

Constraints Faced by the Banana Growers in Production in Gorakhpur District of Uttar Pradesh

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Abstract

The present study was conducted during 2023-24 in four banana-growing villages of Gorakhpur district, namely Ramchaura, Campiarnagar, Sonaura Khurd, and Sonaura Bujurg, using a sample of 80 farmers selected through random sampling across marginal, small, medium, and large farm categories. Data were collected through pre-tested schedules and analyzed using percentage and cost–return approaches. Results indicated that the average yield per hectare was highest in large farms (197.83 qt) followed by medium (195.03 qt), small (193.85 qt), and marginal farms (184 qt). However, higher yields in large farms were offset by increased cultivation costs (Rs. 109181.17/acre) and greater dependence on hired labor, resulting in the highest cost of production per quintal (Rs. 551.89). In contrast, marginal and small farms benefitted from lower input use and family labor, achieving relatively better cost efficiency with lower production costs (Rs. 487.30 and Rs. 492.62/qt, respectively). Profitability indicators such as net returns, family labor income, and farm investment income confirmed the overall viability of banana cultivation, though the benefit–cost ratio was slightly more favorable for marginal (1:3.20) and small farms (1:3.10) compared to medium (1:2.70) and large farms (1:2.69). Despite its profitability, banana farming in Gorakhpur faces several critical constraints, the foremost being abiotic stresses such as wind and drought (93.75%), high price of planting materials (87.50%), labor scarcity (70%), and poor marketing infrastructure (67.50%). Financial constraints, including lack of credit facilities (66.25%) and inadequate insurance coverage (62.50%), alongside limited technical knowledge (45%), further restrict productivity and profitability. The study concludes that while banana farming is economically rewarding, its sustainability is undermined by systemic challenges across production, finance, and marketing. Policy interventions such as the provision of affordable disease-free planting materials, access to institutional credit and insurance, farmer training on improved production practices, and strengthening of storage and market infrastructure are imperative to enhance profitability and ensure long-term viability of banana cultivation in the region.

Key words: Banana, Production, Constraints, XXXXXX, XXXXXXXXX

Banana (*Musa paradisiaca*) the “queen of tropical fruit” is one of the oldest fruits known to mankind. It has enjoyed versatile popularity in this country from times immemorial. The antiquity of banana can be traced to the traditional time. There are frequent references to bananas in the Ramayana and Mahabharata. It has been the food of sages and hence the name *Musa sapientum*. India one of the centers of origin of banana. It is declared to have been taken by Arabs from the West Coast of India to Palestine and Egypt. Indian traders took it to Africa from where it circulates to the West. Banana is grown within thirty degrees latitude on another side of the equator. It is cultivated in India over an area of about 3.2 million hectares and accounts for 23 per cent of the area under fruits [1]. The

estimated production of banana is about 3.3 million tones and 31.7 per cent share of banana in total fruit production in India. As per F.A.O. report. (FAO Report 2020) India ranks first in area and production of Banana in the world. It supports livelihood of a million people, with total annual production of 31.50 million metric tons from 878.0 thousand hectare in 2020 [2]. This fruit occupies second position, next only to mango with regard to area and production. In the state of Uttar Pradesh area under this fruit is about 67.4 thousand hectares producing roughly 30.8 lakh tones annually [3].

Banana is considered the most important energy producing food and is a good source of mineral salts and vitamins. It contains as much as 20 percent sugar, which is a

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rich source of energy. Banana provides a more balanced diet than many fruits. An acre of banana provides 15 million calories of energy compared to 1 million by wheat. It has a calorific value of 67 to 137 cal. per 100 gm. Banana also contains vitamins A, B, and C in reasonable amounts [4]. It leads all other fruits in food value and surpasses most vegetables in energy value and tissue building elements. It is used in green as well as in ripe states. Combined with milk ripe banana is recommended for infants feedings. An excellent presence known as Panchamritam is prepared out of banana. In small scale textile industries banana fibers has been used (fairly) extensively and its stem, containing substantial quantity of starch [5].

Banana cultivation in Gorakhpur district of Uttar Pradesh, though highly remunerative, is constrained by a series of interlinked production, financial, and marketing challenges that significantly undermine its resilience and efficiency. The most formidable challenge reported was abiotic risks such as drought and irregular rainfall which cause substantial crop damage and income instability for vulnerable banana plants [6]. Farmers also suffer from the high cost and inconsistent availability of quality planting materials, particularly tissue-cultured plantlets, which elevate production expenses, especially for small and marginal growers [7]. Closely tied to this is the issue of labor scarcity and rising wages (70%), which intensify input costs and hinder timeliness in critical operations like harvesting and propping [8]. Marketing constraints are equally pressing: limited access to reliable market facilities (67.50%), insufficient storage infrastructure (56.25%), and poor output market knowledge (46.25%) leave farmers dependent on intermediaries, diminishing their share of returns [9]. Financial barriers including lack of easy credit (66.25%) and inadequate insurance coverage (62.50%) hamper farmers' ability to invest in quality inputs or cushion losses [10]. Finally, gaps in technical knowledge (45%) around improved production techniques and disease management further impede productivity and cost-efficiency [11]. Addressing these interconnected challenges through interventions such as

subsidized disease-free planting materials, crop insurance, focused training programs, and improved market and storage facilities is essential for fostering sustainable profitability and reducing vulnerability in banana farming in the region [12].

The estimated production of banana is about 3.3 million tones and 31.7 per cent share of banana in total fruit production in India [13] (FAO Report 2020). The important banana growing states in India are Tamil Nadu, Kerala, Maharashtra, Andhra Pradesh, and Bihar. Banana is extensively cultivated in the Gangetic plains of Uttar Pradesh, Bihar and West Bengal and North eastern states with considerable socio-economic and cultural importance. Uttar Pradesh is 5th largest banana producing state in India with the production of 4037.9 MT and second largest banana producing district is Gorakhpur with the production of 30,558 Tones in Uttar Pradesh [14].

MATERIALS AND METHODS

The study area was confined to Gorakhpur district of Uttar Pradesh, which have fertile land with good irrigation facilities. Simple random sampling methods were used in selection of village. The total sample size of 80 banana growers was selected for the present study which was equally apportioned to selected four villages of Gorakhpur district viz: Ramchaura, Campiarnagar, Sonaura Khurd and Sonaura Bujurg villages were selected according to highest area under banana. We had categorized the sample farmers in four category marginal (Up to 1Acre), small (1-2 Acre), medium (2-4 Acre), and large (More than 4 Acre) because time to time decrease the landholding sized due to increase the population. The sample farmers were randomly selected from each of the selected villages for getting required information on banana cultivation using pre-tested and well-structured schedule. Information relating to various problems faced by banana growers was enlisted in pretested interview schedule. The farmers were asked the constraints in banana production. The details were collected during the period 2023-24. The collected data were analyzed by using percentage.

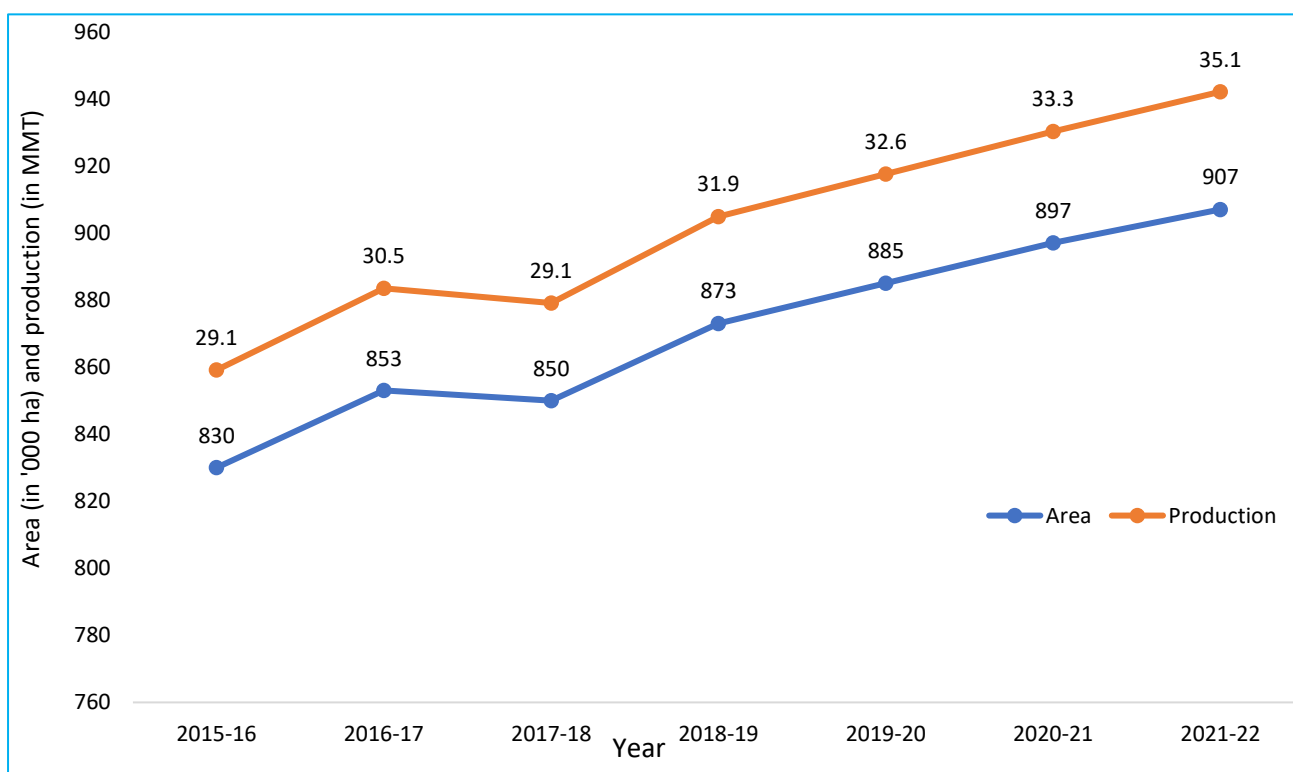


Fig 1 Trend of area (in'000 hectares) and production (in MMT) of banana in India

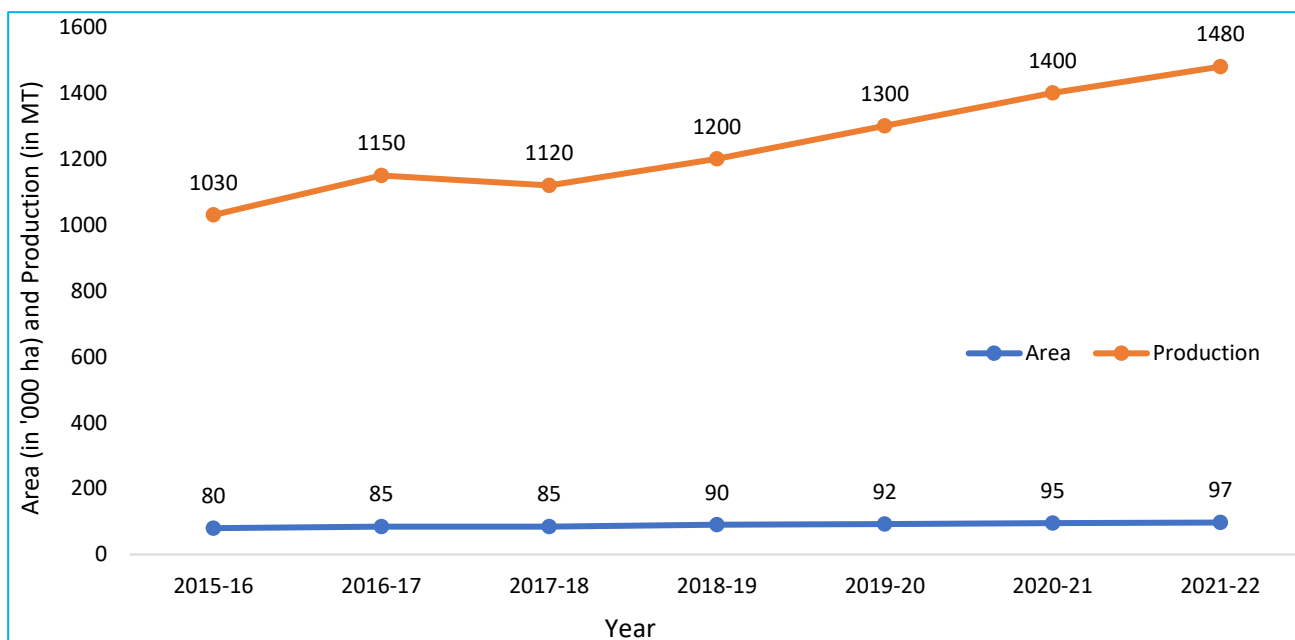


Fig 2 Trend of area (in'000 hectares) and production (in thousand MT) of banana in Uttar Pradesh

Source: Agricultural Statistics at a Glance 2022

Table 1 Major district of area and production of banana in Uttar Pradesh (FY 2022-23)

S. No.	District	Area (Hectare)	Production (Tonnes)
1.	Kushi Nagar	756	41,033.00
2.	Gorakhpur	563	30,558.00
3.	Fatehpur	398	21,602.00
4.	Kaushambi	261	14,166.00
5.	Bahraich	198	10,747.00
6.	Maharajganj	195	10,584.00
7.	Barabanki	172	9,336.00
8.	Kheri	152	8,250.00
9.	Sitapur	133	7,219.00
10.	Gonda	109	5,916.00
11.	Lucknow	76	4,125.00

Source: www.apeda.gov.in

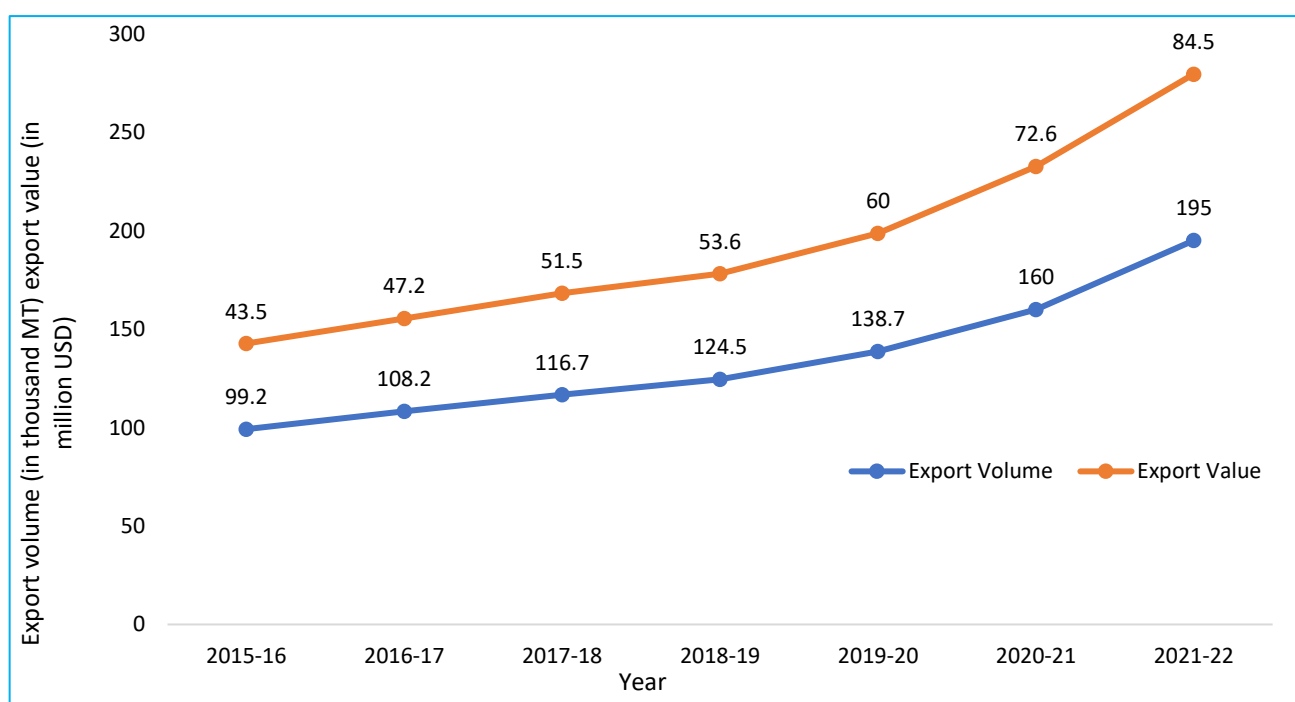


Fig 3 Trend of export volume (in thousand MT) and export value (in million USD) of banana of India

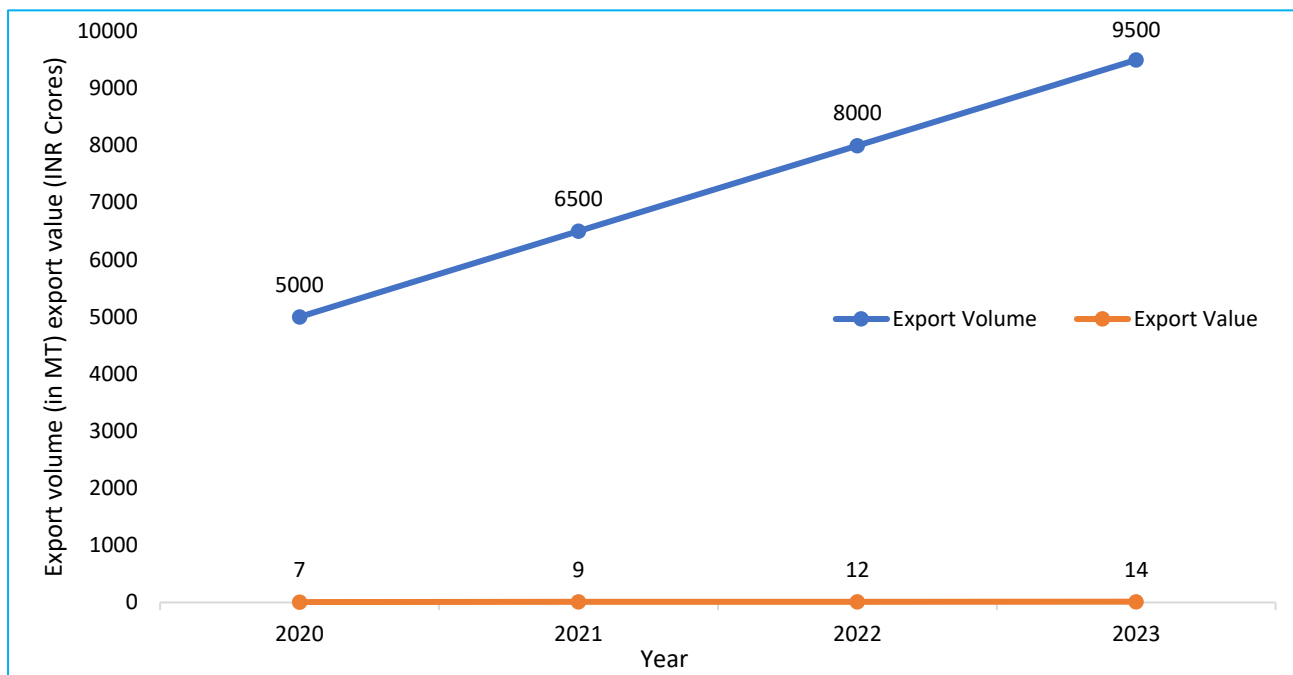


Fig 4 Trend of export volume (in MT) and export value (in INR crores) of banana of Uttar Pradesh

Source: <https://data.desagri.gov.in>

Table 2 Selected villages and banana growers

S. No.	Villages	Marginal	Small	Medium	Large	Total
1.	Ramchaura	3	7	8	2	20
2.	Sonaura Bujurg	4	10	6	0	20
3.	Sonaura Khurd	7	4	7	2	20
4.	Campiernagar	3	5	10	2	20
	Total	17	26	31	6	80

RESULTS AND DISCUSSION

The data in (Table 3) represents the yield, and return of banana. The average yield per ha from the sample farms was maximum in large (197.83 qt) followed by medium (195.03 qt), small farms (193.85 qt) and marginal farms (184 qt). The average price was Rs.1555.88, Rs. 1478.48, Rs. 1475.97, Rs. 1476.17 for marginal, small, medium and large farmers respectively. The maximum cost of cultivation happened in large farms (Rs. 109181.17), followed by medium farms (Rs.

105029.74), small farms (Rs. 93618.10) and marginal farms (Rs. 89663.58), which resulted due to farm size and amounts of input expenditure. As far as cost of production per quintal is concerned, it is minimum in marginal farms which is Rs. 487.30 followed by small farms which is Rs. 492.62, followed by medium farms Rs. 540.33 and maximum in large farms with Rs. 551.89 per quintal [11-12]. This resulted because of large farm size could more valuable in input applications, and use of outside labors rather than family labors, which eventually increased cost of production.

Table 3 Yield, cost and return of banana at the sample farms (Rs. /acre)

S. No.	Particular	Marginal	Small	Medium	Large	Overall
1.	Average yield (qt.)	184	193.85	195.03	197.83	191.02
2.	Average price (Rs. /qt.)	1555.88	1478.84	1475.97	1476.17	1490.69
3.	Cost of cultivation / acre	89663.58	93618.10	105029.74	109181.17	99373.148
4.	Cost of production / qt	487.30	492.62	540.33	551.89	520.22
5.	Gross return	286281.92	286673.13	287858.42	292030.71	284753.51
6.	Net return (Gross return-cost of cultivation)	196618.34	193055.03	182828.68	182849.54	185380.36
7.	Family labour income (Gross return - Cost B ₂)	203645.39	199610.41	188707.39	186996.21	191281.89
8.	Farm business income = Gross return - Cost A ₁	233908.33	229423.87	220050.81	222062.87	222903.94
9.	Farm investment income = Net return + rental value of own land + interest on fixed capital	226881.28	222868.49	214172.10	217916.20	217001.98
10.	Benefit cost ratio	01:03.20	01:03.10	01:02.70	01:02.69	01:02.90

The analysis of yield, cost, and returns of banana cultivation across different farm sizes in Gorakhpur district revealed significant differences in performance and profitability. The results show that the average yield per hectare was highest in large farms (197.83 qt), followed by medium (195.03 qt), small (193.85 qt), and marginal farms (184 qt). This

trend suggests that larger landholdings are able to achieve marginally higher yields due to greater capacity for input use, mechanization, and better resource availability. However, the differences in yield between categories are relatively narrow, indicating that small and marginal farmers are able to remain competitive in terms of productivity, largely due to intensive

family labor use and careful resource management. The average price per quintal, interestingly, was highest for marginal farmers (Rs. 1555.88) compared to small (Rs. 1478.48), medium (Rs. 1475.97), and large farmers (Rs. 1476.17). This price variation may be attributed to differences in market access, selling strategies, and timing of sales. Marginal farmers often sell smaller quantities directly in local markets or to consumers, allowing them to capture slightly higher prices, while larger farmers rely more on bulk sales to intermediaries at prevailing wholesale prices [13-14].

In terms of cost of cultivation, large farms incurred the highest expenditure (Rs. 109181.17/acre), followed by medium (Rs. 105029.74), small (Rs. 93618.10), and marginal farms (Rs. 89663.58). This pattern reflects the economies of scale in land use but also highlights the cost-intensive nature of large farms. Greater dependence on hired labor, mechanization, and higher input application in large farms inflate the overall cultivation costs, whereas small and marginal farmers reduce expenses by relying on family labor and low-cost traditional practices. The cost of production per quintal further reinforces this distinction. It was lowest in marginal farms (Rs. 487.30/qt), followed by small farms (Rs. 492.62/qt), medium farms (Rs. 540.33/qt), and highest in large farms (Rs. 551.89/qt). These figures indicate that despite achieving higher yields, large farms are less cost-efficient compared to marginal and small farms. The latter

benefit from the utilization of family labor and careful management of inputs, leading to lower production costs per unit of output [15]. Overall, these findings corroborate the idea that scale does not always guarantee efficiency in banana farming. While larger farms enjoy a production advantage, they also face higher operational costs that erode their profitability margin. On the other hand, marginal and small farmers demonstrate relatively better cost efficiency, underscoring the resilience of smallholder farming systems in sustaining profitability despite limited land resources [16].

Constraint faced by banana farmers

Constraint in banana production were collected from the sample banana growers in Gorakhpur district of Uttar Pradesh and were compared for their order of importance based on highest facing problems percentage. The ranking obtained for different constraints with highest percentage is presented in (Table 4). Majority of the banana growers in the study area expressed the problem of risk due to abiotic factors (wind, drought etc.) was the major constraint followed by high price of planting materials, shortage of labour, reliable market facilities, lack of finance, lack of availability of good quality plantlets and inputs, insurance benefits, Storage facilities, inadequate output market knowledge, lack of technical knowledge [17-18].

Table 4 Problems faced by sample farmers in production of banana

S. No.	Constraints	Farmers	Percent of farmers	Rank
1.	Risk due to abiotic factors (wind, drought etc.)	75	93.75	I
2.	Lack of availability of good quality plantlets and input	51	63.75	VI
3.	High price of plantlets	70	87.50	II
4.	Insurance benefits	50	62.50	VII
5.	Reliable market facilities	54	67.50	IV
6.	Storage facilities	45	56.25	VIII
7.	Shortage of labour	56	70	III
8.	Lack of technical knowledge	36	45	X
9.	Lack of finance	53	66.25	V
10.	Inadequate output market knowledge	37	46.25	IX

Suggestions

With a view to overcome constraints mentioned earlier and to enhance overall effectiveness the following suggestions have been made for consideration.

- The farmers were facing the problems of viral disease and Fusarium wilt and Panama wilt in banana production; horticulture department should gear up to meet the requirements of planting materials (disease free) for farmers at reasonable price.
- It should be ensured by the government that soil testing is done from time to time so that farmers can get information about soil borne disease and requirement of fertilizers.
- Easy and efficient finance service from different financing agencies is very important to promote area and production of banana in study area.
- To make banana crop more remunerative, market organization should be strengthened, State government should come forward for more incentive remunerative prices for the banana growers.
- Efforts should be made by state agricultural universities and seed agencies to provide supply the quantity seed of Banana

at the proper time to farmers as seed is one of the important inputs to improve the production of banana.

- Majority of the farmers was ignorant about market news. They must be communicated at village level so that they can sell their produce when they get attractive remunerative price.

CONCLUSION

The study clearly reveals that banana cultivation in Gorakhpur district of Uttar Pradesh (India) is a profitable enterprise across all farm sizes, but the economics vary with scale of operation. The average yield per hectare was found to be highest in large farms (197.83 quintals) and lowest in marginal farms (184 quintals), indicating that larger landholdings enable relatively higher productivity. However, despite higher yields, the cost of cultivation was also maximum in large farms due to greater input application, mechanization, and dependence on hired labor, which consequently increased the cost of production per quintal (Rs. 551.89). In contrast, marginal and small farms benefitted from family labor and relatively lower input use, which reduced their production cost per quintal (Rs. 487.30 and Rs. 492.62, respectively). Profitability indicators such as net return, family labor income, and farm investment income also highlight that banana farming

remains economically viable across categories, though the benefit–cost ratio was slightly higher for marginal (1:3.20) and small farms (1:3.10) compared to medium (1:2.70) and large farms (1:2.69). This suggests that smaller farms are relatively more cost-efficient despite their limited yield levels, while larger farms, though productive, incur higher expenditures that reduce relative profitability. On the other hand, several constraints significantly affect the sustainability and expansion of banana production. The most pressing challenge reported by farmers was risk from abiotic factors such as wind and drought (93.75%), followed by high prices of planting materials (87.50%), shortage of labor (70%), and inadequate market infrastructure (67.50%). Financial limitations, unavailability of good-quality plantlets, lack of insurance coverage, and

insufficient storage facilities further aggravate production and marketing difficulties. The relatively lower percentages of constraints like lack of technical knowledge and output market information still indicate notable gaps in extension services and farmer awareness. Overall, banana farming in the region is both productive and remunerative, but its efficiency and sustainability are compromised by high cultivation costs, production risks, and systemic marketing and institutional constraints. Addressing these challenges through policy interventions, timely supply of disease-free planting materials, affordable credit facilities, improved extension services, and strengthened market linkages will be crucial to enhance profitability and ensure long-term viability of banana cultivation for all categories of farmers.

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