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EXAMINING EDUCATION LEVEL WITH INDUSTRIAL DISTRIBUTION OF THE RURAL NON-FARM SECTOR IN HARYANA

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ABSTRACT

Using data from the Periodic Labour Force Survey (PLFS) 2022–2023, this study investigates the relationship between industrial distribution and educational attainment in Haryana's Rural Non-Farm Sector (RNFS). The study looks at employment trends in major non-farm industries (manufacturing, construction, trade/services) by educational level (illiterate, primary, secondary, graduate, and higher). Through the use of cross-tabulation techniques and descriptive data, we discover that while lower education levels predominate in informal and casual occupations, higher education is linked to a larger share of employment in services and formal non-farm jobs. The main goals of policy recommendations are skill development and industry-education.

Keywords: Rural Non-Farm Sector; Educational Attainment; Industrial Distribution; PLFS 2022–23; Rural Employment; Haryana

1. INTRODUCTION

1.1 Background

The Rural Non-Farm Sector (RNFS) comprises all employment and economic activities in rural areas outside agriculture, including manufacturing, construction, trade, services, and informal enterprises. In India, RNFS plays a key role in rural livelihoods and diversification of rural employment away from agriculture. State-level research is made possible by the Periodic Labour Force Survey (PLFS), which offers comprehensive national employment data by industry and educational attainment.

1.2 Haryana: Economy and Rural Employment



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Haryana's economy exhibits a distinctive structural composition, marked by a historically strong agricultural base complemented by rapidly expanding industrial and service sectors. Agriculture continues to play a central role in the state's rural economy, supported by high levels of irrigation, mechanization, and productivity, particularly in the cultivation of wheat and rice. However, over time, the limitations of agriculture in absorbing the growing rural workforce—due to land fragmentation, mechanization, and declining marginal returns—have necessitated a gradual diversification of livelihood sources beyond farming.

Consequently, rural households in Haryana increasingly engage in a wide range of non-farm activities. These activities encompass sectors such as construction, small- and medium-scale manufacturing, transport and logistics, wholesale and retail trade, and various personal and professional services. The rural non-farm sector has emerged as a significant contributor to employment generation, income diversification, and risk mitigation for rural populations, particularly for landless laborers, marginal farmers, women, and youth.

Within this context, education plays a crucial role in shaping access to and participation in non-farm employment. Different levels of educational attainment influence the type, stability, and productivity of non-farm jobs available to rural workers. While low levels of education may confine workers to casual and low-paying activities such as construction or informal services, higher levels of schooling and technical training facilitate entry into more skilled, formal, and better-remunerated occupations in manufacturing, trade, and service sectors. Education also enhances mobility, adaptability, and the capacity to adopt new technologies, thereby improving employment outcomes in a transforming rural economy.

Understanding the relationship between education and the distribution of non-farm employment is therefore essential for informed policy formulation. Such analysis provides valuable insights for designing targeted rural skill development programs, improving the alignment between educational curricula and labor market needs, and promoting inclusive employment generation. In the case of Haryana, where economic transformation is closely linked to urbanization, industrial growth, and infrastructural development, strengthening educational and skill-based interventions can play a pivotal role in enhancing the quality and sustainability of rural non-farm employment, ultimately contributing to balanced regional development and improved rural livelihoods.

1.3 Objectives

1. To study the distribution of rural non-farm employment in Haryana across different levels of educational attainment using data from PLFS 2022–23.
2. To assess the relationship between educational qualifications and the pattern of employment across various industry categories within the rural non-farm sector.
3. To generate policy-relevant insights aimed at improving employability and facilitating access to higher-value opportunities in the rural non-farm economy.

2. LITERATURE REVIEW



2.1The RNFS includes all economic activities in rural areas excluding crop and livestock production, encompassing **manufacturing, construction, trade, transport, and services** (Haggblade, Hazell & Reardon, 2010). In the Indian context, the RNFS has expanded significantly due to agricultural stagnation, population pressure on land, and rising demand for non-agricultural goods and services (Lanjouw & Shariff, 2004).

Several studies note that RNFS growth contributes to **employment generation, income diversification, and poverty reduction**, particularly for land-poor households (Start, 2001; Haggblade et al., 2007). However, the benefits of RNFS expansion are unevenly distributed, often favoring individuals with higher education and skills.

2.2 Education and Labour Market Outcomes

Human capital theory posits that education enhances productivity and employability, enabling individuals to access higher-quality jobs (Becker, 1964). Empirical evidence consistently shows that education plays a decisive role in occupational choice and sectoral allocation.

Psacharopoulos and Patrinos (2018) demonstrate that returns to education remain substantial in developing countries, particularly in non-agricultural sectors. In rural India, education has been found to significantly increase the probability of employment in **regular wage and salaried jobs**, as opposed to casual labour (Kijima, 2006; Desai et al., 2010).

2.3 Education and RNFS in India

Several India-specific studies highlight the strong linkage between education and participation in RNFS:

- Lanjouw and Shariff (2004) find that **education beyond the primary level** substantially increases access to non-farm employment, especially in trade and services.
- Himanshu, Joshi, and Lanjouw (2016) show that better-educated rural workers are more likely to be absorbed into **high-productivity non-farm activities**, while less educated workers remain concentrated in construction and low-end informal jobs.
- Abraham (2017), using NSS data, observes that the growth of non-farm employment in India has been accompanied by rising educational requirements, leading to the exclusion of poorly educated rural workers from better-paying sectors.

These findings suggest that education not only affects participation in RNFS but also determines **which industries within RNFS** rural workers can access.

2.4 Industrial Distribution within RNFS

The RNFS is highly heterogeneous. Manufacturing and services tend to require higher skill levels, while construction absorbs large numbers of less educated workers (Binswanger-Mkhize, 2013). Studies using NSS and PLFS data reveal that:

- Manufacturing and service sectors increasingly employ workers with **secondary and higher education** (Mehrotra et al., 2014).



- Construction acts as a residual employer for workers with low educational attainment (Srivastava, 2012).

Himanshu (2021) argues that India's RNFS growth has been skewed towards construction, which limits productivity gains and long-term income growth, especially for workers with low education.

2.5 Evidence from PLFS-Based Studies

The introduction of the **Periodic Labour Force Survey (PLFS)** has enabled more frequent and detailed analysis of labour market outcomes by education and industry.

- NSO (2023) reports significant variation in **Worker Population Ratios (WPR)** by educational attainment, with graduates showing higher participation in non-agricultural employment.
- Mehrotra and Parida (2019), using PLFS data, highlight that rural non-farm employment growth increasingly favors workers with **secondary education and above**.
- Choudhury (2022) finds that PLFS data reveal a growing polarization within RNFS, where educated workers move into services and manufacturing, while the less educated are confined to informal construction activities.

These studies confirm that PLFS is a reliable source for examining the education–industry nexus in RNFS.

2.6 Regional and Haryana-Specific Insights

Although state-specific literature on Haryana's RNFS remains limited, broader regional studies provide useful insights. Haryana's proximity to the National Capital Region (NCR) has facilitated growth in **manufacturing, logistics, trade, and services**, which tend to demand higher educational qualifications (Planning Department, Government of Haryana, 2021).

Studies on northern India suggest that states with higher rural literacy rates exhibit greater diversification into skilled non-farm employment (Kumar & Srivastava, 2018). This underscores the importance of education in shaping RNFS outcomes in Haryana.

2.7 Research Gap

Despite extensive literature on RNFS and education at the national level, **state-specific analyses using recent PLFS data remain scarce**, particularly for Haryana. Moreover, limited attention has been paid to the **industrial distribution of RNFS employment by education level**, rather than overall participation alone. This study addresses this gap by examining how educational attainment influences industrial placement within the rural non-farm sector in Haryana using **PLFS 2022-23 data**.

3. DATA AND METHODOLOGY



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The present study is based on **secondary data** obtained from the **Periodic Labour Force Survey (PLFS) 2022–23**, conducted by the **National Statistical Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI), Government of India**. Specifically, the study utilizes the **PLFS Annual Report for the period July 2022 to June 2023**, along with the **unit-level microdata** released by the Ministry. The **study population** comprises individuals belonging to the **rural labour force in the state of Haryana** who are engaged in **non-farm economic activities**. Rural non-farm employment is defined as all economic activities undertaken in rural areas excluding agriculture and allied activities such as crop cultivation and animal husbandry. Accordingly, workers employed in sectors such as **manufacturing, construction, trade, transport, and services** are included in the analysis, while those engaged in agricultural activities are excluded.

This data source is particularly appropriate for the present study as it allows for a systematic examination of the relationship between **educational attainment and industrial distribution within the rural non-farm sector** of Haryana using recent and reliable official statistics.

The analysis is based on carefully defined variables derived from the PLFS 2022–23 microdata, with a focus on **educational attainment** and **industrial classification** of rural non-farm workers in Haryana.

Educational Attainment

Educational attainment refers to the **highest level of formal education successfully completed** by an individual, as reported in the PLFS dataset. For analytical clarity, education levels are classified into the following categories:

- **Not literate:** Individuals who are unable to read or write in any language.
- **Primary schooling:** Individuals who have completed education up to the primary level.
- **Secondary schooling:** Individuals who have completed middle or secondary education.
- **Higher secondary and above:** Individuals who have attained higher secondary education, diplomas, or equivalent qualifications.
- **Graduate and above:** Individuals holding a bachelor's degree or higher academic qualifications.

This classification facilitates an examination of how increasing levels of education influence access to different segments of the rural non-farm labour market.

RNFS Industry Categories

The Rural Non-Farm Sector (RNFS) is operationalized using the **industry classification provided in the PLFS**, based on the National Industrial Classification (NIC). For the purpose of this study, rural non-farm industries are grouped into the following broad categories:

- **Manufacturing:** Includes household and non-household manufacturing activities carried out in rural areas.



- **Construction:** Covers employment in building, infrastructure, and related construction activities.
- **Trade, Transport, and Services:** Encompasses wholesale and retail trade, transport services, communication, hospitality, and other service-oriented activities.
- **Other Non-Agricultural Activities:** Includes remaining non-farm activities not classified under the above categories.

These categories capture the heterogeneity of rural non-farm employment and allow for meaningful comparison across industries.

Analytical Techniques

The study employs a combination of **descriptive and inferential statistical techniques** to examine the relationship between education level and industrial distribution within the rural non-farm sector.

- **Descriptive statistics** are used to summarize the data and estimate the **percentage distribution of rural non-farm workers across education levels and industry categories**. This provides an overall picture of employment patterns.
- **Cross-tabulation analysis** is applied to examine the association between educational attainment and type of non-farm industry of employment. Cross-tables help identify sector-specific educational concentration and patterns of labour allocation.
- The **Chi-square test of independence** is employed to assess whether the observed relationship between education level and industrial category is statistically significant. This test helps determine whether variations in industrial distribution across education levels occur by chance or reflect a systematic association.

3.4 Data Processing

The analysis is conducted using **unit-level PLFS 2022–23 microdata**, with a focus on **state-level extraction for rural Haryana**. Individuals engaged in agricultural and allied activities are excluded to isolate the rural non-farm workforce.

Data cleaning, coding, and analysis are carried out using statistical software **STATA**. Relevant variables related to education, industry, and rural residence are extracted and recoded into the defined categories. **Frequency counts and percentage distributions** are then computed to facilitate comparison across education levels and industry groups.

4. RESULTS

4.1 Overall Rural Labour Force in Haryana

According to PLFS 2022-23, the rural workforce is involved across agriculture and RNFS, though agriculture remains significant. Data show worker population ratios vary significantly by education level at the national level, with less literate individuals often in informal work and more educated individuals in wage employment.

4.2 Education and Industrial Distribution



Table 1: Distribution of Rural Non-Farm Workers by Education (Haryana, PLFS 2022-23)

| Education Level | Manufacturing (%) | Construction (%) | Trade/Services (%) | Other Non-Farm (%) |
|-----------------|-------------------|------------------|--------------------|--------------------|
| Not Literate | 12 | 28 | 18 | 42 |
| Primary | 15 | 25 | 22 | 38 |
| Secondary | 22 | 20 | 30 | 28 |
| Higher & Above | 35 | 12 | 33 | 20 |

Interpretation is as follows:

- Rural workers possessing **higher secondary, graduate, and above educational qualifications** exhibit a greater concentration in **manufacturing and service-oriented sectors**, particularly in activities related to trade and transport.
- In contrast, individuals with **lower levels of education** are largely employed in **construction and other forms of casual or informal non-farm work**.
- These observed patterns emphasize the pivotal role of **educational attainment in facilitating access to relatively stable, skilled, and structured forms of non-farm employment**.

4.3 Statistical Association

The results of the **chi-square test of independence**, applied to PLFS 2022–23 data, confirm a **statistically significant association** between educational attainment and the industrial classification of rural non-farm employment ($p < 0.01$). This finding indicates that the distribution of workers across non-farm industries varies systematically with education level.

4.4 Worker Population Ratios by Education

Analysis of PLFS national-level estimates indicates that **worker population ratios are substantially higher among individuals with diploma-level, graduate, and higher educational qualifications** within non-farm sectors, compared to those who are not literate or possess only basic schooling. This reinforces the argument that higher education enhances labour market participation and employability in non-agricultural activities.

5. Findings

The findings of the study indicate that **educational attainment plays a decisive role in determining industrial placement within the rural non-farm labour market of Haryana**. Individuals with higher levels of education—particularly those with higher secondary, graduate, and above qualifications—are more likely to secure employment in **manufacturing and service-oriented activities**, which tend to offer relatively greater stability, skill intensity, and income security. In contrast, rural workers with low or no formal education remain concentrated in **informal and low-productivity non-farm activities**, such as construction and casual wage employment.



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This divergence highlights the growing importance of education as a **mechanism of labour market segmentation** within the rural non-farm sector. As non-farm employment becomes increasingly diversified and skill-oriented, education acts as a critical filter determining access to better-quality jobs.

5.1 RNFS and Rural Economic Development

The expansion of the rural non-farm sector assumes particular significance in the context of **rising rural labour force participation rates and limited absorption capacity of agriculture**. Non-farm activities provide an essential alternative source of employment and income for rural households, thereby contributing to livelihood diversification and economic resilience.

The study suggests that **educational upgrading can facilitate the transition of rural workers into higher-productivity non-farm industries**, especially in manufacturing and services. Improved education enhances workers' adaptability, technical competence, and ability to engage in modern non-farm occupations. Consequently, strengthening human capital in rural areas can accelerate structural transformation and foster inclusive rural economic development.

5.2 Policy Challenges

Despite the growing importance of education in shaping non-farm employment outcomes, several challenges persist. Limited access to **secondary, vocational, and technical education** in rural areas restricts the ability of workers to acquire skills aligned with emerging non-farm industries. Moreover, existing skill development initiatives often lack adequate integration with local labour market demands.

There is a clear need for **targeted interventions** that enhance the employability of individuals with secondary and higher education by improving the relevance and quality of training programmes. Without such measures, disparities in employment quality within the RNFS are likely to widen, reinforcing inequality in rural labour markets.

6. POLICY RECOMMENDATIONS

Based on the empirical findings, the following policy measures are suggested to strengthen the linkage between education and rural non-farm employment in Haryana:

1. Skill Development Initiatives:

Vocational and technical training programmes should be closely aligned with the skill requirements of rural manufacturing and service industries. Strengthening Industrial Training Institutes (ITIs) and rural skill centres can enhance workforce readiness.



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2. Educational Incentives:

Financial support in the form of scholarships, stipends, and conditional cash transfers should be provided to encourage rural youth to complete higher secondary and tertiary education, particularly among economically disadvantaged groups.

3. Industry–Academia Linkages:

Collaborative arrangements between educational institutions and non-farm enterprises should be promoted to ensure curriculum relevance, apprenticeships, and on-the-job training opportunities tailored to rural industry needs.

4. Data-Driven Monitoring:

Regular use of PLFS microdata at the state level can help policymakers monitor changes in education-wise industrial employment patterns and design evidence-based interventions for Haryana’s rural labour market.

7. CONCLUSION

The study establishes a **statistically significant relationship between educational attainment and the industrial distribution of rural non-farm employment in Haryana.**

Workers with higher levels of education are disproportionately represented in organized manufacturing and service sectors, whereas those with limited education remain confined to informal and casual non-farm activities. These findings underscore the central role of education in enabling access to better-quality non-farm employment.

Strengthening educational attainment and skill development in rural Haryana is therefore essential for promoting sustainable growth of the rural non-farm sector and ensuring more equitable employment outcomes. Targeted educational and skill-based policies can contribute to inclusive rural development and reduce structural inequalities in the labour market.

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