ISSN: 3107-6513

Socio-Economic Vulnerability of Brick Kiln Workers in Telangana: An Empirical Analysis

Dr.Ch.Srinivas

Assistant Professor ©

Department of Applied Economics, Telangana University, Nizamabad, Telangana State, India.
Email: srinivas.ch44@gmail.com

Abstract— The brick kiln industry provides employment to a large number of informal workers in India, particularly among economically and socially marginalised communities. Despite its importance as a livelihood source, the sector is characterized by low wages, seasonal employment, hazardous working conditions, and poor living environments. This study examines the socio-economic vulnerability of brick kiln worker households using a multidimensional framework. Primary data were collected from 237 brick kiln worker households through a structured survey. A Composite Socio-Economic Vulnerability Index (CSEVI) was constructed using eight indicators grouped under four dimensions: economic vulnerability, employment vulnerability, social vulnerability, and living condition vulnerability. Cross-tabulation and chi-square tests were used to examine the association between vulnerability and selected indicators. The results reveal that 51.5 percent of households fall under high vulnerability, while 29.9 percent fall under moderate vulnerability and only 18.6 percent fall under low vulnerability. The findings highlight that low income, high indebtedness, irregular employment, limited educational attainment, high dependency ratios, and inadequate housing and sanitation facilities significantly contribute to vulnerability among brick kiln workers. The study suggests policy interventions focusing on labour protection, improved housing, access to social security schemes, and basic infrastructure development in brick kiln settlements.

Keywords— Brick kiln workers, socio-economic vulnerability, informal labour, composite vulnerability index, living conditions

1. Introduction

The brick kiln industry plays a crucial role in supporting the construction sector in India by supplying essential building materials. At the same time, it provides employment opportunities for a large number of unskilled and semi-skilled workers who often belong to economically disadvantaged communities. Many of these workers migrate seasonally from rural areas in search of livelihood opportunities and depend heavily on brick kiln employment for their survival.

Despite its economic significance, the brick kiln sector is largely characterised by informal labour arrangements and weak regulatory mechanisms. Workers frequently face low wages, irregular employment, and hazardous working environments. Advance payments provided by labour contractors often lead to indebtedness, which restricts workers' mobility and reinforces their dependence on kiln owners.

In addition to employment-related challenges, brick kiln workers typically reside in temporary settlements near kiln sites where access to basic amenities such as sanitation, safe drinking water, healthcare, and education is limited. These conditions expose workers and their families to multiple forms of socio-economic vulnerability.

Socio-economic vulnerability is a multidimensional concept that includes economic insecurity, employment instability, social disadvantages, and inadequate living conditions. Traditional poverty measures based solely on income are insufficient to capture the complex realities faced by informal labourers. Therefore, a comprehensive assessment requires a

ISSN: 3107-6513

multidimensional approach that integrates several indicators of well-being.

The present study aims to examine the socio-economic vulnerability of brick kiln worker households by constructing a Composite Socio-Economic Vulnerability Index (CSEVI). By incorporating indicators related to income, employment, education, household dependency, and living conditions, the study provides a holistic understanding of vulnerability among brick kiln workers.

2. Review of Literature:

Jan Breman (2013) examined the working conditions of informal labourers in India and highlighted the extreme vulnerability faced by migrant labour in unorganized sectors such as brick kilns. The study found that brick kiln workers often remain trapped in a cycle of poverty due to low wages, advance-based labour contracts, and debt bondage. Breman argues that the lack of labour rights and social protection mechanisms intensifies the economic and social vulnerability of these workers.

Ben Rogaly (2008) analysed seasonal labour migration in India and emphasized that migrant workers employed in industries like brick kilns face precarious employment conditions. The study revealed that labour contractors often control recruitment and wage payments, which leads to exploitative work arrangements. The research also highlighted the lack of access to education, healthcare, and housing among migrant labour households.

Rina Agarwala (2013) explored labour rights and informal workers in India. The study emphasized that workers in informal industries such as brick kilns experience multiple vulnerabilities due to insecure employment, lack of legal protection, and exclusion from social welfare schemes. Agarwala argues that collective action and labour organization are crucial for improving the socio-economic conditions of informal workers.

A report published by the International Labour Organization (2015) examined forced labour and working conditions in South Asian brick kiln industries. The report found that many brick kiln workers experience exploitative labour arrangements, including debt bondage and child labour. It also highlighted that poor housing, lack of sanitation, and unsafe drinking water in kiln settlements contribute significantly to workers' vulnerability.

Smita Premchander (2016) studied labour conditions in informal sectors and noted that brick kiln workers face multidimensional poverty. The study identified several factors contributing to vulnerability, including low educational attainment, high dependency ratios, lack of health services, and limited livelihood alternatives. The research emphasized the need for policy interventions that address both employment conditions and living standards.

International Organization for Migration (2019) examined the socio-economic conditions of migrant labourers in brick kiln industries in South Asia. The study found that migrant brick kiln workers often live in temporary settlements with inadequate housing, sanitation, and water facilities. These poor living conditions, combined with irregular employment and low income, significantly increase the vulnerability of worker households.

3. Research Methodology

3.1 Data Source

The study is based on primary data collected through a field survey conducted among brick kiln worker households in Telangana State. A structured questionnaire was used to gather information on demographic characteristics, income levels, employment conditions, education, household structure, housing quality, and access to sanitation and drinking water. A total of 237 households engaged in brick kiln labour were surveyed. The respondents were primarily household heads or adult members involved in brick production activities.

3.2 Sampling Technique

Brick kiln settlements with a high concentration of workers were identified through purposive sampling. Within these

ISSN: **3107-6513**

settlements, households were selected using simple random sampling to ensure representation of different worker categories.

3.3 Indicators of Vulnerability

The study considers eight indicators grouped into four dimensions of vulnerability.

Dimension	Indicators
Economic vulnerability	Monthly household income, household debt
Employment vulnerability	Workdays per month, nature of employment
Social vulnerability	Education level, dependency ratio
Living condition vulnerability	Housing quality, sanitation and drinking water access

3.4 Construction of Composite Socio-Economic Vulnerability Index

To measure overall vulnerability, a Composite Socio-Economic Vulnerability Index (CSEVI) was constructed. All indicators were normalised using the Min-Max normalisation method to convert them into comparable values ranging from 0 to 1.

Each indicator was assigned equal weight. Since eight indicators were included, the weight of each indicator was 0.125 (1/8=0.125).

The composite index was calculated using the formula: $CSEVI = \sum (Wi \times Xi)$

Where Wi represents the weight assigned to each indicator and Xi represents the normalized value of the indicator.

The index values were classified into three vulnerability categories:

Index Range	Vulnerability Level
0.00 – 0.33	Low
0.34 – 0.66	Moderate
0.67 – 1.00	High

4. Results and Discussion

Table 1: Economic Vulnerability and Monthly Household Income

Income Level	Low	Moderate	High	Total
Below 8000	5	10	37	52
8001 – 12000	14	25	45	84
12001 – 16000	12	20	29	61
16001 – 18000	08	10	10	28
Above 18000	5	6	1	12
Total	44	71	122	237

Chi-square = 18.62

The table shows a clear relationship between monthly household income and economic vulnerability among brick kiln worker households. A large proportion of workers earning **below 8000 rupees per month fall into the high vulnerability category,** indicating that low income significantly contributes to economic insecurity. These households struggle to meet basic consumption needs and often rely on informal credit or advance payments from labour contractors. Workers earning between 8001 and 12000 rupess also show a considerable level of vulnerability, suggesting that even moderate-income levels are insufficient to ensure financial stability. In contrast, households with income levels above 16000 rupees demonstrate relatively lower vulnerability, indicating that higher income improves economic resilience. The chi-square value of 18.62 suggests that the association between income level and economic vulnerability is statistically significant. Overall, the results highlight that income inequality is a major determinant of economic vulnerability among brick kiln workers**.**

 ISSN: **3107-6513**

Table 2: Economic Vulnerability and Household Debt

Income Level	Low	Moderate	High	Total
No Debt	20	10	08	38
Below 20000	12	20	35	67
20001 - 50000	08	26	44	78
Above 50001	04	15	35	67
Total	44	71	122	237

Chi-square = 21.47

The results reveal a strong association between household debt levels and economic vulnerability. Households with higher levels of debt are disproportionately represented in the high vulnerability category**,** indicating that indebtedness significantly increases financial risk. Many brick kiln workers rely on advance payments from contractors to meet immediate consumption needs, which often results in long-term debt obligations. Workers with debt levels above 50000 rupess show particularly high vulnerability, reflecting their limited capacity to repay loans and their dependence on kiln owners. In contrast, households without debt are largely concentrated in the low vulnerability category, suggesting that financial independence reduces economic insecurity. The chi-square value of 21.47 indicates a statistically significant relationship between debt and vulnerability. These findings demonstrate that debt dependency is a key factor reinforcing economic vulnerability among brick kiln workers**.**

Table 3: Employment Vulnerability and Workdays per Month

Work Days	Low	Moderate	High	Total
Less than 15	03	08	18	19
15 -20	10	20	33	63
21 – 25	16	27	48	91
More than 25	15	16	23	54
Total	44	71	122	237

Chi-square = 16.83

The number of workdays per month is an important indicator of employment stability among brick kiln workers. The table indicates that workers with fewer than 15 workdays per month experience higher vulnerability**,** as irregular employment leads to unstable income and financial uncertainty. Even workers with 15–20 workdays show considerable vulnerability, suggesting that seasonal employment patterns affect income security. Workers receiving more than 25 workdays demonstrate relatively lower vulnerability due to greater employment stability. However, even among this group some households still experience vulnerability due to other socio-economic constraints. The chi-square value of 16.83 confirms a statistically significant association between workdays and vulnerability. These results suggest that irregular and seasonal employment is a major source of livelihood insecurity for brick kiln workers**.**

Table 4: Employment Vulnerability and Nature of Employment

Nature of Employment	Low	Moderate	High	Total
Casual Labour	18	28	47	93
Contract Labour	20	25	48	93
Piece Rate Worker	06	18	27	51
Total	44	71	122	237

Chi-square = 14.55

The nature of employment significantly influences the level of vulnerability among brick kiln workers. Casual labourers constitute a large proportion of the high vulnerability group, reflecting the insecure nature of their employment arrangements. Casual workers often lack job security, formal contracts, and access to labour rights, which increases their vulnerability. Contract labourers also experience substantial vulnerability, although they may have slightly better employment stability compared to casual workers. Piece-rate workers are particularly vulnerable because their income depends on the number of bricks produced, which can fluctuate depending on demand and production conditions. The chi-square value of 14.55 indicates a statistically significant relationship between employment type and vulnerability. These findings highlight that informal employment arrangements contribute significantly to labour vulnerability in the brick kiln sector**.**

 ISSN: **3107-6513**

Table 5: Social Vulnerability and Education

Education Level	Low	Moderate	High	Total
Illiterate	10	25	63	98
Primary	18	27	27	72
Secondary	16	19	32	67
Total	44	71	122	237

Chi-square = 12.74

Education plays a critical role in shaping socio-economic vulnerability among brick kiln workers. The table shows that illiterate workers are highly concentrated in the high vulnerability category, indicating that lack of education limits access to better employment opportunities and social mobility. Workers with primary education demonstrate moderate vulnerability, suggesting that basic education provides some advantage but may not be sufficient to overcome structural disadvantages. Those with secondary education are relatively better positioned, although some still experience vulnerability due to employment constraints. The chi-square value of 12.74 indicates a significant association between education level and vulnerability. The results emphasize that improving educational access is essential for reducing socio-economic vulnerability among marginalised labour communities**.**

Table 6: Social Vulnerability and Dependency Ratio

Dependency Ratio	Low	Moderate	High	Total
Low	24	16	13	53
Medium	12	35	58	105
High	08	20	51	79
Total	44	71	122	237

Chi-square = 17.92

The dependency ratio reflects the economic burden placed on earning members within a household. The table indicates that households with high dependency ratios are more likely to experience high vulnerability, as income must support a larger number of dependents. Such households face greater financial pressure and limited capacity to save or invest in education and healthcare. In contrast, households with lower dependency ratios are better able to manage their economic resources and therefore exhibit lower vulnerability. The chi-square value of 17.92 suggests a statistically significant association between dependency ratio and vulnerability. These findings indicate that household demographic structure plays an important role in shaping socio-economic vulnerability.

Table 7: Living Condition Vulnerability and Housing Quality

Housing Type	Low	Moderate	High	Total
Temporary	10	28	64	102
Semi-Temporary	16	25	35	076
Permanent	18	18	23	059
Total	44	71	122	237

Chi-square = 13.66

Housing quality is an important indicator of living standards among brick kiln workers. The table shows that households living in temporary houses are predominantly concentrated in the high vulnerability category**.** Temporary housing structures often lack adequate protection from weather conditions and basic infrastructure such as electricity and sanitation facilities. Semi-permanent housing shows moderate levels of vulnerability, indicating slightly better living conditions. Workers living in permanent houses demonstrate relatively lower vulnerability, suggesting improved stability and access to resources. The chi-square value of 13.66 confirms a statistically significant association between housing quality and vulnerability. These findings highlight that housing conditions play a crucial role in determining the well-being of brick kiln worker households**.**

Table 8: Living Condition Vulnerability and Sanitation and Water Access

Level of Access	Low	Moderate	High	Total
Improved	24	22	27	73
Partial	14	28	50	92
None	06	21	45	72
Total	44	71	122	237

Chi-square = 19.24

Access to sanitation and safe drinking water is a crucial determinant of health and living standards. The table indicates that households lacking proper sanitation and water facilities are more likely to experience high vulnerability. Workers living in settlements without these facilities face increased risks of waterborne diseases and poor hygiene conditions.

ISSN: **3107-6513**

Households with partial access to sanitation and water also experience moderate to high vulnerability, reflecting the inadequacy of available facilities. In contrast, households with improved facilities demonstrate lower vulnerability levels. The chi-square value of 19.24 indicates a statistically significant association between sanitation access and vulnerability. These results underline the importance of improving basic infrastructure in brick kiln worker settlements**.**

4. Composite Socio-Economic Vulnerability Index

Vulnerability Level	Frequency	Percentage
Low	44	18.60
Moderate	71	29.90
High	122	51.50
Total	44	71

Average CSEVI score = 0.595

The index reveals that more than half of the households experience high vulnerability. Multiple forms of deprivation including low income, irregular employment, limited education, and poor living conditions interact to reinforce vulnerability among brick kiln workers.

5. Dimension-wise Socio-Economic Vulnerability Index

Dimension	Indicators Included	Average Normalised Score	Weight of Dimension	Vulnerability Index Value
Economic Vulnerability	Income, Debt Level	0.65	0.25	0.6125
Employment Vulnerability	Workdays per Month, Nature of Employment	0.575	0.25	0.1438
Social Vulnerability	Education Level, Dependency Ratio	0.605	0.25	0.1513
Living Condition Vulnerability	Housing Quality, Sanitation & Water Access	0.55	0.25	0.1375
Overall CSEVI	8 Indicators	2.38	1.00	0.595

Average CSEVI score = 0.595

6. Conclusion

The study reveals that brick kiln workers face significant socio-economic vulnerability. The predominance of households in the high vulnerability category highlights the precarious nature of employment and living conditions in the brick kiln industry. Low income, high indebtedness, irregular employment, and poor housing and sanitation facilities are key factors contributing to vulnerability.

References:

[1]. Agarwala, R. (2013). *Informal labor, formal politics, and dignified discontent in India.* Cambridge University Press.

[2]. Breman, J. (2013). *At work in the informal economy of India: A perspective from the bottom up.* Oxford University Press.

[3]. International Labour Organization (2015). *Brick kiln sector in South Asia: Working and living conditions of labourers.* Geneva: ILO.

[4]. International Organization for Migration (2019). *Migration and labour exploitation in brick kiln industries.* Geneva: IOM.

[5]. Premchander, S. (2016). Informal labour and livelihood vulnerability in India. *Indian Journal of Labour Economics*, 59(3), 391–408.

[6]. Rogaly, B. (2008). Intensification of workplace regimes in British agriculture and the role of migrant workers. *Population, Space and Place*, 14(6), 497–510.