Rural-urban migration and welfare among farming households in Ogbomoso, Oyo State, Nigeria

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ABSTRACT

Rural-urban migration can reduce poverty of farming households through remittances sent by the migrant members, thereby improving welfare, although it is not encouraged in order to avoid loss of labour for farm activities. Hence, the study examined the impact of rural-urban migration on farming households' poverty status in Ogbomoso, Oyo State, Nigeria. Primary data was used for the study collected via a multistage sampling procedure to survey 160 farming household heads. Data collected were analyzed using descriptive statistics, FGT poverty indices and propensity score matching. Results showed age and total household income were significantly higher among migrant farming households, while farm size and farm income were significantly higher among non-migrant households. Probability of migration was increased by age (0.0474), household size (0.5284), being married (1.1642) and crop production (0.8400). Poverty was higher among non-migrant households than migrant, and was significantly reduced by rural-urban migration, up to 43%. Therefore, poverty reduction policy should incorporate rural-urban migration of farming households through provision of employment opportunities for members who are willing to migrate to urban centers.

Keywords: Farming households, FGT indices, Poverty status, Propensity score matching, Rural-Urban migration.

INTRODUCTION

Poverty is a grave global pandemic which is most devastating in developing countries, especially in the rural areas. Most rural areas of developing countries lack opportunities to escape poverty hence, rural-urban migration is increasingly vital to sustainable development and poverty reduction in the rural areas (Somanje *et al*., 2020). About 8.8% of the world's population live in poverty, 478 million Africans live in extreme poverty; living on less than 1.90 PPP$/day (United Nations Conference on Trade and Development [UNCTAD], 2021). Sub-Saharan Africa has the highest concentration of poverty incidence, exceeding 35% in half of the countries. One-fifth of all poor people in Sub-Saharan Africa live the Nigeria (World Bank, 2022). Poverty is a prevalent problem pervading most sectors, especially economic and political. Nigeria ranks 161 out of 189 countries, in the category of low human development (United Nations Development Programme [UNDP], 2020). The country has been unable to achieve inclusive growth on a sustainable level, while challenges of climate change and more recently, the COVID-19 pandemic have made the task of achieving poverty reduction more difficult (World Bank, 2022).

Unequal distribution of poverty exists between urban and rural areas in Nigeria (World Bank, 2022). Poverty has been increasing in Nigeria, especially in the rural areas, despite the concerted efforts of the government to eradicate poverty in line with the first SDG goal. Migration has been suggested as an important pathway out of poverty (FAO, 2016). Historically, rural-urban migration has been a significant part of the urbanization process and continues to be important in scale in developing countries. It is a socioeconomic phenomenon as well as a spatial process that involves people moving from rural areas to cities, either permanently or semi-permanently. Rural-urban migration in Nigeria has been increasing over the years; between 1985 and 1990 over 3 million Nigerians migrated from rural areas to urban centres, while over 5 million Nigerians migrated between 2011 and 2021. This shows over 75% increase in the rural-urban migration for every period of ten years (Statista, 2022).

According to the Drivers for Migration and Urbanization in Africa report by the United Nations (2017), about half of the world's population now live in cities. This trend is expected to increase to 75 per cent by 2050, at a growing rate of 65 million urban dwellers annually. Migration had been considered to cause undesirable effects in terms of the departure of young, healthy and educated labour force from the rural area, resulting in rural economy deterioration, chronic poverty and food insecurity (Oginni and Tahirou, 2019). However, migration has also been identified as a survival strategy used by the poor, especially the rural dwellers (Gwanshak, Yusoff and Shafre, 2021; Hung and Peng, 2020; Mukhtar *et al*., 2018). Evidence infers that migration can have significant positive impacts on livelihoods and well-being (Gwanshak, Yusoff and Shafre, 2021; Hung and Peng, 2020; Mukhtar *et al*., 2018). However, it also carries risks and costs since the burdens of migration will be borne by the poor, especially if poorly managed. Migration is now seen as a global

phenomenon that needs to be understood and managed (Miroslav, 2018).

The assessment of migration's impacts on rural areas has remained relevant because migration acts as a catalyst in the transformation process of the migrating individual's (migrant) fate, the conditions of family members left behind, the local communities, and the larger sending regions (Nguyen *et al*, 2017). Hence, many rural households rely on migration to reduce or escape poverty. One significant source of development for the rural population as a result of this rising drift towards the cities is remittances. Migrants' remittances and the income multipliers they create are becoming critical resources for the sustenance strategies of receiving households as well as agents of regional and national development. Households that receive remittances tend to use the funds primarily for current consumption (food and clothing), as well as investments in children's education, health care, household food and security, and water and sanitation. (Hung and Peng, 2020).

Aside from a few studies such as Nguyen *et al*. (2017) in Vietnam and Agza *et al*. (2020) in Ethiopia, most studies on rural-urban migration excluded the impact of migration on the rural sending households and communities. Most studies are sample surveys on characteristics and determinants of migration, (Al-Maruf *et al.*, 2022; Xu *et al.*, 2021; Alarima, 2018; Fassil and Mohammed, 2017). Thus, more empirical research to identify the impact of rural-urban movement on rural households and communities in developing nations are needed, particularly in Nigeria,

where rural-urban migration is increasing, though empirical studies that show the link with poverty are limited. Therefore, this study examined the impact of rural-urban migration on farming households' welfare in Ogbomoso, Oyo State. Specifically, the study examined the factors that influence rural-urban migration in the area, estimated the farming households' welfare (using poverty level as proxy) and examined the impact of rural-urban migration on farming households' poverty status.

METHOLOGY

Ogbomoso is a city in Oyo State, South-Western Nigeria. According to World Bank (2022) the income poverty level in the state was 9.8% while the multidimensional poverty level is 19.6%. Ogbomoso population was approximately 503,806 in 2018 with population density of $253/km^2$ (World population review, 2018). The area lies on 8^0 10' North of the Equator and 4^0 10' East, of the Greenwich meridian. It is located within the derived savanna region and has a fairly high uniform temperature, moderate to heavy seasonal rainfall, and high humidity. The major occupation of the people in the area is farming and the predominant crops cultivated include; maize, cassava, yam, watermelon and cash crops like cashew, palm trees and mango. Ogbomoso Agricultural zone is one of the four agricultural zones in Oyo State. According to the Agricultural Development Project (ADP) categorization, each LGA represents a block and each block has eight (8) cells. The zone has a unique concentration of farming households relative to other zones. Figure 1 depicts the map of Ogbomoso town.
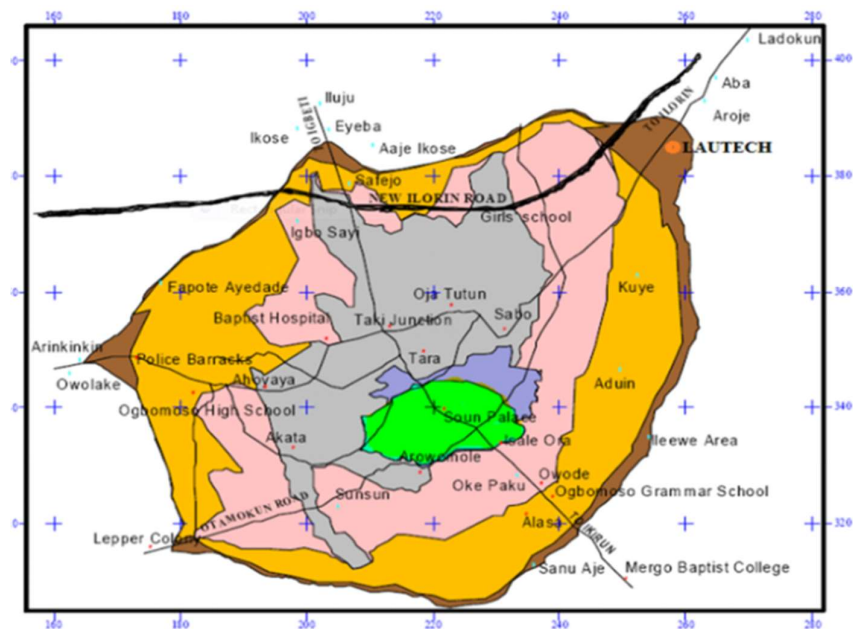

Figure 1. Map of Ogbomoso, Oyo state
Source: Britannica online, 2007

Primary data was used for the study and collected using semi-structured questionnaires through a multi-stage sampling technique. In the first stage, two local government areas (Oriire and Ogo-Oluwa local government areas) were chosen at random from the five local government areas (LGA) in Ogbomoso. The second stage involved choosing two wards randomly from each selected LGA (wards 1 and 10 in Oriire LGA , and wards 2 and 3 in Ogo-Oluwa LGA). The third stage involved random selection of two villages from each selected ward (Oloko and Fapote village in ward 1, Elerepamo and Eleesu village in ward 10 from Oriire LGA, Osupa-ojutaye and Oluboyepe village in ward 2, Alapon and Ayede village in ward 3 from Ogo-Oluwa LGA). Lastly, a total of 160 farming households were selected, proportionate to size and used for the analysis. The sampling unit for the study was the household head.

Analytical techniques

Descriptive statistics such as frequencies, percentages, means and standard deviation were used to profile the farming household heads' socio-economic characteristics, income and migration status. In this study, a migrant household is defined as one in which at least one person who is considered as a member of the household has migrated to live in the city for more than three months, whereas a non-migrant household has no member who has migrated to the city.

The Foster–Greer–Thorbecke (FGT) poverty indices of 1984, was employed to measure poverty among the rural farming households. The FGT poverty measure is given as:

$$FGT_\alpha = \frac{1}{N} \sum_{i=1}^{H} \left(\frac{z - y_i}{z}\right)\alpha \quad \ldots\ldots (1)$$

Where, N is the sample size, z is the poverty line, y is per capita income for the ith person, and α is the poverty aversion parameter. When α= 0, Pα is the headcount index or the proportion of poor people; when α = 1, Pα is the poverty gap index, a measure of the depth of poverty and when α = 2, Pα is a measure of severity of poverty and reveals the degree of inequality among the poor. The poverty line for the study was set at two-thirds of the respondents' mean per capita household expenditure (MPCHHE). Household expenditure was used instead of the income because it was challenging to capture all the farmers' income sources (Kahsu and Nagaraja, 2017).

The causal effect of rural-urban migration on rural households' poverty was examined using the propensity score matching technique, due to the issue of selectivity bias. It is expressed as follows:

$$P(X_i) = P_r(M_i = 1 | X_i) = E(M_i | X_i) \ldots (2)$$

M_i denotes a dummy variable such that $M_i = 1$ if at least one member of a farming household migrated and $M_i = 0$, otherwise.

Similarly, let Y_i^1 and Y_i^0 denote potential observed welfare outcomes for migrant households and non-migrant households, respectively. X is the vector of pre-treatment characteristics. The average effect of treatment on treated samples (ATT), is the parameter of interest which can be estimated as:

$$ATT = E\{E[Y_i^1 - Y_i^0 | M_i = 1, P(X_i)]\} \ldots (3)$$
$$= E\{E[Y_i^1 | M_i = 1, P(X_i)] - E[Y_i^0 | M_i = 0, P(X_i)] | M_i = 1\}$$

The propensity score is predicted with the probit model. The predicted propensity score is then used to estimate the treatment effect. The ATT is a mean for the unobservable counterfactual, $E[Y_i^0 | M_i = 1]$ following Rosenbaum and Rubin (1983). The nearest neighbour matching (NNM) and kernel-based matching (KBM) methods are methods employed in this study

The definitions of variables used in the analysis are shown in Table 1.

Table 1: Definition of variables used in the probit analysis

Explanatory variables	Definition	Expected Sign
Gender (Male or Female)	1 if the household is male, 0 otherwise	-
Age	Age of household head in years	+/-
Household size	Total number of members in the household	+
Years of education	Years of education of household head	+/-
Farm size in ha	Size of farm cultivated in hectares	-
Farm Income per year	Estimated income from the farming activities in Naira	-
Marital Status	1 if married, 0 otherwise	+
Crop production	1 if crop production, 0 otherwise	+

RESULTS AND DISCUSSIONS

Socioeconomic characteristics

The description of farming household heads' characteristics by their migration status is shown in Table 2. It reveals that both groups (migrant and non-migrant households) mostly have similar characteristics. Both migrant (87.93%) and non-migrant (77.27%) farming households, were mostly male-headed in the study area. The mean age of the household heads was 62.35±9.75 years, although the migrant farming household heads were significantly older (64.53±10.06 years) than their non-migrant (59.25±8.19 years) counterparts. This may be due to younger farmers migrating from rural areas to urban areas in search of better lives. This conforms to the findings of Oginni and Tahirou (2019), which revealed that migrant household heads were significantly older than the non-migrant households. There was no significant difference in household size, which was about 7 persons. This implies relatively large farming households. Similarly, the years of schooling for migrant and non-migrant farming household heads were not significantly different, being 7.34±3.96 years. This indicates that most of the household heads were literate and may be open to migration for the increased economic gains. This is not consistent with the study of Alarima (2018), who found that migrant households are larger than non-migrant households. Conversely, the non-migrant household heads operated significantly larger farm sizes (1.79±0.82 ha) than the migrant household heads (1.43±0.80 ha). This

may be due to migration of able-bodied youth from the migrant households, leaving the business of farming to the aging population who may not be able to cultivate large hectares of farm land owing to the traditional farming system practiced. The mean farm size was 1.53±0.83 hectares, indicating small farm holdings prevalent in the area. This disagrees with Sun *et al.* (2021) who found that migrants households' farms are larger than that of non-migrant households. Similarly, the average farm income per year for the non-migrant household heads was significantly larger (N165,613.60±76405.15) than for the migrant household heads (N136,189.70±67102.12). Hence, non-migrant households earn more income from farming activities than migrant households. This could be due to a smaller amount of family labour available for farm activity, consequent upon migration of able-bodied members from rural to urban areas. On the other hand, migrant household heads earned significantly more income (N345, 982.76±70152.67) than non-migrant household heads (N165,613.60±76405.15), on the whole. This could be as a result of the remittances received by the migrant households from the member(s) living in the cities. This has positive implications on household expenditure and poverty reduction and agrees with Liu *et al.* (2022) study of migrant households in China, which indicated that migrant households earned higher incomes compared to non-migrant households, attributing this difference to the remittances received by migrants from family members residing in urban areas.

Table 2: Description of farming household characteristics

Variables	Migrant households N = 116	Non-migrant households N = 44	Pooled N = 160	t-statistics
Explanatory variables				
Gender				
Male (%)	87.93	77.27	85.00	
Female (%)	12.07	22.73	15.00	
Age (Mean)	63.53 (10.06)	59.25 (8.19)	62.35 (9.75)	4.28***
Household size (Mean)	6.86 (1.27)	6.27 (1.04)	6.71 (1.24)	0.589
Years of education (Mean)	7.10 (3.92)	7.97 (4.04)	7.34 (3.96)	1.2493
Farm size in ha (Mean)	1.43 (0.80)	1.79 (0.82)	1.53 (0.83)	2.5417***
Farm Income per year (Mean) in ₦	136,189.66 (67102.12)	165,613.64 (76405.15)	144281.31 (80629.22)	2.0826**
Household income per year in ₦ (farm income + remittances)	345,982.76 (70152.67)	165,613.64 (76405.15)	260,178.17 (85383.65)	1.975**
Marital Status (Married) (%)	81.90	63.64	76.88	
Crop production (%)	93.10	81.82	89.76	

Source: Field survey (2018). ***, ** Significant at 1% and 5% levels, respectively. SD in parentheses.

Estimation of poverty measures

The poverty indices (headcount, depth and severity) of migrant and non-migrant farming households in the area are shown in Table 3. The poverty line was calculated as two-thirds of the mean monthly household expenditure per capita obtained as ₦5,100.04. Most non-migrant households were poor, with poverty incidence of 59.09%, whereas most migrant households (68.97%) were non-poor. Generally, most of the respondents were not poor, although the poverty incidence, depth and severity were higher in non-migrant households than in migrant households. An assessment of the poverty depth showed that an average poor non-migrant households needed an added 15.77% of household expenditure to get out of poverty, whereas an average

poor migrant farming household will only require an added 4.69%. The results for severity of poverty among the farming households also showed that poverty was more severe among non-migrant farming households than the migrant households (1.25%). Hence, a household among the poorest of the non-migrant households requires an additional 6.09% of household expenditure to escape poverty, relative to the average poor household, whereas the poorest migrant households require an additional 1.25%. The results of the migrant households' poverty status could be due to the remittances received from the migrated members living in the urban areas, which provide an additional source of income. Agza *et al.* (2020) also found that migrant households in Ethiopia were less poor than the non-migrant households.

Table 3: Poverty level by migration status

Variables	Migrant households	Non-migrant households	Pooled households
Poverty incidence (P_0)	0.3103	0.5909	0.3938
Poverty depth (P_1)	0.0469	0.1577	0.0813
Poverty severity (P_2)	0.0125	0.0609	0.0282
Poverty line (2/3 of MPCMHHE) in ₦	5,100.04	5,100.04	5,100.04

Source: Author's computations; MPCMHHE is mean per capita monthly household expenditure.

Determinants of farming households' rural-urban migration

The probit estimates of the migration decision propensity equation are shown in Table 4. The likelihood ratio test of the hypothesis reveals that all coefficients of the explanatory variables are zero and have a Chi-square value of 36.76, suggesting that the estimated model is significant. The results show that a number of variables were statistically significant at 1% level in influencing migration decision, including: age, household size, involvement in crop production and being married, which were positively associated with the probability of rural-urban migration. Thus, a unit increase in the age of the household head, increases the probability of a member of the household migrating from the rural area to the urban by 4.7%. This is plausible due to the fact that other household members have to support the aging household head, hence may seek higher wages in the urban centres. As older household heads experience dwindling economic opportunities, younger members may be inclined to seek better prospects in urban areas. This is consistent with Agza *et al.* (2023), Agza *et al.* (2020) and Alarima (2018), which revealed that the likelihood for members of rural households to migrate increases with the age of the household head. Further, an increase in the household size increases the probability of a household member migrating to the urban area by 5.28%. This may be due to surplus family labour available for farm activities, causing mobility of

labour by members to the urban areas where demand for and price of labour is higher. Also, larger households may face increased economic pressures, leading members to migrate in pursuit of better-paying jobs to support the family financially. Larger household may also have a higher dependency ratio, making it more challenging to meet the needs of all members within the household, thus encouraging migration for better opportunities. This is consistent with Agza *et al.* (2023), which revealed that the probability of rural-urban migration increases with the household size.

Involvement in crop production also had a positive influence on the probability of migration. Farming households that primarily engage in crop production tend to have members who migrate to urban regions in pursuit of a better living. This may be due to the poor revenue generated from crop farming and its associated drudgery and risks. Ren *et al.* (2023) also found that migration was common to rice farming households in China. Being married also had a positive and significant influence on the probability of migration, indicating that the tendency to migrate from rural areas to the cities is increased with being married. This is plausible due to the increased responsibility from marriage to provide for family members. The finding is corroborated by Jang *et al.* (2014) who found that marriage positively influences migration in the United States. Alarima (2018), also indicates that

the tendency to migrate from rural areas to the cities is increased with being married.

Table 4: Probit estimation of propensity score (NNM) for rural-urban migration

Variables	Coefficient	Standard error	Z	P>|z|
Gender	-0.1982373	0.4495689	-0.44	0.659
Age	0.0473904***	0.01483	3.20	0.001
Farm size	0.1737431	0.2230722	0.78	0.436
Household size	0.5284466***	0.1329662	-3.97	0.000
Years of Education	-0.004808	0.0372923	-0.13	0.897
Farm income	-3.01e-06	2.28e-06	-1.32	0.188
Crop Production	0.8399843**	0.4096537	2.05	0.040
Marital Status	1.164263***	0.4100214	2.84	0.005
Constant	-0.094261	1.174942	-0.08	0.936
Log-likelihood	-75.727604			
Pseudo R^2	0.1953			
Model Chi-square	36.76***			
Correctly predicted non-migrants	98.99			
Correctly predicted migrants	74.14			
Number of observations	160			

Source: Author's calculations. ***Significant at 1%, ** 5%.

Impact of Rural-Urban Migration on Poverty

Following the estimation of propensity scores for migration decisions, we assess the matching quality of the process using the common support condition. The marching exercise found that the predicted propensity score ranges from 0.1795 to 0.9975, with a mean of 0.7369. Thus, the common support assumption is satisfied in the region of [0.1795, 0.9975]. Figure 2 presents the histogram of the estimated propensity scores for migrant households and non-migrant households. A visual examination of the density distributions of the predicted propensity scores for the two groups reveals a significant overlap in both migrant and non-migrant households' density distributions, fulfilling the common support condition. This is shown in the intersection area of the common support graph depicted in Figure 1. The propensity scores distribution for non-migrant households is shown in the bottom half of the graph. In contrast, the propensity scores distribution for migrant households is shown in the upper half. On the horizontal axis are the density scores.
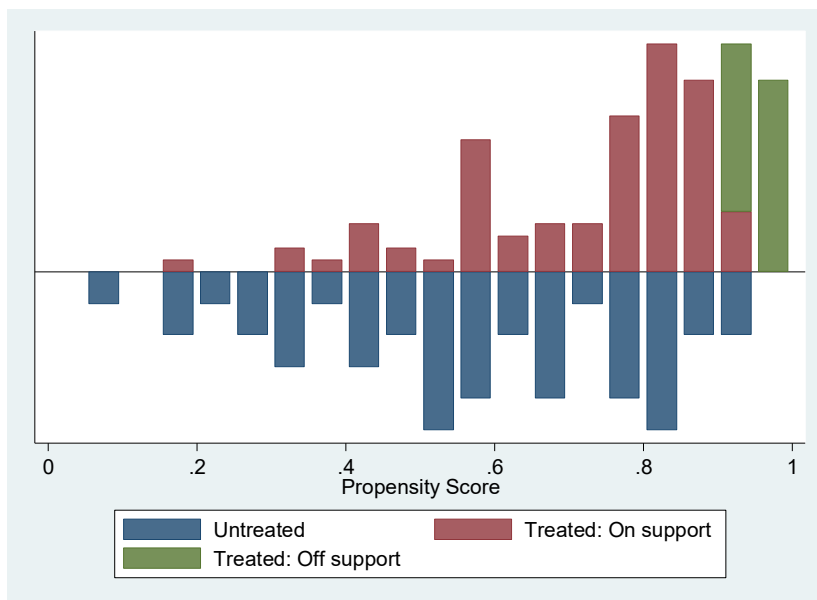

Figure 2. Distribution of propensity scores and common support for propensity score estimation.

Treated: On support indicates the observations in the migrant households' group, which have a fair comparison.

Treated: Off support indicates the observation in the migrant households' group, which do not have a fair comparison.

The result of ATT estimates for the effect of rural-urban migration on farming households' poverty status is presented on Table 5. The result showed that being a migrant household significantly reduces the poverty level of the farming households. The ATT estimate of -0.43 for poverty reduction, shows that the household participation in migration decreases the probability of poverty by 0.43 points, suggesting that rural-urban migration has a significant impact on poverty reduction among the farming households in the study area. This conforms to Agza *et al.* (2020) findings, who found out that rural-urban migration had a positive impact on rural-urban migration in Ethiopia.

Table 5: Effect of rural-urban migration on farming households' poverty; PSM results

Outcome variable	Participants	Non-participants	ATT	T-statistic
Poverty	0.27	0.70	-0.43	-5.50***

Source: Author's calculations. PSM: Propensity score matching, ATT: Average treatment effect on the treated, ***Sig at 1%

Table 6 demonstrates that rural-urban migration has a substantial effect on rural household poverty using the matching framework across all approaches. The estimated impact of participation measured by the outcome variable, poverty, are -0.430, -0.473 and -0.520 for nearest neighbour, radius and kernel matching method, respectively, suggesting that the probability of poverty decreases when rural-urban migration happens. In the presence of hidden bias, it is accepted that propensity score matching usually underestimates the average treatment effects, matching only controls for observable bias.

Table 6: Average treatment effect and sensitivity analysis: Propensity score matching results

Matching	Outcome Variable	No. of neighbours/ kernel type	Caliper	ATT	T	No. of treated	No. of control
NNM	Poverty	6	0.002	-0.430	-4.352***	116	44
Radius	Poverty	-	0.005	-0.473	-4.788***	116	44
Kernel	Poverty	Bandwidth	0.005	-0.520	-5.805***	116	44

Source: Author's calculations. ***Sig at 1%.

CONCLUSION AND RECOMMENDATIONS

The study concluded that most rural farming households in the area have at least one member that has migrated to the cities, hence, are migrant households. Most migrant households are not poor whereas non-migrant ones are mostly poor. Furthermore, it was established that rural-urban migration is enhanced by the age of the household head, household size, being married and involvement in crop production. It was also concluded that rural-urban migration reduces the probability of poverty. Hence, it is recommended that poverty reduction policy options should incorporate migration, since it was found to reduce poverty among the rural farming households. The government and non-governmental organisations should create more employment opportunities to absorb rural-urban migrants, while proper migration management policies that improve welfare gains beyond the household level to the community level should be initiated by government. At the household level, short-term migration during the off-season should be encouraged to engage idle resources, since farming activities are seasonal due to reliance on rain-fed agriculture. This ensures efficiency which will bring about welfare gains for the farmers.

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