Impact of Migration on Rural Inequalities: Evidence from India

ABSTRACT

Research on migration in India has been hampered by the lack of data as well as the clarity of definitions used for the process of migration. In this paper, we try to understand whether long-term and short-term migration are driven with similar kind of forces, and do they have a similar effect on inequalities in source areas? How does public employment opportunities in origin affect these processes? For the purpose, we used two waves of Indian Human Development Survey, a nationally representative panel survey of households. The findings suggest that long-term and short-term migration are driven by different factors and so should be studied interchangeably. Short-term migration is the survival strategy adopted by households from less educated and economically weak background. On the contrary, long-term migration is more common in richer and more educated households. The results also suggest that income from these types of migration have a different impact on rural inequalities. Using Heckman selection model, we found that where households remittances from long-term migrants tend to heighten rural disparities, seasonal migration equalizes it.

1. INTRODUCTION

Balanced regional development has been a priority in Indian policy agenda since economic reforms of 1991 when opening up the economy for competition from abroad raised fears for the development of already favoured regions. The concern was first made in the Mid-term appraisal of Ninth Plan (2002-07) published in 2000. The thrust towards addressing regional inequalities gained momentum in the 11th and 12th five-year plans, wherein the plan documents contain a separate chapter addressing issues concerning regional inequalities (GOI, 2008, pp. 137-164; 2013, pp. 302-336). The issue attracted academicians and researchers as well to investigate the inequalities in the country and the studies have consensus that these inequalities have increased during the reform period (Chauhan, Mohanty, Subramanian, Parida, & Padhi, 2016; Dev & Ravi, 2007; Sen & Himanshu, 2004; Thorat & Dubey, 2012).Some studies suggest that the increase in inequality is caused by a sharp increase in rural inequalities during

the post-reform period. (Sen & Himanshu, 2004). One reason for such increasing disparity has been the role of remittances or the rural to urban migration (Rao & Finnoff, 2015).

The role of migration in rural inequality is particularly noteworthy. It is motivated by the fact that in the past two to three decades, where permanent migration has traditionally been low than the other developing countries (Munshi & Rosenzweig, 2016), there has been a significant rise in seasonal/short-term migration (Bird & Deshingkar, 2013) .Various push and pull factors have contributed to this trend in the last few decades. Prevalence of extreme hunger and poverty, lack of employment opportunities, rising rural-urban wage gap, fragmentation of rural landholdings and assets, farm mechanization leading to labour-substituting methods of cultivation, debt trap, etc. have substantially increased risk and uncertainty for rural households (de Haan, 2017; Nayyar, 2018; Panda & Mishra, 2018). As a result, there has been a gradual transition in rural areas, with individuals and households becoming occupationally diverse and spatially mobile, reinforcing the phenomenon of rural out-migration (Agrawal & Chandrashekhar, 2015; Keshari & Bhagat, 2010; Kone *et al*., 2018; Shah *et al.*, 2018).

Such mobility has however posed significant challenges to the policymakers. On the one hand, at household level, migration usually improves income and well beings (Arjan de Haan, 2013). On the other hand, such mobility can result in worsening inequalities within origin areas, when better off people migrate for more rewarding opportunities. The impact of migration on inequality depends upon the initial position and of the migrant household in the spectrum and also the nature of usage of the income earned. According to the Borjas (1987) classification, if the households are negatively selected, i.e. poorer households migrate, it might have positive or negative effect on the income distribution. In one case, when migrants use the remittances for investments and savings, it will rise their well- being the hence the equality(J. Adams & Richard, 1998; R. H. Adams & Page, 2005). On the other case, if the migrants became dependent on the migrant remittance and spend the income on consumption, it might make them more vulnerable and increase the inequality levels (Rubenstein, 1992). On the other hand, if the migrants are positively selected (Chiswick, 1999; Jasso & Rosenzweig, 1990), i.e. richer households migrate, the inequality increases due to more income earned by the already richer households (Acosta, Calderón, Fajnzylber, & Lopez, 2008; R. H. J. Adams, 1989; Barham & Boucher, 1998).

For this, the relatively sparse literature in India shows positive and negative impact of migration upon inequality depending upon the duration of migration considered. One set of evidence suggests that migration has worsened inequality in the rural areas due to higher remittances in the richer households (A. de Haan & Dubey, 2006; Joe, Samaiyar, & Mishra, 2009; Oberai & Singh, 1980; Vakulabharanam & Motiram, 2016). Other studies show that seasonal migration has helped poor people to overcome poverty and reducing inequalities in the origin (Deshingkar, 2010; Rogaly et al., 2001).

It is in the above context that this paper contributes to the literature in the following ways. *First,* we examine the impact of rural out-migration based on a large scale nationally representative Indian Human Development Survey-2 (IHDS-2) dataset. The advantage of using IHDS data is that it provides information for both consumption and income of the households. Income inequality is found to be larger than the that of consumption, comparing both is important (Azam, 2017). We have compared the effect of migration on income inequality as well as consumption inequality. *Second,* we investigate the effect of seasonal and permanent migration separately on rural inequalities. Unlike the existing studies, which give different results depending upon the duration of migration considered. Again, IHDS-2 provides information for seasonal migration as well which National Sample Survey (NSS) data is unable to capture. *Third,* in Indian literature, our study is first to deal with endogeneity and use contrafactual models to study the effect of migration on inequality in India. The need for this has been well established in migration literature but somehow not incorporated in India.

Our study throws up several interesting findings. First, we found significant difference between the Gini coefficient of consumption and income for rural India which justifies our approach for the study. Further, using contrafactual consumption and income estimates, we found that within group inequality has reduced in seasonal migrant households due to migration while the within-group inequality in permanent migrants has increased drastically. The same is true for both consumption and income inequalities. For overall inequality, we found that due to both seasonal and permanent migration, income inequality in the origin areas increases, however, consumption inequality reduces. The findings suggest positive impact of migration on rural income distribution in the way that, the income earned is used for investment purposes rather than consumption purposes. Thus, our study enhances the previous works in many ways and draws several important policy imperatives.

The rest of the paper is as follows. Section 2 provides a review of the extant literature and discusses how our study attempts to address the identified gaps in the literature. Section 3 describes the variables considered in our analysis and the data sources. Section 4 explains the econometric model and methodology adopted in our study. Section 5 reports the results obtained from the econometric analysis. The concluding section discusses the key findings and the policy imperatives arising from this study.

2. RELATED LITERATURE

The impact of rural out-migration on income distribution is critical and central to the relationship of economic growth and given the fact that developing countries have a larger proportion of rural population, rural income inequalities play a major role in total inequality. While the theoretical and empirical literature on distributional impacts of migration and remittances are rich, the findings are ambiguous and sometimes contrasting. Empirical literature investigating migration-inequality relationship can be divided into three categories based on the approach they adopted (Table 1).

First, studies which have checked for impact of remittances across cross-country samples. All these studies have used regression estimates to measure the impact of international remittances on inequalities in origin countries and most of these studies have found an equalising impact of remittances over time. Koechlin and Leon (2007) examined the impact of international remittances on inequality for 78 countries. They found an inverse U relationship between remittances and inequalities i.e inequalities increases initially with an increase in remittances and then it declines. Acosta et al. (2008) uses 10 Latin American and Caribbean countries in a panel dataset framework and conclude that international remittances have increased income growth and reduced inequality and poverty. One other recent study on 18 Latin American countries (Vacaflores, 2018) also finds reduced poverty and inequality during 2000-2013 due to international remittance transfer. Again doing a cross-national analysis for sub-Saharan Africa, Akobeng (2016) and for 33 African countries, Anyanwu (2011) finds that international remittances have an equalising impact on income distribution while impact on poverty depends upon the definition of poverty.

The comparison across countries can be substantially uninformative for drawing national policies, there are some studies which look at one specific country and we have divided these studies into second and third set of literature.

Second set of studies are those which took one country as sample and have considered remittances as exogeneous transfers and does not include the opportunity cost of migration (Oded Stark, Taylor, & Yitzhaki, 1986; Qded. Stark, 1980). This approach was used in most of the studies (Lipton, 1980; Oded. Stark & Yitzhaki, 1982; Qded Stark, 1980). These studies estimated Gini coefficient for migrating and non-migrating households. Stark *et.al*. (1986) used decomposition of Gini coefficient to estimate the share of remittances in inequality. Jones (1998) finds that inter family inequality in a village is conditional upon the duration of migration. It first decreases and then starts increasing with the migration experiences. Wouterse (2010) investigated for Burkina Faso, employing Gini coefficient and concentration index, and found that intra-African remittances tend to reduce inequality in the country while intra-continental remittances perpetuate it. Using GMM framework, Ha *et al.* (2016) points out that where contemporary migration increases inequality, migration in previous year reduces it significantly in source villages. Bang, Mitra, and Wunnava (2016) used instrumental quintile regression to estimate impact of remittances on income inequality in Kenya. They found that remittances increase household's consumption expenditure significantly and this increase is greatest in case of poorest households. Thus, they conclude that remittances equalise income. The approach though helps policy makers to draw inferences about the income distribution associated with remittances, it assumes income to be exogenous. Ha, Yi, Yuan, and Zhang (2016)

The third set of studies are based on the approach introduced by R. H. Adams (1993). He, in his work, criticized the earlier approach for assuming zero opportunity cost of migration. By constructing a contrafactual income scenario, he finds that remittances have a negative impact on inequality in rural Egypt. Extending the Adam's contrafactual model, Barham and Boucher (1998) proposed selection control model to deal with the endogeneity problem involved in the original migration decision. For Nicaragua, they find an increased income inequality resulting from remittances and migration on income inequality as compared to the no migrant contrafactual case. Taylor and Wyatt (1996) did not use contrafactual scenario but they controlled for endogeneity with restricted regression approach, and found equalising impact of remittance in Mexico households. They also pointed out that the impact of remittances differs according to the initial wealth distribution among the households. Focussing on internal rural to urban migration Zhu and Luo (2010) have tried to advance the method proposed by Barham and Boucher (1998) by taking into account the unobserved error term in calculating contrafactual income. They argued that migration participation reduces inequality

and poverty in the sending areas. Using the same approach, Beyene (2014) estimates impact of international remittances on poverty and inequality in urban areas of Ethiopia. He finds that while poverty has significantly reduced as a result of receiving remittances, inequality did not change. Howell (2017) has also used contrafactual approach for investigating impact of remittances in China. He finds an overall decline in spatial inequality due to remittances, but between ethnic group inequality increases due to remittances. Nguyen, Van den Berg, and Lensink (2011) used difference-in-differences technique and also finds a slight decrease in inequality due to migration in case of Vietnam.

Most of the studies reviewed above have focussed on flow of international remittances and there is very little information on internal remittances although they are much likely to be larger because of larger number of people involved especially in countries like India. However, in India, though some attempts have been made to connect migration and inequality, studies based on the use of household survey data tends to be particularly limited (A. de Haan, 2011). Lipton (1980) points out that migration causes intra rural and rural-urban inequalities because of the historical policy bias towards urban development. Similarly, Oberai and Singh (1980) in Punjab households, finds remittances widening the gap between the rich and the poor. Surveying one state, West Bengal, Rogaly et al. (2001) finds that seasonal migration helps lowering inequality in the source areas. In opposite, Vakulabharanam and Motiram (2016) stated that migrants have performed well in the post liberalization era but it has led to heightening of inequality. Using NSS 1999-00 survey, A. de Haan and Dubey (2006) calculated the Gini coefficient of consumption expenditure among Migrant and non-migrant households and showed that inequality is higher among migrants than the non-migrants households. Joe et al. (2009) in their study, calculated the net gain of rural to urban migration based on the probability of migrant and non-migrant in different income quintiles. Their results show that migrants have a much lower probability of being in the lower quintiles than the non-migrant population in the source areas. One study by John (2016), for one Indian state Kerala, concludes that migration generates inequalities between households.

Apart from the very few scholarly works examine the impact of migration on rural inequality, the extant studies have some significant limitation which needs to be explored further. First, none of the Indian study adopted contrafactual approach or dealt with endogeneity problem in migration decision, the importance of which is highlighted in international literature. Second, there exists considerable ambiguity in the definition of migration. All the studies, we surveyed do not distinguish between the impact of long term and

short-term migration. In developing countries, circular or short-term migration is found to be an increasing phenomenon in poorer sections of the society as it does not involve fixed cost of migration e.g. settling down in the destinations. Thus, being an important livelihood strategy of the poor, it has better potential to improve income inequality in villages.

Our study addresses the above limitations by assessing the impact of migration on rural inequality using a nationally representative large-scale survey data conducted in 2011. It thus, allows us to capture the effect across all states as contrast to the other studies which investigated for one particular state or some districts in India. Departing from the earlier approaches, for better insights, we used contrafactual/ simulated income scenario to predict inequality in case of absence of migration. Further, unlike any other study, we test for the effects of both, short-term and long-term migration on income inequality in the source areas.

3. DATA AND VARIABLES

The empirics of the current study are based on the Indian Human Development Survey (IHDS) data. IHDS is a collaborative research project of the University of Maryland, USA and National Council of Applied Economic Research (NCAER), India. It is a nationally representative survey covering 41,554 households spread covering all the states and union territories (barring Andaman, Nicobar and Lakshadweep islands) encompassing 1503 villages and 971 urban neighbourhoods in 276 towns and cities (Desai et al., 2010, pp. 213-214). The first round of the survey (IHDS-I) was completed in 2004-05. In the second round (IHDS-II), each of these households (as well as any split households) were re-interviewed with a re-contact rate of 84 per cent. IHDS-II covers 42,152 households in 1,503 villages and 971 urban neighbourhoods across India.

IHDS-II (unlike its predecessor IHDS-I) provides a unique opportunity for assessing the impact of migration decisions on rural income inequality as it contains additional information on seasonal migration. Since our study concerns inequalities in the source areas only, we have used data of 27,579 rural households provided in IHDS-II. The primary sampling unit (PSU) is a village, as per the sample considered in this study.

The advantage of using IHDS data is that it provides estimates for both consumption as well as income. Most statistics of inequality in India are based on consumption expenditures.

Income is not usually measured in surveys of developing countries and rarely in India. However, consumption expenditures measured in surveys have their own set of issues like respondent fatigue and volatility. Desai et al. (2010, p. 21) argues that it is important to track income inequality over time since as incomes rise, income inequality may witness higher growth than consumption inequality.

3.1 Variables description

Names and definitions of the variables used in the estimation process are reported in Table 1. Determinants of migration and income/consumption levels are identified on the basis of systematic review of literature (Imbert & Papp, 2014; Mberu, 2005; Munshi & Rosenzweig, 2016) These variables include demography, social and economic factors. In demography, we have used number of dependents and number of workers in the family. Dependents play the role of safeguarding the household's right to land by supplying a minimum amount of farm labour and hence facilitating the exit of labour. Number of workers are defined as number of members employed in any work. Educational factors have also been controlled for. People with higher levels of education are expected to migrate more for long-term rather than for seasonal work. For economic determinants, the main source of income and land size owned by the household have been used.

The instruments we use to control for endogeneity are village characteristics. We have used proximity from basic public services and remoteness of the village from transportation system. Both of these variables are expected to increase migration from rural areas.

4. ECONOMETRIC STRATEGY

To analyse how migration decision impacts inequality, following Barham and Boucher (1998), we adopt a three-step procedure. First, we estimate household income and consumption equations from the observed values. Second, we estimate household income and consumption in the absence of migration i.e. we estimate counterfactual income and consumption equations in the hypothetical case of no migration. Third, we compare inequality measures in counterfactual and actual cases. As indicated earlier, the counterfactual approach, by viewing remittances as a substitute for home earnings, takes into consideration the full opportunity cost of migration. This approach is particularly relevant for developing countries, wherein migration

is mostly a family decision (as opposed to individual decision). Households send their members outside in the expectation of receiving remittances later (Beyene, 2014).

For constructing the contrafactual income/consumption for the remittance receiving households, the following income/consumption equation is estimated using information from the non-remittance receiving households only:

$$logY_i = \alpha_1 + \beta_1 X_i + \beta_2 H_i + u_{1i} \quad (1)$$

Where Y_i represents the per capita income/consumption of the households; $\vec{X}_i$ is the vector of socio-economic factors determining the income/consumption like land size, caste, education levels; and $\vec{H}_i$ is vector of household factors like number of workers and number of dependents in the household.

At this juncture, it is worthwhile to mention that if remittance receiving households are drawn randomly from the population, there will not be any selection bias and income/consumption equation can be estimated using the OLS method as was done by R. H. J. Adams (1989). However, when there is a possibility of self-selection (i.e. when systematic differences between migrant and non-migrant households apply), OLS estimation will lead to biased and inconsistent estimates (Beyene, 2014). For obtaining consistent estimates, the standard two-step Heckman (1979) selection model is employed. In the first stage, the probability of not receiving remittance is estimated using probit model. In the second stage, the estimates from the probit model are used to calculate the contrafactual income/consumption for the remittance receiving households. The selection model may be specified as:

$$M_i = \alpha_2 + \gamma_1 X_i + \gamma_2 H_i + \theta Z_i + u_{2i} \quad (2)$$

Where M_i represent the propensity of being in the non-migrant group; Z_i represents the vector of variables which affect migration decision but not the income/ consumption equation (village characteristics in our case); and u_{2i} represents the disturbance term.

Y_i is observed only for those households who do not have any migrant member in the family or for whom $M_i = 0$. The error terms of Equations (1) and (2) follow a bivariate normal

distribution. This distributional assumption on the error terms, conditional on migrant household implies:

$$E(logY_i|M_i) = \alpha_1 + \beta_1 X_i + \delta_i \lambda_i \quad (3)$$

Where λ_i is the selection inverse Mill's ratio. It is a monotinc decreasing function of the probability that an observation is selected into the sample and is specified as:

$$\lambda_i = \frac{\varphi(\alpha_2 + \gamma_1 X_i + \gamma_2 H_i + \theta Z_i}{\Phi(\alpha_2 + \gamma_1 X_i + \gamma_2 H_i + \theta Z_i)} \quad (4)$$

Here, φ and Φ are the density and the cumulative normal functions respectively. If δ in Equation (3) is equal to 0, the OLS estimates will give consistent estimates. But, if $\delta \neq 0$, OLS will give biased results. To include the selection term in consumption/income equation, λ_i is estimated from the first stage Probit regression of no-migration probability and included in the second stage regression. Thus, the equation to be estimated in the second stage becomes:

$$logY_i = \alpha_1 + \beta_1 X_i + \beta_2 H_i + \delta_i \lambda_i + V_i; \text{ where } E(V_i|X_i, H_i, \lambda_i) = 0 \quad (5)$$

(5)

Having simulated the income from migrant households, the inequality estimates for migrant and non-migrant households can be compared. First, we calculated Gini index for observed income $G(y_i)$ and that of simulated income $G(y_{0i})$.

5. RESULTS AND DISCUSSION

The empirical results are presented in two parts. First, the participation in migration and income equation is estimated to identify the factors affecting participation in migration and per capita income, the coefficients of which are used to simulate the income in contrafactual scenario of without migration. Second, the study compares Gini coefficients to examine the effects of migration on income distribution.

5.1 *Summary statistics*

Descriptive statistics for variables used in the analysis for all households are depicted in Table 1. Out of total 27,579 households, 8.66 % have seasonal migrant and about 26% have at least

one non-resident member in the family. Consumption and Income figures are similar showing consistency in IHDS estimates of economic status of the households. IHDS-2 have a higher proportion of scheduled caste households in their survey than the Census (Desai *et al*., 2012) and that is reflected in our table as well. But these samples are comparable to NSS and NFHS as those surveys also have a slightly higher representation of scheduled caste and scheduled tribe households. The sample also shows that rural population majorly (37%) earns income from cultivation as the primary source followed by non-agricultural labour households. At educational front, we observed that 22% household still lacks in any formal education.

Mean comparisons for all the continuous variables separately for household with seasonal migrants and households with permanent migrants are exhibited in Table 2. Figures depicts that households with non-resident member (permanent migration) are comparatively richer than the households with no migrant member as income, consumption and land size are significantly higher in households with permanent migrant member. These households also have smaller family size indicated by the average number of workers per household being 1.82 as compared to the non-migrant household which is 2.08; and the number of dependents in the households are 1.94 as compared to 2.02 in non-migrant households.

In contrast, in seasonal migrant households, average per capita income of households is significantly lower (₹13,473) than households without seasonal migrants (₹33,350). This holds true for all the economic variables i.e. consumption, per capita remittances and size of land owned validating our prior understanding that seasonal migrants come from the economically weaker section of the society. Also, these households have larger family size as both number of people involved in jobs and number of dependents are higher in these households.

One common characteristic for both these household is that, these households are located remotely and far from public services which can be one reason for them to migrate.

5.2 Determinants of participation in migration and income

Table 3 reports the estimates of the determinants for participation in seasonal and permanent migration using Probit models. We found that most of the socio-economic variables hold opposite signs for seasonal and permanent migration decisions.

We found age of the household head to be a significant determinant of migration decisions. The households with older age head have more probability of sending migrants for permanent

work. The reason behind this kind of relationship is obvious. People migrate for permanent job leaving the elder population behind who can take care of the land or other properties in the origin. Generally, these households consist of elder parents who receive remittances from the children residing outside. On the contrary, this type of households does not migrate for seasonal work because seasonal migration is often a strategy of young agricultural or non- agricultural labourer who do not find job in the village during lean season or wages are lower temporarily in the village.

Where, households from backward and schedule castes are more likely to have a short-term migrant member, schedule tribes are least likely to have a permanent migrant member. The relationship confirms the previous hypothesis that seasonal migration is concentrated among the more vulnerable section of the society which is generally deprived of long-term migration due to the higher cost involved in that.

Similarly, agricultural and non-agricultural labourer are more likely to migrate for short-term during lean season or when there is temporary unavailability of work in the source areas. Households with salary and other sources as main source of income have the most likely to have permanent migrant member. And, these households have less propensity for migrate for a longer duration. We also find land size to be an important determinant of migration pattern. Shortage of land motivates workers to migrate for seasonal work whereas households with bigger size of land have more permanent migrants.

Further, the location and availability of the basic amenities in the village also matters for migration decision. It is hypothesized that if a village is far away from the transport system, there will be difficulty in commuting to work on a daily basis, which should lead to an increase in both seasonal and long-term migration. We found an expected result for this hypothesis. Remoteness of the village increases permanent migration whereas it doesn't affect seasonal migration. The reason is that, if the village is remote, people do not wish to come back easily and settle down in the destinations. Whereas, availability of services in the village affects seasonal migration. If the village is developed, e.g. markets, banks etc., workers can get job temporarily in their origin which becomes difficult in case of lack of these amenities. In that case, migrants go outside the village in lean season.

5.3 Consumption and Income equations

Consumption and income equations coefficients are reported in Table 4. First thing to look in the estimated consumption and equation is the significance of inverse Mill's ratio. We found

that for both the models, consumption and income, the inverse Mill's ratio is significant. This means the errors of the two equations are correlated with each other. The same can be inferred from the significance of Wald test of independent equations as well. For which, the null hypothesis is that the two equations are independent, which we did not find in any case.

Almost all the household level variables have significant effect. Age of the household is important for consumption levels. An additional year is associated with 3% higher consumption per capita in household selected without non-resident member and 0.8% in households selected without seasonal migrants. The coefficient for squared of the age is not significant in most cases, but negative shows that consumption increases with age but at a decreasing rate. We also observed that, being a household from schedule tribe household drops consumption and income by almost 30% as compared to households from General category. Number of dependents in the households also affect consumption and income levels. One additional dependent member in the family reduces consumption by 13-14% and similarly income by 14-15%. Education levels also improves the economic well being of households by increasing both consumption and income levels. The marginal impact of educational levels increasing with additional years of schooling. For example, having higher education till higher secondary increases consumption by 11-13% and income by 14-20%, whereas having graduation or above education increases this by 35-38% and 36-45% respectively.

This consumption and inequation equation estimates (Table 4) have been used to simulate contrafactual consumption and income for households with migrants in a hypothetical case of no migration. This process is done separately for households with seasonal migrants and households with permanent migrants. As in the estimation of the selection equation, household level variables are adjusted to include the migrants.

5.4 Effects on Inequality

Table 5 compares Gini coefficients in absence of migration and in the presence of migration. First of all, we can notice that there is substantial difference between inequality estimates of income and consumption. Much of the discussion regarding inequality in India has been focussed consumption-based inequality. Consumption Gini for 2011 is 0.39 which positions India into moderate inequality countries but this is not true for income-based measure. This difference occurs because higher propensity to consume in the households from low income groups whereas, households from high income levels spends less of their income and save more. Hence, using consumption as a measure underestimates inequality in a region. On the

other hand, we found rural income inequality in India to be considerably high with Gini coefficient of 0.55.

From the inequality estimates reported in Table 5, the effect of seasonal and permanent migration shows divergent paths. Where within group income and consumption inequality declines as a result of seasonal migration, it shoots up from permanent migrant remittances. In the no case of seasonal migration, income inequality slightly improves by 3% and consumption inequality improves by 23%. This shows a positive result in terms of welfare effects of migration. On the other side, we found permanent migration having negative effect on both consumption and income inequality. The inequality within remittance receiving households increased by 10% in income and 33% in consumption.

Given that, the migrant households are better than non-migrant households, remittances are expected to increase in overall inequality in the source regions, which we found as true. Looking at the overall impact of seasonal and permanent migration on income and consumption and income inequality, we observed that where there is substantial difference between the two measure, it would not have been this different if there were no migration. Where, income inequality worsens (Gini increases) as a result of remittances from both seasonal and permanent out-migration, consumption inequality is going up. This result suggests that income from migration are not being consumed rather invested, that is why, it does not reflect in consumption but increase in income disparity shows it. Thus, examining both of the measure becomes more important.

Figure 1 shows how households with seasonal and permanent migrant members s are distributed across quintiles of consumption and income per capita both in actual and counterfactual case. The figure exhibits similar patterns for consumption and income distribution. For permanent migration, we see that in counterfactual case, the migrant households are concentrated in first and second quintiles whereas in actual case, migrant households are concentrated in top two quintiles supporting our results for increasing inequalities due to permanent migration. On the other hand, seasonal migrant households are concentrated towards lower quintiles in both counterfactual and actual scenario.

6. CONCLUSION

Migration plays an important role in increasing income level and reshaping the income distribution in rural India. To investigate the effect, contrafactual consumption and income are estimated in the hypothetical case of no migration in a selection corrected estimation

framework using information which incorporates migration decisions by households. The analysis has been done separately for seasonal and permanent migrants and the Gini were estimated for both income and consumption. Inequality estimates in the contrafactual case are then compared with the actual values.

We now attempt to summarise the conclusions arising from the study. *First*, there is a substantial difference between inequality levels when measured through consumption and income. Income inequality puts India into high inequality countries where consumption inequality puts it into moderate inequality countries. For better policy imperatives, both measures should be taken into account.

Second, our results show the differential impacts of seasonal and permanent migration on consumption and income inequality. Where, seasonal migration helps within group inequality, permanent migration worsens it. So, there is a need to identify these types of migration separately and should be considered while formulating migration policies. Though, within group inequality in permanent migrant household increases, it reduces overall inequality across groups.

Finally, migration offers opportunities for households to make rational choices in optimizing income strategies, and households invest the migrant income into investment and not in consumption. Policy makers should acknowledge the importance of migration in income distribution.

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Table 1: Description of the variables

	Definition	Mean/Percentage	Sample
Seasonal Migrant	1 if household has any household member left for seasonal/short-term work during last 5 years and returned	8.66	2,387
Permanent Migrant (mean)	1 if household has any non-resident member	26.47	7,299
Per Capita Income (mean)	Per capita annual Income of the household	22495.35	27,579
Per Capita Consumption (mean)	Per capita annual consumption of the household	22773.57	27,579
Socio-economic variables			
Education level	Highest adult education received in the household		
No education		22.09	6,091
Below Primary		15.69	4,326
Below higher secondary		49.69	13,703
Graduation and above		12.54	3,459
Caste	Caste group of the household		
General		24.34	6,712
OBC		40.26	11,103
SC		22.84	6,298
ST and other		12.57	3,466
Main source of Income	Principal source of income for the household		
Cultivation		37.13	10,239
Agricultural Labour		14.30	3,945
Non-Agricultural labour		22.80	6,288
Business		8.37	2,307
Salaried		10.75	2,966
Others		6.65	1,834
Log of land size (mean)	Log of the total land size owned (in acres)	0.63	27,579
Household Variables			
No. of dependents (mean)	Number of persons in the household below age 16 and above 60	2.00	27,579
No. of workers(mean)	Number of persons employed in any work for at least 240 hours in previous year	2.01	27,579
Village Characteristics			
Proximity from public service (mean)	Sum of the distance of the village from Primary Health Centre, Primary School, Post Office, Bank, Kirana Shop, Market, Public Distribution Centres and Police Station	31.59	27,579
Remoteness (mean)	Sum of the distance of the village from Pucca Road, Bus stop, Railway Station and the nearest town	44.25	27,579
Total Sample		**27,579**	

Table 2: Descriptive Statistics

Permanent Migrant	**Migrants**	**Non-Migrants**	**Difference**
Per Capita Income	28302.23	20405.39	-7896.84***
Per Capita Consumption	27588.19	21040.19	-6547.99***
Per Capita Remittances	6864.86	-	
Log of land size (in acres)	0.7345	0.5955	-0.1389***
Proximity from public service (in kms.)	33.07	31.06	-2.003***
Remoteness (in kms.)	47.81	42.97	-4.8405***
No. of dependents	1.94	2.02	0.0836***
No. of workers	1.82	2.08	0.2555***
Observations	**7,299**	**20,280**	
Seasonal Migrant			
Per Capita Income	13473.37	23350.2	9876.83***
Per Capita Consumption	17638.02	23260.45	5622.43***
Per Capita Remittances	585.76	1933.49	1347.73***
Log of land size (in acres)	0.5675	0.6385	0.0709***
Proximity from public service (in kms.)	34.66	31.31	-3.36***
Remoteness (in kms.)	48.69	43.83	-4.85***
No. of dependents	2.25	1.97	-0.2732***
No. of workers	2.40	1.97	-0.4279***
Observations	**2,387**	**25,192**	

Table 3: Determinants of Migration, Seasonal and Permanent

	Seasonal Migration	Permanent migration
Proximity from public service	0.0026**	-0.0012
	(0.0010)	(0.0008)
Remoteness	-0.0006	0.0013**
	(0.0007)	(0.0006)
Age of the hh head	-0.0383***	0.1101***
	(0.0071)	(0.0080)
Age^2	0.0003***	-0.0009***
	(0.0001)	(0.0001)
Socio-economic variables		
Highest adult education		
No education®		
Below Primary	0.1276**	-0.0566
	(0.0534)	(0.0416)
Below higher secondary	-0.0771*	-0.1535***
	(0.0440)	(0.0363)
Graduation and above	-0.2593***	-0.2911***
	(0.0655)	(0.0436)
Caste		
General®		
OBC	0.1295**	-0.0178
	(0.0522)	(0.0426)
SC	0.1863***	0.0502
	(0.0626)	(0.0476)
ST and other	0.1396	-0.2324***
	(0.0854)	(0.0588)
Main source of Income		
Cultivation®		
Agricultural Labour	0.0374	-0.1952***
	(0.0608)	(0.0491)
Non-Agricultural labour	0.1905***	-0.1116**
	(0.0575)	(0.0535)
Business	-0.2320***	-0.0450
	(0.0766)	(0.0482)
Salaried	-0.2967***	0.2106***
	(0.0787)	(0.0484)
Others	-0.2126	0.5017***
	(0.1355)	(0.0647)
Log of land size	-0.0927***	0.1159***
	(0.0326)	(0.0245)
Household variables		
No. of dependents	0.0287***	0.0414***
	(0.0110)	(0.0094)
No. of workers	0.1625***	-0.1235***
	(0.0166)	(0.0136)
Constant	-0.6494***	3.5651***
	(0.1878)	(0.2130)
Observations	27,579	27,579
Pseudo R-square	0.0634	0.079
Wald Chi2	432.61***	832.65***

Table 4: Estimates of selection controlled contrafactual income and consumption for Seasonal migrants

	Seasonal Migrant		Permanent Migrant	
	Log Consumption Per Capita	**Log Income per capita**	**Log Consumption Per Capita**	**Log Income per capita**
Age of the hh head	0.0085***	-0.0091	0.0019	0.0378***
	(0.0027)	(0.0059)	(0.0032)	(0.0074)
Age^2	-0.0001	0.0001*	0.0001	-0.0003***
	(0.0000)	(0.00005)	(0.0003)	(0.0001)
Socio-economic variables				
Education level				
No education®				
Below Primary	-0.0043	0.1465***	0.0064	0.0872**
	(0.0202)	(0.0382)	(0.0203)	(0.0424)
Below higher secondary	0.1363***	0.2049***	0.1109***	0.1461***
	(0.0168)	(0.0350)	(0.0161)	(0.0432)
Graduation and above	0.3834***	0.4545***	0.3509***	0.3614***
	(0.0295)	(0.0578)	(0.0282)	(0.0665)
Caste				
General®				
OBC	-0.0687***	-0.1282***	-0.0446*	-0.1531***
	(0.0233)	(0.0362)	(0.0241)	(0.0441)
SC	-0.1848***	-0.0753*	-0.1532***	-0.1489***
	(0.0247)	(0.0406)	(0.0236)	(0.0489)
ST and other	-0.3017***	-0.1931***	-0.2825***	-0.3311***
	(0.0498)	(0.0601)	(0.0449)	(0.0675)
Main source of Income				
Cultivation®				
Agricultural Labour	0.0170	0.3517***	0.0229	0.2431***
	(0.0265)	(0.0409)	(0.0249)	(0.0435)
Non-Agricultural labour	-0.0548**	0.5115***	-0.0329	0.3889***
	(0.0218)	(0.0428)	(0.0226)	(0.0463)
Business	0.2102***	0.4069***	0.1799***	0.4323***
	(0.0247)	(0.0604)	(0.0257)	(0.0702)
Salaried	0.3236***	0.8339***	0.2827***	1.0149***
	(0.0279)	(0.0480)	(0.0272)	(0.0608)
Others	0.1661***	0.3614***	0.1425***	0.6013***
	(0.0288)	(0.0728)	(0.0409)	(0.1121)
Log of land size	0.1801***	0.2966***	0.1524***	0.3558***
	(0.0131)	(0.0221)	(0.0127)	(0.0278)
No. of dependents	-0.1466***	-0.1562***	-0.1366***	-0.1496***
	(0.0045)	(0.0071)	(0.0045)	(0.0082)
No. of workers	-0.0515***	0.1518***	-0.0276***	0.0767***
	(0.0062)	(0.0150)	(0.0066)	(0.0153)
Constant	9.5532***	9.2123***	9.7701***	8.2798***
	(0.0772)	(0.1488)	(0.0819)	(0.1893)
Inverse Mill (Lambda)	0.5308***	-1.0310***	-0.0532***	-1.1590***
	(0.0149)	(0.0444)	(0.0203)	(0.0638)
Wald test of independent equations	381.90***	530.44***	6.87***	395.72***
Observations	25,192	25,192	20,280	20,280
Wald Chi2	2987.85***	1309.28***	2269.85***	1400.95***

Table 5: Estimated Within group and total Gini

		Income Gini	Consumption Gini
Seasonal Migrant Households	Contrafactual	0.4745	0.4612
	Actual	0.4612	0.3534
	Difference	↓ 0.0133 (3%)	↓ 0.1078 (23%)
Permanent Migrant Households	Contrafactual	0.5031	0.5538
	Actual	0.5532	0.7353
	Difference	↑ -0.0501 (10%)	↑ -0.1815 (33%)
In absence of seasonal migration	Contrafactual	0.4612	0.4320
In absence of permanent migration	Contrafactual	0.4610	0.5066
All households	Actual	0.55	0.39

Figure 1: Distribution of Migrating households by quintiles of income and consumption