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Role of PM-KISAN on Reducing Agricultural Debt of Beneficiaries: A Case Study of Kashmir Division

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ABSTRACT

This study aims to assess the role of Pradhan Mantri Kisan Samman Nidhi Yojana (PM-KISAN) in reducing the agricultural debt of beneficiaries. Data has been collected through interview schedule. 402 beneficiaries were selected through a simple random sampling method from 3 agricultural blocks (Districts) namely Shahabad (Anantnag), Kandi Rafiabad (Baramulla), and Kralpora (Kupwara). The study found that non-farm income has a negative coefficient of -0.258, implying that an increase in non-farm income is associated with a decrease in agricultural debt. Farm size has a negative coefficient of -0.129, suggesting that larger land sizes are associated with lower debt. Agriculture subsidy has a negative coefficient of -0.111, indicating that higher receipts from subsidy schemes are associated with lower agricultural debt. Education of the beneficiary has a positive coefficient of 0.023, suggesting that higher education levels are associated with slightly higher debt. Farm income has a negative coefficient of -0.467, indicating that higher farm income is strongly associated with lower agricultural debt. Household expenditure has a positive coefficient of 0.252, implying that higher household expenditure is associated with higher debt 82.58% of surveyed respondents have debt, indicating a need for financial assistance. The analysis of PM-KISAN's role on agriculture debt reduction is evident from the significant Chi-Square value ($\chi 2 = 214.478$, $p < 0.05$), indicating a substantial relationship between the PM-KISAN and debt reduction among small and marginal farmers. In response to the findings, addressing agricultural distress should involve optimizing land use for larger landholders and maximizing government subsidies' impact to reduce farming expenses and debt. Balancing education with financial skills is vital. Additionally, improving farm income through advanced techniques and managing household expenses wisely can significantly alleviate debt. Beneficiaries undoubtedly appreciate the PM-KISAN scheme for its direct income support. However, given the escalating input costs, there is a pressing need to increase the income benefits to adequately address the rising input cost requirements. The government should adequate financial support especially small and marginal farmers who lack formal income sources, in order to help them sustain their agricultural livelihoods.

Key words: Agriculture indebtedness, Socio-economic factors, agriculture schemes, PM-KISAN

Introduction

The Indian economy is primarily based on the agriculture sector, which is also crucial to the expansion and development of the nation. The agricultural sector, which employs two-thirds (70%) of the workforce, not only ensures the country's food security but also significantly boosts employment, rural livelihoods, and overall economic growth. 54.6 percent of the workforce is employed in agriculture and related industries, which also provide 17.4 percent to the nation's gross value added (Census 2011). The GVA share of the agricultural and related industries in India was 55.33 percent in the fiscal year 2022. The most widely eaten staple crop in India is rice, which is produced in quantities exceeding 130 million metric tons (A. Minhas, 2023). Due to the large variety of crops and India's different agro-climatic zones, the sector is significantly essential as a supplier of raw materials for numerous enterprises and as a producer of export money. To satisfy the demands of a growing population, India's food security depends on boosting cereal crops and increasing the production of fruits, vegetables, and milk (World Bank, 2012).

Indian farmers confront a multitude of challenges during cultivation. These include inadequate access to modern agricultural practices, limited irrigation facilities, unpredictable weather patterns due to climate change (Thanh, N. C., & Singh, B. 2006), and inefficient market channels (Karthick, S et al. 2020). Additionally, small and marginal farmers often struggle with limited access to credit mainly females (Sandhu, N., et al. 2012), and land fragmentation, which collectively hinder their economic well-being. Agriculture credit is important for increasing agricultural productivity (Yadav, I. S., & Rao, M. S., 2022). Since it supports farmers to fund their initial input requirements. Small and marginal farmers have less access to farm credit (Basu, P. (2006) to increase their income levels and uplift their living standards.

Multiple factors drive farmers to fall into debt traps which include level of education, non-farm income, farm size, and non-institutional credit (Singh, S., et al., 2014). Around 50.2% of agricultural households fall under agricultural debt with an average outstanding loan amount of Rs.74121 (Agriculture Statistics at a Glance, 2021). However, the high levels of farmer indebtedness can lead to a vicious cycle of dependency on loans, often resulting in a debt trap that is hard to escape. The consequences of this indebtedness are profound, including increased stress on mental and emotional well-being, reduced investments in agricultural practices, and even tragic instances of farmer suicides (Narayanamoorthy, A., & Kalamkar, S. S., 2005). Small and medium-sized farmers are highly affected by the indebtedness levels as they take credit from private money lenders (Singh, G., et al., 2017). Limited access of rural farmers to institutional credit diverts farmers to seek credit from money lenders at high-interest rates (Pandey, G. K. (2016).

The government of India launched an income-based scheme PM-KISAN, which is a centrally funded initiative for small and marginal farmers. Under this initiative ₹6000 will be provided to all land-holding farmer families in equal three installments. PM-KISAN scheme showed an incremental impact on farmers' income when compared to fertilizer subsidy schemes (Sharma, A. K.,2019). PM-KISAN benefit is a progressive step for the development of farmers but due to the inadequate amount paid to farmers, they were unable to uplift their living standards (Kumar, D., & Phougat, S. (2021). Application of technology is vital for increasing agricultural productivity while lowering input costs, PM-KISAN showed a significant impact on the adoption of modern technology (Pandey, G. K. 2016). More than 11 crore farmers have received installment payments totaling more than 2.42 lakh crores under the PM-KISAN program (PIB Delhi, July 2023). This paper encompasses to assess the role of PM-KISAN on reducing agriculture debt of beneficiaries with respect to Kashmir division.

Literature review

Batra, V. Savita. (2020) this study used a sample of 360 participants from Gurugram, Rewari, and Mahendragarh to examine the problem of debt among farmers in South Haryana. The results show that debt is largely caused by a number of elements, including the high costs of farming, crop failures, the lack of adequate irrigation systems, and significant capital and recurring expenditures involved with agricultural activities. Furthermore, the study revealed that 90% of the respondents view their inability to pay back loans as a stressful aspect that deters them from continuing in this line of work. The report also emphasized the need to combat corruption concerns and make sure that farmers receive fair and prompt payment for their agricultural output.

Chhikara, K. S., & Kodan, A. S. (2014) this study was conducted in Haryana to assess the indebtedness status of farmers, the researcher approached an exploratory research design in which secondary data was used. The study revealed that 71 percent loan to the total was used in productive activities which are low compared to the aggregate 73.10 percent. Marginal and small farmers use a significant portion of loan amounts in marriages and ceremonies. The study also found that average land size and informal credit lending are negatively correlated due to increasing population growth and single-family trends. The researcher emphasizes that govt. should boost and enhance self-help groups and dairy farms to increase income. The researcher also underlines that Banks should also achieve the target of agriculture credit each year according to the prescribed target and the researcher also demands RBI intervention against those institutions that do not achieve the target of agriculture credit.

Datta, S. et al., (2018) the study was conducted in the Medak district of Telangana state in which the researcher attempted to examine the extent and magnitude of indebtedness among rural

households. The researcher used primary data from 100 sample farmers and used Bayesian and LASSO regression methods for the identification of factors responsible for the indebtedness of a household. The study revealed that 75% of total households in Medak district fall under the category of small and marginal farmers. An average of 25% of the sample households are in debt, with small and marginal farmers having an incidence of debt that ranges from 80 to 90%. The study also showed that the factors influencing the loans taken by the farmers in the study region include their primary employment, their use of contemporary technology, the interest rate, their medical expenses, and the source of the loan. According to the report, farmers who spend their money on unproductive ventures are more indebted. The study also discovered an inverse relationship between the prevalence of debt and the usage of contemporary technologies. Therefore, encouraging modern agricultural technologies can lessen farmer debt and the resulting agrarian misery.

Jeromi, P. D. (2007) this study was conducted in Kerala in which the researcher made an attempt to examine the extent and factors leading to farm crises and also examine the extent of indebtedness of farmers and its connection with farmer suicides. The study revealed that farmers' indebtedness has risen due to deficient rainfall, excessive concentration on export-oriented perennial crops, decline in productivity, fall in prices, etc. Continuity in farmers' distress led to a rise in agricultural indebtedness levels, and farmers' inability to pay the outstanding loans became the reason for committing suicide. The researcher focuses on restructuring plans for raising yield levels and lowering the input cost of production in order to meet the problems of trade liberalization.

Kaur, Sukhvir, (Sept 2011) this study aimed to investigate poverty and indebtedness among marginal and small-scale farmers in rural Punjab state. The researcher specifically chose three districts and surveyed a total of 650 farmers falling into this category. These farmers are grappling with challenges such as the lack of interest-free loan facilities, limited access to education, and insufficient subsidies for agricultural inputs, among others. The findings indicate that a staggering 83 percent of the surveyed farm households are burdened by debt. Furthermore, the study unveiled a positive correlation between farm size and income, suggesting that larger farm sizes are associated with increased consumption expenditure.

Ma, W. et al. (2020) the researcher made an attempt to assess the relationship between debt and dairy productivity and profitability of 250 dairy farms in New Zealand. The researcher used 10-year balanced panel data from 2005-2014 and the study revealed that a higher debt ratio increased farm productivity during 2005-2009 and decreased dairy productivity during 2011-2014 which shows variation in the effects of debt ratio on farm productivity over time. The study also reported that the debt ratio does not significantly affect both dairy productivity and profitability, but farm-specific attributes like farm cycle and managerial ability of dairy farmers also have an effect on the debt ratio.

Maurya, S. K., & Vishwakarma, N. (2021) the researcher endeavored to assess the state of agricultural credit and indebtedness in India. The study encompasses the time period from the agricultural census year 2015-2016 and the input survey year 2011-2012. It encompasses a nationwide scope with a focus on selected districts, including Uttar Pradesh, Madhya Pradesh, Andhra Pradesh, Punjab, West Bengal, Bihar, Maharashtra, Odisha, Rajasthan, Telangana, and Karnataka. Basic statistical methods were applied to illustrate the percentage of agricultural households burdened by debt. The study's findings indicate that marginal landowners primarily resort to short-term and medium-term loans, with marginal and small agricultural households constituting a significant portion of total operational landholdings. These smaller agricultural entities heavily rely on short-term and medium-term loans. The study underscores the need to enhance creditworthiness by promoting market-oriented production practices.

Nouman, M., et al., (2013) the results indicate that factors such as marital status, education level, farm size, and farm status significantly influence the amount of agricultural credit that farmers can access. The high Chi-square value and the highly significant p-value from the Ordinal Logit Model underscore the substantial collective impact of these socio-economic characteristics on farmers' access to agricultural credit. Consequently, it can be firmly established that the characteristics of farmers play a pivotal role in determining their access to agricultural credit.

Singh, S. et al., (2014) the study was conducted in Punjab to analyze the Magnitude and determinants of indebtedness among farmers in Punjab. Employing a multiple-step regression analysis, the researcher identified socioeconomic factors that influenced levels of indebtedness. Notably, education, farm size, and the proportion of non-institutional factors were found to be positively correlated with indebtedness levels. Additionally, the study highlighted the significant role played by commission agents in pushing farmers into cycles of indebtedness, particularly impacting marginal and small-scale farmers. This underscores the importance of intervening in this critical area to improve their circumstances.

Objectives of the study

1. To study the demographic profile of PM-KISAN beneficiaries.
2. To study the role of PM-KISAN on the agriculture indebtedness of beneficiaries.

Hypothesis of the study

- There is no significant impact of socio-economic factors on the agricultural indebtedness of PM-KISAN beneficiaries.

- ❖ PM-KISAN plays a significant role in reducing the agriculture indebtedness of beneficiaries.

Research methodology

The nature of research is exploratory in nature. The study is based on primary data, which were collected from the beneficiaries through a pre tested interview schedule. A multistage simple random sampling method is used in this study in which 3 districts namely Baramulla, Kupwara, and Anantnag were selected from the Kashmir division. From each district one agricultural block is selected through simple random sampling. A total of 134 beneficiaries were selected randomly from each agricultural block.

Plan of analysis

The gathered data has been transcribed into lengthy sheets, and tables have been created and analyzed through suitable statistical methods, including mean, S.D., Chi-square, and multiple linear regression.

Model specification:

$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\ldots+\beta_nX_n+\varepsilon$

- Y represents the dependent variable (Agricultural Indebtedness) we trying to predict.
- β 0is the intercept, which represents the expected value of Y when all independent variables (X_1, X_2, X_3,……, X_n) are set to zero.
- $\beta_1, \beta_2, \beta_3,\ldots, \beta_n$ are the coefficients associated with each independent variable.
- X_1, X_2, X_3,……, X_n are independent variables.
- ε represents the error term, which accounts for the unexplained variability in the dependent variable.

ANALYSIS AND DISCUSSION

Recognizing the paramount importance of demographic profile, it is evident that these elements wield significant influence over various aspects regarding sustaining agricultural productivity (Dash, P.B., et al., 2022)

Table 1.1

Gender of the sample PM-KISAN holders

Gender	District			Total (%)
	Baramulla	Kupwara	Anantnag (%)	
	Count (%)	Count (%)	Count (%)	
Male	98(73.13)	115(85.82)	121(90.29)	334(83.08)
Female	36(26.86)	19(14.17)	13(9.70)	68(16.91)
Total	134(100)	134(100)	134(100)	402(100)

Fig. in parenthesis showing percentage Source: Field survey.

In table 1.1 the results depict that in Baramulla, there are 98 male and 36 female beneficiaries. In Kupwara, there are 115 male and 19 female beneficiaries. In Anantnag, there are 121 male and 13 female beneficiaries. Overall, there are 334 male beneficiaries (83.08%) and 68 female beneficiaries (16.91%) out of a total of 402 beneficiaries. This means that a larger percentage of beneficiaries are male compared to female in these districts.

Table 1.2

Age-wise Distribution of the sample PM-KISAN holders

Age group	Number of the PM-KISAN holders	Percentage to Total
Up to 28	18	4.77
29-39	50	12.43
40-50	170	42.28
50+	164	40.79
Total	402	100.0

Source: Field Survey

Table 1.2 reveals that there are 18 beneficiaries who are under the age of 28, accounting for approximately 4.77% of the total. In the 29-39 age range, there are 50 PM-KISAN holders, constituting 12.43% of the total count. The largest demographic falls within the 40-50 age group, with 170 beneficiaries, making up a substantial 42.28% of the total. Finally, there are 164 PM-

KISAN holders aged 50 or older, representing 40.79% of the overall beneficiaries. This data underscores that the majority of PM-KISAN holders are in the 40-50 age category, while the younger age groups have fewer beneficiaries in comparison.

Table No. 1.3

Distribution of PM-KISAN beneficiaries on the basis of marital status

Marital status	Count.	Percent to Total
Married	345	85.82
Unmarried	0	0.0
Windows	57	14.2
Others	0.0	0.0
Total	402	100.0

Source: Field Survey

The data presents the distribution of PM-KISAN beneficiaries based on their marital status. Among the beneficiaries, 345 (85.82%) are married, 0 (0.0%) are unmarried, 57 (14.2%) belonged to widows category. This information indicates that the majority of beneficiaries are married respondents, while a smaller percentage is widows category . There are no beneficiaries in the "Others" category, which might include respondents with a different marital status.

Table 1.4

Category of the sample PM-KISAN holders:

Caste	Count	Percent
SC	75	18.66
ST	35	8.71
OBC	15	3.73
General	277	68.90
Total	402	100.0

Source: Field Survey

From the above table 1.4 the largest group is the General category, comprising a significant 68.90% of the total sample, with 277 respondents. Followed by SC (Scheduled Caste) category

represents 18.66% of the sample, consisting of 75respondents. The ST (Scheduled Tribe) group accounts for 8.71% of the total, with 35 respondents. Finally, the OBC (Other Backward Classes) category is the smallest, making up only 3.73% of the sample, with 15 respondents.

Table 1.5

Distribution of PM-KISAN Holders according to Family Type

Family Type	Count.	Percent
Joint Family	39	9.7
Nuclear family	363	90.3
Total	402	100.0

Source: Field survey

According to Table results 1.5, the majority of PM-KISAN holders, representing 90.3% of the total sample, come from Nuclear Families. This means that the program predominantly supports respondents who belong to smaller, independent family units. In contrast, Joint Families account for a smaller proportion, with 9.7% of the total count. Joint Families typically consist of extended family members living together, while Nuclear Families comprise a more compact household structure, often limited to parents and their children.

Table No. 1.6

Family Size of the PM-KISAN Holders

Family Size	Count.	Percent
Up to 2	8	1.99
3-5	276	68.65
6-8	113	28.10
Above 8	5	1.24
Total	402	100.0

Source: Field Survey.

The majority of beneficiaries, 68.65%, have families consisting of 3 to 5 members, totaling 276 respondents. About 28.10% of the beneficiaries have larger families of 6 to 8 members, which accounts for 113 respondents. A smaller proportion, 1.99%, has family sizes of up to 2 members, involving 8 respondents. Additionally, a very small percentage, 1.24%, has families with more than 8 members, which includes 5 respondents.

Table 1.7

Education-wise distribution of PM-KISAN holders

Education	Count	Percent
Illiterate	195	58.5
Primary	138	34.3
Secondary	45	11.2
Higher Secondary	14	3.5
Graduate	8	2.0
Post Graduate	2	.5
Total	402	100.0

Source: Field Source

Table 1.7 presents the educational background of respondents participating in the PM-KISAN program. The majority of beneficiaries are illiterate, accounting for 58.5% of the total, followed by those with a primary education at 34.3%. A smaller percentage of participants have completed secondary education (11.2%) or higher secondary education (3.5%). A mere 2.0% of PM-KISAN holders are graduates, while only 0.5% have a post-graduate degree.

Table No. 1.8

Occupation of PM-KISAN holders.

Occupation	Count	Percent
Agriculture and allied activities	71	17.66
Labour	246	61.0
Business	16	4.22
Other technical work	11	2.9
Total	402	100.0

Source: Field survey

The table provides a breakdown of the occupations held by PM-KISAN beneficiaries, indicating the number and percentage of respondents in each category. The majority of PM-KISAN holders, accounting for 61.0%, are engaged in labor-related occupations, while 17.66% are involved in agriculture and allied activities. A smaller portion, 4.22%, is in business, and there are 2.9% involved in other technical work. Interestingly, there are no PM-KISAN recipients reported to be in government service.

Table No. 1.9

Land type among PM-KISAN Holders

Land Type	Count	Percent
Irrigated	8	2.0
Non-Irrigated	63	15.7
Both	331	82.3
Total	402	100.0

Source: Field Survey.

The table provides insights into the types of land owned by respondents participating in the PM-KISAN program. Among these beneficiaries, 2.0% have irrigated land, which means they have access to a water source for farming. In contrast, 15.7% have non-irrigated land, indicating that they rely on natural rainfall for farming. The majority, representing a substantial 82.3%, have both irrigated and non-irrigated land, suggesting a diverse mix of agricultural practices among PM-KISAN holders.

Table No. 1.10

land size among PM-KISAN holders:

Land Size	Count	Percent
Up to 2 Kanal	13	3.2
2.1- 4 Kanal	66	16.4
4.1- 6 Kanal	99	24.6
6.1 - 8 Kanal	139	34.6
Above 8 Kanal	85	21.1
Total	402	100.0

Source: Filed survey

The table displays the distribution of land sizes among PM-KISAN beneficiaries. It shows that 3.2% of the participants have land up to 2 Kanal in size, while a larger proportion, 16.4%, falls into the 2.1-4 Kanal category. A significant portion of 24.6% of beneficiaries possess land in the range of 4.1 to 6 Kanal, and 34.6% have land ranging from 6.1 to 8 Kanal. Additionally, 21.1% of PM-KISAN holders own land exceeding 8 Kanal in size. In total, there are 402 beneficiaries in the sample, representing various land size categories.

2.1 Socio-economic factors affecting agriculture indebtedness among pm-kisan beneficiaries

The upsetting truth is that many farmers continue to struggle with rising debt despite the government's efforts to help them through different agricultural plans and subsidies. While these government programs try to lessen the financial pressures on agricultural communities, a number of intricate socioeconomic and structural issues continue to pose a threat to farming's viability. Level of education, Farm size, non-farm income, farm income, family size, kind of cultivation, family size, agriculture expenditure and government subsidies received, were identified as the factors impacting agricultural indebtedness during the study in the first run model. Six important variables persisted in the final run. The outcomes are shown in the following model summary.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.724[a]	.525	.518	.80597

a. Predictors: (Constant), Agriculture expenditure, non-farm income, education of the beneficiary, Farm size (kanals), agricultural subsidies, annual farm income.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	281.203	6	46.867	72.150	.000[b]
	Residual	254.636	392	.650		
	Total	535.840	398			

a. Dependent Variable: How much debt you have
b. Predictors: (Constant), Agriculture expenditure, non-farm income, Education level, farm size, Agriculture subsidies, farm income

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

	(Constant)	4.578	.196		23.351	.000
	Non-farm income	-.258	.034	-.278	-7.538	.000
	Farm size	-.129	.039	-.121	-3.325	.001
1	Subsidies programmes	-.111	.024	-.170	-4.724	.000
	Education level	.023	.011	.070	1.995	.047
	Farm income	-.467	.034	-.613	-13.722	.000
	Agriculture expenditure	.252	.030	.347	8.264	.000

a. Dependent Variable: Agricultural debt

In this multiple linear regression model, the overall performance of the model is summarized by an R-squared value of 0.525, indicating that approximately 52.5% of the variance in the debt amount can be explained by the predictor variables. The adjusted R-squared value of 0.518 accounts for the number of predictors in the model and suggests that the model is still a good fit after adjusting for complexity. The standard error of the estimate is approximately 0.80597, representing the typical error in predicting debt amounts. Analyzing the coefficients, the constant term (intercept) is 4.578. For the predictor variables, non-farm income has a negative coefficient of -0.258, implying that an increase in non-farm income is associated with a decrease in debt. Farm size has a negative coefficient of -0.129, suggesting that larger land sizes are associated with lower agricultural debt. Subsidies received from Govt. schemes have a negative coefficient of -0.111, indicating that higher receipts from subsidy schemes are associated with lower debt. Education of the beneficiary has a positive coefficient of 0.023, suggesting that higher education levels are associated with slightly higher debt. Farm income has a negative coefficient of -0.467, indicating that higher farm income is strongly associated with lower debt. Household expenditure has a positive coefficient of 0.252, implying that higher household expenditure is associated with higher debt.

3.1 Role of PM-KISAN in reducing agricultural indebtedness

The rising indebtedness among rural farmers has significantly impacted their lives, created financial burdens and limited their ability to fully utilize the government's agricultural support programs.

TABLE NO. 3.1

Beneficiaries burdened with agricultural debt:

Are you burdened with debt	Count.	Percent
Yes	293	72.9
No	109	27.1
Total	402	100.0

Source: Field Survey

Table 3.1 shows agricultural debt among the beneficiaries, 293 people, or about 72.9% have agricultural debt. On the other hand, 109 people, or about 27.1 % do not have such debt. The majority of the beneficiaries are burdened with agricultural debt.

Table No.3.2

Agriculture debt range among beneficiaries before PM-KISAN:

Debt range	**Count.**	**Percentage**
No debt	109	27.1
Up to 5000	11	2.7
5001-10000	93	23.1
10001-15000	152	37.8
15001-20000	33	8.2
20000 Above	4	1.0
Total	**402**	**100.0**

Source: Field Survey

Table 3.2 illustrates that 109 respondents (27.1%) have no agricultural debt, 11 (2.7%) have debts up to 5000, 93 (23.1%) have debt between 5001 and 10000, 152 (37.8%) are indebted with amounts ranging from 10001 to 15000, 33 (8.2%) have debts between 15001 and 20000, and 4 (1.0%) have debts exceeding 20000, with a total of 402 beneficiaries included in the study.

Table No. 3.3

Role of PM-KISAN in Reducing Agriculture Debt

	Observed N	Expected N	Residual
No debt	109	100.5	8.5
Fully reduced	45	100.5	-55.5

Partially reduced	217	100.5	116.5
Not reduced	31	100.5	-69.5
Total	402		

Source: Field survey

The above table 3.3 is explained under the following heads below:

No debt: There were 109 observed cases of farmers with no debt, which was slightly higher than the expected value of 100.5. This resulted in a positive residual of 8.5, indicating that more farmers had no debt than expected.

Fully reduced: In this category, there were 45 observed cases of fully reduced debt, significantly lower than the expected value of 100.5. This resulted in a negative residual of -55.5, suggesting that fewer farmers experienced a full reduction in debt compared to what was expected.

Partially reduced: The observed cases of partial debt reduction were 217, substantially higher than the expected value of 100.5. This yielded a positive residual of 116.5, indicating that a larger number of farmers experienced partial debt reduction compared to the expected amount.

Not reduced: For farmers whose debt was not reduced, there were 31 observed cases, which was notably lower than the expected value of 100.5. This led to a negative residual of -69.5, signifying that fewer farmers had no reduction in debt compared to what was expected. The table suggests that PM-KISAN had a more significant impact on partially reducing debt.

Chi-Square ($\chi 2$)

Test Statistics

Df	Level of significance	Calculated Value	Table value	Accept/Reject
3	0.05	214.478[a]	7.815	H0 Rejected

The chi-square test results indicate that with 3 degrees of freedom and a level of significance of 0.05, the calculated chi-square value is 214.478 which is much higher than the table value of 7.815. This significant difference leads us to reject the null hypothesis and conclude that PM-KISAN plays a significant role in reducing agricultural debt levels of beneficiaries.

CONCLUSION

A gender-wise distribution analysis reveals varying percentages of male (83.68) and female (16.91) participants across different districts. The majority of PM-KISAN holders fall within the age group of 40-50, comprising 42.28% of the total beneficiaries, followed by those aged 50 and above at 40.79%. The majority, 85.82%, is married, additionally, 14.2% of the respondents belonged to widows windows category and there are no respondents categorized as "unmarried" in terms of marital status. The majority of PM-KISAN beneficiaries are engaged in labor-intensive occupations, with a significant portion involved in agriculture and allied activities. The absence of respondents in government service among the recipients is noteworthy. The majority of PM-KISAN holders, representing 82.3%, possess both irrigated and non-irrigated land, while a smaller proportion owns either solely non-irrigated or irrigated land. The majority of PM-KISAN holders possess land sizes in the range of 6.1-8 Kanals, comprising 34.6% of the total, while a significant portion, 21.1%, own land above 8 Kanals. Smaller land sizes are less common among the beneficiaries.

Multiple linear regression model provides valuable insights into the factors affecting debt among beneficiaries. The model exhibits an R-squared value of 0.525, indicating that approximately 52.5% of debt variance is explained by predictor variables. The adjusted R-squared value of 0.518 underscores the model's suitability, considering complexity. The constant term (Intercept) of 4.578 represents the expected debt amount for beneficiaries when all other predictor variables are zero. Non-Farm Income (-0.258) indicates that a one-unit increase in non-farm income is associated with a decrease of 0.258 units in the expected debt amount, suggesting that higher non-farm income is linked to lower debt. Farm size (-0.129) implies that for every one-unit increase in land size, the expected debt amount decreases by 0.129 units, indicating that larger land sizes are associated with reduced debt. Subsidies from Government Schemes (-0.111) means that a one-unit increase in subsidies received from government schemes corresponds to a decrease of 0.111 units in the expected debt amount, showing that higher subsidies are linked to lower debt levels. Education of the Beneficiary (0.023) suggests that with a one-unit increase in the education level of the beneficiary, the expected debt amount increases by 0.023 units, indicating a slight positive association between education and debt. Farm Income (-0.467) strongly associates an increase of one unit in farm income with a decrease of 0.467 units in the expected debt amount, highlighting that higher farm income significantly reduces debt. Agricultural expenditure (0.252) indicates that each one-unit increase in household expenditure is associated with a 0.252 unit increase in the expected debt amount for beneficiaries, suggesting that higher household expenditure tends to lead to higher debt levels. These coefficient interpretations provide insights into how each predictor variable affects the expected debt amount among beneficiaries, shedding light on the factors influencing debt levels. A significant majority, 72.9 %, of the surveyed respondents reported being burdened with debt, while 27.1 % indicated no agriculture debt. These findings underscore the prevalent issue of debt among the surveyed population, highlighting the need for targeted financial assistance and debt management programs. the analysis of PM-KISAN's role on agriculture debt reduction is evident from the significant Chi-Square value ($\chi 2 = 214.478$, $p < 0.05$), indicating a substantial

relationship between the program and debt reduction among small and marginal farmers(beneficiaries). The data suggests that PM-KISAN has played a role in reducing agriculture debt, with a notable number of beneficiaries experiencing either full or partial debt reduction, signifying its positive influence in alleviating financial burdens among beneficiaries.

In light of the aforementioned findings, it is necessary to implement certain changes in formers corner that could aid farmers in resolving the current agricultural distress. Beneficiaries with larger land sizes should aim to optimize land usage for improved agricultural productivity, potentially reducing the need for additional borrowing. Leveraging government subsidies and ensuring their effective utilization can help lower farming expenses and, consequently, debt burdens. While higher education levels were associated with slightly higher debt, respondents can balance education with financial management skills to make informed decisions about income and debt. To significantly reduce debt, it's essential to enhance farm income through improved farming techniques, crop diversification, and expanded market access. Beneficiaries should manage household expenditure wisely to avoid further debt associated with higher spending, prioritizing essential expenses and reducing unnecessary costs. The government should consider offering attractive schemes to support small and marginal farmers, particularly those who are beneficiaries of programs like PM-KISAN and do not have access to formal sources of income. These farmers heavily rely on government financial assistance to sustain their agricultural livelihoods.

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