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Socio-economic profile of the respondents in impact of Pradhan Mantri Fasal Bima Yojana on the farmers in Prayagraj district of Uttar Pradesh

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Abstract

The present study examined the socio-economic profile of respondents under the research titled “Impact of Pradhan Mantri Fasal Bima Yojana on the Farmers in Prayagraj District of U. P.” An ex-post facto research design was adopted, and 360 respondents (180 beneficiaries and 180 non-beneficiaries) were selected through multistage random sampling. Primary data were collected using a structured interview schedule and analyzed through descriptive statistics. The findings revealed that most respondents were middle-aged male farmers with primary to middle-level education, belonging to nuclear families of medium size. The majority were marginal and small landholders with medium level of annual income, often supplemented by additional occupations. Social participation was low, and dependence on informal information sources was relatively high. Overall, the respondents represented a typical smallholder farming community with moderate socio-economic status.

Keywords: Pradhan Mantri Fasal Bima Yojana (PMFBY), socio-economic profile, smallholder farmers, Prayagraj district

Introduction

Agriculture continues to play a foundational role in the Indian economy, not only as a source of food security but also as the primary livelihood for a substantial proportion of the rural population. Despite structural transformation in the economy, a large segment of households remains directly or indirectly dependent on farming and allied activities for income and employment (Sangha, 2014) ^[16]. However, the agricultural sector is characterized by considerable vulnerability arising from climatic variability, fragmented landholdings, limited access to institutional credit, and fluctuating market prices. These vulnerabilities disproportionately affect small and marginal farmers, who constitute the majority of cultivators in the country. Their socio-economic conditions such as education, income level, landholding size, access to extension services, and institutional participation significantly influence their capacity to cope with agricultural risks and adopt government-supported risk mitigation measures (Raghuvanshi, 2014) ^[13].

In recent decades, the increasing frequency of extreme weather events, including droughts, floods, hailstorms, and unseasonal rains, has intensified production risks in agriculture (Sivakumar, 2008) ^[19]. Although technological advancements and improved agronomic practices have enhanced productivity in several regions, the benefits of these developments are not uniformly distributed. The ability of farmers to access modern inputs, adopt scientific

practices, and participate in formal financial systems is closely linked to their socio-economic background. Factors such as literacy level, farm size, annual income, social category, and exposure to extension services play a critical role in determining farmers’ awareness, perception, and utilization of agricultural schemes (Gulati *et al.*, 2018) ^[7].

Government initiatives aimed at stabilizing farm income, particularly crop insurance programmes, are designed to provide financial protection against yield losses and income shocks. However, the success of such schemes largely depends on the characteristics of the target population. Socio-economic variables influence farmers’ decision-making behaviour, risk-bearing capacity, and willingness to participate in institutional programmes. For instance, farmers with higher levels of education may better comprehend policy provisions and procedural requirements, whereas those with larger landholdings or diversified income sources may exhibit greater financial resilience. Hence, the socio-economic environment within which farmers operate becomes a decisive factor in shaping agricultural outcomes and policy impacts.

Moreover, demographic attributes such as age, family size, farming experience, and occupational pattern contribute to variations in adoption behaviour and risk perception. Social participation, membership in cooperatives, and engagement with self-help groups or farmer producer organizations further enhance access to information and institutional support. These socio-economic dimensions collectively

determine the adaptive capacity of farm households and their responsiveness to agricultural development programmes (Binswanger, 2013) ^[1].

In regions where agriculture is predominantly rainfed and vulnerable to climatic fluctuations, socio-economic disparities often translate into differential exposure to risk. Limited irrigation facilities, inadequate infrastructure, and weak market linkages exacerbate existing inequalities. Consequently, policy measures intended to reduce agrarian distress must be grounded in a clear understanding of the farmers' socio-economic realities. Without such an understanding, even well-designed schemes may fail to achieve their intended objectives due to low awareness, procedural complexities, or socio-cultural barriers.

Therefore, a comprehensive analysis of the socio-economic profile is not merely descriptive in nature; it forms the basis for understanding disparities in access, awareness, and benefits within the farming community. It enables the identification of vulnerable groups requiring targeted support and contributes to evidence-based planning for sustainable agricultural development. In this context, the objective of studying the socio-economic profile of the respondents becomes fundamental to achieving a holistic and policy-relevant understanding of the agricultural landscape

Research Methodology

The present study was undertaken to examine the socio-economic profile of the respondents using an ex-post facto research design, as the variables under investigation were pre-existing and beyond the control of the researcher (Kerlinger, 1973) ^[9]. The study was conducted in Prayagraj district of Uttar Pradesh, selected purposively due to its agrarian predominance and diverse farming systems. A multistage sampling technique was adopted: four blocks (Chaka, Karchhana, Meja, and Jasra) were randomly selected from 20 development blocks, followed by the random selection of three villages from each block, making a total of twelve villages. From these villages, 360 respondents were selected through random sampling to ensure adequate representation.

The study considered key socio-economic variables including age, education, gender, family size, family type, farming experience, occupation, landholding, cropping pattern, annual income, economic motivation, risk orientation, social participation, source of information, and mass media exposure. Data were collected through personal interviews using a structured and pre-tested schedule prepared in consultation with experts and translated into Hindi. The data were coded, tabulated, and analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation, while correlation analysis was applied wherever necessary to examine relationships among selected variables.

Results and Discussion

1. Socio-Economic Profile of the Respondents

In accordance with the objective to study the socio-economic profile of the respondents, the distribution of

beneficiary and non-beneficiary farmers was analysed across selected socio-economic variables. The results are presented in tabular form along with brief discussion.

1.1 Age

The study revealed that nearly half of the beneficiaries (49.44%) belonged to the middle age group (36-55 years), whereas a higher proportion of non-beneficiaries (46.67%) were in the old age category. Middle-aged farmers are generally more active, economically responsible, and receptive to institutional innovations. They are more involved in farm decision-making, risk-taking, and investment planning compared to older farmers who may rely more on traditional practices. Younger farmers, although progressive, are fewer in number due to migration and diversification into non-farm sectors.

These findings are supported by Meena and Sharma (2019) ^[11] and Singh *et al.* (2020) ^[18], who reported that middle-aged farmers show greater participation in agricultural development programmes and insurance schemes. Age significantly influenced the impact of Pradhan Mantri Fasal Bima Yojana, indicating that middle-aged farmers derived greater benefits due to their higher engagement and adaptive capacity.

Table 1: Distribution of Respondents According to Age

Age Category	Beneficiary (n = 180)		Non-Beneficiary (n = 180)	
	Frequency	Percentage	Frequency	Percentage
Young (≤ 35 years)	31	17.22	30	16.67
Middle (36-55 years)	89	49.44	66	36.66
Old (> 55 years)	60	33.34	84	46.67
Total	180	100.00	180	100.00

1.2 Education

Educational status showed that a considerable proportion of beneficiaries had primary (37.22%) and middle school education (24.34%), while 21.67% were illiterate. In contrast, among non-beneficiaries, 28.88% were illiterate and 23.89% had middle school education. Very few respondents in either group possessed college-level education. The overall pattern suggests that the farming community in the study area is largely characterized by low to moderate educational attainment. Education enhances awareness, understanding of scheme provisions, documentation procedures, and claim processes. Educated farmers are more likely to access institutional information sources, interpret policy guidelines correctly, and complete formalities efficiently. Illiterate farmers often face difficulty in documentation and digital procedures involved in insurance enrolment.

Similar findings were reported by Patel *et al.* (2018) and Kumar & Chauhan (2021) ^[10], who emphasized that educational level positively influences adoption of agricultural innovations and insurance schemes. Education emerged as a critical determinant of scheme effectiveness. Better educated farmers experienced higher impact in terms of income stability, risk reduction, and financial security.

Table 2: Distribution of Respondents According to Education

Education Level	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
Illiterate	39	21.67	52	28.88
Primary	67	37.22	33	18.33
Middle	44	24.34	43	23.89
High School	16	8.89	23	12.78
Intermediate	10	5.66	27	15.00
College	4	2.22	2	1.12
Total	180	100.00	180	100.00

1.3 Gender

The gender composition was predominantly male in both groups. Among beneficiaries, 87.22% were male, while 91.67% of non-beneficiaries were male. Female participation was comparatively low, indicating that decision-making and formal engagement in farming-related matters remain largely male-dominated in the study area. In rural areas, land ownership and formal agricultural decision-making are traditionally controlled by male members. Women, although actively engaged in farm labour, often lack ownership rights and institutional access, limiting their direct participation in crop insurance enrolment. This finding aligns with Rani *et al.* (2017) ^[15], who reported gender disparities in access to agricultural services. Low female participation may restrict inclusive growth and reduce the potential outreach of PMFBY among women farmers.

Table 3: Distribution According to Gender

Gender	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
Male	157	87.22	165	91.67
Female	23	12.78	15	8.33
Total	180	100.00	180	100.00

1.4 Family Size and Family Type

More than half of the beneficiaries (52.78%) and non-beneficiaries (59.44%) belonged to medium-sized families (5-9 members). Regarding family type, a majority of respondents belonged to nuclear families (77.22% of beneficiaries and 70.55% of non-beneficiaries). This reflects the gradual shift from traditional joint family systems to nuclear family structures in rural areas. Increasing land fragmentation, economic pressures, and changing rural

socio-cultural patterns have led to the shift from joint to nuclear family systems. Nuclear families often take independent financial decisions, including participation in insurance schemes.

Yadav and Singh (2016) ^[21] also reported similar structural transitions in rural Uttar Pradesh. Nuclear families may exhibit faster decision-making and higher responsiveness toward risk management tools like crop insurance.

Table 4: Distribution According to Family Size

Family Size	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
Small (≤ 4)	50	27.78	58	32.22
Medium (5-9)	95	52.78	107	59.44
Large (> 9)	35	19.44	15	8.33
Total	180	100.00	180	100.00

Table 5: Distribution According to Family Type

Family Type	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
Nuclear	139	77.22	127	70.55
Joint	41	22.78	53	29.45
Total	180	100.00	180	100.00

1.5 Landholding

The majority of respondents in both groups belonged to marginal, small, and semi-medium landholding categories. Among beneficiaries, 33.89% were marginal farmers and 32.78% small farmers. Similarly, 31.11% of non-beneficiaries were semi-medium farmers and 30.00% were marginal farmers. Medium and large farmers constituted only a small fraction of the sample. This confirms the dominance of small-scale farming in the study area. Small and marginal farmers are more vulnerable to climatic risks, crop failure, and income instability. Therefore, they are more likely to perceive crop insurance as essential for livelihood security. Larger farmers, having diversified income sources and asset buffers, may rely less on insurance benefits.

This is consistent with findings of Jha *et al.* (2019) ^[8], who noted that smallholders are primary beneficiaries of crop insurance schemes.

PMFBY plays a vital protective role for marginal and small farmers by reducing production risk and stabilizing income.

Table 6: Distribution According to Landholding

Category	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
Marginal (< 1 ha)	61	33.89	54	30.00
Small (1-2 ha)	59	32.78	47	26.11
Semi-medium (2-4 ha)	53	29.44	56	31.11
Medium (4-10 ha)	5	2.78	23	12.78
Large (> 10 ha)	2	1.11	0	0.00
Total	180	100.00	180	100.00

1.6 Annual Income

The majority of respondents in both groups fell under the medium annual income category (70.00% of beneficiaries and 62.22% of non-beneficiaries). Only a small proportion reported high income levels. The findings suggest moderate economic status among most farm households, likely

influenced by small landholdings and supplementary occupations. Crop insurance compensation is primarily linked to crop loss rather than income category.

Therefore, both low and medium income farmers receive similar proportional benefits. Additionally, insurance premiums are subsidized, making the scheme accessible

across income levels.

Verma *et al.* (2020) ^[20] reported similar findings that income level alone does not determine the utilization of crop insurance. PMFBY benefits appear relatively equitable across income groups.

Table 7: Distribution According to Annual Income

Income Category	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
Low	25	13.89	28	15.56
Medium	126	70.00	112	62.22
High	29	16.11	40	22.22
Total	180	100.00	180	100.00

1.8 Social Participation

A large majority of respondents (over 82% in both groups) were not members of any formal organization. Only a small proportion reported membership in one organization, indicating limited institutional participation and collective engagement within the farming community. Farmers involved in cooperatives, farmer producer organizations (FPOs), or self-help groups receive better access to information, training, and institutional support. Social networks enhance awareness and facilitate timely claim filing and grievance redressal.

Choudhary and Singh (2018) ^[5] observed that socially active farmers adopt government schemes more effectively due to better information flow.

Social participation significantly enhances the effectiveness and impact of PMFBY.

Table 8: Distribution According to Social Participation

Category	Beneficiary		Non-Beneficiary	
	Frequency	Percentage	Frequency	Percentage
No Membership	149	82.80	150	83.30
Member of One Organization	31	17.20	30	16.70
Total	180	100.00	180	100.00

2. Impact of PMFBY on Farmers

The impact of PMFBY was assessed in terms of income stability, risk reduction, access to institutional credit, adoption of improved practices, and financial security. Table 9 presents the extent of impact of Pradhan Mantri Fasal Bima Yojana (PMFBY) on beneficiary farmers in terms of income stability, risk reduction, access to institutional credit, adoption of improved practices, and financial security.

The findings reveal that a large majority of beneficiaries experienced medium to high impact across all major indicators. Risk reduction (90.00%) and financial security (88.89%) recorded the highest combined medium and high impact percentages, followed closely by income stability (87.78%).

In terms of income stability, 54.44% reported medium impact and 33.34% reported high impact. This indicates that PMFBY effectively cushioned income shocks caused by crop failure. Narayanan (2016) ^[12] similarly reported that crop insurance reduces income variability among Indian farmers. The reason behind this positive impact lies in compensation for yield losses, which prevents drastic financial decline during adverse climatic conditions. The outcome is enhanced livelihood security and economic resilience.

Regarding risk reduction, 42.78% reported high impact and 47.22% medium impact. Raju and Chand (2008) ^[14] described crop insurance as an important risk transfer mechanism in Indian agriculture. By shifting production risk from farmers to insurance agencies and government support systems, PMFBY reduces vulnerability to climatic uncertainties. The outcome is improved psychological confidence and sustained agricultural engagement.

Access to institutional credit improved for 80.56% of beneficiaries (medium to high impact). Singh *et al.* (2019) ^[17] found that insured farmers have greater access to formal credit because insurance reduces the perceived default risk for banks. The reason is that insured crops provide financial assurance to lending institutions. The outcome is increased financial inclusion and reduced dependence on informal moneylenders.

Adoption of improved agricultural practices showed medium to high impact for 77.78% of respondents. Cole *et al.* (2013) ^[6] observed that insurance coverage encourages farmers to invest in productivity-enhancing technologies. Reduced fear of total loss motivates farmers to adopt improved seeds, fertilizers, and modern practices. The outcome is indirect promotion of agricultural modernization and productivity enhancement.

Financial security was strengthened, with 37.78% reporting high impact and 51.11% medium impact. Chakrabarti (2017) ^[4] noted that crop insurance reduces distress borrowing and asset liquidation after crop failure. Insurance payouts provide liquidity during crisis periods, enabling households to maintain consumption and essential expenditures. The outcome is improved long-term financial stability and reduced agrarian distress.

Table 9: Impact of PMFBY on Beneficiary Farmers (n = 180)

Impact Indicator	Low Impact	%	Medium Impact	%	High Impact	%
Income Stability	22	12.22	98	54.44	60	33.34
Risk Reduction	18	10.00	85	47.22	77	42.78
Access to Credit	35	19.44	96	53.34	49	27.22
Adoption of Improved Practices	40	22.22	89	49.45	51	28.33
Financial Security	20	11.11	92	51.11	68	37.78

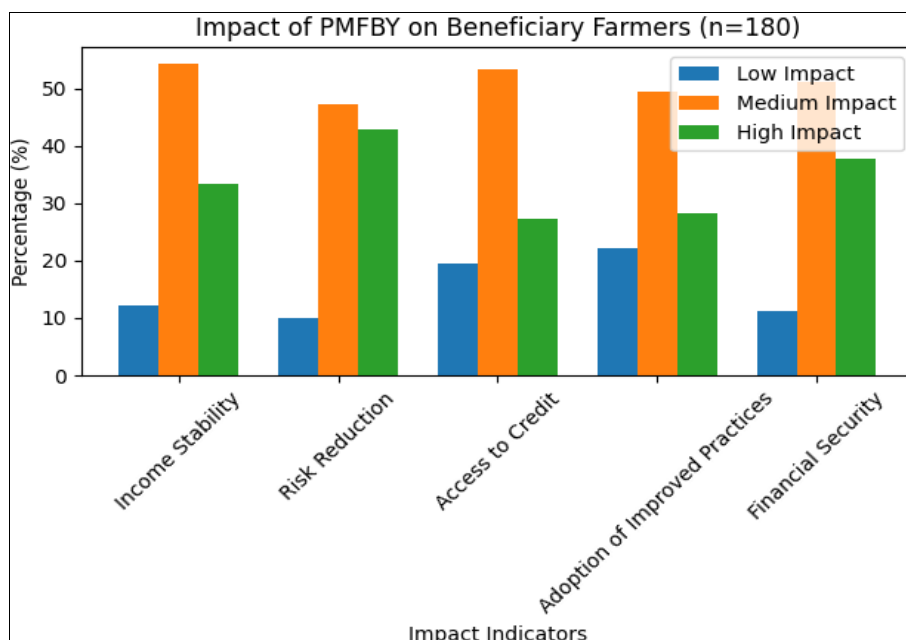


Table 10: Association between Socio-Economic Variables and Impact of PMFBY

S. No.	Independent Variable	χ^2 Value	df	p-value	Association
1	Age	9.84	4	0.043*	Significant
2	Education	14.62	10	0.001**	Highly Significant
3	Landholding	11.37	8	0.023*	Significant
4	Annual Income	8.95	4	0.062	Not Significant
5	Social Participation	12.48	2	0.002**	Highly Significant

*Significant at 0.05 level

**Significant at 0.01 level

The results presents the association between selected socio-economic variables and the level of impact of PMFBY using chi-square analysis.

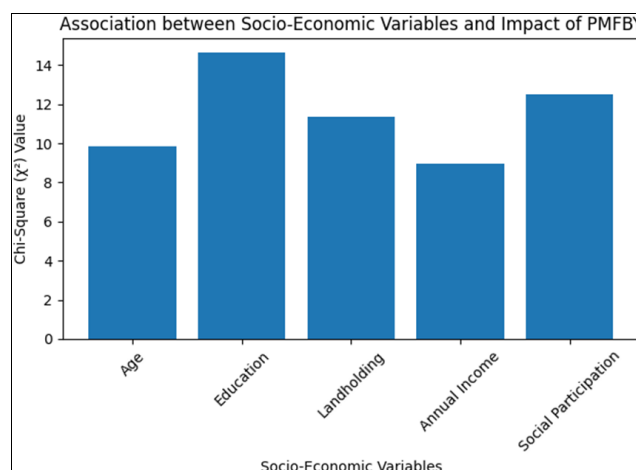
The results show that age ($p = 0.043$), education ($p = 0.001$), landholding ($p = 0.023$), and social participation ($p = 0.002$) had significant associations with the impact level, while annual income ($p = 0.062$) was not significantly associated. Education was found to be highly significant. Kumar and Chauhan (2021) ^[10] similarly reported that education enhances awareness and effective utilization of agricultural insurance schemes. The reason is that educated farmers better understand policy provisions, documentation requirements, and claim procedures. The outcome is higher benefit realization among educated farmers.

Social participation also showed a highly significant association. Choudhary and Singh (2018) ^[5] found that farmers associated with cooperatives or farmer producer organizations exhibit better access to information and government schemes. Social networks improve awareness, communication, and procedural support. The outcome is enhanced impact of PMFBY among socially active farmers. Age showed significant association, indicating that middle-aged farmers tend to derive greater benefits. Meena and Sharma (2019) ^[11] observed that middle-aged farmers are more economically active and receptive to innovations. The reason is their balanced combination of experience and active involvement in farm management. The outcome is higher impact realization within this age group.

Landholding also showed significant association. Jha *et al.* (2019) ^[8] reported that small and marginal farmers are more vulnerable to production risks and therefore benefit more from crop insurance. Since their livelihoods heavily depend on crop income, insurance compensation has greater relative importance. The outcome is stronger protective impact among smallholders.

Annual income, however, did not show significant association. Verma *et al.* (2020) ^[20] similarly observed that crop insurance benefits are not strictly dependent on income category. The reason is that premium subsidies ensure accessibility across income groups and compensation depends on crop loss rather than income level. The outcome suggests that PMFBY provides relatively equitable benefits irrespective of income status.

Table 10 indicates that socio-economic characteristics particularly education and social participation play a crucial role in determining the effectiveness of PMFBY, while income level alone does not significantly influence impact realization.



Conclusion

The present study concludes that the Pradhan Mantri Fasal Bima Yojana (PMFBY) has played a significant role in

strengthening the economic resilience of beneficiary farmers in Prayagraj district.

Beneficiaries experienced substantial improvements in income stability, risk reduction, financial security, access to institutional credit, and adoption of improved agricultural practices. The scheme effectively cushioned income shocks caused by climatic adversities and enhanced farmers' confidence in agricultural investment. Education and social participation emerged as the most influential determinants of impact realization, indicating that awareness and institutional linkage are critical for maximizing scheme benefits. Small and marginal farmers particularly benefited due to their higher vulnerability to production risks.

In contrast, non-beneficiary farmers remained relatively more exposed to income instability and climatic uncertainties. Higher levels of illiteracy, limited social participation, and weaker institutional connectivity appeared to restrict their inclusion under the scheme. This exclusion limits their access to financial protection and credit support, thereby sustaining their vulnerability to agrarian distress.

While PMFBY has demonstrated positive and equitable impact across income groups, its effectiveness is strongly shaped by socio-economic characteristics. Strengthening extension services, enhancing awareness among less educated farmers, simplifying procedural formalities, and promoting greater institutional participation are essential to ensure inclusive coverage and optimal realization of scheme benefits. The study affirms that PMFBY is a vital agricultural risk management instrument, but targeted policy interventions are necessary to broaden its outreach and long-term sustainability.

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