

## **A Study of Socio-economic Profile of Sorghum growers in U.P Bundelkhand region**

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### **ABSTRACT**

*Sorghum (Sorghum bicolor L.), often referred to as the “King of Millets,” serves as a crucial dryland crop supporting rural livelihoods in arid and semi-arid regions. Although the overall cultivation area in India has declined in recent years, increasing productivity trends highlight the importance of examining the socio-economic characteristics of its farmers. This study investigates the socio-economic profile of sorghum growers in the Banda District during 2022. A multistage sampling approach was employed to select 120 respondents from the Baberu and Naraini blocks. The analysis, based on descriptive statistics, indicates that marginal farmers represent the largest proportion (43.33%), while medium-scale farmers account for the majority of cultivated land (46.52%), with an average landholding size of 5.14 hectares. Educational levels among respondents are largely concentrated at the primary and secondary stages, with an illiteracy rate of 16.66%. In terms of living conditions, 70.83% of respondents reside in permanent (pucca) housing, and agriculture remains the main source of livelihood for 58.33% of the sample population. These findings emphasize the dominance of smallholder and marginal farmers, highlighting the need for targeted interventions, particularly in capacity building and training programs, to improve productivity and enhance the socio-economic well-being of farming communities.*

**Keywords:** *Dryland agriculture, marginal farmers, landholding structure, occupational pattern, productivity trends.*

## INTRODUCTION

Sorghum (*Sorghum bicolor* L.), commonly referred to as “jowar” in India and often recognized as the “King of Millets,” is a key dryland crop that supports rural livelihoods in arid and semi-arid regions worldwide. Its multifunctional nature allows it to be utilized for human consumption, animal feed, fodder, and various industrial purposes. On a global scale, sorghum ranks as the fifth most important cereal crop after rice, maize, wheat, and barley. In developed countries, particularly the United States, it also serves as an important industrial raw material in multiple processing industries. Moreover, under favorable agro-ecological and management conditions, sorghum has the potential to achieve productivity levels comparable to maize. From a nutritional perspective, sorghum grains typically contain around 10–12% protein, 3% fat, and approximately 70% carbohydrates, making it a significant contributor to food and nutritional security, especially in water-scarce environments.

In the Indian context, however, the area under sorghum cultivation has declined over recent years, decreasing from 6.17 million hectares in 2014–2015 to 4.24 million hectares in 2020–2021. A similar downward trend is observed in total production, which fell from 5.45 million tonnes to 4.78 million tonnes during the 2015–2021 period. Despite this contraction in cultivated area and overall output, productivity has shown a consistent increase, with yields rising from 8.84 to 11.28 quintals per hectare, albeit with slight fluctuations. In light of these dynamics, this study aims to examine the socio-economic characteristics of sorghum farmers in the Banda District.

## LITERATURE REVIEW

The socio-economic dynamics of sorghum cultivation in India are influenced by the interaction between conventional agricultural practices and the integration of modern farming innovations. Gaining a comprehensive understanding of this context is essential for effectively addressing the constraints encountered by farmers, particularly those operating in dryland regions.

### **Agricultural Productivity Trends in India**

Recent empirical studies reveal a notable paradox within the agricultural sector of India. Although cropping patterns have undergone considerable changes, Ampa and Mandal (2025) emphasize that agricultural productivity remains a key concern in ensuring national food security. Their findings indicate that, despite variations in cultivated area, efforts to improve yield performance are essential for maintaining the sustainability of the agrarian economy. This perspective is consistent with the

observed increase in sorghum productivity, even as the total area under cultivation continues to decline.

### **Socio-Economic Dynamics in the Bundelkhand Region**

The Bundelkhand region, especially areas such as Banda District and Jhansi, is characterized by distinct socio-economic constraints. Singh et al. (2012) examined the condition of farmers in this region and found that socio-economic factors—particularly landholding size and levels of education—play a decisive role in shaping the sustainability of rural livelihoods. Their study further highlights that farmers in Bundelkhand generally operate under limited economic capacity, leading to a strong reliance on resilient dryland crops such as sorghum.

### **Technology Adoption and Socio-Economic Benefits**

The shift toward advanced production technologies plays a crucial role in improving the livelihoods of sorghum farmers. Chapke and Tonapi (2018) demonstrate that the adoption of enhanced post-rainy sorghum production technologies is closely associated with improved socio-economic outcomes. Their findings suggest that farmers who adopt improved varieties and better management practices, rather than relying solely on traditional methods, tend to experience increased household income and greater economic stability. These insights highlight the importance of targeted interventions aimed at narrowing the gap between the availability of agricultural innovations and their actual adoption, particularly among marginal farmers.

## **METHODOLOGY**

The study was carried out in 2022 in the Banda District, located within the Bundelkhand region. Although the district consists of eight development blocks—Badokhar Khurd, Mahuva, Baberu, Naraini, Jaspura, Tindwari, Bisanda, and Kamasin—the research specifically focused on the Baberu and Naraini blocks. These locations were purposively selected due to their relatively high concentration of sorghum cultivation.

A multistage sampling technique was employed to identify eight representative villages across the selected blocks. From each village, 15 sorghum farmers were chosen, resulting in a total sample of 120 respondents. Primary data were collected using a structured questionnaire designed to assess the socio-economic characteristics of farming households. The instrument covered key variables such as landholding size, educational level, access to market information, farming practices, and the constraints faced by farmers.

The collected data were systematically processed and analyzed using descriptive statistical methods to generate meaningful insights and provide a detailed understanding of the socio-economic profile of the respondents.

## **RESULT AND DISCUSSION**

Table 1 presents the core socio-economic characteristics of the respondents, indicating that agriculture in the study area is largely dominated by small-scale farming systems. The landholding distribution shows that marginal farmers form the largest group (52 respondents), followed by small farmers (35), medium farmers (25), and a relatively small number of large farmers (8). This pattern reflects the dominance of fragmented landholdings among sorghum cultivators in the Banda District.

In terms of educational background, the data reveal relatively low levels of formal education among the 120 respondents. Approximately 16.66% of participants are illiterate, while the majority have attained only primary (29.16%) or secondary education (26.66%). A smaller proportion (23.33%) completed higher secondary education, and only 4.16% reached the graduate level. Notably, none of the respondents reported postgraduate qualifications, indicating a significant educational gap that may constrain the adoption of modern agricultural technologies and improved farm management practices.

An assessment of living standards based on housing conditions shows that 29.16% of respondents reside in kachha houses, whereas the majority (70.83%) live in pakka structures. The sampled households comprise a total population of 558 individuals, with a gender distribution of 57.34% male and 42.65% female. The demographic structure is skewed toward younger age groups, with children accounting for 50.17% of the population, followed by the elderly (25.62%) and adults (24.19%). This indicates a high dependency ratio within the households.

Livelihood patterns further demonstrate a strong reliance on agriculture, with 58.33% of respondents depending solely on farming as their primary occupation. The remaining households supplement their income through wage labor or other secondary activities. Overall, these findings highlight the socio-economic vulnerability of small and marginal farmers, particularly those with limited educational attainment. This situation underscores the need for targeted interventions, including capacity-building programs, improved access to education, and technical training initiatives, to enhance productivity and strengthen the socio-economic resilience of sorghum growers in the Bundelkhand region.

**Table .1 Socio-economic status of respondents in the study area**

S.NO.	Dimensions	Category	Number	Percentage
1	Land Holding	Marginal(<1ha)	52	43.33
		Small(1-2ha)	35	29.16
		Medium(2-10ha)	25	20.83
		Large(>10ha)	8	6.66
		<b>Total</b>	<b>120</b>	<b>100</b>
2	Education	Illiterate	20	16.66
		Primary	35	29.16
		Secondary	32	26.66
		Higher Secondary	28	23.33
		Graduation	5	4.16
		Post-Graduation	0	0
		<b>Total</b>	<b>120</b>	<b>100</b>
3.	House	Kachha house	35	29.16
		Pakka house	85	70.83
		<b>Total</b>	<b>120</b>	<b>100</b>
4.	Family size	Male	320	57.34
			(120 families)	
		Female	238	42.65
			(in 120 families)	
		<b>Total</b>	<b>558</b>	<b>100</b>
			(in 120 families)	
		Adult	135	24.19
			(in 120 families)	
		Children	280	50.17
	(in120families)			
	Old	143	25.62	

S.NO.	Dimensions	Category	Number	Percentage
			(in 120 families)	
		<b>Total</b>	<b>558</b>	<b>100</b>
			(in 120 families)	
5.	Occupation	Agriculture	70	58.33
		Agriculture+labour+others	50	41.66
		<b>Total</b>	<b>120</b>	<b>100</b>

The socio-economic profile of the respondents, as presented in Table 1, reflects a farming structure largely dominated by small-scale operations. Landholding patterns indicate that marginal farmers form the largest group (52 respondents), followed by small (35), medium (25), and a limited number of large farmers (8). This distribution highlights the fragmented nature of land ownership among sorghum cultivators in the Banda District, where most farmers operate on relatively small plots.

Educational attainment among the 120 respondents remains relatively low. About 16.66% are illiterate, while the majority have only completed primary (29.16%) or secondary education (26.66%). Although 23.33% reached higher secondary education, only 4.16% attained a graduate degree, and none pursued postgraduate studies. This limited educational background may restrict farmers' ability to adopt advanced agricultural technologies and improved management practices.

In terms of living conditions, 29.16% of respondents live in kachha houses, whereas 70.83% reside in pakka houses, indicating a moderate level of housing stability. The total household population consists of 57.34% males and 42.65% females. The age composition is skewed toward younger members, with children accounting for 50.17%, followed by the elderly (25.62%) and adults (24.19%), suggesting a high dependency ratio.

Occupational patterns further demonstrate a strong reliance on agriculture, with 58.33% of respondents depending solely on farming for their livelihood, while others engage in supplementary income-generating activities such as labor work. Overall, these findings point to the socio-economic vulnerability of farmers, characterized by limited land resources and low levels of education. This underscores the necessity for targeted interventions, including capacity-building initiatives and improved access to education, to enhance the resilience and well-being of sorghum growers in the region.

**Table 2. Distribution of average size of land holding (ha) in Naraini and Baberu blocks of Banda district.**

Categories	No. of holding	Per cent of total holding	Area under cultivation(ha)	Per cent to the total area under cultivation	The average size of holding per farm (ha)
Marginal	52	43.33	31.32	9.16	0.60
Small	35	29.16	54.9	16.06	1.56
Medium	25	20.83	159	46.52	6.36
Large	8	6.66	96.5	28.23	12.06
<b>Total</b>	<b>120</b>	<b>100</b>	<b>341.72</b>	<b>100</b>	<b>5.14</b>

Table 2 illustrates the distribution of landholdings among sorghum farmers in the Naraini and Baberu blocks of the Banda District, highlighting the predominance of small-scale farming units. Marginal farmers represent the largest proportion of respondents, accounting for 43.33% (52 holdings), followed by small farmers at 29.16% (35 holdings), medium farmers at 20.83% (25 holdings), and large farmers at only 6.66% (8 holdings). This distribution reflects a highly fragmented agrarian structure, where most farmers operate on limited land resources.

However, a different pattern emerges when examining the total cultivated area. Medium farmers control the largest share of land, covering 159 hectares or 46.52% of the total sorghum area. Large farmers account for 96.5 hectares (28.23%), while small and marginal farmers manage comparatively smaller areas of 54.9 hectares (16.06%) and 31.32 hectares (9.16%), respectively. The total area under sorghum cultivation across both blocks amounts to 341.72 hectares, indicating a concentration of land resources among medium and large landholders despite their smaller population share.

The average landholding size across all respondents is 5.14 hectares; however, this figure conceals substantial disparities among farmer categories. Large farmers possess the highest average holding size (12.06 ha), followed by medium farmers (6.36

ha), while small farmers (1.56 ha) and marginal farmers (0.60 ha) have significantly lower averages. This unequal distribution of land resources highlights a clear socio-economic disparity, where marginal farmers, although numerically dominant, contribute less to the total cultivated area due to severe land limitations.

## CONCLUSION

The study titled “Socio-economic Profile of Sorghum Cultivation in Banda District of the Bundelkhand Region, Uttar Pradesh, India” reveals that the agrarian system in the Banda District is largely dominated by marginal and smallholder farmers who continue to rely on traditional farming practices. One of the key findings highlights a strong association between the relatively low levels of formal education – primarily limited to primary and secondary schooling – and the farmers’ limited ability to adopt modern, high-productivity agricultural technologies.

Although the majority of respondents exhibit a certain degree of housing stability, as reflected by residence in pakka structures, there remains a pronounced disparity in landholding sizes among different farmer categories. This inequality underscores the existence of socio-economic stratification within the region.

In response to these challenges, the study recommends a comprehensive policy approach that emphasizes the development of vocational education and structured training programs aimed at enhancing farmers’ technical knowledge and skills. Additionally, improvements in rural infrastructure, better access to institutional credit, and the provision of timely market information are essential to support agricultural development. The introduction of targeted subsidies for key inputs and farm machinery is also crucial in reducing production costs. Collectively, these interventions are expected to strengthen the socio-economic resilience and improve the livelihoods of sorghum farmers in the Bundelkhand region.

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