

Distribution Pattern and Determinants of Income among Casual Labour Households: Empirical Evidence from Rural Punjab

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Abstract

A sample of 480 households that rely on casual labour in rural Punjab was selected through multistage stratified random sampling to examine the patterns and factors influencing household income during the 2022-23 agricultural year. The findings showed that due to irregular work and low wages in the farm sector, casual agricultural labour households were forced to seek alternative sources of income through non-farm employment and MGNREGS. Despite these attempts, they remained among the most economically vulnerable segments of rural Punjab. The analysis of inequality measurements showed that inequality worsened when switching from casual agricultural to non-agricultural labour households in rural Punjab. The findings of the Binary Logistic Regression further indicated that the working members in a household, days of employment, participation in MGNREGS, ownership of productive assets, engagement in the primary sector, and the presence of illiterate members within the family were significant determinants of household income. Based on the results, the study also suggested multidimensional strategies such as skill development, expanding rural non-agricultural employment opportunities, and effective implementation of MGNREGS.

Keywords: Household Income, Employment, Inequality, Casual Labour.

JEL Classification: D310, D630, J310, Q150

Introduction

In his famous book 'The Great Divide', renowned economist Joseph Stiglitz argued that the richest 1 per cent of the world's population possesses as much wealth as the poorest half. He acknowledged that this extreme level of inequality is not an inevitable outcome of economic laws but rather the cumulative consequences of unjust policies and misplaced priorities (Stiglitz, 2015). His argument remains highly relevant to the Indian economy. No doubt, India is among the world's rapidly growing economies. However, the well-being of its population depends not just on economic growth but also on how the fruits of that growth are distributed among different sections of society, including marginalised and disadvantaged groups. In India, the fastest-growing economy, income inequality is a grave concern (Chancel and Piketty, 2019). A significant proportion of scheduled castes, scheduled tribes, and other socio-religious segments in rural India have witnessed income uncertainty due to their participation in casual, low-skilled, and poorly paid employment. This has contributed to rising income inequality among various socio-religious groups (Mehta and Shree, 2017).

In rural Punjab, the distribution of household earnings has been reported as highly skewed (Vatta *et al.*, 2008). Rural labour markets in Punjab often failed to generate an adequate number of employment days for casual workers, rendering them highly vulnerable to poverty. This highlighted the precarious nature of casual wage employment (Vatta and Sidhu, 2010). In rural Punjab, casual labourers remain among the most overlooked and disadvantaged groups. They account for the lowest share of the national income. No doubt major policy shifts such as the Green Revolution and New Economic Reforms have brought progress to specific sections of society, yet they have largely failed to improve the living and financial situations of casual labourers in rural Punjab (Singh and Singh, 2015; Singh and Singh, 2019). Evidence from rural Punjab suggested a notable shift in the employment patterns of casual labour households employed in the agricultural sector, in which mechanisation and monoculture practices under the Green Revolution reduced agriculture's labour-absorbing capacity, transforming permanent farm labour into casual employment (Singh and Bhogal, 2020). Moreover, due to limited non-agricultural employment opportunities in villages, they primarily depend on seasonal agricultural work for their livelihood (Sandhu and

Toor, 2022). The distressing nature of the rural labour market forced a significant proportion of labour households to rely on multiple income sources (Vatta *et al.*, 2008). Furthermore, landlessness and uncertainty about work availability in the agricultural sector make casual labour households vulnerable to low earnings (Vatta and Sidhu, 2010). Similar observations have been made by many authors in their empirical studies carried out in rural Punjab (Sarkar and Mehta, 2010; Kumar and Singh, 2013; Singh and Singh, 2015; Singh and Singh, 2020).

A plethora of studies have found that factors such as working members in a household, days of employment, participation in MGNREGS, ownership of productive assets, primary sector of employment, number of illiterates in a family, experience, and social groups perform a major role in the determination of the aggregate household income in rural India and Punjab (Vatta *et al.*, 2008; Vatta and Sidhu, 2010; Sidhu *et al.*, 2012; Deininger and Liu, 2019; Das, 2021; Sabreen and Behera, 2021; Birthal *et al.*, 2022; Waris *et al.*, 2023). These labourers continue to face persistently low incomes, poverty, and unemployment, mainly because of the seasonal nature of agricultural employment and limited non-agricultural work opportunities in villages. Therefore, this paper attempts to analyse the distribution patterns and determinants of aggregate annual income among rural households reliant on casual labour in Punjab (Sandhu and Toor, 2022; Kaur and Rani, 2024; and Singh, 2024).

Data Sources and Methodology

Primary data is utilised to assess the distribution and key determinants of income among rural households engaged in casual labour in Punjab. The data have been gathered using a well-structured schedule from sampled households selected through a multi-stage stratified random sampling technique across rural Punjab. The actual data collection pertained to

the 2022-23 agricultural year. In the first stage of sampling, Hoshiarpur, Tarn Taran, Patiala, Mansa, and Faridkot districts were chosen based on the fraction of households engaged in casual agricultural and non-agricultural labour among the aggregate of households. In the second stage of sampling, two development blocks from each selected district have been chosen for the study based on a higher proportion of marginal workers in the total workforce. In the third stage of sampling, three villages from each development block in the selected districts have been chosen. At the last stage of the sampling technique, 480 households were selected from 30 villages, comprising 180 casual agricultural labour households and 300 non-agricultural labour households. The data collected from the primary survey have been analysed by using averages, percentages, Gini Coefficient, and a binary logistic regression model.

Logistics Regression Model

The following Binary Logistic Regression Model has been applied to estimate the effect of the key factors influencing household income among casual labour households in rural Punjab:

$$\text{Household Income} = \beta_0 + \beta_1 \text{Working members in a household} + \beta_2 \text{Days of employment} + \beta_3 \text{Participation in MGNREGS} + \beta_4 \text{Ownership of productive assets} + \beta_5 \text{Primary sector of employment} + \beta_6 \text{Number of illiterates in a family} + \beta_7 \text{Experience} + \beta_8 \text{Social group} + \xi_i$$

The dependent variable in this model is qualitative in nature, represented as a dummy variable. Specifically, the variable takes the value '1' if the household's annual income is above the poverty threshold and '0' otherwise. This binary specification allows estimation of the probability that a household belongs to the above-poverty-income category, given a set of explanatory variables. The model is specified as follows:

Table 1: List of Variables Used in Binary Logistic Regression Model

Sr. No.	Name of Variables	Description of Variables
I	Dependent Variable	
1.	Household Income	1, if the household is above the Poverty Line; 0, otherwise
II	Explanatory Variable	
2.	Number of Working Members in a Household	1, if the number of working members in a household is more than one; 0, otherwise
3.	Days of Employment	1, if above the average days of employment; 0, otherwise
4.	Participation in MGNREGS	1, if yes; 0, otherwise
5.	Ownership of Productive Assets	1, if yes; 0, otherwise
6.	Primary sector of Employment	1, if non-agricultural sector; 0, otherwise
7.	Number of illiterates in a Family	1, if the number of illiterates in a Family is more than two; 0, otherwise
8.	Experience	1, if yes; 0, otherwise
9.	Social group	1, if SCs; 0, otherwise

$$P_i = f(z_i) = \frac{1}{(1 + e^{-z_i})}$$

Where P_i denotes the probability that the i^{th} casual labour household has an income above the poverty line. $Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_k X_k$ represents the linear combination of explanatory variables, and $X_1, X_2, X_3 \dots X_k$ are the independent variables (attributes associated with the i^{th} household). $\beta_0, \beta_1 \dots \beta_k$ are the parameters to be estimated, and e is the base of the natural logarithm, which is approximately equal to 2.718. In this formulation, the value of Z_i may range from $-\infty$ to $+\infty$, but the resulting probability P_i always lies between 0 and 1.

Results and Discussion

Distribution of Household Income (Per Annum)

Casual labour households in rural areas derived a major part of their income from a variety of sources, including

selling their muscle power in agricultural activities, MGNREGS employment, other non-farm occupations, and livestock rearing. The average annual household income from multiple activities among rural households engaged in casual labour in Punjab is shown in Table 2. The in-depth analysis of the income sources of casual labour households in rural Punjab indicated that the mean annual income was Rs. 1,04,769.86. Of the aggregate household income, casual labour families earned an average of Rs. 91,097.86 from wages, constituting 86.95 per cent, by selling their labour for agricultural and non-agricultural work and for employment under MGNREGS. Moreover, the results show that, among the aggregate income, casual labour households obtained the maximum average income of Rs. 63,649.71 (60.75 per cent) from selling labour power in non-agricultural activities, followed by Rs. 21,103.19 (20.14 per cent) from agricultural work and Rs. 6,344.97 (6.06 per cent) from participation in MGNREGS. In addition, these households derived Rs.

Table 2: Pattern of Average Household Income from Different Sources among Casual Labour Households in Rural Punjab (In Rs. per Annum)

Sr. No.	Sources of Income	Casual Agricultural Labour Households	Casual Non-Agricultural Labour Households	Casual Labour Households
1	Farm Business Income	893.33 (1.02)	476.67 (0.41)	632.92 (0.60)
2	Dairy and Livestock	2065.24 (2.36)	392.33 (0.34)	1019.67 (0.97)
3	Wages from Hiring Out Labour in Agricultural Activities	46963.50 (53.60)	5587.00 (4.86)	21103.19 (20.14)
4	Wages from Hiring Out Labour in Non-Agricultural Activities	19965.89 (22.79)	89860.00 (78.10)	63649.71 (60.75)
5	Wages from Hiring Out Labour in MGNREGS	6487.47 (7.40)	6259.46 (5.44)	6344.97 (6.06)
6	Sub Total of Wages from Hiring Out Labour (3+4+5)	73416.86 (83.79)	101706.46 (88.40)	91097.86 (86.95)
7	Income from Domestic Services	4486.87 (5.12)	5705.20 (4.96)	5248.32 (5.01)
8	Pension	3633.33 (4.15)	3180.00 (2.76)	3350.00 (3.20)
9	Scholarships	583.33 (0.67)	1176.67 (1.02)	954.17 (0.91)
10	Remittances	127.78 (0.15)	366.67 (0.32)	277.08 (0.26)
11	Others*	2415.53 (2.76)	2054.40 (1.79)	2189.83 (2.09)
12	Total (1-11)	87622.29 (100.00)	115058.40 (100.00)	104769.86 (100.00)

Source: Field Survey, 2022-23; Note: Figures in parentheses indicate the percentage to total.; Others* Artisans Work, Forestry, Menial Jobs, etc.

5,248.32 from domestic services, Rs. 3,350.00 from pensions, and Rs. 2,189.83 from other miscellaneous sources.

In percentage terms, domestic services, pensions, and other miscellaneous sources contributed to 5.01, 3.20, and 2.09 per cent, respectively. The proportions of household income derived from livestock, scholarships, and remittances have been calculated at 0.97 per cent, 0.91 per cent, and 0.26 per cent, respectively. The field survey also indicated that other sources of income, such as dairy and livestock, as well as farm business income, together accounted for only 1.57 per cent of aggregate family income in casual labour households. This negligible contribution was primarily because approximately 96 per cent of such households lacked access to cultivated land, resulting in minimal income from farm-related activities.

The research further revealed a heavy dependence of casual labour households on wage-based employment, with the majority of their household income derived from hiring out labour in both farm and non-farm work. These findings are consistent with the studies carried out by Vatta and Sidhu, 2010; Singh and Singh, 2015; Singh and Singh, 2019, who also found that a vast majority of rural labourers in Punjab were landless and compelled to sell their muscle power in both farm and non-farm activities. A similar observation was made by Singh *et al.*, (2017), who found that hiring out labour remained the principal source of earnings for agricultural labour households across different regions of Punjab.

The analysis further pointed out that the majority of casual labour households were engaged in subsidiary employment alongside their principal occupation. The agricultural sector failed to ensure an adequate number of working days and decent earnings. So, these rural casual agricultural labour households try to engage in alternative activities to supplement their income. However, irregular and seasonal employment in agriculture, ineffective implementation of MGNREGS, widespread landlessness, and illiteracy have collectively hindered any substantial improvement in their income levels. These structural challenges continue to reinforce the economic vulnerability of rural households engaged in casual labour in Punjab.

An analysis of the various sources of income among casual non-agricultural households envisaged that their primary source of income was the sale of labour power in non-agricultural activities, accounting for 78.10 per cent of their aggregate income. Income earned from hiring out labour under MGNREGS accounted for 5.44 per cent of the aggregate income of casual non-agricultural labour households. Moreover, the proportional share of domestic services, agricultural labour, pensions, livestock, and other miscellaneous sources was 4.96, 4.86, 2.76, 0.34, and 1.79 per cent, respectively. However, there were considerable variations in household income among these households. Casual agricultural labour households reported a lower

average income than households engaged in casual non-agricultural labour in villages of Punjab. Singh and Singh (2019) observed in their extensive research that agricultural labour households tend to have lower incomes than other rural households.

Per Capita Income Distribution (Per Annum)

It is important to analyse the per-person income levels of rural households dependent on casual labour in Punjab to present a more accurate understanding of their economic conditions. A perusal of Table 3 captured the distribution pattern of per-person income among casual labour households. The overall average per capita income among casual labour households stood at Rs. 23,174.90. A substantial portion of this per capita income, amounting to Rs. 20,150.68, was earned through wages from hiring out labour for agricultural and non-agricultural activities as well as participation in MGNREGS. The results showed that, overall, more than half of the income of casual labour households in rural Punjab was earned from hiring out labour for non-agricultural activities. These observations are further supported by Vatta and Sidhu (2010), who found that the widespread landlessness among casual labour households has compelled them to diversify their livelihoods toward non-farm employment. As a result, these households derive a significantly higher fraction of their aggregate income from non-farm sources.

Among casual agricultural labour households, more than half of the per-person income came from agricultural wage indicating a firm reliance on seasonal, often low-paid farm employment. Additionally, these households earned Rs. 4,345.66 from non-farm labour and Rs. 1,412.03 through employment under MGNREGS. The income from other sources, such as dairy and livestock (Rs. 449.51), domestic services (Rs. 976.59), and pensions (Rs. 790.81), was relatively limited. Farm business income remained minimal at Rs. 194.44, reflecting widespread landlessness. These findings were further supported by Sandhu and Toor (2022), who observed that a major portion of the per-person income of agricultural labour households in rural Punjab came from casual farm work and pointed out that the relative share of other income sources, such as pensions, the sale of manure, and livestock products, was minimal.

Moreover, the per-person family income from selling labour power in non-agricultural work was the highest (Rs. 20,072.97) for casual non-agricultural labour households and the lowest (Rs. 4,345.66) for casual agricultural labour households. The mean per capita income earned through hiring out labour in non-agricultural activities by casual non-agricultural labour households was 4.61 times that of casual agricultural labour households. As far as per capita income from domestic services was concerned, it was highest for the casual non-agricultural labour category and lowest for the casual agricultural labour category. Earnings from domestic

Table 3: Distribution Pattern of Per Capita Income of Casual Labour Households in Rural Punjab
(Rs. per annum)

Sr. No.	Sources of Income	Casual Agricultural Labour Households	Casual Non-Agricultural Labour Households	Casual Labour Households
1	Farm Business Income	194.44	106.48	140.00
2	Dairy and Livestock	449.51	87.64	225.55
3	Wages from Hiring Out Labour in Agricultural Activities	10221.80	1248.03	4667.99
4	Wages from Hiring Out Labour in Non-Agricultural Activities	4345.66	20072.97	14079.20
5	Wages from Hiring out Labour in MGNREGS	1412.03	1398.24	1403.49
6	Sub Total of Wages from Hiring Out Labour (3+4+5)	15979.49	22719.24	20150.68
7	Income from Domestic Services	976.59	1274.43	1160.92
8	Pension	790.81	710.35	741.01
9	Scholarships	126.96	262.85	211.06
10	Remittances	27.81	81.91	61.29
11	Others*	525.75	458.91	484.39
12	Total (1-11)	19071.64	25701.80	23174.90

Source: Field Survey, 2022-23

services (Rs. 1,274.43) and scholarships (Rs. 262.85) were slightly higher than those of agricultural labour households. The per-person income from farm labour and MGNREGS has amounted to Rs. 1,248.03 and Rs. 1,398.24, respectively. In contrast to their agricultural counterparts, these households earned less from farm-based and livestock activities.

The data further revealed a notable disparity in per-person income between rural households engaged in casual agricultural labour and those employed in casual non-agricultural labour in rural Punjab. The per-person income of casual agricultural labour households was lower than that of casual non-agricultural labour households. This income gap exposed the economic vulnerability of casual agricultural labourers, who were largely dependent on seasonal and irregular employment, often at lower wages. Factors such as increasing mechanisation in agriculture, limited employment days, and lack of access to productive land further constrain their earning potential.

Measurement of Income Inequality

In the present research paper, the Gini Coefficient has been estimated, and Lorenz curves have been drawn to measure the scale of inequalities in the distribution of aggregate household income among households engaged in casual labour in rural Punjab. The Gini-coefficient values for casual agricultural and non-agricultural labour households were 0.215 and 0.228, respectively. This indicated low-

to-moderate inequality in the income distribution among these households. However, the level of inequality slightly worsened when moving from casual agricultural to non-agricultural labour households in rural Punjab.

Results of Binary Logistic Regression Analysis

Table 4 presents the results of the Binary Logistic Regression model of variables influencing household income levels among casual labour households in rural Punjab. The model further indicated that working members in a household, days of employment, participation in MGNREGS, ownership

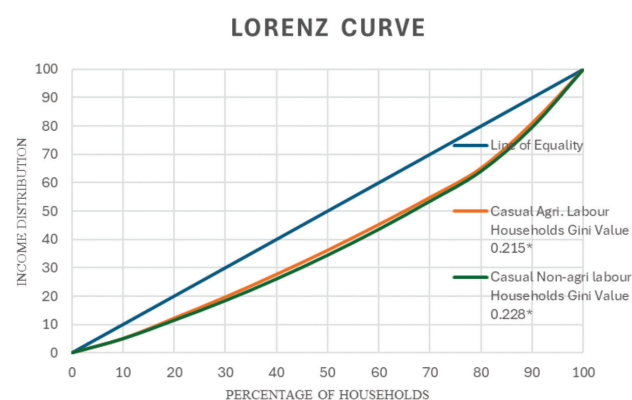


Figure 1 Income Inequality among Casual Labour Households in Rural Punjab

of productive assets, engagement in the primary sector, and the presence of illiterate members within the family emerged as important determinants of household income.

The findings revealed that casual labour households with more working members have significantly greater odds of achieving a higher income level. As the number of working members increases, the household income increases, and vice versa. Waris *et al.* (2023) affirmed that a greater number of earners within a household increases the possibility of household income in a regression model. The regression results further indicate a strong and highly significant positive relationship between days of employment and household income. The results, which are highly statistically significant, demonstrate that longer employment duration is a key determinant of household income. Vatta and Sidhu (2010) also observed that rural labour markets in Punjab failed to generate an adequate number of employment days for casual workers, leaving them highly vulnerable to incomes that fell below the poverty line. The regression analysis pointed out that the public employment programme contributed positively to income generation, particularly for the rural poor. The

model further envisaged that participating in MGNERGS increases the odds of the desired outcome by 1.91 times and raises the probability by 11 per cent. The results showed that households participating in MGNREGS have higher log-odds of being in the higher-income category.

Moreover, the model estimated that if a casual labour household is engaged in agriculture and then shifts to the non-agricultural sector, the log-odds of higher income increase. This income advantage is primarily due to higher wages and greater opportunities in non-agricultural occupations than in the seasonal, uncertain work of agriculture. A higher number of illiterate members within a household often reflected limited skills, reduced access to information, and fewer opportunities for gainful employment. This strong negative and statistically significant relationship indicated that illiteracy was a major barrier to income enhancement in casual labour households. The regression results indicated that each additional year of work experience increases the log odds of higher income. While the direction of the relationship is positive, the effect size is relatively small and statistically insignificant, indicating experience alone is not a strong

Table 4: Determinants of Income of Casual Labour Households in Rural Punjab

Variables	Coefficients	Odds Ratio	Marginal Effect
Constant	-4.665*** (0.889)	0.009	-
Number of Working Members in a Household	2.502*** (0.417)	12.206	0.4304
Days of Employment	3.478*** (0.457)	32.392	0.5983
Participation in MGNREGS	0.648*** (0.392)	1.911	0.1114
Ownership of Productive Assets	0.965** (0.402)	2.625	0.1661
Primary sector of Employment	2.303*** (0.407)	10.008	0.3993
Number of Illiterates in a Family	-2.734* (0.523)	0.649	-0.4703
Experience	0.0182 (0.0207)	0.752	0.0031
Social Group	0.0410 (0.558)	1.018	0.0071
Model Statistics			
Log Likelihood= -92.2963			
LR χ^2 (10) = 466.55			
Prob > χ^2 = 0.0000			
Pseudo R ² = 0.7165			
N=480			

Source: Calculated from Primary Data
Standard errors in parentheses

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

predictor in the casual labour households. However, the results of the Binary Logistic Model reflected a negative but statistically insignificant relationship between social groups and household income of casual labour households in rural Punjab.

Conclusions and Policy Implications

In summary, the above analysis revealed that casual labour households derived the largest share of their aggregate household income from selling labour power; however, relying on a single economic activity of earning remained insufficient to meet their basic needs. Casual non-agricultural labour households have higher average incomes than casual agricultural labour households in rural Punjab. This is mainly due to higher wages and greater opportunities in non-agricultural occupations compared to the seasonal, uncertain work in agriculture. Moreover, the results of the Binary Logistic Regression further estimated that the working members in a household, days of employment, participation in MGNREGS, ownership of productive assets, engagement in the primary sector, and the illiterate members within the family were the significant determinants of household income among casual labour households in rural Punjab. The model envisaged that more working days, greater engagement in the non-farm sector, and higher participation in MGNREGS increase the probability of earning a higher income. It stressed the need to expand rural employment opportunities by diversifying the agricultural sector, promoting construction and small-scale manufacturing jobs, and effectively implementing MGNREGS to increase household incomes and lift casual-labour households out of poverty. Addressing these challenges is critical to improving the livelihoods and economic security of the most vulnerable rural casual-labour households in Punjab.

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Received: May 10, 2026 Accepted: June 15, 2026