



Strengthening Agricultural Household Livelihoods through Guaranteed Employment: Differential Welfare Effects of MGNREGA in India

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HIGHLIGHTS

- MGNREGA participation improves agricultural household income and consumption while generating varied financial outcomes.
- Programme impacts differ significantly across social groups, education levels, gender, and farm-size categories.
- ST households, female-headed households, and small farmers derive relatively greater livelihood benefits.

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ABSTRACT

Enhancing the livelihood security of agricultural households remains a central challenge for rural development policy in India. As India's largest welfare programme, MGNREGA, which is presently renamed as Viksit Bharat–Guarantee for Rozgar and Aajeevika Mission (Gramin) (VB-G RAM G), seeks to address this challenge by providing supplementary wage employment and strengthening rural economic security. This study examined MGNREGA's impact (presently, VB-G RAM G) on the socio-economic well-being of agricultural households, with emphasis on income, consumption expenditure, and indebtedness, using unit-level data from NSSO Situation Assessment Survey covering 42,819 households. Propensity Score Matching (PSM) was employed to estimate the average treatment effect while addressing selection bias, and propensity score-weighted regression was used to assess robustness. The findings indicated that programme participation improved income and consumption outcomes, although its effects on indebtedness varied across beneficiary groups. The disaggregated analysis revealed substantial heterogeneity in programme impacts across social categories, gender, educational and farmer groups. Household income increased by up to 20.2% among beneficiary groups, with comparatively larger gains observed for graduate households (19.5%) and small farmers (20.1%). The findings reaffirm importance of employment guarantees in strengthening agricultural livelihoods and promoting inclusive rural development while highlighting need for targeted extension and livelihood interventions.

INTRODUCTION

Rural livelihoods in India are characterised by persistent challenges of seasonal unemployment, income instability, underemployment, and indebtedness, particularly among small and marginal farming households. The dependence of agricultural households on uncertain farm incomes, combined with limited access to productive assets and non farm employment opportunities,

exacerbates economic vulnerability and constrains rural development (Lahiri et al., 2024; (Bharne et al., 2025). In this context, Employment Guarantee Schemes (EGS) have emerged as important policy instruments for enhancing livelihood security and stabilising household incomes during periods of agrarian distress (Kumar & Maya, 2023; Pavana Kumar et al., 2024; Chandegara et al., 2024). MGNREGA, which is presently renamed as VB-G RAM G (Viksit Bharat – Guarantee for Rozgar and Aajeevika Mission (Gramin), is

one of the most significant rural livelihood interventions in India. By guaranteeing up to 100 days of wage employment to rural households, the programme seeks to supplement farm income, reduce livelihood insecurity, and create productive rural assets (Arun et al., 2011). Beyond its employment generation, MGNREGA is expected to influence broader household welfare outcomes through more stable incomes, improved consumption capacity, and reduced financial vulnerability (Mohapatra & Abi, 2022).

A substantial body of literature highlights MGNREGA's contribution to rural welfare and reports positive effects on wage growth, poverty reduction, consumption smoothing, and rural asset creation (Imbert & Papp, 2015; Deininger & Liu, 2019). Research also suggests that the programme improves bargaining power in rural labour markets and promotes greater participation of socially disadvantaged groups (Chopra, 2014; Narayanan et al., 2019; Pavana Kumar & Lahiri, 2023). Nevertheless, evidence regarding its impact on agricultural households remains inconclusive. While several studies document improvements in income and consumption expenditure (Narayanan et al., 2017; Bose, 2017), others indicate substantial variations in programme outcomes across social groups, educational categories, and farm-size classes (Klonner & Oldiges, 2013; Joshi et al., 2017). Consequently, the benefits derived from EGS may not be distributed uniformly across beneficiary groups (Shaba & Alam, 2024). Understanding such differential effects is essential for evaluating the inclusiveness and effectiveness of MGNREGA as a rural development intervention. However, existing empirical evidence on the heterogeneous impacts of MGNREGA on agricultural households remains fragmented and insufficiently developed, particularly with respect to differences across social groups, educational levels, and farm-size classes (Reddy & Babu, 2018).

The policy relevance of this issue has become even more pronounced following the enactment of the VB G RAM G, which replaced MGNREGA and expanded the EGS framework for rural households (VB G RAM G ACT, 2025). In this context, an assessment of MGNREGA's distributional effects provides valuable insights for future employment and livelihood policies. Using unit-level data from the NSSO, the study employs Propensity Score Matching (PSM) to estimate programme impacts while accounting for selection bias. By estimating both overall and subgroup-specific effects using nationally representative data, the study extends previous PSM studies on MGNREGA by focusing on a more specific beneficiary group and by examining how programme gains vary across the levels of society.

METHODOLOGY

The study used unit-level data from the latest available 'Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India' (NSSO, 2022), which adopts a multistage stratified sampling design with survey weights to ensure national representativeness. The survey provides nationally representative information on agricultural households, including demographic characteristics, income sources, consumption expenditure, indebtedness, landholding, and participation in the MGNREGA. After excluding observations with incomplete information and outliers, a final sample of 42,819 agricultural households was retained for analysis.

MGNREGA participation was treated as a binary treatment variable and coded as 1 if any household member had worked under the programme during the previous 365 days and 0 otherwise. The main outcome variables were monthly household income, monthly household consumption expenditure, and total outstanding loan amount. Because these variables exhibited positively skewed distributions, their natural logarithms were used in the empirical analysis. Household size, age, and gender of the household head, social category, educational attainment, farmer category, access to irrigated land, expenditure on fertilisers, non farm income and possession of a Kisan Credit Card (KCC) were included as covariates to capture relevant socio economic and production characteristics.

To estimate the impact of programme participation, PSM was employed following Rosenbaum and Rubin (1983). Propensity scores were estimated using a binary logistic regression model, where the probability of MGNREGA participation was expressed as:

$$P(X_i) = \Pr(D_i = 1 | X_i)$$

where (D_i) denotes participation status and (X_i) represents the vector of observed household characteristics. Based on the estimated propensity scores, beneficiary households were matched with comparable non-beneficiary households to estimate the Average Treatment Effect on the Treated (ATT):

$$ATT = \mathbb{E}[Y_i(1) - Y_i(0) | D_i = 1]$$

where ($Y_i(1)$) and ($Y_i(0)$) represent the potential outcomes with and without programme participation, respectively. Covariate balance between matched treatment and control groups was assessed using Standardised Mean Difference (SMD) and summary statistics for the propensity score distributions, with all post matching standardised mean differences falling below the 0.1 threshold after Nearest Neighbour Matching (NNM) (Thoemmes & Kim, 2011). ATT values were computed for different social categories, education levels, gender of household head, and farmer categories to assess the distribution of programme benefits across agricultural households. Using RStudio, model fit was evaluated using Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) to confirm logit specification adequacy. Sensitivity analysis based on Rosenbaum bounds was used to examine the robustness of the estimated effects to potential unobserved bias. Taken together, these procedures provide a credible basis for estimating both overall and subgroup specific programme impacts for agricultural households.

RESULTS

Descriptive statistics and covariate imbalance

Descriptive statistics in Table 1 revealed significant differences between MGNREGA participants ($n = 10,481$) and non-participants ($n = 30,392$) across socio-economic and agricultural variables before matching. Participants were disproportionately from ST (35.7% vs 14.4%; SMD = 0.581) and had lower educational attainment (HHEdu_Cat), with 36.3% illiterate compared to 32.0% among non-participants (SMD = 0.272). Participants showed higher marginal farmer representation (66.1% vs 60.7%; SMD = 0.147)

Table 1. Standardised Mean Differences Before and After Logit Matching (N= 42,819)

S. No.	Variable	Type	Non-participants	Mean	SD	Participants	Mean	SD	SMD	logit SMD
1	HH Size	Continuous	31991	5.06	2.46	10828	4.85	2.1	0.091	
2	Soc Ctgry (%)	Categorical							0.581	0.0091
	Others		9339 (29.2)			1492 (13.8)		-0.1541	0.0127	
	ST		4608 (14.4)			3865 (35.7)		0.2129	0.0187	
	SC		4310 (13.5)			1693 (15.6)		0.0216	-0.0099	
	OBC		13734 (42.9)			3778 (34.9)		-0.0804	-0.0214	
3	Gender (%)	Categorical	29256			9912	0.003	-0.0057		
	(Female = 0, Male =1)		(91.5% Male)			(91.5% Male)				
4	Age	Continuous	31991	51.37	13.61		49.99	12.68	0.105	0.0078
5	HH Edu Cat (%)	Categorical							0.272	
	Illiterate		10233 (32)			3931 (36.3)		0.0432	-0.0132	
	Primary		12616(39.4)			4953 (45.7)		0.0631	0.002	
	Secondary		6848 (21.4)			1626 (15)		-0.0639	0.0076	
	Graduate		2294 (7.2)			318 (2.9)		-0.0423	0.0036	
6	Farmer Cat (%)	Categorical							0.147	
	Others		4181 (13.1)			957 (8.8)			-0.0423	0.0008
	Marginal		19417 (60.7)			7160 (66.1)			0.0543	-0.0092
	Small		8393 (26.2)			2711 (25)			-0.012	0.0084
7	LNHH Income	Continuous	31991	8.97	1.05	10828	8.91	0.93	0.059	0.032
8	LN Inc Non CP	Continuous	31991	7.34	3.1	10828	7.92	2.13	0.219	-0.0099
9	LN Ferti	Continuous	31991	5.58	2.25	10828	4.68	2.7	0.362	-0.0277
10	LN Con Exp M	Continuous	31991	9.04	0.54	10828	9.01	0.49	0.045	0.0005
12	KCC (%)	Binary	6356			1466	0.17	0.0045		
	(No = 0, Yes = 1)		(19.9% Yes)			(13.5% Yes)				
13	If Any Irrigated (%)	Binary	22024			5478	0.379	-0.009		
	(No = 0, Yes = 1)		(68.8% Yes)			(50.6% Yes)				
14	LN Loan	Continuous	31991	5.6	5.68	10828	5.46	5.54	0.026	0.032

Note: All SMDs after matching fall below the 0.1 threshold, indicating successful covariate balance.

and lower access to irrigated land (50.6% vs 68.8%; SMD = 0.379). Non-participants invested more in agricultural inputs, spending significantly more on fertilisers, manure and pesticides (SMD = 0.362) and holding more KCC (19.9% vs 13.5%; SMD = 0.170). Household income (LNHH_Income) was slightly higher among non-participants (mean LNHH income = 8.97 vs 8.91; SMD = 0.059), while participants reported higher non-crop income (mean = 7.92 vs 7.34; SMD = 0.219). These pre existing imbalances across key covariates justified the use of PSM to reduce selection bias before estimating programme effects.

Propensity score estimation and balance diagnostics

Propensity scores were estimated using a logistic regression model that related MGNREGA participation to the observed household characteristics specified in the methodology. After Nearest Neighbour Matching (NNM), covariate balance improved substantially across all variables. The logit model reduced SMDs (logitSMD) to acceptable levels (<0.1) for all covariates, demonstrating effective balancing of treatment and control groups in Table 1. Household size (HHSIZE) balanced to SMD = 0.0091, SC status to SMD = -0.0099, and ST status to SMD = 0.0187. Non-crop income (LNIncNonCP), which showed a substantial pre-matching imbalance (SMD = 0.2738), balanced to SMD = -0.0099.

Fertiliser expenditure (LNFerti) improved from SMD = -0.3339 to SMD = -0.0277. Irrigated land access (IfAnyIrrigated) balanced from SMD = -0.1825 to SMD = -0.0090. Household income (LNHHIncome) was balanced to SMD = 0.0320, and KCC access was balanced to SMD = 0.0045. All post-matching SMDs fell below the 0.1 threshold, indicating successful covariate balancing. Propensity score distributions converged after matching, with treated and control groups showing similar score distributions compared to substantial pre-matching differences (Thoemmes & Kim, 2011). The logit model achieved adequate balance across all covariates, validating the non-confoundedness assumption required for causal inference.

Average treatment effect on the treated (ATT)

The PSM estimates indicated that participation in MGNREGA was associated with higher household income and consumption expenditure among agricultural households, together with modest reductions in outstanding loans on average. In Table 2, the ATT suggested that beneficiary households experienced statistically significant improvements in livelihood indicators relative to comparable non beneficiary households. However, the size and direction of these effects varied across social categories, gender, education levels, and farmer categories, indicating substantial

Table 2. ATT by Subgroup (N= 42,819)

Subgroup	Category	ATT (Expenditure)	Expenditure ATT (%)	ATT (Income)	Income ATT (%)	ATT (Loan)	Loan ATT (%)
Social category	Others	0.0695	7.2	0.1836	20.15	-0.1057	-10.03
	ST	0.0518	5.32	0.1074	11.34	-0.0846	-8.11
	SC	0.0331	3.37	0.0661	6.83	0.0381	3.88
	OBC	0.0336	3.42	0.0653	6.75	0.1013	10.66
Gender	Female	0.0597	6.15	0.1021	10.75	-0.0602	-5.84
	Male	0.0343	3.49	0.0747	7.76	+0.0311	+3.06
Education	Illiterate	0.0033	0.33	0.0553	5.69	-0.0026	-0.26
	Primary	0.0204	2.06	0.0746	7.75	-0.0083	-0.83
	Secondary	0.0764	7.94	0.1633	17.74	-0.0062	-0.62
	Graduate	0.0949	9.95	0.1781	19.49	-0.0798	-7.67
Farmer category	Others	0.0042	0.42	0.0125	1.26	-0.0477	-4.66
	Marginal	0.0979	10.29	0.1491	16.08	0.0303	3.08
	Small	0.0887	9.28	0.1827	20.05	+0.0263	+2.60

Note: ATT is calculated as $(e^{\beta} - 1) \times 100$ where β = log coefficient.

heterogeneity in programme impacts. With respect to social categories, ST households saw expenditure gains of about 5.3%, income increases of around 11.3%, and reduction in outstanding loans of 8.1%. SC households recorded expenditure gains of about 3.4% and income growth of 6.8%, with a small increase in debt of around 3.9%. OBC households also showed expenditure and income gains of around 3.4% and 6.8%, but their loan burden rose by about 10.7%. Households in the “Others” category registered income and expenditure gains of about 20.2% and 7.2%, and a reduction in loans of around 10.0%.

Gender disaggregated estimates showed that female headed households experienced larger gains in income and consumption than male headed households, with consumption rising by about 6.2% and income by nearly 10.8%, compared with 3.5% and 7.8% for male-headed households. Outstanding loans also declined more for female-headed households, by around 5.8%, versus 3.1% for male-headed households, indicating relatively stronger debt relief for women. Education also shaped programme outcomes. Graduate households recorded the largest gains, with expenditure rising by about 10.0%, income by 19.5%, and loans falling by 7.7%. Secondary-educated households also did well, with income up by nearly 17.7% and expenditure by 7.9%. Illiterate and primary-educated households saw smaller gains, with income rising by 5.7% and 7.8% and expenditure by only 0.3% and 2.1%, respectively. These results suggest that better educated households were able to leverage MGNREGA participation more effectively, although less educated households also benefited in terms of income.

By farm size, marginal and small farmers both benefited from participation, but in different ways. Marginal farmers saw expenditure rise by about 10.3% and income by 16.1%, along with a modest 3.1% increase in loans. Small farmers recorded similar expenditure gains of 9.3% but stronger income growth of 20.1%, with a slight 2.6% fall in loans. The “Others” category showed almost no change in expenditure, a small income increase of 1.3%, and a 4.7% reduction in loans. This pattern indicates that small farmers were better able than marginal farmers to translate additional earnings into improved financial positions. Overall, the

heterogeneous ATT estimates (Table 2) show that MGNREGA's livelihood effects for agricultural households were not uniform. ST households, female headed households, better educated households and small farmers derived relatively larger gains from participation, while some other groups saw smaller improvements or higher loan burdens. These differences underline the importance of tailored implementation and extension support for different socio economic groups within the rural population.

Propensity score weighted regression results

To complement the matching estimates, PS-weighted regression models were estimated for household income, consumption expenditure and outstanding loans, using the same set of covariates as in the PS model in Table 3. These regressions adjusted for residual differences in observed characteristics between participants and non participants and provided an additional check on the direction and significance of programme effects. For household income, MGNREGA participation had a positive and statistically significant coefficient (0.322, $p < 0.01$), indicating higher income among participating households. Household size was negatively associated with income, suggesting lower income for larger families. Social category and other characteristics also influenced: ST households had lower income than the reference group, while OBC households had higher income. Male-headed households earned more than female-headed households, and households with a KCC recorded substantially higher income, highlighting the role of credit access.

For consumption expenditure, MGNREGA participation had a positive and significant effect (0.064, $p < 0.01$), suggesting that part of the additional income was used for higher household spending. Larger household size was linked to higher expenditure, reflecting greater needs. SC, ST, and OBC households spent less than the reference group, showing persistent consumption gaps. Higher education and access to irrigated land were positively associated with expenditure, while for outstanding loans, MGNREGA participation had a small but significant negative effect (-0.012 , $p < 0.01$), indicating a modest debt reduction. ST households had higher debt than the reference group, and graduate

Table 3. PS-Weighted Regression Coefficients for Household Outcomes

Variable	Income Coefficient	Expenditure Coefficient	Loan Coefficient
MGNREGA Work	0.322***	0.064***	-0.012***
Household Size	-0.239**	0.122**	-0.010***
Scheduled Tribe	-1.913***	-0.157***	0.069***
Scheduled Caste	0.662**	-0.100**	-0.017
OBC	0.995***	-0.076**	0.003
Gender	0.614**	0.032*	-0.029*
Age	-0.016**	0.002***	0.005**
Primary Education	-0.504***	0.114**	0.103**
Secondary Education	-0.688***	0.174**	0.251**
Graduate Education	-0.740**	0.168**	0.380***
Marginal Farmer	-1.636***	-0.065**	-0.435***
Small Farmer	-0.929***	-0.026**	-0.191***
KCC	2.639**	-0.045*	-0.009**
Irrigated Land	0.267**	0.019***	0.069**

Note: *** p < 0.01, ** p < 0.05, * p < 0.10.

households also carried more loans, while fertiliser and pesticide spending and irrigation access were associated with higher borrowing.

Overall, the PS-weighted regression results were consistent with the matching estimates in indicating that MGNREGA participation was associated with higher income and consumption and a small reduction in outstanding loans, while confirming the importance of household size, social category, education, credit access and productive assets in shaping livelihood outcomes.

Model fit and sensitivity analysis

Model fit for the propensity score specification is assessed by comparing a baseline model (Mod0) with the covariate rich logit model using AIC, BIC and log likelihood values (Table 4). For all three outcome variables, the logit specification yields substantially lower AIC and BIC values and higher log likelihood than the corresponding Mod0 model, indicating markedly better fit. Household income improves from AIC 262210.3 and BIC 262392.2 in Mod0 to 131464.8 and 131632.5 in the logit model, with log-likelihood rising from -131084.1 to -65711.42. Similarly, consumer expenditure and outstanding loan also show the same pattern,

confirming the superior fit of the logit specification. This confirms that the chosen set of covariates provides an adequate representation of the participation process and supports the use of the logit based propensity scores in the matching and weighting procedures.

To examine the robustness of the impact estimates to potential unobserved bias, a Rosenbaum sensitivity analysis is conducted for the Hodges–Lehmann point estimates (Table 5). For household income and consumption expenditure, the estimated effects remain positive, and their associated bounds stay away from zero even when the odds of programme participation are allowed to differ by up to fivefold between matched households ($\Gamma = 5$), suggesting that these results are robust to moderate levels of hidden bias. In contrast, the bounds for outstanding loans cross zero at lower values of $\bar{A}$, indicating that the modest debt reducing effect is more sensitive to possible unobserved confounding. Together, these diagnostics strengthen confidence in the main findings on income and consumption while highlighting the need for a more guarded interpretation of the loan results.

DISCUSSION

The analysis shows that MGNREGA participation is associated with higher household income and consumption expenditure among agricultural households, together with modest reductions in outstanding loans on average. This pattern is consistent with earlier evidence that the programme raises rural wages, smooths consumption and reduces poverty (Deininger & Liu, 2019; Bose, 2017). At the same time, the present study confirms that these gains are not uniform: the magnitude and direction of effects vary systematically by social category, gender, education and farm size, in line with studies that document substantial heterogeneity in MGNREGA outcomes across regions and groups (Klonner & Oldiges, 2013).

Across social categories, the finding that ST households experience relatively high income and consumption gains, accompanied by a reduction in outstanding loans, supports Dreze's (2011) view of MGNREGA as particularly important for marginalised communities. However, the continued income disadvantage of ST households in the regression analysis and their higher overall debt levels are in line with Patwardhan and Tasciotti's (2023) evidence on persistent structural inequalities in tribal areas. For SC and OBC, the smaller expenditure and income gains and

Table 4. The goodness-of-fit analysis

	Household Income		Consumer Expenditure		Outstanding Loan	
	Mod0	Logit	Mod0	Logit	Mod0	Logit
AIC	262210.3	131464.8	39889.13	19415.83	93574.22	44755.8
BIC	262392.2	131632.5	40071.08	19583.46	93756.17	44923.43
logLik	-131084.1	-65711.42	-19923.57	-9686.91	-46766.11	-22356.9

Table 5. Rosenbaum Sensitivity Test for Hodges-Lehmann point estimates

Model	Unconfounded Estimate	$\Gamma=1$ Lower / Upper	$\Gamma=2$ Lower / Upper	$\Gamma=3$ Lower / Upper	$\Gamma=4$ Lower / Upper	$\Gamma=5$ Lower / Upper
Income	8.418	8.418/8.418	8.018/8.818	7.818/9.018	7.718/9.118	7.618/9.218
Consumer Expenditure	8.474	8.474/8.474	8.174/8.774	8.074/8.874	7.974/8.974	7.974/8.974
Outstanding Loan	5.472	5.472/5.472	3.972/5.672	-0.027/6.272	-0.527/9.072	-0.527/9.772

the rise in loans among OBC households resonate with Shankar and Gaiha's 2013 discussion of caste based income gaps, suggesting that MGNREGA mitigates but does not eliminate structural inequalities. In this sense, the programme functions as an important, but partial, instrument of redistribution for agricultural households.

Gender disaggregated results indicate that female headed agricultural households record larger percentage gains in income and consumption and stronger reductions in outstanding loans than male headed households. This aligns with Narayanan et al. (2017) and Chopra (2014), who show that MGNREGA expands women's participation in paid work and strengthens their bargaining position. At the same time, male headed households still enjoy higher absolute income, echoing Rodriguez's (2022) findings on persistent gender wage gaps. The evidence here suggests that MGNREGA narrows, but does not close, gender disparities in rural livelihoods and that complementary interventions are needed to sustain and deepen its benefits for women.

The education and farm-size patterns point to important interactions between public employment and household capabilities. The relatively larger income and expenditure gains for secondary and graduate educated households suggest that education improves households' ability to combine public employment with other livelihood activities and to allocate additional income effectively. This aligns with Deininger and Liu's (2019) argument that higher education enhances access to better opportunities and facilitates more informed financial decisions. At the same time, the positive income effects for illiterate and primary educated households indicate that MGNREGA remains accessible to less educated groups, though the smaller expenditure changes imply constraints in translating income gains into sustained improvements in living standards.

The results by farm size fit well with earlier findings that MGNREGA is particularly important for land poor households (Yadav & Ghosh, 2023). Marginal and small farmers both record notable improvements in income and consumption, but only small farmers reduce their outstanding loans. This divergence suggests that marginal farmers may still rely on borrowing to finance agricultural inputs and investments, even when MGNREGA strengthens their cash flow (Mohanakumar et al., 2018). The positive association between input expenditure, irrigation access and loan amounts is consistent with studies showing that productivity enhancing investments in agriculture often require credit (Patwardhan & Tasciotti, 2023; Jiragal et al., 2025).

Overall, the pattern of higher income and consumption and slightly lower debt among participants proves that MGNREGA acts as a partial buffer against distress borrowing, while the modest size of the loan effects underscores that the programme is not a substitute for targeted credit or debt relief policies. These findings provide nationally representative evidence on heterogeneous impacts specifically among agricultural households, a group that remains less explored in many earlier studies. Although the data precede the introduction of the VB-G RAM G, the distributional patterns documented here offer relevant lessons for that expanded employment guarantee framework. The evidence that ST households, female headed households and land poor farmers derive relatively larger gains suggests that any new scheme seeking to build

on MGNREGA should explicitly preserve and strengthen its pro vulnerable features. Extension agencies and local institutions can use these findings to inform labour-budget planning, selection of works, and convergence with credit and input programmes under VB G RAM G so that the households that benefit most from employment guarantees continue to receive priority support.

CONCLUSION

The findings substantiate that participation in the MGNREGA contributes positively to the socio-economic development of agricultural households by enhancing household income and consumption while generating differential financial outcomes across beneficiary groups. The variation in programme effects across social categories, gender, educational attainment, and farm-size classes demonstrates that agricultural households are heterogeneous in their ability to derive livelihood benefits from participation. Hence, extension practitioners require evidence-based guidance for designing targeted interventions across vulnerable subgroups, with differentiated financial literacy programs needed for marginal farmers and simplified communication strategies essential for illiterate households. Such complementary interventions can help improve both the efficiency and equity of rural employment policy. Future research should look at long-term impacts, include broader contextual factors, and compare outcomes across regions. The study provides useful insights for the design and implementation of emerging rural livelihood policies, including the evolving employment guarantee framework under the VB-G RAM G Act.

DECLARATIONS

Ethics approval and informed consent: The study used NSSO data hence, Departmental Committee of Political Science Department, Institute for Excellence in Higher Education, Bhopal, 462026, M.P., India waived the ethical approval.

Conflict of interest: The research was carried out without any financial or commercial ties that might be seen as a potential conflict of interest, according to the authors. The authors affirm that they carefully examined, amended and edited the content as necessary when preparing this work. The final content of this publication is entirely the authors' responsibility.

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