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BOTTLENECKS IN POTATO PRODUCTION AND MARKETING: EVIDENCE FROM FARMERS IN KANNAUJ DISTRICT OF UTTAR PRADESH, INDIA

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ABSTRACT

One of India's most important food and cash crops, potatoes greatly increase food security, provide jobs and boost farmers' incomes. However, a number of technical, financial and infrastructure constraints limit its manufacturing and distribution. The present study was conducted in Kannauj district of Uttar Pradesh during the agricultural year 2025-26 in order to identify and examine the major production and marketing challenges faced by potato growers. A pre-tested interview schedule was used to gather primary data from 360 potato growers chosen from three blocks using a multistage purposive random sampling technique. The limitations were ranked according to farmers' opinions using Garrett's Ranking Technique. The results revealed that the most serious issue among production constraints was the absence of improved and high-yielding varieties (Garrett mean score 67.42), which was followed by disease and insect pest attacks (62.64) and high capital requirements combined with limited access to financing (62.21). The paucity of labor and the high cost of seed were both significant issues. The most important limitation in the marketing area was the lack of processing units (59.49), which was followed by price fluctuations (55.07), high costs of transportation (54.22) and poor market demand (53.48). Farmers' profitability was further diminished by inadequate storage facilities, poor market intelligence systems and reliance on intermediaries. Strengthening seed supply systems, expanding access to institutional credit, encouraging contemporary production technology, building infrastructure for processing and storage, and creating effective marketing networks and Farmer Producer Organizations (FPOs) are among recommendations suggested by the study. These actions would improve potato farming's sustainability, profitability and production in the research area.

Key words : Garrett's ranking, HYVs, Processing units, Price, Marketing.

Introduction

Agriculture contributes significantly to the economic growth of the nation by supplying food for the population, increasing exports, fostering capital formation and securing markets for industrialization. Agriculture continues to play a major role in the Indian economy, with 65% of the population dependent on it and 90% of the population residing in rural areas. It contributes about 40% of both national income and growth. Therefore, it is essential to meet the growing needs of a large population (Diliprao, 2015). Improved productivity per unit area and

time is necessary to meet the increased demand for food due to the expanding population and per capita income. According to this viewpoint, potatoes are significant for a number of reasons. First, compared to many other food crops, potatoes yield more edible energy and protein per unit area and time. Second, because of its short growing season and compatibility with other crops, potatoes are a good choice for multiple well and intercropping systems for small and marginal farmers. Thirdly, potatoes are a profitable commercial business due to their high profitability as a cash crop. Lastly, this crop has a wide

range of seasonal flexibility and is well adapted to Indian climate (Gurjar *et al.*, 2017).

Potato is currently grown on an estimated 19 Mha of farmland globally and the potato production worldwide stands at 378 MT. China is the world's largest producer of potatoes, accounting for almost 94 MT. India is the second largest potato producer contributing around 14.3 percent in global production (FAO, 2022). Potato in India is now grown over 2.3 million hectares with an annual production of 60.14 million tons. In peninsular India, sub-topical plains account for over 90% of the total potato area, followed by hills at 6% and plateau regions at 4%. With a 26–27% percentage of the nation's total vegetable production in 2024–2025, potato farming has been crucial in boosting vegetable production. Over the past ten years, the nation's share of the global potato pool has grown from 10% to 12–13%. Potato utilization has become more diverse with processed products commanding a large share of the potato market (Das *et al.*, 2025).

One of the world's four main food crops is the potato. The remaining three crops are maize, wheat and rice. Together, six states *viz.*; Uttar Pradesh, West Bengal, Bihar, Gujarat, Madhya Pradesh and Punjab contribute more than 90 percent of total potato production in India. In terms of total production, Uttar Pradesh, West Bengal and Bihar occupy top three positions with the total annual potato production of 20.126 MT (33.46%), 14.508 MT (24.12%) and 9.075 MT (15.09%), respectively (Singh and Dutt, 2024). The highest productivity of the potato is in Gujarat (30–34 tonnes/ha) followed by West Bengal (25–28 tonnes/ha) and Punjab (25–28 tonnes/ha) and the productivity of Uttar Pradesh is 22–25 tonnes/ha. The potato crop covers 45 thousand hectares in the Kannauj district of Uttar Pradesh, its production is 20.4 lakh metric tonnes and productivity is 25.43 tonnes/ha followed by Agra and Farrukhabad (Kumar *et al.*, 2024). But in average productivity, Agra having first place (26–27 tonnes/ha) followed by Farrukhabad (25–26 tonnes/ha) and Kannauj (24–26 tonnes/ha) (Directorate of Agriculture, Lucknow, 2024–25).

Natural conditions and pricing risk pose significant risks to agriculture as an economic activity. There are several issues with agriculture marketing at the national, international and APMC levels. Prior to independence, the majority of Indian agriculture was subsistence farming, with farmers selling only a small portion of their output at prices significantly below market rates in order to pay off debts, rent and other expenses (Gohain and Singh, 2018). There were several issues for farmers who brought their produce to mandis, or full sale markets. Village traders, kuchha arhityas, pucca arhityas, brokers,

wholesalers, retailers and moneylenders were among the numerous middlemen in the agricultural marketing system. Other significant barriers to the nation's competitive agricultural marketing system include the absence of infrastructure such as storage, transportation, quality control, packaging, price risk management, cool chains, market-led extension and a framework that supports contract farming. Farmers' decision-making on storage was hampered by inadequate transportation infrastructure and a lack of owned storage. As a result, shortly after harvest, almost 90% of the marketable surplus was sold. (Rajesh and Sundaresan, 2002). Additionally, the consumer unnecessarily pays a higher price during the lean season, while the grower farmer is denied of a good price for his crop during the peak marketing season due to a lack of food processing and storage (Ramkishan, 2004).

The facilities built in market yards are still insufficient, as stated in the Planning Commission Report. According to the report, market committees have not sufficiently standardized the cleaning, grading and packing of agricultural products before farmers sell them. The majority of market yards do not even have facilities for this. According to the report, the quantity of regulated marketplaces in an area is not as important as the facilities and amenities that are provided to farmers (Sobhana, 2026). In 66% of the regulated markets, there are both covered and open auction platforms. There are common drying yards in only 25% of the marketplaces. Less than 33% of markets have grading facilities and just 9% of marketplaces have cold storage units. More than 80% of the markets have access to the essential amenities, such as internal roadways, boundary walls, electric lighting, loading and unloading facilities and weighing equipment. 50% of the regulated markets have farmer's rest houses (Das *et al.*, 2026). In light of this, the present study was conducted to examine the several obstacles that Kannauj district farmers encounter when growing and selling potatoes. It would be beneficial to examine the issues that the framers encountered in order to identify the areas of the infrastructure that require additional development.

Materials and Methods

The present study was undertaken in the Kannauj district of Uttar Pradesh to study the problems of farmers in the production and marketing of potato. The pre-coded interview schedule was constructed in order to elicit information needed to obtain the objectives of the study. Multistage purposive random sampling technique was followed to select the state, district, blocks and finally respondents. A total of three blocks were selected for

the study namely Chhibramau, Jalalabad, Kannauj. Furthermore, five villages from each blocks were selected from which a sample of 360 farmers were selected for the study. The primary data for the study pertains to the period 2025-26.

Respondents' preferences on various criteria are ranked using Garrett's ranking technique. This approach aids in determining the most important factor affecting the respondent. Respondents are asked to rate their preferences for each factor using this manner. The resultant outcomes of such rankings are converted to per cent position using the formula:

$$\text{Per cent position} = \frac{100(R_{ij} - 0.50)}{N_j}$$

Where,

R_{ij} = Rank given for i^{th} variable by j^{th} respondents

N_j = Number of variable ranked by j^{th} respondents

From the Garrett's Table, the percent position calculated is converted into scores. Then for each factor, the scores of each individual are added and then total value of scores and mean values of score is calculated. The factors having highest mean value is considered to be the most important factor.

Results and Discussion

Farmers faced numerous challenges in agriculture and they also face difficulties when growing potato because of numerous limitations. Farmers' responses were gathered during the survey in order to assess the severity of these issues and limitations in potato production. On a scale of 1 to 12, with 1 being the most significant, farmers were asked to rank a number of concerns pertaining to potato production and marketing. Garrett's

Ranking technique was used to rank the limitations encountered during potato production and presented in Tables 1 and 2. Two types of constraints viz.; production and marketing constraints were discussed under the following headings:

Production constraints

The problems faced by the sample potato growers throughout the production process were Lack of improved and high yielding varieties, Attack of insect, pest and disease, High capital requirement/ Unavailability of finance, High seed cost, Non availability of labour in time, High wage rate, High cost of insecticides/ High fertilizer cost, Lack of seed treatment, Lack of latest technical know-how about the crop, Lack of irrigation facilities, Lack of nutrients in soil and lack of sufficient soil testing facilities, Difficulty of getting bullock and implements on hire for different operations. The data related to production constraints were analyzed and the findings have been presented in Table 1.

The table revealed that, Lack of improved and high yielding varieties was considered as major problem faced by potato growers with average score 67.42 (first rank) in garret ranking, Attack of insect, pest and disease was the second major problem in potato production with the average garret mean score of 62.64 (2nd rank) and third problem was High capital requirement/ Unavailability of finance with average score of 62.21 (3rd rank) followed by High seed cost, Non availability of labour in time, High wage rate, High cost of insecticides/ High fertilizer cost, Lack of seed treatment, Lack of latest technical know-how about the crop, Lack of irrigation facilities, Lack of nutrients in soil and lack of sufficient soil testing facilities, Difficulty of getting bullock and implements on hire for different operations with average score of 62.04, 60.93,

Table 1 : Constraints in Production of Potato as perceived by the producers.

S. no.	Factors	Garrett's Mean Score	Rank
1.	Lack of improved and high yielding varieties	67.42	I
2.	Attack of insect, pest and disease	62.64	II
3.	High capital requirement/ Unavailability of finance	62.21	III
4.	High seed cost	62.04	IV
5.	Non availability of labour in time	60.93	V
6.	High wage rate	59.29	VI
7.	High cost of insecticides/ High fertilizer cost	42.35	VII
8.	Lack of seed treatment	40.55	VIII
9.	Lack of latest technical know-how about the crop	38.40	IX
10.	Lack of irrigation facilities	37.74	X
11.	Lack of nutrients in soil and lack of sufficient soil testing facilities	37.30	XI
12.	Difficulty of getting bullock and implements on hire for different operations	36.13	XII

Table 2 : Constraints in Marketing of Potato as perceived by the Producers.

S. no.	Factors	Garrett's Mean Score	Rank
1.	Lack of processing unit	59.49	I
2.	Problem of price variation in the market	55.07	II
3.	High transport charges and lack of transportation facilities	54.22	III
4.	Low demand of product	53.48	IV
5.	Absence of Assured Pricing	53.42	V
6.	Lack of regulated and co-operative market	51.13	VI
7.	Lack of efficient marketing information system	49.90	VII
8.	Absence of Standardization and Grading	48.51	VIII
9.	Malpractices adopted in markets	47.56	IX
10.	Lack of storage facilities	46.88	X
11.	Financial Vulnerability & Export Challenges	44.79	XI
12.	Dependence on Middlemen	42.56	XII

59.29, 42.35, 40.55, 38.40, 37.74, 37.30, 36.13, respectively. Similar results were given by Reema *et al.* (2020), Shukla *et al.* (2022). The farmers also highlighted the significant issues related with the production of potato, such as lack of knowledge about varieties and insect-pest management and which they reported was due to the of lack of timely and appropriate transfer of technology.

Marketing constraints

Marketing constraints involved problems faced by the potato growers during marketing of potato. It included Lack of processing unit, Problem of price variation in the market, High transport charges and lack of transportation facilities, Low demand of product, Absence of Assured Pricing, Lack of regulated and co-operative market, Lack of efficient marketing information system, Absence of Standardization and Grading, Malpractices adopted in markets, Lack of storage facilities, Financial Vulnerability & Export Challenges, Dependence on Middlemen. The data related to marketing constraints has been presented in Table 2.

It is clear from the table, the major constraints faced by the farmers in the study area were Lack of processing unit with the garret mean score of 59.49 (rank I) followed by Problem of price variation in the market with the average score of 55.07 (rank II), High transport charges and lack of transportation facilities has mean garret score value of 54.22 (rank III), Low demand of product which got rank IV with a garret score of 53.48. Rank V constraint reported by the farmers was Absence of Assured Pricing

which resulted in decrease of farmer's share in consumer's rupee with overall garret score of 53.42, problem of Lack of regulated and co-operative market was also one of the major constraints which got VI rank with overall garret score of 51.13. In addition to the above problems, Lack of efficient marketing information system has got rank VII with the average score of 49.90, followed by Absence of Standardization and Grading, Malpractices adopted in markets, Lack of storage facilities, Financial Vulnerability & Export Challenges, Dependence on Middlemen with the garret score of 48.51, 47.56, 46.88, 44.79, 42.56, respectively. Similar results were given by Pandey and Sarkar (2005), Kumar *et al.* (2019); Raj (2018) who also reported potato crop was the most capital and labour intensive due to substantial cost incurred on seed, fertilizer and human labour.

Conclusion

According to the study, productivity, profitability and the general sustainability of potato cultivation are negatively impacted by a number of production and marketing challenges faced by potato growers. The most serious limitation among the production-related issues was the absence of enhanced, high-yielding cultivars. Because the local potato farm had not been producing or supplying potato seed for the previous three to four years, the farmers in the study region faced a shortage of high-quality potato seed. Therefore, private vendors, who primarily brought the seed from Manali, Himachal Pradesh, sold it to farmers. As a result, farmers eventually had to pay a very high price for seed. The production of crops, particularly root crops, has declined due to the prevalence of insect pests and diseases like nematodes, as well as the high capital requirements and limited access to financing. Because potatoes are a labor-intensive crop that requires more seeds per acre than other vegetables and grains, the respondents highlighted high input costs as the biggest barrier. The challenges faced by farmers are exacerbated by high seed costs, labor shortages, rising pay rates and the rising cost of agricultural supplies. The most significant marketing obstacle was found to be the lack of processing units, which was followed by price fluctuations, expensive transportation, poor market demand, and the absence of reliable pricing methods. Farmers' income and bargaining strength are further diminished by inadequately regulated markets, subpar

market information systems, inadequate storage facilities, and reliance on intermediaries. The primary cause of the labor shortage during peak season was worker migration to other industrialized states in search of greater earnings. Another reason for this restriction could be the other sector, such as the brick industry in the study area, offering workers better earnings during peak season.

Government agencies, research institutes and extension groups must work together to improve the potato production and marketing system. It is important to guarantee the prompt availability of high-quality seed, the promotion of enhanced and disease-resistant cultivars and simple access to institutional funding. It is also crucial to strengthen extension services by providing farmers with regular training on integrated pest management and contemporary crop technology. Additionally, farmer producer organizations (FPOs) and cooperative marketing can help stabilize prices and increase farmers' share of consumer spending, as can the establishment of potato processing facilities, the expansion of cold storage infrastructure, the development of effective transportation and marketing networks and more. The productivity, profitability and long-term sustainability of potato farming would all be greatly increased by such initiatives.

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