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**Akash Rai**

Ph.D. Scholar (Agri-Business Management), Department of Agriculture Economics, Shuats, Prayagraj, Uttar Pradesh, India

**Dr. Nitin Barker**

Assistant Professor, Department of Agriculture Economics, Shuats, Prayagraj, Uttar Pradesh, India

**AS Pradhan**

Ph.D. Scholar (Agri-Business Management), Department of Agriculture Economics, Shuats, Prayagraj, Uttar Pradesh, India

## Exploring the socio-economic dimensions of agri-input customer profiles: A case study in farming communities

**Akash Rai, Dr. Nitin Barker and AS Pradhan**

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### Abstract

This study investigates the socio-economic profiles of the farmers who are customers of Agri-inputs. It explores key factors such as land distribution, age, family size, literacy levels, occupation, annual income, retailer age distribution, literacy level etc. For the socio-economic profile of farmers, the study reveals that a significant proportion of farmers belong to the marginal farm size category, with the majority distributed across other categories. In terms of age, the study highlights variations across different farm size categories, with the highest number of farmers falling in the age group of 30-45. Family size distribution indicates that the majority of farmers have small family sizes (1-4 members). Literacy levels among farmers vary, with a substantial number of them having graduate or secondary-level education. Occupationally, a significant portion of farmers relies on agriculture as their primary source of income. The study also delves into the annual income of farmers, with a notable number of them falling below the 2 lakhs income level.

**Keywords:** Socio economic, respondents, literacy, Income, land-holding, occupation

### 1. Introduction

Agriculture has been the cornerstone of India's economy and a way of life for millions of its citizens for centuries. The agricultural landscape of this diverse nation is composed of a myriad of regions, each with its unique characteristics and challenges. Ballia, a district in the northern state of Uttar Pradesh, stands as a distinctive emblem of India's agricultural diversity, rich cultural heritage, and its complex socioeconomic tapestry. This study embarks on an exploration of the socioeconomic profiles of the farmers in Ballia District, Uttar Pradesh. At the heart of this investigation is the desire to comprehend the lives and livelihoods of those who toil on the fertile lands of this region. We seek to understand their economic conditions, the structure of their households, their educational backgrounds, and the nature of their agricultural engagements. Agriculture, as the primary occupation in Ballia, significantly defines the district's socioeconomic landscape. The patterns of landholding, the nature of crops grown, and the modes of agricultural practices are intimately linked with the residents' well-being. It is within these farming households that we find the intricate web of family dynamics, educational aspirations, and economic sustenance.

Ballia's socioeconomic profile is a mosaic of diverse factors, including the size of landholdings, the age and gender of farmers, the education levels attained, and the annual income generated. This study seeks to decode these facets and unravel the intricate relationship between the socioeconomic conditions of the farmers and the agricultural practices they employ. In understanding the socioeconomic intricacies of Ballia's farmers, we can discern not only the challenges they face but also the remarkable strengths they bring to the field. This research is not merely an academic exploration; it is a pursuit of knowledge that holds the potential to inform policies, influence interventions, and shape the future of agriculture in Ballia. By peeling back the layers of the socioeconomic profile of Ballia's farmers, we hope to provide valuable insights that can guide efforts aimed at enhancing the quality of life for those who labor on this bountiful land. As we delve into the socioeconomic fabric of the farmers in Ballia District, Uttar Pradesh, we embark on a journey to understand the heartbeat of this region's agriculture, the lifeblood of its people, and the dynamics of its society.

### 2. Methodology

#### 2.1 Data Collection

The data for this study was gathered from both primary and secondary sources. Primary data was collected by distributing structured questionnaires and conducting interviews with

**Corresponding Author:**

**Akash Rai**

Ph.D. Scholar (Agri-Business Management), Department of Agriculture Economics, Shuats, Prayagraj, Uttar Pradesh, India

executives and store managers in selected retail establishments in the research area. The questionnaires included closed-ended questions, and executive responses were rated on a Likert scale from 1 to 5.

Secondary data was sourced from various publications, including those from the Ministry of Commerce and Trade Policies, journals, working papers, committee reports related to organized retail, trade association publications, and the RBI's Handbook of Statistics on the Indian Economy.

**2.2 Sampling methodology**

For the sampling methodology, a combination of purposive and random sampling methods was employed. The sample included 246 farmers and 50 retail centers and was selected from the Ballia district in Uttar Pradesh, a region known for its high agricultural activity.

**2.3 Study Area**

In the state of Uttar Pradesh, which has a massive population of around 200 million, agriculture is the primary source of revenue, with major crops being paddy, wheat, and sugarcane. Although advancements like high-yielding seed varieties, fertilizers, and irrigation have transformed the state into a significant food grain producer, farmers still face challenges due to small landholdings and limited financial resources for modernization. Additionally, dairy and livestock husbandry offer alternative income sources.

**2.4 Selection of District**

The district of Ballia was purposefully chosen for the study due to its thriving agricultural activities and successful Agri-input retail centers. Within Ballia, the specific blocks of Rasra and Sohaon were selected for their bustling agri-retail operations.

**2.5 Statistical Tools**

The analysis of data in this study was conducted to examine the socio-economic profile of farmers in the research area. To assess the socio-economic status of farmers, a socio-economic scale was employed, which included a set of questions and parameters. These parameters encompassed various aspects, including age distribution, education, family size, occupation, farm size groups, farming experience, annual income, and crop growing season. These factors, collectively representing the socio-economic position of farmers, were considered in the evaluation.

The analysis of the data involved using simple descriptive statistical tools like averages and percentages. Other tool employed was the Chi-square Test, a statistical test used to assess how well a model aligns with actual observed data. It is applicable to data that is random, unprocessed, mutually exclusive, obtained from independent variables, and drawn from a sufficiently large sample.

**3. Result and Discussion**

**3.1 Land distribution of farmers**

Out of 246 respondents, 109 of them belong to the marginal

farm size category, as indicated in Table 1. The remaining farmers are distributed across other categories, with 49 in the small category, 42 in the semi-medium category, 32 in the medium category, and 14 in the large category.

**Table 1:** Farmers distribution according to their farm size

Farmer	Number of Farmers	Percent
Large Farmer	14	05.69
Medium	32	13.00
Semi-Medium Farmer	42	17.07
Small farmer	49	19.91
Marginal Farmer	109	44.30
Grand Total	246	100.00
Chi-square-104.934, df-4, sig.- 0.000		
(Source: Present survey data)		

The table provides an insightful depiction of farmers' distribution based on their farm size, offering valuable insights into the agricultural landscape. It categorizes farmers into five distinct groups: "Large Farmer," "Medium Farmer," "Semi-Medium Farmer," "Small Farmer," and "Marginal Farmer," along with the number and percentage of farmers in each category.

The data reveals that the largest segment comprises "Marginal Farmers," representing a substantial 44.30% of the total surveyed population. These farmers typically operate on the smallest scale, often facing resource constraints that challenge their agricultural productivity and income potential. The "Small Farmer" category, with 19.91% of the total, is the second most significant group. "Semi-Medium Farmers" follow closely at 17.07%. Together, these three categories highlight a predominant presence of smallholder and subsistence farmers, underscoring the need for targeted support to uplift their livelihoods.

In contrast, "Medium Farmers" make up around 13% of the total, signifying a relatively modest but larger segment. The "Large Farmer" category is the smallest, comprising just 5.69% of the total. This suggests a concentration of land and resources in the hands of a few.

The statistical analysis, indicated by a high chi-square value (104.934) and an extremely low significance level (0.000), implies a highly significant association between farm size categories and the distribution of farmers. This underscores the non-random nature of this distribution and calls for in-depth research to understand the underlying factors and determinants shaping it. In sum, the table highlights the diversity within the farming sector and the importance of tailored strategies to address the unique needs of farmers based on their farm size, fostering more equitable and sustainable agricultural development.

**3.2 Distribution of the farmers Age**

Major factors in study of socio-economic profile is age. The youngest farmer in the present research was about 23 years and the oldest is of age 78 years.

**Table 2:** Category-wise distribution of farmers age

Farmers Age (in Years)	Large	Medium	Semi-medium	Small	Marginal	Total	Percentage
Under 30	1	4	4	7	22	38	15
30-45	3	15	16	15	47	96	39
45-60	7	9	14	20	31	81	33
Above 60	3	4	8	7	9	31	13
<b>Total</b>	14	32	42	49	109	246	100
Chi-square ( $\chi^2$ ) = 13.418, df. = 16, p-value = 0.641							
Source: Data was collected from field and results was computed by the researcher.							

As represented in table 2 the largest proportion of farmers falls into the 30-45 age group, representing 39% of the total. This suggests that a significant number of farmers are in their prime working years, actively engaged in agriculture. The 45-60 age group follows closely, accounting for 33% of the total. This indicates that a substantial portion of the farming community consists of individuals approaching or in middle age.

The under 30 age group, representing 15% of the total, signifies the presence of younger farmers entering the agricultural sector. While this group is smaller in number, it is crucial for the rejuvenation of the agricultural workforce.

The above 60 age group, constituting 13% of the total, represents elderly farmers who may be approaching retirement or experiencing reduced involvement in farming activities.

The chi-square test, which assesses the relationship between age and farm size categories, yields a  $\chi^2$  value of 13.418 with a p-value of 0.641. This p-value, greater than the typical significance level of 0.05, suggests that there is no significant

association between age and the distribution of farmers among different farm sizes. In other words, age does not strongly influence which farm size category a farmer belongs to. This finding is interesting, as it implies that farmers of various age groups are fairly uniformly distributed across different farm sizes.

In summary, the data portrays a diverse age distribution among farmers, with significant representation in the 30-45 and 45-60 age groups. The lack of a significant relationship between age and farm size categories implies that farmers of varying ages engage in farming activities across different scales. This data underscores the need for comprehensive agricultural support and policy measures that cater to the diverse age groups within the farming community, promoting sustainability and inclusivity in agriculture.

### 3.3 Family-size distribution of the farmers

The family plays a significant role in discussions about the socio-economic aspects of the farmer.

**Table 3:** Category-wise distribution of farmers family size

Size	Large	Medium	Semi-medium	Small	Marginal	Total	Percentage
Small (1-4)	7	19	25	29	57	137	56
Medium (5-8)	5	11	14	11	44	85	34
Large (9 and above)	2	2	3	9	8	24	10
Total	14	32	42	49	109	246	100
Chi-square ( $\chi^2$ ) = 9.139, df. = 8, p-value = 0.330							
Source: Data was collected from field and results was computed by the researcher.							

The table 3 presents the distribution of farmers' family sizes categorized into Small (1-4 members), Medium (5-8 members), and Large (9 and above members), within different farm size categories. The majority of farmers fall into the "Small" family size category, comprising 56% of the total population. The "Medium" family size category represents 34% of the total, while the "Large" family size category constitutes 10%.

The chi-square test, with a  $\chi^2$  value of 9.139 and a p-value of 0.330, indicates that there is no significant association between family size and farm size categories. This implies that farmers' family sizes are fairly evenly distributed across different farm size categories. In other words, family size does not strongly influence which farm size category a farmer

belongs to.

Inference: The data suggests that farmers have diverse family sizes, with the majority falling into the "Small" and "Medium" categories. However, there is no clear connection between family size and farm size, as the distribution of farmers in various farm size categories appears to be independent of their family size. This finding indicates that the number of family members does not strongly dictate the choice of farm size, and other factors or considerations may play a more significant role in determining the scale of agricultural operations among these farmers.

### 3.4 Literacy level distribution

**Table 4:** Category-wise distribution of farmers literacy level

Education	Large	Medium	Semi-medium	Small	Marginal	Total	Percentage
Illiterate	0	0	1	8	19	28	11
Primary	0	0	3	4	31	38	16
Secondary	1	15	14	13	34	77	31
Graduate	5	13	20	21	23	82	33
PG & Other	8	4	4	3	2	21	9
Total	14	32	42	49	109	246	100
Chi-square ( $\chi^2$ ) = 95.644, df. = 16, p-value = 0.000							
Source: Data was collected from field and results was computed by the researcher.							

Literacy is also one of the factor while discussing the socio-economic of the study area. The table 4 has the literacy level distribution of the farmer.

The table displays the distribution of farmers across various literacy levels, categorized as "Illiterate," "Primary," "Secondary," "Graduate," and "PG & Other," within different farm size categories. The data reveals that the majority of farmers have completed either a "Secondary" education (31%)

or have reached the "Graduate" level (33%). "Illiterate" farmers account for 11%, "Primary" educated farmers make up 16%, and "PG & Other" educated farmers represent 9% of the total.

The chi-square test, with a  $\chi^2$  value of 95.644 and a very low p-value of 0.000, indicates a highly significant association between literacy level and farm size categories. In other words, farmers' literacy levels strongly influence the

distribution of farmers among different farm size categories.

**Inference:** The data demonstrates a clear and statistically significant relationship between farmers' literacy levels and their choice of farm size. Farmers with higher levels of education, particularly those at the "Graduate" level, tend to be more prevalent in larger farm size categories. Conversely, "Illiterate" and "Primary" educated farmers are more common

among smaller farm size categories. This suggests that education plays a substantial role in shaping the scale of agricultural operations among these farmers. Policymakers and agricultural stakeholders should consider the educational background of farmers when implementing targeted initiatives or interventions to support different farm sizes.

### 3.5 Occupational Distribution

**Table 5:** Category-wise distribution of farmers occupation

Occupation	Large	Medium	Semi-medium	Small	Marginal	Total	Percentage
Agriculture	4	7	7	20	73	111	45
Agriculture+ Animal Husbandry	3	11	12	8	21	55	22
Agriculture + Allied	5	4	17	12	10	48	20
Employee + Agriculture	2	10	6	9	5	32	13
Total	14	32	42	49	109	246	100
Chi-square ( $\chi^2$ ) = 62.037, df. = 12, sig.0.000							
Source: Data was collected from field and results was computed by the researcher.							

The table presents the distribution of farmers based on their occupations, categorized as "Agriculture," "Agriculture + Animal Husbandry," "Agriculture + Allied," and "Employee + Agriculture," within different farm size categories.

The data reveals that the majority of farmers across all farm size categories are engaged primarily in "Agriculture." This occupation represents 45% of the total. The second most common occupation is "Agriculture + Animal Husbandry," accounting for 22%. "Agriculture + Allied" follows at 20%, and "Employee + Agriculture" makes up 13% of the total.

The chi-square test, with a  $\chi^2$  value of 62.037 and a very low p-value of 0.000, indicates a highly significant association between farmers' occupations and farm size categories.

**Inference:** The data highlights a strong and statistically significant relationship between farmers' occupations and their choice of farm size categories. Most farmers are primarily engaged in agriculture, indicating its dominance as an occupation. However, the diversity in occupations within the farming community implies that different types of farming activities are often combined with other occupations. The

significance of this relationship suggests that a farmer's occupation significantly influences the scale of their agricultural operations. Policymakers and agricultural development initiatives should consider farmers' primary occupations when tailoring strategies and support for different farm sizes.

### 3.6 Annual Income

Table 6 throw light on the income level of the farmers. The table provides insight into the distribution of farmers based on their annual income, categorized into different income brackets. The data illustrates that the majority of farmers fall within the income range of "2-4 lakhs," constituting 23.57% of the total population. The "4-6 lakhs" income bracket follows closely, representing 22.76% of the total. Farmers with annual incomes "below 2 lakhs," "6-8 lakhs," and "above 8 lakhs" comprise 19.10%, 19.51%, and 15.04%, respectively. The chi-square test, with a  $\chi^2$  value of 119.335 and a very low p-value of 0.000, indicates a highly significant association between farmers' annual income and farm size categories.

**Table 6:** Category-wise distribution of farmers annual income

Income (Rs.)	Large	Medium	Semi-medium	Small	Marginal	Total	Percentage
Below 2 lakhs	0	0	3	7	37	47	19.10
2-4 lakhs	0	0	5	9	44	58	23.57
4-6 lakhs	2	8	14	17	15	56	22.76
6-8 lakhs	3	14	13	11	7	48	19.51
Above 8 lakhs	9	10	7	5	6	37	15.04
Total	14	32	42	49	109	246	100.00
Chi-square ( $\chi^2$ ) = 119.335, df. = 16, p-value = 0.000							
Source: Data was collected from field and results was computed by the researcher.							

**Inference:** The data reveals a strong and statistically significant relationship between farmers' annual income and their choice of farm size categories. Farmers' income levels significantly influence the scale of their agricultural operations. The income distribution among farmers underscores the importance of considering income disparities when designing policies and interventions tailored to various farm sizes. Policymakers and agricultural stakeholders should take into account the financial capacity and income sources of farmers when formulating strategies to support and promote sustainable agriculture.

### 4. Conclusion

This study presents a comprehensive view of the socio-economic profiles of farmers in Ballia District, Uttar Pradesh, where agriculture is central to the economy. It categorizes farmers into different farm size groups, emphasizing the prevalence of small-scale and subsistence farming. The majority of farmers fall within the 30-45 age group, underlining the need for inclusive agricultural strategies spanning various age groups. Family size was diverse but did not significantly affect farm size choices. Notably, farmers' literacy levels, occupations, and annual incomes were

strongly linked to their choice of farm size. These findings highlight the importance of tailored policies to support diverse farm sizes and ensure sustainable agricultural development. The study findings have substantial policy implications and provide insights for agricultural stakeholders and policymakers. Tailored strategies and interventions should consider the socio-economic characteristics of farmers, including farm size, age, family size, literacy levels, occupation, and income, to ensure equitable and sustainable agricultural development in Ballia District. Understanding these socio-economic profiles is crucial to enhancing the well-being of the farming community and shaping the future of agriculture in the region. This research contributes to the broader understanding of the complex and diverse socio-economic fabric of Ballia's farming sector, making it a valuable resource for informed decision-making and targeted support.

### 5. Author's Contribution

Conceptualization and designing of the research work (Akash Rai, Dr. Nitin Barker) Execution of Field/Lab experiments and data collection (Akash Rai); Analysis of data and interpretation (Akash Rai, A.S. Pradhan); Preparation of manuscript (Akash Rai, A.S. Pradhan)

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