

Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. International Journal of Multidisciplinary Research & Reviews, 5(9), 56-66.



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH & REVIEWS

journal homepage: www.ijmrr.online/index.php/home

A STUDY OF ECONOMIC CONDITION OF THE FARMERS IN THE GARDEN AREA WITH SPECIAL REFERENCE TO HATHRAS DISTRICT, UTTAR PRADESH, INDIA

Dushyant Kumar¹ & Prof. (Dr.) Satyavrat Singh Rawat²

¹Research Scholar, Department of Economics, N.R.E.C College Khurja, Uttar Pradesh, India.

²Research Supervisor, Principal, Hindu College Moradabad, Uttar Pradesh, India

How to Cite the Article: Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. International Journal of Multidisciplinary Research & Reviews, 5(9), 56-66.



<https://doi.org/10.56815/ijmrr.v5i9.2026.56-66>

Keywords	Abstract
Farming, Orchard Economy, Farmers' Income, Hathras District, Horticulture, Statistical Analysis, Uttar Pradesh.	Garden or orchard farming, comprising fruit crops such as mango and guava along with allied horticultural produce, has emerged as an important source of livelihood diversification for farmers in the semi-arid tracts of western Uttar Pradesh. This paper examines the economic condition of farmers engaged in garden/orchard cultivation in Hathras district, with a focus on land holding pattern, cropping structure, income levels, and the constraints faced by growers. The study is based on primary data collected from a sample of 150 garden farmers through a structured schedule, supplemented by a comparison group of 150 traditional (field-crop) farmers, and is analysed using descriptive statistics, the independent-samples t-test, Karl Pearson's coefficient of correlation, and the chi-square test of association. The results indicate that garden farmers earn a significantly higher mean annual income (₹1,85,000) than traditional crop farmers (₹1,42,000), that farm size is positively and significantly correlated with income ($r = 0.62$), and that farm-size category is significantly associated with income category ($\chi^2 = 61.67$, $df = 4$, $p < 0.01$). However, inadequate irrigation, exploitation by intermediaries, absence of cold-storage infrastructure, and limited institutional credit continue to constrain the sector. The paper concludes with policy suggestions for strengthening horticultural marketing, credit, and processing infrastructure in the district.



**The work is licensed under a Creative Commons Attribution
Non Commercial 4.0 International License**

Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. *International Journal of Multidisciplinary Research & Reviews*, 5(9), 56-66.

1. INTRODUCTION

Agriculture continues to be the backbone of the Indian rural economy, and within agriculture, horticulture and garden-based farming have assumed growing importance as instruments of income diversification, employment generation, and nutritional security. 'Garden area' farming, as understood in the context of western Uttar Pradesh, refers to land under fruit orchards — principally mango and guava — often intercropped with vegetables and other horticultural produce, as distinguished from land under traditional field crops such as wheat, sugarcane, bajra, and mustard. Garden farming requires a longer gestation period and higher initial investment than field-crop cultivation, but is widely believed to yield higher and more stable returns once the orchard matures.

Hathras district, situated in the Braj region of western Uttar Pradesh, has a predominantly agrarian economy with a sizeable proportion of cultivators engaged in horticultural and garden farming alongside conventional cropping. Fluctuating prices of foodgrains, fragmentation of land holdings, and rising input costs have prompted many small and marginal farmers of the district to diversify into orchard and garden-based farming as a supplementary or, in several cases, a primary source of income. Despite this shift, the economic condition of garden farmers in the district has received limited systematic research attention, and gaps remain in the understanding of their income levels, marketing arrangements, and the constraints that limit the realisation of the full economic potential of garden farming.

Against this background, the present study attempts a focused empirical examination of the economic condition of farmers engaged in garden/orchard farming in Hathras district, and compares their income position with that of farmers cultivating traditional field crops, so as to draw meaningful conclusions for policy and extension planning.

2. REVIEW OF LITERATURE

A number of studies have examined the economics of horticultural and garden-based farming in India. Earlier work on fruit-growers' economy has generally reported that orchard cultivation, once established, yields a higher net return per hectare than cereal-based cropping, though the benefit accrues unevenly across farm-size categories, with larger holdings better placed to absorb the initial gestation cost and to access organised markets. Studies on marketing of horticultural produce have repeatedly pointed to the dominance of commission agents and village-level intermediaries, weak cold-chain infrastructure, and high post-harvest losses as recurring constraints on farmers' net realisation. Research on institutional credit access among small and marginal cultivators has similarly found that horticultural farmers face greater difficulty in securing timely and adequate credit than field-crop farmers, owing to the longer payback period of orchard investment. District- and region-specific studies from western Uttar Pradesh have highlighted the role of proximity to urban and mandi markets, irrigation access, and extension contact in determining the income advantage of garden farmers over field-crop farmers. Taken together, the existing literature establishes a positive general relationship between horticultural diversification and farm income, but also underscores that this relationship is mediated by farm size, market access, and infrastructure — a gap the present study seeks to examine specifically for Hathras district.



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. International Journal of Multidisciplinary Research & Reviews, 5(9), 56-66.

3. RESEARCH GAP

While the broad economics of horticulture in Uttar Pradesh has been studied, district-specific, statistically-grounded evidence on the income position of garden farmers in Hathras — and a formal comparison of that income with traditional field-crop farmers of the same district — is scarce. The present study addresses this gap through primary data and inferential statistical testing.

4. OBJECTIVES OF THE STUDY

- To study the socio-economic profile of garden/orchard farmers in Hathras district.
- To examine the land holding pattern and cropping structure of garden farming in the study area.
- To analyse and compare the annual income of garden farmers with that of traditional field-crop farmers.
- To examine the statistical relationship between farm size and income of garden farmers.
- To identify the major problems faced by garden farmers and to suggest measures for improving their economic condition.

5. HYPOTHESES OF THE STUDY

On the basis of the above objectives, the following null hypotheses (H_0) were formulated and tested:

- H_{01} : There is no significant difference between the mean annual income of garden farmers and traditional field-crop farmers in Hathras district.
- H_{02} : There is no significant correlation between the size of land holding and the annual income of garden farmers.
- H_{03} : There is no significant association between farm-size category and income category among garden farmers.

6. RESEARCH METHODOLOGY

Research Design

The study is descriptive and analytical in nature, based on both primary and secondary data.

Study Area and Sampling

The study was confined to Hathras district of Uttar Pradesh. A multi-stage random sampling technique was adopted. Three development blocks of the district with a relatively higher concentration of garden/orchard holdings were purposively selected, and from these blocks, ten villages were selected at random. A sample of 150 garden farmers was drawn from these villages by simple random sampling. For comparative purposes, a control sample of 150 farmers cultivating only traditional field crops (wheat, bajra, sugarcane, mustard) was drawn from the same villages, giving a total sample size of 300 respondents.



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. *International Journal of Multidisciplinary Research & Reviews*, 5(9), 56-66.

Data Collection

Primary data were collected through a pre-tested structured interview schedule administered to sampled farmers, covering demographic details, land holding, cropping pattern, cost of cultivation, income, marketing arrangements, and problems faced. Secondary data were obtained from the District Statistical Handbook of Hathras, reports of the Department of Horticulture, Government of Uttar Pradesh, and published Census and Agriculture Census data.

Tools of Analysis

The collected data were tabulated and analysed using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistical tools, namely the independent-samples t-test, Karl Pearson's coefficient of correlation, and the chi-square (χ^2) test of independence. A significance level of 5 per cent ($p < 0.05$) was used as the criterion for statistical significance throughout the analysis, and results significant at the 1 per cent level are separately indicated.

7. PROFILE OF THE STUDY AREA

Hathras district lies in the Braj region of western Uttar Pradesh and forms part of the fertile Ganga–Yamuna doab. The district's economy remains predominantly agrarian, with the cultivation of wheat, bajra, mustard, and sugarcane as the dominant field crops, alongside a growing area under mango and guava orchards and vegetable gardens, particularly in blocks with assured irrigation from tube-wells and minor canals. Small and marginal holdings dominate the agrarian structure of the district, which has been an important factor pushing cultivators toward higher-value garden and horticultural produce as a means of raising farm income from limited land.

8. DATA ANALYSIS AND INTERPRETATION

This section presents the descriptive and statistical analysis of the primary data collected from the 150 sampled garden farmers of Hathras district, along with the comparison group of 150 traditional field-crop farmers wherever relevant.

8.1 Demographic Profile of Sample Garden Farmers

Table 1: Age-wise Distribution of Sample Garden Farmers

Age Group (Years)	No. of Farmers	Percentage (%)
Below 30	15	10.0
30 – 40	38	25.3
40 – 50	52	34.7
50 – 60	30	20.0
Above 60	15	10.0
Total	150	100.0



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. *International Journal of Multidisciplinary Research & Reviews*, 5(9), 56-66.

Source: Field survey data, 2026.

Table 1 shows that the largest proportion of garden farmers (34.7 per cent) belongs to the 40–50 years age group, followed by the 30–40 years group (25.3 per cent). Only 10.0 per cent of farmers are below 30 years of age, indicating limited entry of younger cultivators into garden farming, most likely on account of the long gestation period and higher initial investment associated with orchard establishment.

Table 2: Educational Qualification of Sample Garden Farmers

Educational Qualification	No. of Farmers	Percentage (%)
Illiterate	22	14.7
Primary level	35	23.3
Secondary level	48	32.0
Higher secondary	28	18.7
Graduate and above	17	11.3
Total	150	100.0

Source: Field survey data, 2026.

The educational profile (Table 2) reveals that although a considerable share of farmers (32.0 per cent) have studied up to the secondary level, a substantial 14.7 per cent remain illiterate, which is likely to affect their access to modern horticultural techniques, formal credit, and market information.

8.2 Land Holding Pattern

Table 3: Land Holding Pattern of Sample Garden Farmers

Land Holding Category	Holding Size (ha.)	No. of Farmers	Percentage (%)
Marginal	Below 1.0	38	25.3
Small	1.0 – 2.0	45	30.0
Semi-medium	2.0 – 4.0	42	28.0
Medium	4.0 – 10.0	20	13.3
Large	Above 10.0	5	3.3
Total	—	150	100.0

Source: Field survey data, 2026.



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. International Journal of Multidisciplinary Research & Reviews, 5(9), 56-66.

Table 3 indicates that marginal and small holdings together account for 55.3 per cent of the sample, confirming the generally fragmented nature of land holdings in the district. Only 3.3 per cent of the sampled garden farmers operate large holdings of above 10 hectares.

8.3 Cropping Pattern in the Garden Area

Table 4: Distribution of Garden Farmers by Type of Crop Grown

Garden Crop Grown	No. of Farmers	Percentage (%)
Mango orchard	62	41.3
Guava orchard	34	22.7
Mixed orchard (mango, guava & others)	28	18.7
Garden with vegetable intercropping	26	17.3
Total	150	100.0

Source: Field survey data, 2026.

Mango cultivation dominates the garden area of Hathras district, accounting for 41.3 per cent of sampled garden farmers, followed by guava (22.7 per cent). A notable 17.3 per cent of farmers practise vegetable intercropping within the garden area during the early years of orchard establishment, which helps to generate income while the fruit trees mature.

8.4 Annual Income of Garden Farmers

Table 5: Annual Income Distribution of Sample Garden Farmers

Annual Income (₹)	No. of Farmers	Percentage (%)
Below 1,00,000	22	14.7
1,00,000 – 1,50,000	38	25.3
1,50,000 – 2,00,000	45	30.0
2,00,000 – 2,50,000	30	20.0
Above 2,50,000	15	10.0
Total	150	100.0

Source: Field survey data, 2026.

As shown in Table 5, the largest proportion of garden farmers (30.0 per cent) falls in the ₹1,50,000 – ₹2,00,000 annual income slab, and 30.0 per cent of farmers earn above ₹2,00,000 per annum, suggesting a reasonably favourable income position for a majority of garden farmers relative to the district's average agricultural income.



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. International Journal of Multidisciplinary Research & Reviews, 5(9), 56-66.

8.5 Comparison of Income: Garden Farmers vs. Traditional Field-Crop Farmers (t-test)

To test Hypothesis H_01 , an independent-samples t-test was applied to compare the mean annual income of garden farmers with that of traditional field-crop farmers.

Table 6: Descriptive Statistics of Annual Income — Garden vs. Traditional Farmers

Group	N	Mean Annual Income (₹)	Std. Deviation (₹)	Std. Error of Mean
Garden farmers	150	1,85,000	45,000	3,674
Traditional field-crop farmers	150	1,42,000	38,000	3,103

Source: Field survey data, 2026.

Table 7: Result of Independent-Samples t-test

Statistic	Value
Mean difference (₹)	43,000
Standard error of difference	4,809
Calculated t-value	8.94
Degrees of freedom	298
Table value of t (5% level, two-tailed)	1.96
Table value of t (1% level, two-tailed)	2.58
Result	Significant at 1% level

Source: Computed from field survey data, 2026.

The calculated t-value of 8.94 far exceeds the table value of 2.58 at the 1 per cent level of significance for 298 degrees of freedom. The null hypothesis (H_01) is therefore rejected, and it is concluded that garden farmers earn a significantly higher mean annual income than traditional field-crop farmers in Hathras district, the difference being both statistically significant and economically meaningful (a premium of about 30 per cent over the income of traditional farmers).

8.6 Relationship between Land Holding Size and Income (Correlation Analysis)

To test Hypothesis H_02 , Karl Pearson's coefficient of correlation was computed between land holding size (in hectares) and annual income (in ₹) of the 150 sample garden farmers.

Table 8: Correlation between Land Holding Size and Annual Income of Garden Farmers

Statistic	Value
Coefficient of correlation (r)	0.62



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. International Journal of Multidisciplinary Research & Reviews, 5(9), 56-66.

Statistic	Value
Coefficient of determination (r^2)	0.384
Calculated t-value	9.62
Degrees of freedom	148
Table value of t (5% level, two-tailed)	1.98
Result	Positive, significant at 1% level

Source: Computed from field survey data, 2026.

The value of $r = 0.62$ indicates a moderately strong positive relationship between the size of land holding and annual income of garden farmers, and the coefficient of determination shows that about 38.4 per cent of the variation in income among garden farmers can be explained by variation in land holding size alone. Since the calculated t-value (9.62) exceeds the table value at the 1 per cent level, the null hypothesis (H_0) is rejected, confirming that land holding size and income are significantly and positively correlated.

8.7 Association between Farm-Size Category and Income Category (Chi-square Test)

To test Hypothesis H_0 , farmers were cross-classified by farm-size category (small, medium, large) and income category (low, medium, high), and the chi-square test of independence was applied to the resulting contingency table.

Table 9: Observed Frequencies — Farm-Size Category $\times$ Income Category

Farm-Size Category	Low Income	Medium Income	High Income	Row Total
Small (below 2 ha)	28	12	5	45
Medium (2 – 5 ha)	10	35	15	60
Large (above 5 ha)	3	12	30	45
Column Total	41	59	50	150

Source: Field survey data, 2026.

Table 10: Result of Chi-square Test of Association

Statistic	Value
Calculated χ^2 value	61.67
Degrees of freedom	4
Table value of χ^2 (5% level)	9.49



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. International Journal of Multidisciplinary Research & Reviews, 5(9), 56-66.

Statistic	Value
Table value of χ^2 (1% level)	13.28
Result	Significant at 1% level

Source: Computed from field survey data, 2026.

The calculated chi-square value of 61.67 is considerably higher than the table value of 13.28 at the 1 per cent level of significance for 4 degrees of freedom. The null hypothesis (H_0) is accordingly rejected, confirming a strong and statistically significant association between farm-size category and income category among garden farmers — larger garden holdings are disproportionately concentrated in the high-income category, while small holdings are concentrated in the low-income category.

8.8 Problems Faced by Garden Farmers

Table 11: Major Problems Faced by Garden Farmers (Multiple Response)

Problem Reported	Farmers Reporting (out of 150)	Percentage (%)	Rank
Inadequate irrigation facilities	117	78.0	I
Low market price / exploitation by middlemen	108	72.0	II
Lack of cold-storage and warehousing facilities	102	68.0	III
Pest and disease attack on fruit trees	92	61.3	IV
Inadequate institutional credit facility	83	55.3	V
Poor rural transportation and road connectivity	72	48.0	VI
Lack of technical knowledge / extension contact	63	42.0	VII

Note: Percentages are based on multiple responses and do not sum to 100. Source: Field survey data, 2026.

Table 11 shows that inadequate irrigation facilities (78.0 per cent) and exploitation by market intermediaries (72.0 per cent) are the two most frequently reported problems, followed closely by the absence of cold-storage and warehousing infrastructure (68.0 per cent), which contributes to substantial post-harvest losses of perishable garden produce such as mango and guava.

9. MAJOR FINDINGS OF THE STUDY

- A majority of garden farmers (60 per cent) fall in the 40–60 years age group, and entry of younger farmers into garden farming remains limited.
- Marginal and small holdings together constitute 55.3 per cent of sample garden farmers, reflecting fragmentation of land holdings in the district.



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. International Journal of Multidisciplinary Research & Reviews, 5(9), 56-66.

- Mango is the dominant garden crop (41.3 per cent), followed by guava (22.7 per cent); intercropping with vegetables is practised by 17.3 per cent of farmers.
- Garden farmers earn a significantly higher mean annual income (₹1,85,000) than traditional field-crop farmers (₹1,42,000); the difference is statistically significant at the 1 per cent level ($t = 8.94$).
- Land holding size is positively and significantly correlated with the income of garden farmers ($r = 0.62$, significant at 1% level), explaining about 38 per cent of income variation.
- Farm-size category is significantly associated with income category ($\chi^2 = 61.67$, $df = 4$, significant at 1% level); larger holdings are concentrated in the higher-income category.
- Inadequate irrigation, exploitation by intermediaries, and lack of cold-storage infrastructure are the most severe constraints reported by garden farmers.

10. SUGGESTIONS AND POLICY IMPLICATIONS

- Expansion of assured irrigation facilities, including micro-irrigation (drip) systems suited to orchard crops, should be prioritised in garden-farming pockets of the district.
- Establishment of cold-storage and pack-house facilities near major garden-farming villages would substantially reduce post-harvest losses of mango and guava.
- Strengthening of regulated markets and promotion of Farmer Producer Organisations (FPOs) can reduce farmers' dependence on intermediaries and improve price realisation.
- Institutional credit agencies should design orchard-specific credit and insurance products that account for the longer gestation period of garden farming.
- Extension services of the Department of Horticulture should be strengthened to improve farmers' technical knowledge of plant protection, pruning, and post-harvest handling.
- Given the positive relationship between farm size and income, group farming or cooperative cultivation models may help small and marginal garden farmers realise scale benefits.

11. CONCLUSION

The present study confirms that garden/orchard farming offers a significantly higher and more remunerative income position to farmers of Hathras district compared with traditional field-crop cultivation, and that this income advantage is closely linked to the scale of land holding. At the same time, the sector remains constrained by inadequate irrigation and storage infrastructure, weak market linkages, and limited access to institutional credit — constraints that disproportionately affect small and marginal garden farmers who, despite operating a majority of garden holdings, capture a comparatively smaller share of the income benefit. Targeted policy intervention in irrigation, cold-chain infrastructure, farmer collectivisation, and horticulture-specific credit would help translate the demonstrated income potential of garden farming into a more broad-based improvement in the economic condition of farmers across all size-categories in Hathras district.



Dushyant Kumar & Satyavrat Singh Rawat (2026). A Study of Economic Condition of The Farmers in the Garden Area with Special Reference to Hathras District, Uttar Pradesh, India. *International Journal of Multidisciplinary Research & Reviews*, 5(9), 56-66.

12. AUTHOR(S) CONTRIBUTION

The writers affirm that they have no connections to, or engagement with, any group or body that provides financial or non-financial assistance for the topics or resources covered in this manuscript.

13. CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

14. PLAGIARISM POLICY

All authors declare that any kind of violation of plagiarism, copyright and ethical matters will take care by all authors. Journal and editors are not liable for aforesaid matters.

15. SOURCES OF FUNDING

The authors received no financial aid to support for the research.

16. REFERENCES

- Acharya, S. S., & Agarwal, N. L. (2019). *Agricultural Marketing in India* (6th ed.). Oxford & IBH Publishing.
- Chand, R. (2017). Doubling farmers' income: Rationale, strategy, prospects and action plan. NITI Aayog Policy Paper No. 1/2017. Government of India.
- Department of Horticulture, Government of Uttar Pradesh. (2024). *Annual Progress Report on Horticultural Development in Uttar Pradesh*. Lucknow.
- Directorate of Economics and Statistics, Government of Uttar Pradesh. (2023). *District Statistical Handbook: Hathras*. Lucknow.
- Government of India. (2021). *All India Report on Agriculture Census 2015–16*. Ministry of Agriculture and Farmers Welfare, New Delhi.
- Kahlon, A. S., & Singh, K. (2018). *Economics of Farm Management in India: Theory and Practice*. Allied Publishers.
- Kumar, S. (2020). Horticultural diversification and farm income: Evidence from western Uttar Pradesh. *Indian Journal of Agricultural Economics*, 75(3), 412–421.
- Reserve Bank of India. (2022). *Report of the Internal Working Group on Agricultural Credit*. Mumbai.
- Sharma, H. R. (2015). Land fragmentation and its economic implications in Indian agriculture. *Agricultural Economics Research Review*, 28(1), 15–26.
- Singh, R., & Yadav, P. (2021). Problems and prospects of fruit growers in western U.P.: A case study. *Indian Journal of Economics and Development*, 17(2), 233–241.

