



Emerging Challenges in Rural Non-Farm Sector and Inequality in Rural India: Insight from IHDS Survey

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Research Article

Abstract

Purpose: This paper highlights the changing patterns of income diversification and the effects of various socio-economic factors influencing the non-farm (NF) income of rural households in India. The study also explores the inequality effects of the non-farm earnings of the households by using the Fields inequality decomposition.

Method: The study compares and evaluates the determinants and trends of inequality in 2004-2005 and 2011-2012 in the NF sector. It uses nationally representative data from two rounds of the Indian Human Development Survey (IHDS), which includes a panel of 36,278 households at all levels in India. The Censored Least Absolute Deviation (CLAD) model is used to estimate household determinants for non-farm income. The Fields decomposition decomposes total income inequality by considering the socio-economic factors.

Results: The study finds that variations in non-farm earnings have increased. Field's Income Inequality Decomposition estimates show that income inequalities between households are significantly high due to factors such as education, level of the household head, land ownership, and population density, but also appear to be declining in 2011-12. Also, the earning gaps based on gender, age, and geographical zones have increased.

Implications: Overall, the non-farm income during the studied period was observed to be biased towards the better-off households. However, it opened up opportunities for underprivileged households as well. The non-farm sector has huge potential in augmenting incomes for unprivileged rural households. Therefore, the government should pay attention to this sector as a means of reducing income inequality and alleviating poverty.

Keywords: Non-farm Sector, Income diversification, Inequality, Gini, Rural, India

1. Introduction

Rural development, poverty alleviation, and equality are still the major concerns for academicians and policymakers in India. These issues are also given priority in Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs). The rural families in developing countries are mostly engaged in the agriculture sector (J. O. Lanjouw & Lanjouw, 2001). In India, 44.80% of the population is working in agriculture even though the sector is contributing only 16.38% of the country's GVA (Gross Value Addition) (Government of India, 2019). According to the 10th Agricultural Census, the average land ownership in agriculture has also decreased from 1.15 to 1.08 hectares in the period from 2010-11 to 2015-16. As stated by FAO (2003) nearly 70% of the population (121 million people) still lives in rural areas in India.

In such a context, the solution to growth lies in shifting people from the lower productivity sectors to high productivity sectors. It is found that 81% of global poverty is allayed by improving conditions in rural areas and only 19% by migration (World Development Report, 2008) only. Therefore, it is not agriculture or migration to urban centers that can alone increase the incomes of the rural households. It requires the potential rural non-farm sector to augment the different activities for income generation.

There is also evidence across developing countries of non-farm income contributing highly to household incomes. The rural non-farm earnings account for a considerable share of farm household income in rural Africa, Latin America, typically more than in other world regions (Reardon, 1997; Reardon & Berdegue, 1999; Reardon, Taylor, Stamoulis, & Lanjouw, 2000). In India, rural households engage in multiple non-farm activities in addition to farming (Barrett et al. 2005; Ellis 1998; Reardon 1997). There is ample evidence that rural households take part in a variety of non-farm activities, besides traditional agricultural works. Nonfarm contributes 34 % of income to the total incomes of rural households (P. Lanjouw & Shariff, 2004). The structural transformation has been taking place over the last few decades, where rural households are moving from agriculture to non-agricultural activities (Himanshu, Joshi, & Lanjouw, 2016; Himanshu, Lanjouw, Mukhopadhyay, & Murgai, 2011). This movement has explained the increasing non-farm incomes of rural households through activities such as mining, construction, wage labor, tourism, and other services. The trend towards rural development contributes to the growing importance of the rural non-farm sector in reducing income inequality and poverty.

Therefore, the policymakers are interested in the contribution of the non-farm sector to economic development and its specific role in reducing rural income inequality. Thus, given the gravity of the issue, our study is an important addition, as it aims to investigate the income diversification of rural households. Additionally, we explore different determinants of non-farm income in rural areas by estimating the CLAD Model. Based on the Gini coefficient, the income variations are obtained, and the contributions of these socioeconomic variables to the non-farm income are also investigated using fields decomposition formulas.

2. Literature Review

Agriculture plays an important role in the early stages of economic development (Singer & Thorbecke, 1971). Agriculture is the stringent component of inclusive growth of a nation,

especially for the rural areas. The farm families are also increasingly dependent on non-farm income (Pandey, 2017). The non-farm sector may contribute to increasing economic growth, employment outside agriculture and affect overall income inequality (Pandey, 2018). For greater participation and productivity in the rural sector, diverse patterns of activities need to be performed by them (rural households) (Dercon, 2002; Ellis, 1998, 2008) through the non-farm sector.

The non-farm sector is heterogeneous as it comprises different non-farm activities that vary from small petty shops to construction, manufacturing, and other varied activities (Ranganathan, Tripathi, & Pandey, 2017). There are different sectors in the non-farm economy that could create employment in the rural sector such as casual wage, self-enterprises, and regular employment activities. Therefore, participation in non-farm activities is perceived to have immense potential to reduce poverty and income inequalities (Haggblade, Hazell, & Reardon, 2010; P. Lanjouw & Murgai, 2009). Often the non-farm sector provides savings and contributes to food security as well as collateral for added agricultural investment and other sources of capital necessary for basic entrepreneurial investment (Mellor & Lele, 1973). Additionally, the literature has also explained that participation in non-farm activities might exacerbate inequalities in rural areas if more privileged households participate (Himanshu et al. 2011, 2011, 2016).

The participation of rural households in non-farm activities could be due to "push" factors (e.g., risk reduction, land constraints, response to a crisis) and/or "pull" factors (e.g., complementarities with existing income activities, higher profitability of the activities) (Buchenrieder & Möllers, 2006) Other socio-economic factors determine the participants and act as barriers like age, gender, caste, education, capital assets, landholding, density, village yield, and other requirements (Adams, 2002; Khatun & Roy, 2012; Rahut, Jena, Ali, Behera, & Chhetri, 2015). In rural areas, the participation of people in non-farm activities is not possible to all individuals as there could be various socio-economic entry barriers like caste, gender, landholding size, education, skills, networks, etc.

According to the Bhutan Living Standard Survey (2012), non-farm income comprises 60.7% of the rural household income (Rahut et al., 2015). This increase in non-farm income is associated with higher levels of education and skills levels. Poor and less educated people are usually employed in casual wages and petty self-employment activities, which require little or no investment, education, and skills. (Adams, 2002) found that education and levels of skill are important in determining participation in non-farm employment.

3. Data and Research Methodology

The study uses the data from two rounds of the Indian Human Development Survey (IHDS), collected in 2004-05 & 2011-12 by the National Council of Applied Economics Research (NCAER) and University of Maryland, USA. The analysis is based on the common panel of 32,678 households after merging the two rounds of survey (42,551 households in the first round and 41,471 in the second round). The first section includes the estimation of CLAD estimates and the other explains the inequality decomposition with the help of the Gini and Fields.

Based on the reviewed literature, it has been observed that the regression of non-agricultural income on a range of explanatory variables, using the basic OLS technique, yields biased

estimates as the simple linear regression requires that the residual of the regression be normally distributed. And therefore, OLS doesn't allow the account of censoring of the dependent variable with zero value (that is, OLS doesn't account for the non-agricultural households who have zero income or don't have any source of non-agricultural source of income).

Rural households do have zero incomes from the non-farm sector sometimes. Therefore, when analyzing these kinds of data with some extreme cases/issues, we need the censoring of the data to gain by normalizing the effect for best consistent results. Therefore, with substantial truncation or bimodality of the data utilities themselves, the normality of the residuals may not hold.

So, the next approach available is to use the Tobit model. The model handles censoring by assuming that the true value has a normal distribution whose mean is given by a linear combination of the covariates, and therefore is sensitive to the error term. However, using the Tobit model could lead to the problem of heteroscedasticity. Here, parameters based on the Tobit model automatically will not be consistent. To overcome these difficulties, we based our analysis on estimating CLAD Model (Jeffrey, 2013). The model assumes that the median linearly combines the covariates, but leaves the distribution otherwise unspecified. Where the censoring is possible without taking the assumption of homoscedasticity. Therefore, to analyze the determinants (influence by population and sub-groups defined as age, gender, caste, religion, education, proximity to urban areas, etc.) of non-farm incomes, CLAD is preferred. The CLAD estimation starts by estimating the quantile regression on a set of explanatory variables, including zero and negative incomes with the initial sample. Based on predicted outcomes, the negative total non-farm income samples are dropped and these iterations continue by re-estimating the non-farm income until the estimated non-farm income comes to be non-negative (Lanjouw & Shariff 2004).

3.1. Estimating Nonfarm income determinants: CLAD Model.

In the model y_i^* is the latent variable, and observed in the censored regression model.

$$y_i = \begin{cases} y_i^* & (y_i^* > 0) \\ 0 & (y_i^* \leq 0) \end{cases}$$

the latent variable is observed by minimizing the deviations from the median-based variations.

i.e $Med(y_i) = Max(Med(y_i^*), 0)$

According to The Powell (1984) CLAD regression estimation is as follows:

$$y_i^* = X_i' \beta + e_i$$

$$\text{where, } y_i = y_i^* 1(y_i^* > 0)$$

for regression estimates for β is MLE (maximum likelihood estimation) when e_i is independent

of X_i and $N(0, \sigma^2)$ and identifying $X_i' \beta$ as the conditional median of y_i , so $Med(y_i^*/X_i) = X_i' \beta$

Therefore, the Least Absolute Deviation will be then,

$$S_n(\beta) = \sum_{i=1}^n |y_i - \max(0, X_i' \beta)|$$

Or

$$S_n(\beta) = \sum_{i=1}^n (X_i' \beta > 0) |y_i - X_i' \beta|$$

A regression is censored when the recorded data on the dependent variable cuts off outside a certain range with multiple observations at the endpoints of that range. Therefore, when the data are censored, variation in the observed dependent variable will understate the effect of the regressors on the "true" dependent variable. Therefore, censoring is required.

The CLAD estimators of β ,s minimizes the absolute deviations, assuming the conditional medium restrictions on the error term.

y_i = observable response variable

x'_i = dimensional vector of explanatory variables (includes the demographic, economic, and village-specific characteristics).

β = dimensional parameter

Estimator $\hat{\beta}$ which minimizes $S_n(\beta)$ is called the CLAD.

3.2. Inequality Indicators: GINI and Fields Estimation

The simple average percentage method of calculating the Gini is used across income groups. Here Lorenz curve is used for deriving income inequality, where on X-axis shows the cumulating percentage of households and the Y-axis shows the cumulative percentage of household income. If the incomes are completely equal across groups, the Lorenz curve yield a straight line a called perfect equality. The Gini coefficient is derived by calculating the ratio of the area under diagonals to the total area under the curve. It is as follows:

Gini's coefficient = $\{(X_i) * (Y_{i+1})\} - \{(X_{i+1}) * (Y_i)\}$

Were, X_i is cumulative percentage of households

Y_i is cumulative percentage of household income

X_{i+1} is cumulative percentage of household log on

Y_{i+1} is the cumulative percentage of households' income log on

The larger the value of Gini's coefficient or closer to the coefficient value to unity i.e. 1 the greater is inequality.

Fields Decomposition: Regression-based decomposition of inequality allows decomposing the inequalities based on the different socio-economic factors, proposed by (Fields, 2012). We use regression-based decomposition to analyze the contribution of various household and village level characteristics to rural non-farm income inequality. We first model that non-farm income is a function of the socio-economic and demographic factors of the household. Factors' contribution to the total income inequality achieved by calculating the weighted composite variables after estimating the OLS regression parameters,

Where, the regression equation starts with,

$$y = X\beta + \epsilon$$

Where y is $n \times 1$ vector of incomes

X is an $n \times (K+1)$ is a matrix of individual and household characteristics (age, education, gender, households' size, residence, etc.)

β is a $(k+1) \times 1$ vector of coefficients and ϵ is an $n \times 1$ vector of residuals.

A sample of observations $\{y_i, x_i, i = 1, 2 \dots n\}$ are used to estimate the model.

The model starts with the income-generating equation:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + \epsilon_1$$

Contribution of the flow of income from an endowment, x_k , to total inequality:

$$S_k = \frac{\text{cov}(\beta_k x_k, y)}{\sigma_y^2}$$

variance of log of income, σ_y^2 , to measure inequality

S_k is also known as the “factor inequality weight”. The sign of S_k indicates whether the flow from x_k is inequality increasing or decreasing. or the relative contribution of resource k to global inequality is:

$$s^k = \hat{\beta} \left(\sum_{i=1}^n a_i(Y) Y_i^k / (Y) \right)$$

Where, a_i the weight attached to the individual i income component k , Y_i^k . In the regression-based approach, it is assumed that $\hat{Y}_k = X_k \hat{\beta}_k$, X is a vector of sources of income flows, $\hat{\beta}_k$ is the estimated coefficient. The average income shares and income shares for each quartile q are calculated as

$$\hat{\beta}_k \left(\overline{X_k} / \overline{Y} \right) \text{ and } \hat{\beta}_k \sum_{i \in q} X_i^k / \hat{\beta} \sum_{i \in q} X_i^k .$$

The inequality in non-farm income could vary because of differences in the education of the household heads, or land holdings in the household, or the other demography of the household.

4. Empirical Results

Table 1 represents the income diversification patterns of the rural households across different households and spatial characteristics, whereas table 2 reports the determinants of non-farm income based on CLAD estimates for the year 2004-05 and 2011-12. The next section explores the inequality decomposition.

4.1. Income Diversification in the rural households

The average nonfarm incomes of the rural households across groups and their decomposition (shares) are shown. Based on the analysis (Table 1) we find that the average non-farm earnings of households headed by both males and females increased from the period 2004-05 to 2011-12. But if compared to females, the relative growth of incomes experienced to be 24 percent higher for male-headed households. At the same time, the income variation between them, shown by Gini is observed to be decreasing over the period as the relative difference between Gini (inequality) has fallen from .7 to .2 points. Though the growth of incomes of the households is higher, the income gaps between the rural households have widened.

The increasing non-farm incomes are positively correlated with the increasing dependents and results in the increasing Gini from .53 to .59. The Larger households in terms of members motivate the head to diversify into non-farm sources for better livelihood. These income changes in the state's zones have also increased from 2004 to 05 to 2011-12. The northern and southern states experience 35 percent growth of incomes than the eastern and western at 30 percent growth. All four regional zones experience almost similar shares but the income variations between the

households at regional levels are increased. Households from the background of lower castes and lower education levels are experiencing lesser income share than the better-off classes.

Table1: Non-farm income diversification and Inequality in rural India: Gini Index

Variables	Average Income (per year) (2004-05)	Average Income (per year) (2011-12)	Income growth	Gini (2004-05)	Gini (2011-12)
Gender of the household head					
Male	36299 (57)	87112 (62)	70	0.53	0.59
Female	27905 (43)	53825 (38)	46	0.60	0.61
No. of dependents in the family (Family Size)					
one	56829 (17)	26514 (19)	-13	0.55	0.60
Two	88748 (27)	37364 (27)	-14	0.51	0.58
Three	82610 (25)	34453 (25)	-15	0.52	0.58
Four & above	100104 (30)	38841 (28)	-15	0.53	0.59
State Zones					
Northern	34041 (24)	81830 (25)	35	0.56	0.61
Eastern	38278 (27)	84205 (26)	30	0.56	0.59
Western	37716 (26)	83615 (25)	30	0.50	0.56
Southern	33068 (23)	79507 (24)	35	0.49	0.58
Level of education of the household head					
literate	11114 (6)	23987 (6)	29	0.44	0.55
Primary	16846 (9)	36586 (9)	29	0.49	0.52
Secondary	29459 (16)	59895 (15)	26	0.48	0.51
Higher Secondary	44649 (24)	95463 (24)	28	0.49	0.57
Graduated & above	87650 (46)	183911 (46)	27	0.48	0.56
Landholding Classes of the household					
Landless	47408 (35)	108569 (28)	22	0.51	0.54
Marginal	18377 (14)	44325 (12)	24	0.56	0.61
Small	15853 (12)	39348 (10)	25	0.58	0.66
Semi Medium	15613 (12)	42707 (11)	29	0.60	0.65
Medium	16779 (12)	49654 (13)	33	0.52	0.64
Large	20853 (15)	100092 (26)	63	0.41	0.70
Caste of the Household					
Brahmin & Forward	49011 (38)	110087 (36)	31	0.50	0.58
OBC	30864 (24)	71775 (23)	33	0.53	0.59
SC	29029 (22)	69814 (23)	35	0.52	0.55
ST	21291 (16)	54906 (18)	39	0.58	0.66

Note: Zones classification is based on dividing states into four geographical zones.

The less educated or illiterate households only earn 6 percent non-farm income, whereas these income shares increase with the higher levels of education from primary, secondary to higher secondary and above by 9, 16, 24, and 46 percent respectively in both years. The income variation (Gini) in the study periods increases with the increasing income shares.

Landless households participate more and earn 35 to 28 percent from the non-farm sector. Whereas the households with marginal and small landholdings, semi medium and large participate and earn 12 to 14 percent. The growth of earning is observed higher for semi medium, medium, and large landholding as earnings are increased in 2011-12. Over time, these income differences based on landholding have widened, whereas these shares have shortened and favored the higher landholding classes, such as large and medium. In consequence, these income changes increased the (Gini) income variation for medium and large landholding classes from .52 to .64 and .41 to .70. Only marginal differences are observed for other land classes. It also points out that the differences in incomes (higher income shares) favor the landholding class compared to land-less or lesser land holding, and gaps increases with collateral. In landholding classes, income growth is higher since earnings are used to finance further investments in business or agriculture.

Also, Brahmins & forward caste families have higher income shares than OBC, (Scheduled Caste (SC), and Scheduled Tribes (ST) households over time, but rising non-farm incomes growth is higher for SC and ST households than for OBC households. The income variation within the households is higher for Brahmin and ST households. 08 percent. We could conclude that lower castes groups participate more in non-farm incomes, but the income inequality between the households is still prevalent.

Overall, the non-farm income changes from 2004 to 05 to 2011/12 are observed more in favor of better-off households, such as having more landholding, education, and male-headed households. However, the detailed analysis has explored after examining the determinants and inequality effects in the next section.

4.2.Rural Non-Farm Earning: Determinants

For non-farm income determinants analysis, we have estimated and compared two models separately for 2004-05 and 2011-12 (Table 2). After regressing the CLAD model, we found a similar result for both periods. Only the magnitude of the correlation between factors varies. In contrast, the direction and sign remain the same in the estimation. After controlling for other household's characteristics, female-headed households earn 82¹% less per year than male-headed households. Though the relative income shares variations between the males and females reduced, the non-farm income for females is still less. Only a single reason could not affect these reduced incomes but by many other factors too.

First, it is reasonable to assume that the females are participating less or their expected number of hours employed in the non-farm incomes is lesser than the males. Therefore, the household's earnings sometimes depend on how they are engaged in activities other than farming in the rural areas. We also observed that the females participate more in agricultural wage activities compared to the casual wages, regular and own farm self- business activities in the non-farm sector. It is supported by literature as well. Secondly, lesser incomes earned by the females in the

¹ We interpret a coefficient c multiplying a dummy variable as a percent change in the endogenous variable only as long as c is close to zero. For larger values, in absolute terms, it gave the percent change in the endogenous variable by $100[\exp(c)-1]$.

non-farm sector in response to the wages received by their participation are more diminutive than males and therefore earn less.

Table 2: Determinants of (Log) Non-farm Income (yearly): CLAD Model

Estimates	2004-05			2011-12		
	Coefficient	(standard Error)	P>t	Coefficient	(standard Error)	P>t
Log of Non-Farm Income						
Gender of the head	-1.7295	(0.4507)	0.000	-1.7879	(0.3508)	0.000
age	0.0832	(0.0177)	0.000	0.1905	(0.0218)	0.000
age squared	-0.001	(0.0002)	0.000	-0.0022	(0.0003)	0.000
Primary education	0.4916	(0.1688)	0.004	0.731	(0.1062)	0.000
Secondary education	1.192	(0.1673)	0.000	1.1312	(0.0958)	0.000
higher secondary	1.8845	(0.2193)	0.000	1.5058	(0.1193)	0.000
graduate and above	2.8234	(0.246)	0.000	2.3655	(0.1295)	0.000
OBC	-0.0139	(0.0573)	0.808	0.2103	(0.0825)	0.011
SC	-0.0418	(0.0905)	0.644	0.392	(0.0769)	0.000
ST	0.3566	(0.109)	0.001	0.3784	(0.0989)	0.000
Household size	0.2103	(0.0194)	0.000	0.287	(0.0164)	0.000
marginal	-1.7782	(0.153)	0.000	-1.1703	(0.0726)	0.000
small	-7.4112	(0.5058)	0.000	-2.4869	(0.1816)	0.000
semi medium	-8.4477	(0.2452)	0.000	-6.0098	(1.1084)	0.000
medium	-8.6609	(0.3223)	0.000	-8.3632	(0.3276)	0.000
large	-8.1058	(0.6012)	0.000	-6.3851	(2.4006)	0.008
population density	-1.0514	(0.1917)	0.000	-0.8085	(0.1495)	0.000
village yield	-0.0000598	(0.0000384)	0.119	-0.0000001	(0.000001)	0.9440
eastern zone	-0.0353	(0.0513)	0.491	0.0393	(0.0562)	0.485
western zone	-0.2159	(0.0896)	0.016	-1.2798	(0.1908)	0.000
southern zone	-1.0584	(0.157)	0.000	-0.1129	(0.0831)	0.174
constant	6.387	(0.5278)	0.000	4.4725	(0.5061)	0.000
observations						
Pseudo R	1.79			1.71		

Note: the gender, age, and education level are characteristics of the household Head, whereas other variables are characteristics of the household.

Nevertheless, in 2011-12, the analyzed earnings with their participation of these female-headed household heads are increased by at least 1 percent and satisfy the marginally decreased income variation, but is significant and therefore could be the better signal for prospected earnings of women in future. The age of the household's head is also an indicator of the increased earning as the experience in the activities results in paying better over time. Non-farm earning of the rural household head increases with age as a person starts mastering the work performed and earns more over time. The increasing incomes were 8.7 % in 2004/05 to 21% in 2011/12. These earning also start falling after a particular age, say after 20 years.

The association between non-farm earnings and education has always been significant and supported by literature as well. The association between the non-farm earnings and education is significant after controlling for other factors of the household head. Households with at least primary education expected to earn 63% in 2004 and have increased five times in 2011-12. These earnings increase by 100 times with a rise in every level of education. While these earnings are

reduced by 20% for secondary and higher secondary education, they increase by multi-fold for graduate and above education. Having education at the graduate and above level earns higher earnings than the lower levels of education in 2004-05 but reduces to nine-fold in 2011-12.

Also, the SC and ST households are significantly engaged in non-farm earnings in both periods. SC households earn almost 48 percent higher income than the Brahmins, as they high engaged in casual wage non-farm activities in 2011-12. Whereas the ST households earlier earning 42 percent in 2004-05 and increased to 46 percent in 2011-12. It shows the better non-farm opportunities for the lower caste groups in 2004/05 to 2011-12. If explored in types of non-farm activities performed by them, could give a clear picture if increased earnings.

Increasing households' size is significantly associated with increasing non-farm earnings. With every additional member in the rural households, they are pressuring as well as motivating the household head to participate and earn 23% more income from the non-farm activities in 2004-05. It had also increased by 10% in 2011-12.

We analyzed that the rural households with no land or landless are more likely to participate in the non-farm sector. The probabilities of non-farm earning decrease with increasing landholding size (to marginal, small and medium, and large landholdings). With every falling land holding category, the participation of the rural households in terms of income falls to 99%. Almost the same for every landholding category compared to landless households in both periods. We could say that the landholding classes stay motivated toward farming. Their income shares in non-farm income are relatively less or marginal compared to landless, those dependent on the non-farm sector.

Other village-level characteristics are also showing the non-farm sector determinants in our analysis. The population density is the population pressure on the village land. Increasing population density would create more demand and, therefore, motivate rural households to take part and create more opportunities. We also see it as the increased linkages between agriculture and non-agriculture. Nevertheless, the population pressure acts as a push factor to migrate to the urban center. In our analysis, we found decreasing no-farm earnings with increasing population density. This effect was 65 percent in 2004-05 but reduced to 55% in 2011-12. Increasing the population density might create a competitive environment in participating in non-farm activities and thus at reduced earnings.

Village yield, defined as the total village output produced on the entire village cultivated land, is not significant in our study. In our analysis of non-farm estimates of income for zones, we found that, compared to rural households in northern states, households in western and southern states earned lower earnings in 2004-05, whereas in 2011-12, rural households in western states earned less than northern states.

4.3. Non-farm sector Inequality Decomposition

After decomposing the total non-farm income inequality into the various households and village level characteristics (Table 3), we find that inequalities among the rural households coming from factors such as levels of education, landholding, and population pressure on the land observed to be decreasing from 2004 to 05 to 2011-12.

We witnessed that education is significantly and positively associated with increasing non-farm incomes. Consequently, when the total inequality decomposes, education's contribution to inequality is reduced by 10% in 2011/12. Perhaps there might be an increasing income variation because of the limited jobs available for the rural households, or these jobs may be only limited to the lower levels of education, such as in construction and manufacturing and casual wage work.

Every additional member in the rural household motivates them to participate and earn more in the non-farm sector; therefore, the incomes increase by 10% over seven years. Whereas the inequality based on it increased in 2011-12. Perhaps increased participation and earnings were more in favor of already established rural households and therefore could exploit opportunities compared to less advantageous households and result in increased inequalities.

The importance of land in contribution to inequality has decreased by 11% from 2004 to 05 to 2011-12. Earlier landless rural households were restricted to agricultural labor only but are now moving forward by participating in more and more non-farm activities, such as casual wage labor and own farm non-farm enterprises. The variations in non-farm income between landless households and land acquiring households are reduced. Therefore, the importance of land over time has decreased in bringing non-farm income sources. Landholdings act as collateral, but it might not restrict the type of activities performed by the rural households in the non-farm sector, which might be the other factors.

Table 4: Field inequality decomposition: socio-economic and demographic factors' contribution to the total inequality

Fields	Fields Decomposition of inequality based on household's characteristics	
	2004-05	2011-12
Female	3.39	9.30
Age (of head)	1.25	6.51
Education of the head	23.67	13.99
Caste	4.42	2.29
Household Size	7.28	15.89
Landholdings	38.29	27.37
population Density	7.26	2.62
Village Yield	-0.05	0.00
State Zones	14.50	22.02
Total	100.00	100.00

In the same case, the village density, which helps the households to compete more and more for participating in the non-farm activities, ends up lower with incomes, leads to a falling inequality effect by 4.5 percent over two periods. The contribution of other factors (such as gender, age, caste, and state zone) has increasing inequality effects. We found that the village yield has no visible effect in both periods. The inequality contribution of the state-zones to the inequality has increased by 10 percent.

5. Conclusion

Overall, based on the analysis, we found that education supports the non-farm earnings significantly. The gap between the average non-farm earnings among the rural households with a higher level of education has increased. The inequality derives from education has reduced by 10% from 2004-05 to 2011-12. However, the participation of rural households depends upon the activities that are available to them at varying levels of education to support their earnings. The non-farm sector is highly heterogeneous as it varies from small and petty activities to higher-skilled non-farm activities. These activities could advance to better-paying options if matched with desired levels of education, and could also refrain the rural households too if not matched with subsequent education requirements. Caste-based decomposition and income inequality show the improving situations of Scheduled caste (SC) & Scheduled Tribe (ST) households in augmenting NF incomes. Earnings of SC & ST households have increased to 42% and resulting in a fall in inequality by 2% in 2011-12. We also found inequalities based on landholding and population density declined in 2011-12 by 11% and 5% respectively. Land-less households are motivated toward participating in non-farm activities.

The gender gap is observed to be widened, as earnings were found to be biased towards male-headed -households, accounting for 6 percent inequality stemming from gender. Although rural households earn differently depending on their scope and opportunities available across all the states, these spatial differences (state zones) significantly affect the earnings and are increased by 8% in 2011-12 (fields decomposition). Overall, education, landholding, and population density contribute to decreasing inequality whereas other factors such as gender, age, household size, and geographical differences increase the inequality.

The growth of the rural non-farm sector could replace the ongoing “migration” to the urban center, lower agriculture efficiency, and disguised unemployment in the rural sector. Thus, supporting the localization of rural non-farm activities and providing opportunities to the less advantaged households could lead to a reduction in inequalities and better living conditions in the long run.

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