total number of all responses.

$$Response\ \% = \left(\frac{Number\ of\ times\ a\ response\ was\ selected}{Total\ number\ of\ responses}\right) \times 100$$

2. Case Percentage:

It represents the percentage of respondents who selected a particular option. Formula:

$$Case\ \% = \left(\frac{Number\ of\ respondents\ selecting\ the\ option}{Total\ number\ of\ respondents}\right) \times 100$$

Results and Discussion

Factors influencing farmers' preference in the purchase of vegetable seeds

Table 1 highlighted the various factors influencing farmers' preferences when selecting vegetable seeds, ranked using the mean score method. The analysis provided insights into what drives purchasing decisions among farmers in the study area.

The most significant factor, ranked first, was product quality with a mean score of 72.92, indicating that farmers prioritized the assurance of good germination, disease resistance, and seed purity. This was closely followed by higher yield potential (71.07) and past experience with a particular seed brand or company (70.89), which ranked second and third, respectively. These findings revealed that farmers were highly pragmatic and results-oriented in their choices.

Peer farmer recommendations (67.72) and brand reputation (67.01) were also influential, suggesting the role of social validation and brand familiarity in decision-making. Adaptability to local conditions ranked sixth (61.73), emphasizing that farmers did consider agro-climatic suitability when selecting seeds.

Surprisingly, price was placed only at the seventh rank (57.32), indicating that farmers were willing to invest more for quality and yield. Factors such as availability of credit (51.51), promotional efforts (50.83), and dealers' guidance (47.29) were ranked lower, suggesting that while these factors played a role, they were not as critical as product performance.

In summary, this analysis shows that technical performance and personal farming experience significantly outweigh economic or promotional factors in shaping farmers' seed purchasing decisions. Seed companies should therefore focus on maintaining quality and building long-term farmer trust through performance-based results.

Table 1: Factors influencing farmers' preference in the purchase of vegetable seeds

S. No.	Factors	Total Score	Means Score n=105	Rank
1	Product Quality	7657.00	72.92	1
2	Higher yield	7462.00	71.07	2
3	Past experience	7443.00	70.89	3
4	Peer farmers	7111.00	67.72	4
5	Brand	7036.00	67.01	5
6	Adaptability to local condition	6482.00	61.73	6
7	Price	6019.00	57.32	7
8	Availability of credit	5409.00	51.51	8
9	Promotional efforts	5337.00	50.83	9
10	Dealers' guidance	4965.00	47.29	10

Criteria considered by farmers while purchasing vegetable seeds from retailers

Table 2 highlighted the key factors that influence farmers' decisions when purchasing vegetable seeds from retailers. Among the listed factors, past experience ranked highest with a mean score of 66.04, indicating that farmers strongly rely on their previous outcomes with seed varieties.

Brand name (63.97) and quality of seeds (63.22) were also major considerations, reflecting the importance of trust and

seed performance. Other factors such as peer farmer opinion and dealer recommendations held moderate influence, with mean scores of 59.17 and 58.25 respectively.

Interestingly, higher yield ranked sixth, and cost of seed was the least prioritized factor with a mean score of 43.95. This suggested that farmers value reliability, brand, and past performance over price when selecting seeds, indicating a quality driven purchase behaviour in the study area.

Table 2: Criteria considered by farmers while purchasing vegetable seeds from retailers

S. No.	Factors	Total score	Mean Score n=105	Rank
1	Past Experiences	6935	66.04	1
2	Brand Name	6717	63.97	2
3	Quality of seeds	6639	63.22	3
4	Peer Farmer Opinion	6213	59.17	4
5	Dealer Choice	6117	58.25	5
6	Higher Yield	5662	53.92	6
7	Cost of seed	4615	43.95	7

Farmers' overall preference for local seed and hybrid seed purchase

Table 3 showed that a majority of farmers (88.57%) preferred hybrid vegetable seeds, while only 11.43% opted for open-pollinated varieties. This indicated a strong preference for hybrids due to their higher yield and better market value. The data reflected a shift toward modern seed choices among farmers in the study area.

Table 3: Farmers' overall preference for local seed and hybrid seed purchase

Particulars	Number of Respondent	Percentage
Open-pollinated variety	12	11.43
Hybrid Variety	93	88.57
Total	105	100

Brand preferences among farmers when purchasing vegetable seeds

Table 4 illustrated the distribution of farmers' preferences for various vegetable seed brands in the study area, based on multiple response analysis. VNR emerged as the most preferred brand, with 21.19% of the total responses, followed closely by BASF (Nunhems) at 20.20%, and Syngenta at 18.21%, indicating strong market presence and brand trust among farmers.

Advanta received 11.26% of the responses, suggesting a moderate level of acceptance, while Mahyco and Namdhari accounted for 9.93% and 8.28%, respectively. The others category, representing smaller or local brands, constituted 10.93% of the selections.

These findings revealed that a few key brands dominate farmers' preferences in the vegetable seed market, with VNR, BASF (Nunhems), and Syngenta collectively accounting for nearly 60% of total responses. Their leading positions suggested strong brand recognition, trust, and consistent field performance.

Table 4: Brand preferences among farmers when purchasing vegetable seeds

S. No.	Name of companies	Number of Responses	Brand preference (%)	Response (%)	Rank
1	VNR	64	21.19	60.95	1
2	BASF (Nunhems)	61	20.20	58.10	2
3	Syngenta	55	18.21	52.38	3
4	Advanta	34	11.26	32.38	4
5	Mahyco	30	9.93	31.43	6
6	Namdhari	25	8.28	28.57	7
7	Others	33	10.93	23.81	5

Problems experienced by farmers in dealing with vegetable seeds

Table 5 presented the major constraints perceived by farmers in the marketing and use of vegetable seeds. The most significant issue identified was the fear of failure, with a mean score of 72.44, indicating a high level of uncertainty and risk aversion among farmers regarding the adoption of new or hybrid seed varieties.

The second major constraint was adverse weather conditions (66.33), highlighting the vulnerability of vegetable farming to climatic variability. This was followed by the high price of seed (58.76), which continued to be a financial burden for many farmers.

Other reported challenges included low yield (52.86), inadequate extension services (49.16) and quality issues (45.38), which collectively affected both productivity and confidence in market-provided seed options. Inadequate credit facilities ranked lowest (40.36), yet remaind a critical barrier for smallholders with limited cash flow.

These findings pointed to the need for targeted interventions including risk mitigation training, better access to quality seeds at affordable prices, enhanced credit support, and strengthened extension services to address farmers' concerns and improve seed adoption rates.

Table 5: Problems experienced by farmers in dealing with vegetable seeds

S. No	Problem	Total score	Mean Score n=105	Rank
1	Fear of failure	7606	72.44	1
2	Adverse weather condition	6965	66.33	2
3	High price of seed	6170	58.76	3
4	Low yield	5550	52.86	4
5	Inadequate extension services	5162	49.16	5
6	Quality issue	4765	45.38	6
7	Inadequate credit facility	4238	40.36	7

Constraints faced by dealers in vegetable seed marketing

Table 6 outlined the key challenges encountered by dealers in the marketing of vegetable seeds. The most pressing issue reported was competition from other dealers, with the highest mean score of 72.13, indicating intense market rivalry that affects sales margins and market share.

The second major constraint was the demand for credit sales and non-repayment by farmers in time (65.13), which significantly affected the cash flow and financial sustainability of dealers. Inadequate extension activities from companies (55.60) also emerged as a concern, pointing to limited technical support and promotional backing from seed firms.

Further challenges included the inadequate trained marketing personnel (51.93), fear of unsold stocks (49.33) and shorter credit periods offered by companies (43.40), which limited inventory flexibility and increased business risk for dealers.

Overall, these constraints emphasized the need for better coordination between seed companies and dealers, improved credit mechanisms, technical training, and strategies to manage competition effectively in the vegetable seed market.

Table 6: Constraints faced by dealers in vegetable seed marketing

S. No.	Problems	Total score	Mean Score n=15	Rank
1	Competition from another dealer	1082	72.13	1
2	Demand for credit sales and non-repayment of credit by farmers in time	977	65.13	2
3	Inadequate extension activities from companies	834	55.60	3
4	Inadequate trained personal for marketing	779	51.93	4
5	Fear of unsold stocks	740	49.33	5
6	Less credit period given by company	651	43.40	6

Based on the finding of the study, suggested measures to overcome key challenges faced by vegetable seed dealers and farmers

In reference to farmers, these are the suggested measures, promote climate-resilient and short-duration varieties, strengthen early weather warning systems & advisories via SMS or apps, increase crop insurance coverage like PMFBY, recruit more extension officers and strengthen KVK training programs, link seed purchases with credit or deferred payment schemes, expand access to Kisan Credit Cards (KCC) for vegetable farming. educate farmers about label reading, seed storage, and home germination tests. And for dealers use competitive pricing strategies, focus on niche markets, and launch loyalty programs, maintain formal credit documentation to reduce losses & promote advance booking, collaborate with banks/financial institutions for credit risk sharing, participate in training, hire skilled marketers, and leverage online courses, adopt better inventory planning & promotional schemes to manage stock, work with companies to develop tiered credit structures and improve institutional financing options, partner with companies for more field demostration & awareness programs.

Conclusion

Farmers prioritized seed quality, higher yield, and past experience when choosing seeds, with dealer guidance and seed cost lowest, showing preference for reliable, performance-driven decisions. Among brand preference, VNR, BASF, and Syngenta were most preferred due to trust and quality, while Namdhari and "Others" were least favored by farmers. Farmers' greatest challenge was fear of failure, reflecting high risk aversion, while lack of credit was least concerning, showing confidence in self-funding or informal arrangements. Dealers struggled most with competition and delayed payments from farmers, whereas short company credit periods were least problematic, indicating financial sustainability depends more on market rivalry and payment recovery.

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