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## Socio-economic study of vegetable growers in Ballia district, Uttar Pradesh

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### Abstract

Vegetable cultivation plays an important role in improving farm income, generating employment and strengthening rural livelihoods, particularly in regions where smallholder agriculture is predominant. The present study was undertaken to assess the socio-economic characteristics of vegetable growers in Ballia district of Uttar Pradesh. A four-stage multistage sampling technique was employed for the selection of the study area and respondents. Two blocks, namely Murlichhapra and Bairia, and eight villages were selected for the study. A total of 160 vegetable growers were selected through simple random sampling and categorized into marginal, small, medium and large farmers based on landholding size. Primary data were collected through personal interviews using a pre-tested interview schedule for the agricultural year 2024-25, while secondary information was obtained from relevant published and official sources. The findings revealed that 52.50 per cent of the respondents belonged to the middle-age group (31-50 years), while 84.38 per cent were literate. Other Backward Classes constituted the largest social group (47.50%), and 63.75 per cent of respondents belonged to joint families. Agriculture was the principal occupation for 81.87 per cent of the respondents, while 45.62 per cent had more than 20 years of farming experience. Hired irrigation sources were used by 36.88 per cent of the respondents, followed by owned irrigation sources (35.00%). Regarding social participation, 50.63 per cent participated in one organization, whereas 37.50 per cent had no organizational participation. Farm power analysis showed that 42.50 per cent of respondents used power sprayers/sprayers/chaff cutters. Each landholding category accounted for 25.00 per cent of the sample. The largest proportion of respondents (28.75%) reported annual income between ₹2, 00,001 and ₹3, 00,000. The study indicates that vegetable growers constituted a heterogeneous group in terms of socio-economic characteristics, resource access and income status. Strengthening extension services, irrigation facilities, farm mechanization, institutional participation and collective marketing mechanisms may contribute to improving the production and marketing prospects of vegetable growers.

**Keywords:** Vegetable growers, socio-economic characteristics, landholding, farming experience, irrigation, Ballia, Uttar Pradesh

### Introduction

Horticulture and vegetable cultivation serves as a crucial engine of high-value agricultural growth in India (Kumar *et al.*, 2021) <sup>[3]</sup>. Vegetables generally generate substantially higher gross returns per unit area, have shorter gestation periods, and provide greater employment opportunities than traditional cereal crops (Devi *et al.*, 2022) <sup>[6]</sup>. Consequently, commercial vegetable cultivation represents a viable pathway for enhancing rural household incomes, reducing underemployment, and strengthening nutritional security among small and marginal farming communities.

The eastern plain zone of Uttar Pradesh, particularly Ballia district, is characterized by fertile alluvial soils and favorable agro-climatic conditions that support diversified and multi-season vegetable production (Singh & Sharma, 2023) <sup>[9]</sup>. However, agricultural performance in the region is closely associated with farmers' socio-economic conditions, including landholding and tenure arrangements, educational status, age structure, institutional participation, and access to formal credit (Verma & Patel, 2020; Mishra *et al.*, 2024) <sup>[2, 11]</sup>. Farmers' socio-economic status plays an important role in determining their risk-bearing capacity, ability to invest in agricultural enterprises, access to resources, and adoption of improved agricultural technologies (Chauhan *et al.*, 2020) <sup>[1]</sup>.

Despite the considerable importance of horticulture in the Gangetic plains, micro-level empirical evidence on the multidimensional socio-economic characteristics of vegetable-growing households remains limited. A systematic assessment of these characteristics is essential for understanding farmers' resource endowments, production constraints, institutional linkages, and livelihood conditions. Therefore, the present study conducted entitled, "Socio-Economic study of Vegetable Growers in Ballia District, Uttar Pradesh" during the 2024-25.

## Research Methodology

### Sampling Procedure and Data Collection

A four-stage multistage sampling technique was employed for the selection of the study area and sample respondents. In the first stage, Ballia district of Uttar Pradesh was purposively selected for the study. In the second stage, two blocks, namely Murlichhapra and Bairia, were selected. In the third stage, eight villages Sonbarsa, Bhojpur, Lakshimpur, Dalan Chhapara, Upadhyapur, Chakiya Jamalpur, Madhubani, and Karmanpur were selected randomly from the selected blocks (Table 1). In the fourth stage, a comprehensive list of vegetable-growing farmers was prepared for each selected village.

The selected farmers were categorized into four groups based on the size of their operational landholdings: marginal farmers (<1 ha), small farmers (1-2 ha), medium farmers (2-4 ha), and large farmers (>4 ha). From each landholding category, five farmers were selected randomly from each village, resulting in a total sample size of 160 farmers (Table 2). The respondents were selected using the simple random sampling method to ensure adequate representation of different landholding categories.

Primary data were collected directly from the selected farmers through personal interviews using a pre-structured and pre-tested interview schedule. The data collected covered the agricultural year 2024-25. Secondary data were obtained from government reports, published books, journals, research papers, periodicals, and other relevant official publications related to agriculture, vegetable production, and marketing.

For achieving the objectives of the study, appropriate statistical and analytical techniques were employed. The socio-economic characteristics of the selected farm households were analyzed using tabular analysis, simple averages, frequencies, and percentages. These techniques facilitated the systematic presentation, interpretation, and comparison of the socio-economic characteristics of the respondents.

### Simple Average (Arithmetic Mean)

$$\text{Arithmetic Mean} = \frac{\sum X}{N}$$

Where,

- $\sum X$  = Sum of all observations
- $N$  = Number of observations

### Percentage

$$\text{Percentage} = \frac{\text{Part}}{\text{Total}} \times 100$$

Where,

- Part = Value of a specific item
- Total = Overall total value

**Table 1:** Selection of District, blocks and villages in the study area

| S. No. | Particulars | Selection of study area                                                                               | Technique |
|--------|-------------|-------------------------------------------------------------------------------------------------------|-----------|
| 1.     | District    | Ballia                                                                                                | Purposive |
| 2.     | Blocks      | Murlichhapra and Bairia                                                                               | Purposive |
| 3.     | Villages    | Sonbarsa, Bhojpur, Lakshimpur, Dalan chhapara, Upadhyapur, Chakiya Jamalpur, Madhubani, and Karmanpur | Random    |

**Table 2:** Selection of Farmers

| Sl. No. | Village          | Size of Holding               |    |                           |    |                            |    |                            |    | Total |     |
|---------|------------------|-------------------------------|----|---------------------------|----|----------------------------|----|----------------------------|----|-------|-----|
|         |                  | Marginal farmers<br>( < 1 ha) |    | Small farmers<br>(1-2 ha) |    | Medium farmers<br>(2-4 ha) |    | Large farmers<br>( > 4 ha) |    |       |     |
|         |                  | T                             | S  | T                         | S  | T                          | S  | T                          | S  | T     | S   |
| 1       | Sonbarsa         | 216                           | 5  | 187                       | 5  | 168                        | 5  | 79                         | 5  | 650   | 20  |
| 2       | Bhojpur          | 115                           | 5  | 93                        | 5  | 75                         | 5  | 39                         | 5  | 322   | 20  |
| 3       | Lakshimpur       | 55                            | 5  | 49                        | 5  | 30                         | 5  | 22                         | 5  | 156   | 20  |
| 4       | Dalan chhapara   | 184                           | 5  | 169                       | 5  | 155                        | 5  | 84                         | 5  | 592   | 20  |
| 5       | Upadhyapur       | 116                           | 5  | 119                       | 5  | 92                         | 5  | 52                         | 5  | 379   | 20  |
| 6       | Chakiya Jamalpur | 35                            | 5  | 47                        | 5  | 38                         | 5  | 25                         | 5  | 145   | 20  |
| 7       | Madhubani        | 76                            | 5  | 64                        | 5  | 48                         | 5  | 43                         | 5  | 231   | 20  |
| 8       | Karmanpur        | 127                           | 5  | 125                       | 5  | 113                        | 5  | 72                         | 5  | 437   | 20  |
| Total   |                  | 924                           | 40 | 853                       | 40 | 719                        | 40 | 416                        | 40 | 2912  | 160 |

**Note:** T= Total Farmers, S= Selected Farmers

## Results and Discussion

### Socio-economic characteristics of vegetable growers

The socio-economic characteristics of the selected vegetable growers are presented in Tables 3 to 14. These characteristics provide demographic, social, occupational and economic background of the respondents.

### Age of vegetable growers

The distribution of vegetable growers according to age is presented in Table 3. The results revealed that 52.50 per cent of the respondents belonged to the middle-age group (31-50 years), followed by 32.50 per cent who were young (<30 years), while 15.00 per cent were in the old-age group

(>50 years). Thus, the majority of vegetable growers were concentrated in the economically active middle-age category.

The relatively high participation of middle-aged farmers indicates that vegetable cultivation is largely undertaken by farmers with sufficient physical capacity, farming experience and responsibility for household income generation. At the same time, the presence of nearly one-third young farmers suggests continued interest of younger members in vegetable cultivation as an income-generating agricultural activity. Similar observations regarding the participation of younger and economically active farmers in vegetable production have been reported by Gupta *et al.* (2023) <sup>[10]</sup>. The age structure may also influence the adoption of improved production practices and market-oriented technologies.

### Caste composition

Table 4 depicted the caste composition of the selected vegetable growers. The largest proportion of respondents belonged to the Other Backward Classes (47.50%), followed by the General category (36.25%). The remaining 16.25 per cent belonged to the Scheduled Caste/Scheduled Tribe category.

The predominance of OBC farmers indicates their substantial involvement in vegetable cultivation in the study area. The distribution also reflects the socially heterogeneous nature of vegetable-growing households in Ballia district. Such socio-economic diversity is relevant because access to land, institutional support, credit, information and markets may vary among different social groups. Similar socio-economic diversity among smallholder agricultural households has been documented by Chauhan *et al.* (2020) <sup>[1]</sup>.

### Educational status

The educational status of the respondents is presented in Table 5. Out of the 160 vegetable growers, 15.62 per cent were illiterate, whereas 84.38 per cent were literate. Among literate respondents, 34.81 per cent had completed high school, followed by 31.85 per cent with intermediate education, 15.56 per cent with primary education, 10.37 per cent with junior high school education, 5.19 per cent with graduation, and 2.22 per cent with post-graduation or higher education.

The findings indicate that a substantial majority of vegetable growers possessed some level of formal education. The relatively large proportion having high-school and intermediate education may facilitate access to agricultural information, improved production technologies, input recommendations and market information. Education can also improve farmers' ability to understand technical information and evaluate alternative production and marketing practices. Tiwari and Maurya (2025) <sup>[13]</sup> similarly emphasize the importance of educational attainment in the adoption of modern agricultural inputs and practices.

### Family type

The family structure of the selected vegetable growers is presented in Table 6. The results indicate that 63.75 per cent of respondents belonged to joint families, whereas 36.25 per cent belonged to nuclear or single families. Thus, joint families constituted the dominant family structure among the surveyed vegetable growers.

The predominance of joint families may provide greater availability of family labour for labour-intensive vegetable cultivation, particularly during transplanting, weeding, harvesting, grading and marketing. Family-based labour can be important in vegetable farming because many operations are performed repeatedly and within short periods. The finding is also consistent with the importance of household labour and family structure in smallholder agricultural production systems reported by Chauhan *et al.* (2020) <sup>[1]</sup>.

### Family size

Table 7 presents the distribution of respondents according to family size. More than half of the respondents (53.75%) had 4-6 family members, followed by 40.63 per cent having up to three members. Only 5.62 per cent of respondents belonged to households with seven or more members.

The predominance of medium-sized families suggests the availability of a reasonable household labour pool for agricultural operations. In vegetable production, family labour can reduce dependence on hired labour and may contribute to the management of labour-intensive operations. However, larger family size may also increase household consumption requirements and therefore influence the quantity of produce available for sale. Household size and labour availability are important components of farm livelihood and income systems, as also discussed by Kushwaha *et al.* (2021) <sup>[5]</sup>.

### Occupational status

The occupational status of the vegetable growers is presented in Table 8. Agriculture was the principal occupation of 81.87 per cent of respondents. A further 13.12 per cent were engaged in agriculture along with other farming activities. Business and agriculture combined with agro-based enterprises accounted for 1.88 per cent each, while only 1.25 per cent reported caste-based occupations.

The dominance of agriculture as the principal occupation indicates a high degree of dependence of the sampled households on farming. The relatively small proportion of respondents combining agriculture with business or agro-based enterprises suggests limited occupational diversification among the surveyed households. Greater dependence on agriculture makes productivity, profitability and market access particularly important for household income. Similar relationships between agricultural dependence and household livelihood security have been reported by Kushwaha *et al.* (2021) <sup>[5]</sup> and Mishra *et al.* (2024) <sup>[11]</sup>.

### Farming experience

The farming experience of the respondents is presented in Table 9. The largest proportion of vegetable growers (45.62%) had more than 20 years of farming experience, followed by 33.75 per cent having 11-20 years of experience. About 20.63 per cent had 1-10 years of farming experience.

The results indicate that a substantial proportion of the respondents had long-term experience in farming. Such experience may contribute to farmers' familiarity with local soil conditions, climatic conditions, input use, pest management, crop selection and marketing practices. However, experience alone does not necessarily ensure adoption of improved technologies, making access to extension services and updated technical information

important. Verma and Patel (2020) <sup>[2]</sup> highlighted the role of socio-economic factors in determining technology adoption among vegetable farmers.

### Irrigation facilities

The availability of irrigation facilities is presented in Table 10. About 36.88 per cent of vegetable growers depended on hired irrigation facilities, including government and private tube wells. This was followed by 35.00 per cent who possessed their own irrigation sources such as diesel engines and tube wells. The remaining 28.12 per cent depended primarily on natural sources such as canals, rivers and lakes. The results show that irrigation access was distributed among owned, hired and natural sources, with hired irrigation being the most common. Vegetable crops generally require timely and assured water availability, particularly during critical stages of crop growth. Dependence on hired irrigation may increase production costs and expose farmers to uncertainties regarding availability and irrigation charges. Therefore, reliable and affordable irrigation infrastructure can have an important bearing on vegetable productivity and farm profitability. The importance of irrigation resources in the agricultural economy of the eastern Gangetic region has also been discussed by Tripathi and Dubey (2022) <sup>[8]</sup>.

### Social participation

Table 11 presents the social participation of vegetable growers. Half of the respondents (50.63%) participated in one organization, while 37.50 per cent reported no participation in any organization. About 8.12 per cent participated in two organizations and 3.75 per cent participated in more than two organizations.

The findings indicate that although organizational participation existed among a substantial proportion of respondents, a considerable share remained outside formal or informal organizations. Membership in farmer organizations, cooperatives, self-help groups, producer organizations or other rural institutions can facilitate access to information, collective input purchase, credit, technical guidance and marketing opportunities. Greater institutional participation may therefore improve farmers' access to agricultural services and market-related information. Yadav *et al.* (2022) <sup>[7]</sup> emphasized the importance of systematic socio-economic assessment and institutional factors in agricultural studies.

### Farm power and machinery

The distribution of respondents according to farm power is presented in Table 12. The largest proportion of farmers (42.50%) possessed or used power sprayers, sprayers or chaff cutters. This was followed by 33.75 per cent having pumping sets/electric motors and 21.25 per cent possessing tractors with implements. Only 2.50 per cent reported the use of traditional *jhhota buggi*.

The findings indicate that modern farm power and equipment were relatively common among the surveyed vegetable growers, particularly equipment used for plant protection and water management. The relatively low dependence on traditional animal-drawn equipment suggests a gradual shift towards mechanized agricultural operations. Farm mechanization can reduce labour requirements, improve timeliness of operations and facilitate efficient farm management. Srivastava *et al.* (2024) <sup>[12]</sup> similarly examined

the status and importance of mechanization among farmers in the Gangetic Plains.

### Size of landholding

The landholding distribution of the selected vegetable growers is presented in Table 13. The sample was equally distributed among the four landholding categories. Each category marginal (<1 ha), small (1-2 ha), medium (2-4 ha), and large (>4 ha) accounted for 25.00 per cent of the total respondents.

The equal representation of the four categories provides an appropriate basis for comparing vegetable-growing households across different farm-size groups. Landholding size can influence access to irrigation, farm machinery, credit, input use, production scale and marketing options. Larger farms may have greater capacity for commercial production, whereas smaller farms may depend more heavily on family labour and intensive cultivation practices. Differences in farm size and their relationship with farm income and livelihood security have been discussed by Kumar *et al.* (2021) <sup>[3]</sup> and Mishra *et al.* (2024) <sup>[11]</sup>.

### Annual income

The annual income distribution of the respondents is presented in Table 14. The largest proportion of vegetable growers (28.75%) reported annual income between ₹2,00,001 and ₹3,00,000. This was followed by 23.13 per cent with income between ₹1,00,001 and ₹2,00,000 and 18.12 per cent with annual income up to ₹1,00,000. About 16.88 per cent reported annual income between ₹3,00,001 and ₹4,00,000, while 13.12 per cent belonged to the ₹4,00,001-₹5,00,000 income group.

Thus, the largest concentration of vegetable growers was in the middle-income category of ₹2-3 lakh per year. The presence of respondents across all income categories indicates considerable variation in the economic status of vegetable-growing households. Commercial vegetable cultivation has the potential to contribute to farm income because vegetables are generally high-value and relatively intensive crops. However, actual income depends on productivity, input costs, prices, market access and the proportion of household income derived from vegetable cultivation. Kumar *et al.* (2021) <sup>[3]</sup> reported the economic importance of commercial vegetable production, while Devi *et al.* (2022) <sup>[6]</sup> highlighted the role of high-value vegetable crops in improving farm income. Gautam and Jha (2025) <sup>[14]</sup> further emphasized the importance of market-chain integration for improving the economic prospects of perishable agricultural commodities.

### Overall discussion

Overall, the socio-economic profile indicates that vegetable cultivation in the study area was predominantly undertaken by middle-aged, literate and agriculturally dependent households, with a substantial proportion having long farming experience. Joint families and medium-sized households constituted important components of the sample, potentially providing family labour for intensive vegetable production. Irrigation facilities were obtained through a combination of owned, hired and natural sources, while modern farm equipment was used by a substantial proportion of farmers.

The results also indicate that institutional participation remained limited for a considerable proportion of growers,

suggesting scope for strengthening farmer organizations, extension services and collective marketing mechanisms. Since vegetables are perishable commodities, better organization of production, aggregation, transportation, storage and marketing can influence farmers' returns. Gautam and Jha (2025) <sup>[14]</sup> emphasized the significance of market-chain integration for perishable crops, while Kumar *et al.* (2021) <sup>[3]</sup> and Devi *et al.* (2022) <sup>[6]</sup> highlighted the economic potential of commercial vegetable production.

The socio-economic characteristics observed in the present study provide an important baseline for understanding the production and marketing behaviour of vegetable growers in Ballia district. These characteristics should be considered while designing interventions related to improved technologies, irrigation, mechanization, institutional participation, and market access for income enhancement.

**Table 3:** Distribution of vegetable growers according to Age

| Sl. No. | Particulars        | Vegetable growers |            |
|---------|--------------------|-------------------|------------|
|         |                    | Frequency         | Percentage |
| 1       | Young age (< 30)   | 52                | 32.50      |
| 2       | Middle Age (31-50) | 84                | 52.50      |
| 3       | Old Age (> 50)     | 24                | 15.00      |
| Total   |                    | 160               | 100        |

**Table 4:** Distribution of vegetable growers according to their caste

| Sl. No. | Particulars                       | Vegetable growers |            |
|---------|-----------------------------------|-------------------|------------|
|         |                                   | Frequency         | Percentage |
| 1       | General caste                     | 58                | 36.25      |
| 2       | Other backward caste              | 76                | 47.50      |
| 3       | Scheduled caste/ scheduled tribes | 26                | 16.25      |
| Total   |                                   | 160               | 100        |

**Table 5:** Distribution of selected respondents of vegetable growers according to their education

| Sl. No. | Particulars             | Vegetable growers |            |
|---------|-------------------------|-------------------|------------|
|         |                         | Frequency         | Percentage |
| 1       | Illiterate              | 25                | 15.62      |
| 2       | Literate                | 135               | 84.38      |
|         | Primary School          | 21                | 15.56      |
|         | Junior High School      | 14                | 10.37      |
|         | High School             | 47                | 34.81      |
|         | Intermediate            | 43                | 31.85      |
|         | Graduate                | 7                 | 5.19       |
|         | Post Graduate and Above | 3                 | 2.22       |
| Total   |                         | 160               | 100        |

**Table 6:** Distribution of selected respondents of vegetable growers according to their family type

| Sl. No. | Particulars                     | Vegetable growers |            |
|---------|---------------------------------|-------------------|------------|
|         |                                 | Frequency         | Percentage |
| 1       | Single family or nuclear Family | 58                | 36.25      |
| 2       | Joint Family                    | 102               | 63.75      |
| Total   |                                 | 160               | 100        |

**Table 7:** Distribution of selected respondents of vegetable growers according to their family size

| Sl. No. | Particulars     | Vegetable growers |            |
|---------|-----------------|-------------------|------------|
|         |                 | Frequency         | Percentage |
| 1       | Up to 3 members | 65                | 40.63      |
| 2       | 4 to 6 members  | 86                | 53.75      |
| 3       | 7 and above     | 9                 | 5.62       |
| Total   |                 | 160               | 100        |

**Table 8:** Occupational status of selected vegetable growers

| Sl. No. | Particulars                            | Vegetable growers |            |
|---------|----------------------------------------|-------------------|------------|
|         |                                        | Frequency         | Percentage |
| 1       | Caste based occupation                 | 2                 | 1.25       |
| 2       | Agriculture                            | 131               | 81.87      |
| 3       | Agriculture and other farming activity | 21                | 13.12      |
| 4       | Business                               | 3                 | 1.88       |
| 5       | Agriculture +agro based enterprises    | 3                 | 1.88       |
| Total   |                                        | 160               | 100        |

**Table 9:** Distribution of respondents according to Farming experience of vegetable growers

| Sl. No. | Particulars | Vegetable growers |            |
|---------|-------------|-------------------|------------|
|         |             | Frequency         | Percentage |
| 1       | 1-10 years  | 33                | 20.63      |
| 2       | 11-20 years | 54                | 33.75      |
| 3       | > 20 years  | 73                | 45.62      |
| Total   |             | 160               | 100        |

**Table 10:** Distribution of vegetable growers according to irrigation facility

| Sl. No. | Particulars                                 | Vegetable growers |            |
|---------|---------------------------------------------|-------------------|------------|
|         |                                             | Frequency         | Percentage |
| 1       | Owned (diesel engine, tube well)            | 56                | 35.00      |
| 2       | Hired (Govt. tube well & private tube well) | 59                | 36.88      |
| 3       | Natural (canal, river, lake)                | 45                | 28.12      |
| Total   |                                             | 160               | 100        |

**Table 11:** Distribution of vegetable growers according to social participation

| Sl. No. | Particulars                             | Vegetable growers |            |
|---------|-----------------------------------------|-------------------|------------|
|         |                                         | Frequency         | Percentage |
| 1       | No participation                        | 60                | 37.50      |
| 2       | Participation in one organization       | 81                | 50.63      |
| 3       | Participation in two organization       | 13                | 08.12      |
| 4       | Participation in more than organization | 6                 | 03.75      |
| Total   |                                         | 160               | 100        |

**Table 12:** Distribution of vegetable growers according to farm power

| Sl. No. | Particulars                         | Vegetable growers |            |
|---------|-------------------------------------|-------------------|------------|
|         |                                     | Frequency         | Percentage |
| 1       | Jhhota buggi                        | 4                 | 02.50      |
| 2       | Tractor with all implements         | 34                | 21.25      |
| 3       | Pumping set/ electric motor         | 54                | 33.75      |
| 4       | Power sprayer/sprayer/ chaff cutter | 68                | 42.50      |
| Total   |                                     | 160               | 100        |

**Table 13:** Distribution of selected respondents of vegetable growers according to their size of land holding

| Sl. No. | Particulars    | Vegetable growers |            |
|---------|----------------|-------------------|------------|
|         |                | Frequency         | Percentage |
| 1       | Marginal(<1ha) | 40                | 25.00      |
| 2       | Small (1-2 ha) | 40                | 25.00      |
| 3       | Medium (2-4ha) | 40                | 25.00      |
| 4       | Large (>4ha)   | 40                | 25.00      |
| Total   |                | 160               | 100        |

**Table 14:** Distribution of vegetable growers according to their annual income

| Sl. No. | Particulars              | Vegetable growers |            |
|---------|--------------------------|-------------------|------------|
|         |                          | Frequency         | Percentage |
| 1       | Up to Rs. 1,00,000       | 29                | 18.12      |
| 2       | Rs. 1,00,001 to 2,00,000 | 37                | 23.13      |
| 3       | Rs. 2,00,001 to 3,00,000 | 46                | 28.75      |
| 4       | Rs. 3,00,001 to 4,00,000 | 27                | 16.88      |
| 5       | Rs. 4,00,001 to 5,00,000 | 21                | 13.12      |
| Total   |                          | 160               | 100        |

## Summary and Conclusion

### Summary

The study examined the socio-economic characteristics of 160 vegetable growers selected from Ballia district through a multistage sampling procedure. The respondents were distributed across four landholding categories to represent marginal, small, medium and large farmers. Primary data were collected through personal interviews using a pre-tested interview schedule for the agricultural year 2024-25.

The results revealed that 52.50 per cent of the vegetable growers belonged to the middle-age group of 31-50 years, while 32.50 per cent were young and 15.00 per cent were above 50 years of age. In terms of caste composition, 47.50 per cent belonged to the Other Backward Classes, 36.25 per cent to the General category and 16.25 per cent to the Scheduled Caste/Scheduled Tribe category.

Educationally, 84.38 per cent of respondents were literate, with high-school and intermediate education constituting the major educational levels. Joint families were predominant, accounting for 63.75 per cent, while 53.75 per cent of households had 4-6 members. Agriculture was the principal occupation for 81.87 per cent of respondents, indicating a high degree of dependence on farming.

In terms of farming experience, 45.62 per cent of respondents had more than 20 years of experience, indicating considerable familiarity with agricultural production. Irrigation facilities were obtained mainly through hired sources (36.88%), followed by owned sources (35.00%) and natural sources (28.12%). Regarding social participation, 50.63 per cent participated in one organization, whereas 37.50 per cent had no organizational participation.

Farm power analysis showed that 42.50 per cent of respondents used power sprayers/sprayers/chaff cutters, followed by pumping sets/electric motors (33.75%) and tractors with implements (21.25%). The sample was equally distributed among marginal, small, medium and large landholding categories, with each category accounting for 25.00 per cent.

With respect to annual income, the largest proportion of respondents (28.75%) belonged to the ₹2,00,001-₹3,00,000 income group, followed by 23.13 per cent in the ₹1,00,001-₹2,00,000 group. Overall, the findings indicate that vegetable growers represented a heterogeneous group with differences in demographic characteristics, education, family structure, farming experience, resource ownership, institutional participation and income.

### Conclusion

The study concludes that vegetable cultivation in the selected area of Ballia district was primarily associated with economically active, literate and agriculturally dependent farm households. A majority of growers belonged to the

middle-age category and possessed substantial farming experience, indicating a combination of active participation and accumulated knowledge of agricultural practices. The predominance of joint families and medium-sized households also indicates the potential importance of family labour in vegetable production.

The findings further reveal that farmers had access to different sources of irrigation and farm power, although dependence on hired irrigation facilities was slightly higher than dependence on owned sources. Modern agricultural equipment was used by a considerable proportion of respondents, indicating the increasing role of mechanization in vegetable farming. However, the relatively high proportion of farmers with no social participation points towards the need for stronger institutional linkages and collective action.

The equal representation of marginal, small, medium and large farmers provides a useful basis for examining differences in production, costs, returns and marketing behaviour across farm-size categories. The income distribution further suggests that vegetable cultivation forms an important component of the livelihood system of the surveyed households, although income levels varied considerably among respondents.

Based on the findings, strengthening farmer organizations, extension services, irrigation facilities, mechanization support, market information and collective marketing mechanisms could help improve the production and marketing environment for vegetable growers. Particular attention may be given to small and marginal farmers to improve their access to productive resources and institutional services. Since vegetables are highly perishable commodities, improved market-chain coordination, aggregation, transportation and timely marketing may also contribute to better economic outcomes, as emphasized by Gautam and Jha (2025) <sup>[14]</sup>.

Overall, the socio-economic profile presented in the study provides a useful foundation for understanding the conditions of vegetable growers in Ballia district and for developing interventions aimed at improving farm productivity, market participation and household income.

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