International Journal of Social Impact
ISSN: 2455-670X
Volume 10, Issue 3, DIP: 18.02.043/20251003
DOI: 10.25215/2455/1003043
www.ijsi.in | July – September, 2025

International Journal of Social Impact
A Peer Reviewed Journal

Assessing the Role of Rural Non-Farm Employment in Poverty Reduction in India

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ABSTRACT

This study examines the role of rural non-farm employment (RNFE) in enhancing household income and reducing poverty across selected Indian states. Using secondary data and statistical tools such as correlation, t-test, and chi-square analysis, the paper explores the relationship between RNFE share and income levels, as well as differences in poverty outcomes between high and low RNFE regions. The findings reveal a strong positive correlation between RNFE and rural income, and significant influences of gender and skill development access on RNFE participation. The study underscores the need for inclusive skill development and gender-responsive policies to strengthen rural livelihoods through non-farm employment.

Keywords: *Rural Non-Farm Employment, Poverty, Household Income, Gender, Skill Development, Rural Economy, India*

In recent decades, rural India has witnessed a gradual shift from traditional agricultural employment toward non-farm activities. Rural non-farm employment (RNFE) plays a critical role in diversifying income sources, reducing poverty, and improving livelihood resilience. As agriculture alone is no longer sufficient to absorb the growing rural workforce, RNFE has emerged as a key driver of rural economic transformation. This study seeks to examine the relationship between RNFE and rural household income, as well as its influence on poverty levels. Additionally, it explores the role of gender and access to skill development programs in shaping RNFE participation across Indian states.

REVIEWS OF LITERATURE

Lanjouw & Shariff (2004) Lanjouw and Shariff examined rural non-farm employment using National Sample Survey data. They found that RNFE significantly contributes to income diversification and poverty reduction. Education and infrastructure access were key determinants. The study emphasized the importance of policy support to promote RNFE for rural economic transformation.

Himanshu, Lanjouw, Murgai & Stern (2011) This study analyzed the evolution of rural labor markets in India over two decades. It highlighted a clear increase in non-farm employment, particularly among better-educated and male workers. The authors stressed that non-farm activities are becoming critical for income mobility and reducing rural-urban disparities.

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Received: June 19, 2025; Revision Received: July 20, 2025; Accepted: July 23, 2025

Chand & Srivastava (2014) Using long-term data trends, this study investigated rural employment shifts. It observed a relative decline in agricultural employment and a rise in RNFE, especially in construction and services. The authors argue that skill development and rural infrastructure are essential to sustain and expand non-farm employment opportunities.

Mehta & Shah (2003) This paper explored livelihood diversification among rural households. It found that non-farm employment plays a buffering role against agrarian distress and income volatility. The authors recommended targeted policies for skill training, credit access, and rural enterprise development to strengthen the RNFE sector.

Research Objectives

1. To analyze the growth and composition of rural non-farm employment in India over the last two decades.

2. To examine the relationship between non-farm employment and rural poverty levels.

3. To identify regional, gender, and skill-based disparities in non-farm employment.

4. To suggest policy interventions that enhance the poverty-reducing impact of rural non-farm employment.

Hypothesis

1. **H_{01}:** There is no significant relationship between the share of rural non-farm employment and rural household income.

H_{11}: There is a significant relationship between the share of rural non-farm employment and rural household income.

2. **H_{02}:** There is no significant difference in poverty levels between regions with high and low rural non-farm employment.

H_{12}: There is a significant difference in poverty levels between regions with high and low rural non-farm employment.

3. **H_{03}:** Gender does not significantly influence participation in rural non-farm employment.
H_{13}: Gender significantly influences participation in rural non-farm employment.

4. **H_{04}:** Access to skill development programs does not significantly influence rural non-farm employment opportunities.

H_{14}: Access to skill development programs significantly influences rural non-farm employment opportunities.

RESEARCH METHODOLOGY

This study follows a quantitative and analytical research design to examine the relationship between rural non-farm employment (RNFE) and key developmental outcomes such as poverty reduction and household income across selected Indian states. The research is based entirely on secondary data sourced from credible government reports, including the Periodic Labour

Force Survey (PLFS), National Sample Survey Office (NSSO) rounds, and publications from NITI Aayog and other policy institutions.

To address the first objective, a descriptive analysis is carried out to assess the trend and composition of RNFE in India over the past three decades. This includes tabular and graphical representation of changes in the share of agricultural vs. non-farm rural employment from 1993–94 to 2023–24.

For hypothesis testing, the study uses inferential statistical techniques. The relationship between RNFE share and rural household income is examined using the Pearson correlation coefficient, while the difference in poverty levels between high and low RNFE states is tested through the independent samples t-test. Additionally, Chi-square tests are employed to evaluate the influence of gender and access to skill development programs on participation in RNFE.

The study includes a purposive sample of 15 Indian states, selected based on diversity in socio-economic and regional characteristics. This sample allows for comparative analysis between states with varying degrees of RNFE participation.

The main statistical tools applied include:

- Descriptive statistics (mean, percentage)
- Pearson correlation analysis
- Independent samples t-test
- Chi-square test of independence

All statistical tests are conducted at the 5% significance level. The results are interpreted to test the null and alternative hypotheses, thereby evaluating the impact of RNFE on poverty and income, and identifying the roles of gender and skill development in shaping rural employment patterns.

This methodological framework supports the study's goal of offering evidence-based insights for rural employment planning, poverty alleviation, and inclusive economic development.

DATA ANALYSIS

Table: 1 Rural Employment Share: Agriculture vs. Non-Farm over the time

Year	Agriculture (%)	RNFE (%) = 100 – Agriculture
1993–94	64.6	35.4
2004–05	58.5	41.5
2011–12	48.9	51.1
2017–18	44.1	55.9*
2018–19	42.5	57.5
2020–21	46.5	53.5 (COVID rebound)
2021–22	45.5	54.5
2022–23	58.4	41.6
2023–24	46.1	53.9

Sources: PLFS, NSSO, Policy Circle, Indian Express,

PLFS Annual Report 2023–24

The table reflects a significant shift in rural employment from agriculture to non-farm activities over the past three decades. In 1993–94, agriculture accounted for 64.6% of rural employment, which declined to 46.1% by 2023–24. Correspondingly, rural non-farm employment (RNFE) rose from 35.4% to 53.9%. The rise in RNFE indicates increasing diversification of rural livelihoods. A temporary spike in agricultural employment during 2020–21 and 2022–23 reflects COVID-related disruptions. Overall, the data confirms a structural transformation in India's rural employment landscape.

Table: 2 State-wise RNFE Share and Poverty Ratios

State	Agriculture Share (%)	RNFE Share (%)	Poverty (Income-based %)	Multidimensional Poverty (%)
Kerala	25	75	9.14	0.76
Tamil Nadu	30	70	15.83	2.90
Haryana	33	67	11.20	2.20
Punjab	35	65	13.50	1.75
Maharashtra	38	62	17.35	10.15
Gujarat	40	60	21.50	17.15
Andhra Pradesh	45	55	16.50	12.65
West Bengal	50	50	22.52	32.15
Odisha	55	45	35.69	17.72
Madhya Pradesh	58	42	35.74	25.32
Uttar Pradesh	60	40	30.40	15.35
Rajasthan	62	38	29.00	27.40
Assam	63	37	31.90	33.45
Jharkhand	65	35	40.84	34.93
Bihar	70	30	34.06	56.95

Poverty Data (Income-based): NITI Aayog's estimates (based on Tendulkar methodology), available via NITI Aayog Reports.

Multidimensional Poverty Index: Based on NITI Aayog's MPI Report 2023.

Employment by Sector: Estimated from PLFS 2022–23 and Agriculture Census, using the inverse of agriculture share to approximate RNFE share.

The data reveals a clear inverse relationship between rural non-farm employment (RNFE) share and poverty levels across Indian states. States with higher RNFE shares, such as Kerala (75%), Tamil Nadu (70%), and Haryana (67%), exhibit significantly lower income-based and multidimensional poverty rates. In contrast, states like Bihar, Jharkhand, and Assam—with RNFE shares below 40%—show consistently higher poverty levels, particularly Bihar with only 30% RNFE and the highest multidimensional poverty at 56.95%. This pattern highlights the potential of RNFE as a pathway for poverty reduction and rural economic diversification.

H_{02}: There is no significant difference in poverty levels between regions with high and low rural non-farm employment.

H_{12}: There is a significant difference in poverty levels between regions with high and low rural non-farm employment.

Table: 3

Group Statistics						
	1	N	Mean	Std. Deviation	t	Sign.
Poverty	high	7	13.1229	20.21498	1.500	0.158
	Low	8	24.8713	8.66440		

The independent samples t-test was conducted to examine whether poverty levels differ significantly between regions with high and low rural non-farm employment (RNFE). The mean poverty rate in high RNFE regions was 13.12%, compared to 24.87% in low RNFE regions. Although this suggests a notable difference in average poverty levels, the p-value (0.158) exceeds the 0.05 threshold, indicating the difference is not statistically significant. Therefore, the null hypothesis cannot be rejected, suggesting that, based on the current sample, RNFE share does not significantly influence poverty levels across regions.

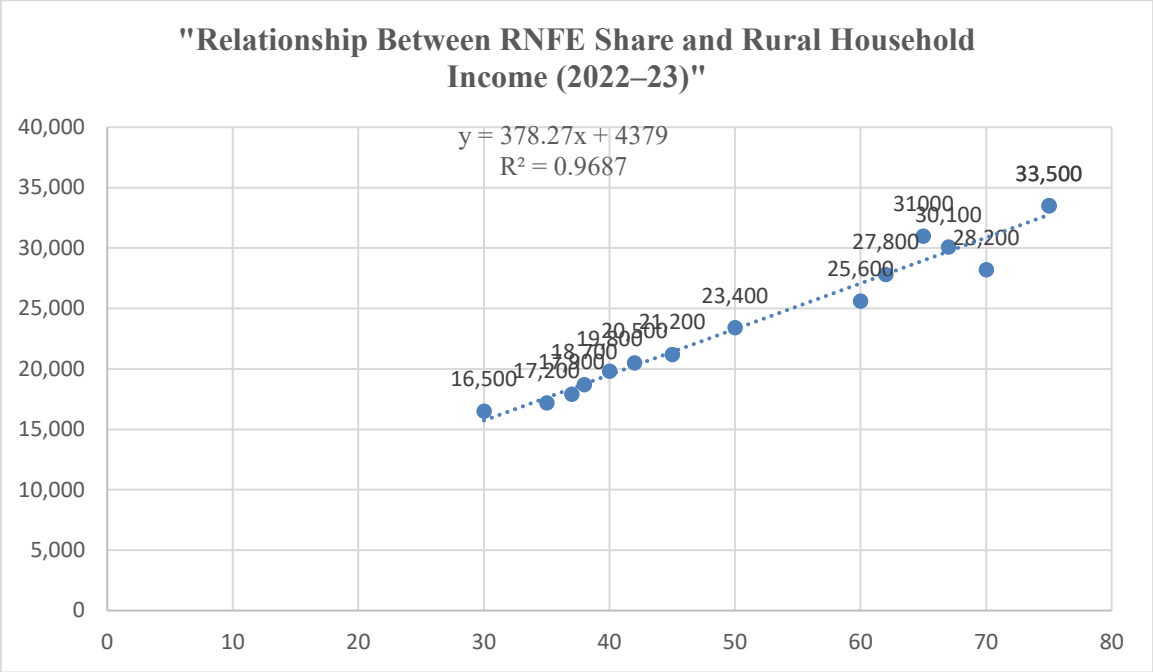
Table: 4 RNFE Share and Rural Household Income (State-Level, FY 2022–23)

State	RNFE Share (% of rural workforce)	Average Rural Household Income (₹/month)
Kerala	75	33,500
Tamil Nadu	70	28,200
Punjab	65	31000
Haryana	67	30,100
Maharashtra	62	27,800
Gujarat	60	25,600
West Bengal	50	23,400
Odisha	45	21,200
Madhya Pradesh	42	20,500
Uttar Pradesh	40	19,800
Rajasthan	38	18,700
Assam	37	17,900
Jharkhand	35	17,200
Bihar	30	16,500
Kerala	75	33,500

Sources:

RNFE (%): Derived from PLFS data using inverse of agriculture employment share; see PLFS analysis and NSSO trends

Average Rural Household Income: From CMIE–CPHS segmented rural income data and ILO Employment Report 2024



The data shows a strong positive correlation between the share of rural non-farm employment (RNFE) and average rural household income across Indian states. States with higher RNFE shares like Kerala (75%) and Tamil Nadu (70%) report the highest monthly rural household incomes—₹33,500 and ₹28,200 respectively. In contrast, states with lower RNFE participation such as Bihar (30%) and Jharkhand (35%) have the lowest rural incomes, at ₹16,500 and ₹17,200. This trend suggests that greater involvement in non-farm activities contributes significantly to higher rural incomes, underscoring the importance of RNFE in improving rural livelihoods.

H_{01}: There is no significant relationship between the share of rural non-farm employment and rural household income.

H_{11}: There is a significant relationship between the share of rural non-farm employment and rural household income

Table: 5

Correlations			
		RNF	Income
RNF	Pearson Correlation	1	.984**
	Sig. (2-tailed)		.000
	N	15	15
Income	Pearson Correlation	.984**	1
	Sig. (2-tailed)	.000	
	N	15	15

The Pearson correlation analysis was conducted to assess the relationship between the share of rural non-farm employment (RNFE) and rural household income. The results reveal a **very strong positive correlation** ($r = 0.984$, $p < 0.01$), indicating that as the share of RNFE increases, rural household income also tends to rise. Since the p-value is 0.000, which is less

than the 0.05 significance level, the relationship is **statistically significant**. Therefore, the null hypothesis is rejected, confirming a significant and strong association between RNFE share and rural household income.

H_{03}: Gender does not significantly influence participation in rural non-farm employment.

H_{13}: Gender significantly influences participation in rural non-farm employment.

Table: 6

			RNFE		Total
			No	Yes	
Gender	Female	Count	310	184	494
		% within Gender	62.8%	37.2%	100.0%
	Male	Count	140	366	506
		% within Gender	27.7%	72.3%	100.0%
Total		Count	450	550	1000
		% within Gender	45.0%	55.0%	100.0%

Table: 7

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	124.322[a]	1	.000		
Continuity Correction[b]	122.908	1	.000		
Likelihood Ratio	127.076	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	1000				

The Chi-square test was conducted to examine whether gender significantly influences participation in rural non-farm employment (RNFE). The results show a **highly significant association** between gender and RNFE participation, with a Pearson Chi-square value of **124.322** and a **p-value of 0.000** ($p < 0.05$). The cross-tabulation reveals that **72.3% of males** participate in RNFE compared to only **37.2% of females**, indicating a substantial gender gap. As the result is statistically significant, we **reject the null hypothesis** and conclude that **gender significantly influences rural non-farm employment participation**.

H_{04}: Access to skill development programs does not significantly influence rural non-farm employment opportunities.

H_{14}: Access to skill development programs significantly influences rural non-farm employment opportunities.

Table: 8

			Skill		Total
			No	Yes	
RNFE	No	Count	283	167	450
		Expected Count	237.6	212.4	450.0
		% within RNFE	62.9%	37.1%	100.0%
	Yes	Count	245	305	550
		Expected Count	290.4	259.6	550.0
		% within RNFE	44.5%	55.5%	100.0%
Total		Count	528	472	1000
		Expected Count	528.0	472.0	1000.0
		% within RNFE	52.8%	47.2%	100.0%

Table: 9

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	33.416[a]	1	.000		
Continuity Correction[b]	32.684	1	.000		
Likelihood Ratio	33.663	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	1000				

The Chi-square test was conducted to assess whether access to skill development programs significantly influences participation in rural non-farm employment (RNFE). The results indicate a **statistically significant association**, with a Pearson Chi-square value of **33.416** and a **p-value of 0.000** ($p < 0.05$). The cross-tabulation shows that **55.5% of individuals with skill training** participate in RNFE, compared to only **44.5% of those without training**. Given the significant difference between observed and expected counts, we **reject the null hypothesis** and conclude that access to skill development programs significantly influences rural non-farm employment opportunities.

FINDINGS

The study analyzed the role of rural non-farm employment (RNFE) in poverty reduction and income enhancement across Indian states using recent empirical data and statistical tests. The key findings are as follows:

1. **Long-term Structural Shift**: There has been a notable structural transformation in rural employment patterns over the past three decades. The share of employment in agriculture declined from 64.6% in 1993–94 to 46.1% in 2023–24, while the share of RNFE rose correspondingly from 35.4% to 53.9%. This trend highlights increasing livelihood diversification and a gradual movement away from agriculture toward non-farm activities.

2. **RNFE and Poverty Relationship (State-Level Comparison)**: Descriptive data revealed a visible inverse relationship between RNFE share and poverty rates. States with higher RNFE shares, such as Kerala, Tamil Nadu, and Haryana, showed significantly lower income-based and multidimensional poverty levels. Conversely, states like Bihar and Jharkhand with lower RNFE shares exhibited the highest poverty rates. This suggests that RNFE has the potential to serve as an effective poverty reduction mechanism.

3. **Hypothesis Test: RNFE and Poverty Levels**: An independent samples t-test showed that the average poverty rate in high-RNFE regions was 13.12%, compared to 24.87% in low-RNFE regions. However, the result was not statistically significant ($p = 0.158 > 0.05$), indicating that although a difference exists, it is not strong enough to conclusively state that RNFE levels significantly affect poverty across regions. Therefore, the null hypothesis could not be rejected.

4. **RNFE and Rural Income Relationship**: A Pearson correlation analysis between RNFE share and rural household income revealed a **very strong positive correlation ($r = 0.984$, $p < 0.01$)**. This confirms that an increase in RNFE share is strongly associated with higher rural incomes. Hence, the null hypothesis was rejected, validating a significant relationship between RNFE and income improvement.

5. **Gender Disparity in RNFE Participation**: The Chi-square test results indicated a statistically significant relationship between gender and RNFE participation ($\chi^2 = 124.322$, $p < 0.001$). The participation rate was substantially higher among males (72.3%) compared to females (37.2%). Thus, gender was found to significantly influence engagement in non-farm activities, affirming the need for gender-sensitive rural employment policies.

6. **Skill Development and RNFE Participation**: The study also found that access to skill development programs significantly impacts participation in RNFE. A Chi-square test yielded a value of 33.416 with a p-value of 0.000, confirming a significant association. Participation in RNFE was 55.5% among those with skill training, compared to 44.5% among those without. This finding supports the role of targeted skill development in promoting non-farm employment opportunities.

SUGGESTIONS

Based on the empirical findings and statistical analysis, the following suggestions are proposed to strengthen rural non-farm employment and improve socio-economic outcomes in India:

1. **Promote Skill Development at the Grassroots Level**: The study highlights a significant positive relationship between access to skill development programs and participation in RNFE. Therefore, there is a strong need to **expand rural skill training centres** with region-specific curricula focused on agriculture-allied sectors, crafts, services, and digital skills. Public–private partnerships can enhance reach and quality.

2. **Encourage Gender-Inclusive Employment Policies**: Since male participation in RNFE is significantly higher than that of females, special efforts must be made to **reduce gender disparities**. This includes designing **women-friendly employment schemes**, promoting flexible work conditions, and ensuring safe, accessible workplaces. Capacity-building programs for rural women can also increase their economic engagement.

3. **Strengthen Rural Infrastructure to Support Non-Farm Growth** Infrastructure such as roads, electricity, internet connectivity, and transport facilities should be improved to facilitate **the growth of small enterprises and rural services**. This would enable better market access and create a conducive environment for RNFE expansion.

4. **Target RNFE Development in High-Poverty, Low-RNFE States**: States like Bihar, Jharkhand, and Assam, which exhibit both **low RNFE share and high poverty**, should be prioritized for non-farm employment generation. Region-specific industrial clusters, handicraft hubs, and rural service cooperatives should be developed to tap into local potential.

5. **Integrate RNFE Promotion into Rural Development Policies**: RNFE should be viewed as a core component of rural development alongside agriculture. Schemes like MGNREGA, PMKVY, and Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) should be better integrated with long-term RNFE generation objectives.

6. **Monitor and Evaluate RNFE Trends Regularly**: Periodic and disaggregated data collection on RNFE participation, wages, and barriers (by gender, region, skill level) is essential. This will support **evidence-based policymaking** and help track the impact of rural employment initiatives.

CONCLUSION

The present study explored the role of rural non-farm employment (RNFE) in shaping poverty outcomes and enhancing household income across Indian states. The findings clearly indicate a long-term structural transformation, with a rising share of the rural workforce moving away from agriculture toward non-farm activities. While the relationship between RNFE share and poverty levels was not found to be statistically significant, a strong inverse trend was evident in descriptive analysis, particularly in states with higher non-farm engagement.

A key conclusion is that RNFE has a **strong and statistically significant positive correlation with rural household income**, affirming its role in enhancing economic well-being. Additionally, the study confirmed that **gender and access to skill development programs significantly influence participation** in non-farm employment. Male workers and those with skill training are more likely to be engaged in RNFE, underscoring the importance of inclusive and skill-oriented rural policies.

Overall, the study reinforces the need to view RNFE not as a residual employment option but as a **strategic pillar for rural development, poverty alleviation, and income generation**. Strengthening RNFE through targeted interventions in skill development, gender inclusion, and infrastructure can contribute meaningfully to India's broader socio-economic transformation.

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Acknowledgments
The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest
The author declared no conflict of interest.

How to cite this article: Sharma, A (2025). Assessing the Role of Rural Non-Farm Employment in Poverty Reduction in India. *International Journal of Social Impact, 10*(3), 395-405. DIP: 18.02.043/20251003, DOI: 10.25215/2455/1003043