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K. Reddy Sai Sravanth & N. Sundaram

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Analysis of socioeconomic status of young migrant farmers in India using probit regression

K. Reddy Sai Sravanth  and N. Sundaram 

Department of Commerce, School of Social Sciences and Languages, Vellore Institute of Technology, Vellore, India

ABSTRACT

Rural-urban migration has been very evident in global population changes in recent decades, especially in India, where migration growth rates are among the highest in the world. Many research articles focused only on the migration of young farmers in India. This article highlights the migration of young farmers from rural to urban areas in Bengaluru, their sustainability, and a survey made on the young farmer's migration. In this context, the study was conducted in the Bangalore region on the migration of Anantapur young farmers, Andhra Pradesh. This study examines the sustainability of young farmers after migration to urban areas and, based on this objective, to find out young migrant farmers are financially well-being or not. For the purpose of analysis, 500 primary data are collected from the young migrant farmers. The Probit model is employed to assess whether young migrant farmers were economically stable or not. The study's findings show that young migrated farmers to urban areas are more likely to be unsustainable due to the cost of living and additional costs. Young migrant farmers do not have enough income so they take loans from private lenders to meet their needs.

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1. Introduction

Migration is the moment to look for new areas to improve economic conditions and improve the sustainable structure of human life. Rural to urban migration is an ongoing process under the current circumstances; 54% of the world's population lives in urban areas, with access to employment resources per capita. Urbanization is projected to add another 2.5 billion people to the urban population by 2050, a 90% increase concentrated in Asia and Africa. China, India and Nigeria have the most extensive urban growth, according to a United Nations report. The three countries accounted for 37% of the world's urban population growth between 2014 and 2050. By 2050, Youth migration is an issue that has existed in the past and continues even now. As per the United

CONTACT N. Sundaram  nsundaram@vit.ac.in

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Nations DESA report, global youth migration increased by 21% in 2015, with Asia topping the list as maximum numbers of youth migration (i.e., 3.2 million).

In India, the number of youth migration is steadily increasing. According to the National Sample Survey Office on migration 2008–09, it has been shown that 20–29 age groups are projected to be 11 million intra-state migrants. This youth migration is due to unemployment, lower quality of jobs, gender disparities, lack of progression from school to work (Wickramsekara, 2013). An increase in economic and social disparities in rural areas forces young people to move from rural to urban areas. Recently, widespread employment and geographic disparity of industries have accelerated internal migration. Migration is also closely linked to factors such as land alienation, relative poverty, inequality, population pressure (Haan, 2010). Youths are not choosing migration only for economic benefits like higher wages and better standards of living (Ren et al., 2021; Wickramsekara, 2013). It is also because of social pressure from family, friends, and relatives.

Rural youths are not involved in farming. They think that agriculture is a survival challenge, so they are not interested in farming. Their parent desires to opt for jobs other than farming (Ali, 2018). Government policies play a significant role in youth migration from rural to urban areas. They are showing negligence in providing the requirement of rural needs, infrastructure, and employment. This phenomenon leads to the vulnerability of rural life. The lack of such facilities is forcing youth to migrate to urban areas (Balodi et al., 2014).

Farmers in the Anantapur district are still leaving agriculture. The conditions in the Anantapur district are the worst. Water scarcity and low rainfall have been the main problems. Rural youth are migrating to search for work in Bengaluru (Rural Development Trust, 2019). Rao (2019) stated that 42% of the population of Bengaluru are migrants; out of 10 people, more than 4 are migrants. Migrants work in different areas depending on their skills. Many of the young farmers who migrate are unskilled labours. Earnings are not enough. Even though they are employed on a daily basis, they are not getting out of debt. In urban migration, this kind of scenario is occurring.

The study provides empirical evidence on the impact of young migrated farmers in the rainfed areas of Anantapur district in Andhra Pradesh, India. It focuses on the sustainability of young migrant farmers and whether these young migrant farmers can satisfy with their income or not. This article is organized as follows; [Section 2](#) discusses the literature on young migrant farmers; [Section 3](#) examines the area of study, variables, sample data and methodology applicable in the analysis of the status of young migrant farmers; the findings and discussion are described under [Section 4](#), and finally, [Section 5](#) concludes this article.

2. Literature review

Agriculture is drastically affected by drought and climate changes. There is no productivity and employment in rural areas; most of the rural people live in poverty. Rural people from Karnataka had migrated to urban areas due to better employment and climate changes. Poor farmers thought there was a lack of employment opportunities for

educated youth in rural areas, their aspirations and climatic variability (Singh & Basu, 2020). Piotrowski et al. (2013) stated that agriculture factors had a significant effect on youth migration. In urban areas, young people will find non-agricultural jobs easily. Knapp and White (2016) stated that wages were influencing youth migration and the poverty rate had affected the rural youth. However, they identified that youth poverty rate negatively affected adult incomes even with migration control.

Environmental changes influenced socio-economic factors. The population density had increased and agriculture productivity also declined. The Chitwan Valley people were mostly influenced by long-distance mobility. Women were mostly affected by the gathering of fodder and high caste Hindus were less affected by environmental changes (Massey et al., 2010). Tiwari and Joshi (2016) analyzed the Himalayan rural male youth migration and women's empowerment. The constraints of the agricultural economy and lack of rural livelihood had compelled the male youth out-migration. This increased the workload and responsibility of women and also declined the life quality of rural women.

The drought situations of Khaliakani village in Orissa were analyzed. Rural people disliked the migration. There are some push factors pushing farmers for migration, including loans taken for cropping and other personal purposes (Julich, 2011). Drought took place in Mali. Many of the families had already migrated. They avoided migrants from this region through their remittances. Due to the drought, the family members are taking strong decisions on family planning operations for women. However, there was an increase in women's and children's migration (Findley, 1994). Gray and Mueller (2012) had analyzed drought and rural people's mobility in high-land Ethiopia. For analysis purpose, history method, the multinomial model and the dichotomous model were used and it was found that consequence of drought significantly affected rural mobility. The total mobility reached 10% of adult men per year. However women marriage mobility had reduced due to drought. It decreased the ability to spend on marriage expenditure and new household formation for their children.

The economic cause has been analyzed as the main reason for rural to urban migration. In this study, large income for young people is based on agricultural land. The findings indicated that there was an increasing trend towards youth's urban migration due to lack of agricultural production (Khatir & Rezaei-Moghaddam, 2014). Withdrawal from agriculture by small and marginal farmers is having impact on Indian economy. Second, low agriculture production per capital showed that young farmers are withdrawing from farming. Third, finding shows that young people are migrating and that only old men and women are left in the labour force. Finally researcher says that migration to urban areas will increase (Sharma, 2007). Socio-economic factors and reasons for migration are the variables of the study. Youth migrate to urban areas and it had a detrimental effect on the agriculture production (Ango et al., 2014). Nurzhanova et al. (2020) analysed the impact of population migration in the Republic of Kazakhstan. They found that the growth of external migration caused historical and ethnic factors and the expansion of internal migration caused the increase of the population level as well as socio-economic factors. Bezu and Holden (2014) analysed the land access and livelihoods of Ethiopia. Due to

forsaking of agriculture it has resulted in search of other livelihoods of youth. The study found that 9% of rural youth are planning to make agriculture their livelihood. Another finding was that rural youth have been migrating to urban areas for employment from the last six years. The main reason for rural youth migration in Ethiopia was the lack of land access.

Cassidy and McGrath (2015) analyzed the relationship between farms and their association with local community. It is based on qualitative narrative analysis. The younger generation who move from farming background neglect this identity. They develop a new identity of fashionable urban identity rather their traditional identities. Bilsborrow et al. (1987) assessed that youth migrated to urban areas because of availability of employment and due to skills of the youth and taste for urban life.

Pattanaik (2009) analyzed as to how and why young people went to urban areas. The following factors like- environment, living standards and spending and type of major problems faced were analysed. He analysed that, due to low wages and lack of work, 60% of young people migrated from rural to urban. Most of the youth who migrated were from lower caste. In the wage system, inequalities existed. Sergienko and Snegireva (2019) identified the increasing influence of family networks as a catalyst for youth migration to cities. State policy defects and affects the socio-economic development of rural areas in the Krai. Further the researcher suggested that rural youth conditions can be improved through state policy. Pham et al. (2018) found that youths are getting high incomes in cities and simultaneously they are facing health issues. Urban migration and absorption of city life transformed young migrant's lifestyles and behaviors. However, female migrants are more stigmatized than male migrants.

Folefack (2017) stated that most rural people went to cities where they became unskilled labourer. At the same time, the population of urban unskilled labour is growing and domestic food crop productions are falling. There is also a fall in the export food crop production. Therefore, the rural labour force has a negative effect on rural areas. Argent and Walmsley (2008) analyzed that youth loss rates have increased in rural areas over the past 20 years. Many remote areas are benefited and the coastal regions are suffering severe losses. Rural youth forms the majority of the population and are searching for jobs in major cities. Bezu and Holden (2014) reported about the challenges and opportunities faced by rural youth in urban areas in Ethiopia. They are forced to migrate to urban areas due to poor living conditions and lack of jobs. Informal self-employed young people are not satisfied. It seems that young women are more vulnerable than young men. They earn less in formal work, and women were also entrapped in low income.

Brown (2015) in his paper has talked about youth stories from different backgrounds in the town of Darjeeling, India. The study is based on the descriptive method. Rural youth is an upward mobility phenomenon, they migrate to metropolitan areas, and urban youth face downward mobility. In their aspirations for modern style and professional careers, urban young people are frustrated. Rural mobility is a challenge for ambitious urban youth, restricting their mobility aspirations. This has been growing tensions with in town between rural and urban populations. Brown et al. (2017) focused on how young people's ambitions are affected by their

compared to other parts of Andhra Pradesh. The district is located in the rain shadow zone of the state and is prone to regular drought. Analysis of rainfall data for the last ten decades reveals that there have been almost seven years of drought in each decade. Although, Groundwater extraction through bore wells with competitive private investment reaches unstable limits (Ravindra & Raina, 2012). The water levels in the Anantapur district were above 30 m bgl recorded in 7 piezometers observed in August – 2014, and the groundwater levels were identified as semi-critical (DIP, 2018).

Agriculture is the primary source of income in the region, accounting for 67% of the total population. It covers 10% of the crop area under irrigation and 57% of the maximum acreage under groundnut. Young farmers are very interest on doing agricultural activities. Farmers receive subsidies from the State and Central Governments for water-saving irrigation equipment such as sprinklers, drip, fertilizer and free electricity. They were cultivating the lands, but they are facing difficulties in farming like no minimum support price, crop loss, drought and groundwater erosion. Most of the young farmers in the Anantapur district were motivated for migrating to the nearest cities.

3.2. Sample description and variables

To study the various determinants of young farmer sustainability after migration, we surveyed from September to November 2020 on the model of marginal, small, semi-medium, medium and large young farmers in the Anantapur district of Andhra Pradesh. Among the prominent places for young migrated farmers, we have chosen Bangalore city as it is the nearest place to the Anantapur district, where most of the young farmer's population is migrated. For the purpose of this study, young Anantapur farmers have been taken as a sample. The 18–35 age group has been considered as youth in the study. The sample data information is obtained through direct personal and telephone interviews. There were a total of 45 open-ended questions distributed. During the data collection process, the semi-structured interview is carried out based on the following topics: drought, land size (acres), personal information, stability (savings in cities (lakhs)), irrigation, bank loans, personal loans, interest rates and loan repayments, crop rotations, yield types.

For the present study, a sample of 500 young migrant farmers is selected using a simple random sampling method. Of the 500 samples, Marginal young farmers accounted for 8.2%, small young farmers 40.2%, semi-medium young farmers 40.4%, medium young farmers 10.6% and large young farmers 0.6% Table 1. While this survey is intended to research the sustainability pattern of migration, it does provide some valuable information about migration sustainability (based on the savings of young migrant farmers in the city). From survey data, we selected a collection of covariables whose impact on the sustainability of migrated young farmers was

Table 1. Shows the classification of different types of young farmers for analysis.

Type of young farmers	% of selected young farmers
Marginal farmers	37.23%
Small farmers	34.72%
Semi-medium farmers	23.14%
Medium farmers	4.52%
Large farmers	0.39%

Source: Primary data compilation.

Table 2. Variables description.

Category of the farmers	Study variable	Variable definition	Unit of measurement
Dependent variable Farmer	Savings in city	Whether the young farmer have any savings after migration	1 = yes; 0 = no
	Age	The age of the young farmer	In years
	Family size	Family size of the young farmer	In numbers
	Education	Farmer educational quantification	1 = yes; 0 = no
	Current employment status	Present employment status of the young farmer after migration	1 - Employee; 0 - Un-employee
After migration	Kind of employment	Type of employment after migration	1-Skilled labour 0-Unskilled labour
	Stay duration	Number of years of duration since the young farmer migrated	In years
	Annual income	Annual income of a young farmer after migration	In Rupees
	Housing expenditure	Young farmer annual expenditure on home needs (House Rent + Family expenditure + Clothing + Medical) after migration	In Rupees
	Borrowings in city	Insufficient of income in cities whether young farmers are borrowings in cities	1 = yes; 0 = no

Source: Primary data compilation.

examined. At the young farmer level, all covariables related to the type of employment, stay duration, and annual income of migrated young farmers was coded. Our database includes a proxy of savings in the city (sustainability) as a dependent variable in the city and the descriptive variable selected based on previous research in the field of study. These covariates affect sustainability, and they are classified into two broad types: young farmer variables and after migration variables [Table 2](#).

3.3. An analytical framework for understanding young migrated farmers' sustainability

Regarding the stability of young migrant farmers from rural to urban areas, whether young migrant farmers are economically stable or not, is financially related to farmers' household expenses, annual income and savings after migration. In general, it refers to whether young migrant farmers in urban (migrant) areas are stable or unstable. To analyses the status of the young migrant farmer, it is necessary to know how to handle the dependent variable. Dubey et al. (2006) and Motsoari et al. (2015) used a Probit regression to determine the incidence of surplus labour in rural areas, and out- migrate from these regions to urban areas. Because logistic regression has an advantage over other regression methods in analysing binary outcome variables, it does not rely on linearity between model-based and independent variables. It uses unequal variations of the study variables. Furthermore, our experimental data fit the ordered probit model to utilize the sustainability of migrant farmers. This allows distinguishing the effect of each detailed variation on the sustainability of immigrant farmers, taking into account the simultaneous impact of other covariates in nature.

The arbitrary assignments in this study are based on a qualitative evaluation since the amount of success or failure is completely unpredictable. As a result, the response is standard.

The Probit pattern for the predictor variables Y_j is defined as:

$$Z = X_i \alpha + \epsilon_i \quad (1)$$

Here, Y_j represents the sustainability of the farmers with the likely values 0 for stable and 1 for unstable and $X_i = [1, X_{i_1}, X_{i_2}, \dots, X_{i_k}]$ is a vector that encompasses the control variables of this study which may impression the migration of farmers. The list of various factors examined for the nature of sustainability analysis is provided in Table 2. $\alpha' = [\alpha_0, \alpha_1, \alpha_2, \dots, \alpha_k]$ provides the attributes that will be calculated by the system and ϵ_i -shows the residual error (Wang, 2009). We have supposed that the dependent variable Y_j is a Bernoulli random variable sand cumulative distribution function of Y_j is:

$$\text{Prob}(Z_j = 1 | X_i) = \Phi(X_i' \alpha)$$

$$\text{Prob}(Z_j = 0 | X_i) = 1 - \Phi(X_i' \alpha) \quad (2)$$

Now that $E(\epsilon_i) = 0$, the forecast value of the dependent variable is

$$E(Z_j) = 1(\pi_i) + 0(1 - \pi_i) = \pi_i \quad (3)$$

It implies that

$$E(Z_j) = X_i' \alpha = \pi_i \quad (4)$$

$$P(Z = 1/X\alpha) = \exp(X\alpha)/(1 + \exp(X\alpha)) \quad (5)$$

the maximum likelihood to estimator for the parameters in the Probit model,

$$LL(\alpha) = \sum_{i=1}^N Z_i \log_e[\Phi(X_i \alpha)] + (1 - Y_i) \log_e[1 - \Phi(X_i \alpha)] \quad (6)$$

The significance of the probit model is explained by Figure 2, which contains two similar curves that indicate the behaviour of Probit vs Logit regression models. We can observe that the probability of the Probit regression curve increases to a greater extent at point $X\beta = 0$, with the slope being 0.3989. In comparison, the probability of the logit regression model increases to a smaller extent at point $X\beta = 0$, with the slope being 0.25. So, we consider the probit model more condensed than that of the logit model to draw young farmers' sustainability.

4. Experimental results

The Probit model is used to predict the sustainability of migrated young farmers. The analysis explained under the effects of independent variables of the study. The model predicts whether young farmers will be stable after migrating to an urban region and

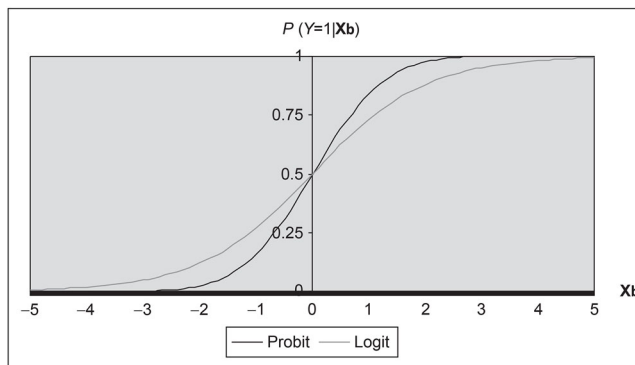


Figure 2. Predicted probability by probit and logit regression.

Source: Wang (2009).

Table 3. Descriptive statistics.

	Total households (500)		Households with stable (170)		Households with unstable (330)	
	Mean	Std. dev	Mean	Std. dev	Mean	Std. dev
Savings in city	0.230	0.421	1.00	0.000	2.000	0.000
Age	26.70	0.990	25.43	1.070	29.10	0.966
Family size	5.502	1.005	5.417	1.228	5.527	0.929
Annual Income	2.254	0.662	2.486	0.481	2.184	0.581
Education qualification	1.968	1.235	2.408	1.363	1.836	1.164
Current employment status	1.926	0.448	1.843	0.615	1.950	0.382
Kind of employment	1.752	0.480	1.600	0.558	1.797	0.445
Stay duration	3.232	1.343	3.573	1.344	3.129	1.328
Housing expenditure	1.602	0.9536	1.773	0.841	1.550	0.942
Borrowings in cities	0.138	0.3452	0.121	0.328	0.142	0.350

Source: Primary data compilation.

Table 4. Estimated ordered probit model results of young farmer sustainability.

Variables	Estimate	Std. error	Z-value	P-value
Intercept	-1.0375723	0.6769326	-1.533	0.125336
Age	-0.0002927	0.0734324	-0.004	0.996820
Family size	-0.0915374	0.0768093	-1.192	0.233360
Annual income	0.2575238	0.0999609	2.576	0.009988 **
Education qualification	0.1746038	0.0535466	3.261	0.001111 **
Current employment status	-0.3247404	0.1472516	-2.205	0.027430 *
Kind of employment	-0.3215776	0.1373812	-2.341	0.019244 *
Stay duration	0.1803565	0.0520898	3.462	0.000535 ***
Housing expenditure	0.1701198	0.0674330	2.523	0.011642 *
Borrowings in city	0.0401864	0.1921281	0.209	0.834320

Notes: Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

Source: Primary data compilation.

identifies the variables that may be used to make this prediction. Tables 3 and 4 show summary statistics for the studied variables, as well as parameter estimation of using Probit regression analysis.

The variables used to describe the sustainability of Young migrant farmers are age, education, family size, Annual Income, current employment status, Kind employment, Stay duration, Housing expenditure and borrowings in the city. 500 young migrant farmers & their descriptive statistics are shown in the Table 3. It includes the mean and standard deviation of the total households, households with sustainability and

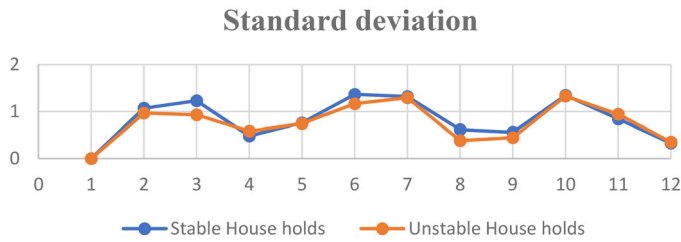


Figure 3. Stable vs unstable young farmers.
Source: Primary data compilation.

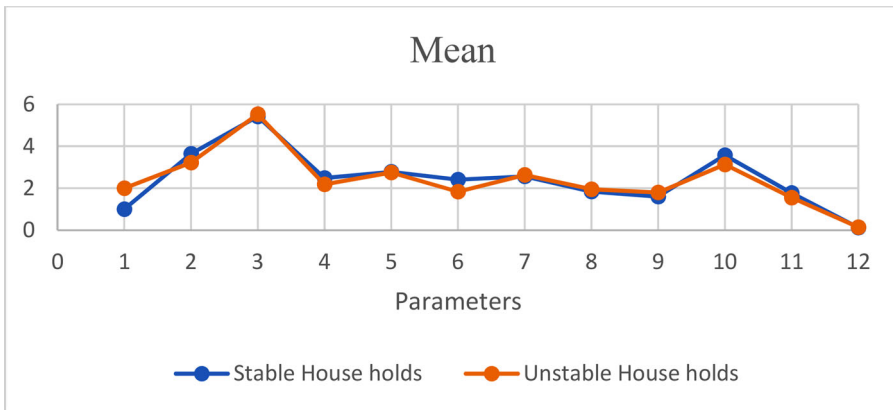


Figure 4. Stable vs unstable young farmers.
Source: Primary data compilation.

households with unsustainability. The average age of young farmers is 26.7 years. For analysis, we assumed that kind of employment considers that the migrant young farmers, whether skilled or unskilled, focus on housing expenditure in this variable carried that house rent expenditure food, medical, and clothing. Stay duration as considering how long they were staying in the urban areas, i.e., less than five years, ten years and more than ten years and borrowings in cities as we assume that young migrant farmers are again borrowing from private members or institutional loans. Figures 3 and 4 show the evaluated mean and standard deviation values for differences in the status of migrant young farmers on several characteristics with stable vs unstable.

A Probit regression analysis is performed to assess the impact of the variable ‘savings in the city’, in which we consider the sustainability of a migrant young farmer using various parameters in the study. Effective technology from R-programming is used to develop regression analysis.

The experimental results are given below in Table 4, displaying the estimated values of the standard error, and the parameters, the calculated Z-value and the probability P-values are presented.

The underlying probit model is based on a non-linear estimate, and the change in marginal effect often depends on the initial value of the dependent variables (although other variables are constant). The migrant young farmers’ age does not have any impact on sustainability. The estimated results indicated that the stay

duration for young farmers is very important, even at a 1% level since the p-value is 0.000535. It indicates that young farmers are unable to survive after migration even if the stay duration is more than ten years.

Also, the estimated value of migrant annual income demonstrates that it is significant at the 5% level and interprets those farmers are unable to sustain annual income from various sources of work. We discovered that a lack of educational qualifications has more significant impact on earnings. The study revealed that the variable is more significant at 1% level, with a p-value of 0.001111. It has a negative and direct impact on economic sustainability. The majority of migrant young farmers are uneducated and doing informal wage labour in the urban areas. The p-value is estimated to be 0.001111 is significant at 1%, and it can be seen that most of the young farmers are informal wage labourers. In comparison to rural regions, young farmers need minimum educational qualifications to get employment so they can pay their debts. A sample of data is collected from migrating farmers based on their level of education (uneducated, primary, secondary, and higher education qualifications). Indeed, as the impact intensity of lack of education, informal wage work and youth's subjective expectations are high, decreasing households' income.

High education and their knowledge in the field of sustainability is captured as successful one among the young migrants, and it has increased the likelihood in the urban area's employment. An increase in educational qualification increases the sustainability of success in urban areas. Education is too positively correlated by the likelihood of selecting skilled wage employment. In other words, in addition to the kind of employment, household expenditure is also affected the household's income. However, the kinds of employment and household expenditure are significant at the 5% level, and p-values are calculated as 0.019244 and 0.011642 because the cost of living and unnecessary expenses spending's is much higher compared to rural areas.

5. Conclusion

The impact of environmental factors on migration has become a tool and it has led to a high interest over the migrants from the past few years. Environmental inequalities in the country, significant changes in lifestyle and a substantial proportion of the rural population engaged in agriculture. In addition, there is a link between environmental conditions and migration (Henry et al., 2003). Migration is a social behaviour affected by specific characteristics and differs from person to person and society to society—economic and non-economic factors influence the creation of rural-urban migration impulses. Decision making on migration differs from one individual to another. Influential factors on people from the different areas are relatively different from the migration decision-making process because they form a broad spectrum of individuals and groups with different backgrounds for migration. Economic, social, political, relational functions, crop loss, unemployment, poverty, urban facilities, wage disparities and unusual rainfall are the major factors that influence people for rural to urban migration (Khatir & Rezaei-Moghaddam, 2014).

While rural to urban migration continues to grow and continuous industries growth, the wage difference among urban and rural regions, showing the relative difference in

marginal productivities, intensifies the migration problem making greater, not lower urban poverty. Migration from rural areas remains despite high levels of urban unemployment or low unemployment in the urban economy (Cvecic & Sokolic, 2018; Goldsmith et al., 2004). Folefack (2017) analysed that rural young people who migrate to urban areas will increase the urban population and reduce the unskilled wage rate. Simultaneously shortage of rural labour wages would also increase in the rural areas. The lack of rural labour significantly influences agriculture production and the growth rate of the country. Intra-state migration is also taking place in India. According to 2005 survey of the National Sample Survey Organization (NSSO), more than 40% of farmers are unhappy with their profession due to the risks involved. There is a negative demand for agriculture and allied sector workers. It has driven a large migration of agricultural workers into other sectors (National Skill Development Corporation, 2013).

This article analyses the sustainability of rural migrant young farmers of the Anantapur district in Andhra Pradesh, India. So, migration to surrounding urban areas can be seen as a strategy to reduce the uncertainties and financial liquidity restraints of rural households, as a result, it can enhance the re-allocation of financial stability. Based on the study of the data sample acquired from the source, we found that migrant farmers' annual income had a negative impact on sustainability. Earning in the cities is not even enough for daily expenses, and debt repayments and even unnecessary expenses are rising exponentially. As living standards are not satisfactory, people live in tiny houses with the worst conditions, which can significantly impact the sustainability of young migrant farmers. Simultaneously, borrowing money from the private lenders to pay for their regular housing and miscellaneous expenditures affects the sustainability of the young farmers in urban areas.

Disclosure statement

No conflict of interest has been declared by the authors.

ORCID

K. Reddy Sai Sravanth  <http://orcid.org/0000-0001-5676-6345>

N. Sundaram  <http://orcid.org/0000-0002-0801-0428>

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