Seasonal Migration and Rural Markets:
Empirical Evidence from Telangana, India

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This paper explores how household amenities, resources and rural markets influence rural household decision-making. The analysis is based on a 2010 field survey in Mahabubnagar District of Telangana State, India. The study reveals that the majority of the households across the study villages possess minimum basic resources, and non-migrant households were at an advantage in almost all aspects as compared to migrant households. Migrant-sending households are not only susceptible to migration under duress, but they also live in sub-standard conditions at the place of origin.

Keywords: Labor, Migration, Resources, Rural markets, Seasonal, Decision-Making.

Introduction

Labor migration is a vital issue not just in India, but also in other developing countries. Movements of the poor and marginalized sections of these societies have become common phenomena and garner much attention in the present globalized world where development activities are primarily concentrated in urban centers. Rural areas, on the other hand, are often neglected and therefore remain underdeveloped. Yet, more than 60% of India's population still depends on the agriculture sector for livelihood and employment purposes (Vyas, 2001).

Indian agriculture is largely characterized by traditional methods of cultivation and dependency on rainfall for agricultural production, resulting in risk of crop failure and uncertainty. On the other hand, the use of modern technology in agriculture — such as pesticides, fertilizers and machines — increases the cost of cultivation. The adverse climatic factors (e.g., delayed monsoon, uneven rainfall) could reduce arable land. As a result, agricultural production declines and distressful conditions arise. Mechanization of agriculture is reducing employment opportunities and increasing farming costs, contributing additional stress to the system. Such conditions in rural areas compel labor and the farming classes to resort to migration toward towns and cities to find alternative job options. Cities, in the meantime, are becoming overcrowded by urban migration, resulting in inadequate urban amenities and infrastructure, as well as unemployment. Thus, an imbalanced economic activity or development focus can cause damage to both rural and urban areas simultaneously. Seasonal labor migration should be considered within this particular context given its increasing importance and policy implications.

In recent years, there has been an increased movement of landless laborers and farmers toward urban centers for work or in search of employment. However, in India, the increasing trend of mass labor migration is mainly seasonal and short-term, taking place mostly during

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the lean agricultural season (Sainath, 2011; Korra, 2011). Thus, seasonal labor migration is associated with agriculture and undertaken mostly by agricultural laborers and small, marginal and medium-size land owning farmers. Ownership of land, area of land, access to irrigation, family size, employment opportunities in the place of origin, access to credit, livestock and agricultural equipment all play an important role in migrants' decision-making (Wood, 1981). The absence of a minimum of economic resources makes the lives of the rural poor even more precarious. The longer that rural residents stay in villages without resources or employment, the greater the threat to their survival (Deshingkar & Farrington, 2006). In contrast, for others, migration may represent an option of earning additional income and making use of spare time during the slack agricultural season.

The scenario in many rural areas is that a lack of investment, specifically at the onset of the agricultural season, has an impact on rural populace movements. Farmers who are severely affected by crop failure would prefer to lease out their cultivable land and migrate to urban cities or towns for employment and income (de Haan & Rogaly, 2007). On the other hand, the absence of labor and credit markets in rural areas stimulates a large proportion of landless, small and marginal farmers to take up seasonal migration as a part of the household strategy to mitigate economic difficulties at the place of origin. In that way, migration helps the poor to overcome shortages of grain, semi-starvation conditions and drought-like situations in the origin economy. In fact, such laborers tend to stay less than six months or one year at migrant destinations, and return to their places of origin for crop cultivation. Normally these seasonal migrants return before the onset of the monsoon which begins in the month of June (Deshingkar & Farrington, 2006). That said, studies on migration have not fully attempted to address the issues involved in seasonal labor migration with reference to their household amenities, resources and rural markets which play a major role in the rural household's well-being and decision-making (Hoff & Stiglitz, 1990; Lucas, 2003).

Intra-rural inequality is a major cause of rural-urban migration. Better-off villagers tend to be "pulled," and worse-off villagers "pushed" from the same context of relatively unequal village settings (Lipton, 1980). Migration is a symptom of imbalances in sending populations, such as high rates of unemployment, underemployment among low-skilled workers, low wages for skilled workers, inadequate resources and unmet demand for education and job training (Dayton-Johnson, Pfeiffer, Schuettler & Schwinn, 2009). In another study, Deshingkar & Farrington (2006) found that while agricultural wages have remained relatively low, a few rural laboring households have been able to break out of poverty through household diversification strategies that use a combination of two or more of the following: accessing regular work (not necessarily well-paid) inside or outside the village; leasing land or being given land by a patron for cultivating; and starting up a small business. There are very few or no studies that address linkages of seasonal labor migration and rural markets and, hence, no literature directly or indirectly related to this topic in the context of India, China and Sub-Saharan Africa (Lipton, 1980; Deshingkar & Farrington, 2006)

Given this backdrop, the current paper addresses the following questions: Who are the seasonal migrants in the region of Mahabubnagar District of Telangana State? Why do they prefer to migrate on a seasonal basis? What are their household resource compositions and characteristics? Are they migrating due to weak or poor economic resources? The purpose behind this examination is to find out whether there is any possible link, either direct or

indirect, between the factors mentioned above and seasonal migration. This dynamic becomes acutely important in the context of the study region of Mahabubnagar District of Telangana State.

Data and Methodology

This study uses data from a field survey collected in three randomly-selected villages in the Mahabubnagar District of Telangana State in 2010. A multi-stage, random sampling method was used, as follows: First, Telangana State was selected purposively because it is one of the major migrant states in India. Second, within the state, Mahabubnagar District was also selected purposively since the district is comprised of a large number of seasonal migrants. Third, out of seven *taluks* (divisions) in the district, three were selected randomly. Fourth, one *mandal* (block) was selected from each of the three *taluks* using simple random sampling. Lastly, one village was selected from each of the three *mandals* using simple random sampling. Thus, Akkaram, Chityala and Pata Kodangal villages were selected for canvassing in the final survey. Data from 80 households was collected in each of the three villages. All of the selected sample households participated in the survey; there were no absentee households and no refusals.

The three villages ranged in size from 230 to 250 households and had populations of 1,000 to 1,100. A person who had migrated to other regions, towns or cities during the year of the survey (2010) for multiple economic reasons was defined as a migrant from a migrant household. A person who had not migrated out of their village in 2010 was defined as a non-migrant who lived in a non-migrant household. This distinction is important since rural households are not homogeneous, and differ from each other in multiple ways. In fact, such differences in characteristics play a crucial role in household participation in various local markets and in decision-making processes.

Note that migrants from the study villages were regarded as seasonal or semi-permanent based on their duration of stay at the destination. In this case, less than one year of stay at the destination was defined as seasonal, and five or more years of stay was considered as semi-permanent migration. This study analyzed the variation within the same category of households and differences between different types of households (i.e., migrant and non-migrant households). The analysis included descriptive statistics, cross tabulation and logistic regression. Tests of significance and likelihood were applied as appropriate.

The paper is organized into six sections: profiles of the district and households, household accessibility to basic amenities, household resources (e.g., land and lease markets), labor and credit markets, agricultural equipment and livestock possession, and results of the logistic regression model. A final section provides a summary and conclusion.

Profiles of the district and households

Mahabubnagar District is named after Mir Mahabub Ali Khan, the Nizam of Hyderabad (1869-1911 A.D.). The district was originally known as Nagarkurnool, having been created

with eight *taluks* in the year 1287. Mahabubnagar District is bound on the north by Hyderabad and Nalgonda Districts, on the east by Nalgonda and Guntur Districts, on the south by the Rivers Krishna and Tungabhadra, and on the west by Raichur and Gulbarga Districts of Karnataka State. The district ranks ninth in population in the State of undivided Andhra Pradesh while, in terms of area, it ranks fourth (18,396 square km), and accounts for just under 7% of the total area of the State. The density of population per square km is 191 people. The total population of the district is 3,513,934. The district has 64 *mandals*, of which Amrabad is the largest *mandal* and Mahabubnagar is the smallest. In terms of number of households, Mahabubnagar had a total of 688,212 households at the time of the 2001 Census. The sex ratio of the total population in the district is 972 females for every 1,000 males. The district is predominately rural (89.4%). The literacy rate in the district is 44.4%, which is lowest in the state (Office of the Registrar General and Census Commissioner, 2001). The average annual rainfall in the district was 413 millimeters in 2005. The rainfall in the monsoon season accounts for around 77% of the annual rainfall, and September is the rainiest month. The major soil group is red earth, comprised of loamy sand (Dubba) and sandy clay loam (Chalka). Black soil, mostly of clayed loams and deep clays, occurs as narrow strips alongside the banks of the Krishna and Tungabhadra Rivers and natural streams (Government of Andhra Pradesh, 1974). The migration rate from the district is over 29% wherein male migrants outnumbered female migrants (Office of the Registrar General and Census Commissioner, 2001). The national Census of India records only permanent and semi-permanent migrants and, thus, does not provide a tally of seasonal migrants.

Household Profile and Migration Status

The study villages contain four social groups, namely Lambada (Scheduled Tribe (ST)), Madiga (Scheduled Caste (SC)), Golla (Other Backward Classes (OBC)) and Reddy (general category), wherein Akkaram has only STs and SCs, and Chityala and Pata Kodangal are comprised of SCs, STs, OBCs and general category populations. Among these, 35% of households were migrant households and 65% were non-migrant households out of the total 240 sample households in the study villages. Of the total SC households, 48% migrated out of the home village, comprising 43% for STs and 14% for OBCs. Two households from the general social category remained in the village as non-migrant households. The share of the migrant households of the total was lower than that of non-migrant households. Therefore, there is a significant relationship between social groups and migration ($p<0.001$) in the study villages (data not presented). Of the 240 households' total, the main occupation of 230 households was agriculture and related activities, and non-migrant households outnumbered migrant households for this factor. Seven households were characterized by occupations in agricultural labor and artisanal semi-skilled work such as masonry, tailoring and blacksmithing. There was not much occupational diversification in the villages. Hence, the association between occupation and migration was insignificant ($p = 0.594$).

Almost all of the surveyed households were found to be below the poverty line. Among these, 93% possessed Below Poverty Line (BPL) cards and the remaining 7% possessed Anthyodaya Anna Yojana ration cards, with the latter being meant for the poorest of the poor who get 35 kg of food grain at subsidized rates. A significant relationship was found between possession of a ration card and migration ($p< 0.001$). Migrants with a BPL card were

0.87 times more likely to migrate than those without BPL cards. Similarly, Anthyodaya card-holders were 5.57 times more likely to migrate than non-Anthyodaya card holders.

Ninety-nine percent of households possessed their own dwellings, however a greater number of households were *pucca* or concrete houses, particularly for non-migrants. By contrast, a moderate number of migrant households lived in *kuccha* or semi-concrete houses, and there was only one migrant household that was a hut/thatched house. Thus, there was an insignificant relationship between dwelling type and migration status (p = 0.053) More important than owning a dwelling is the kind of house as this aspect, in fact, determines their living conditions, quality of life and migration status. Only 6% of households did not have access to electricity, and non-migrant households had less connectivity to the electrical grid than that of migrants. Within migrant households, 13%had no electricity, while the comparable figure was 3% for non-migrant households. Accordingly, the relationship between household electricity and migration is highly significant ($p< 0.001$): A member of a household without electricity was 0.87 times more likely to migrate than a member of a household with electricity.

In addition, 90% of the households had access to drinking water from a public tap, while 9%accessed water from their own wells or tube wells. Further, a large number of families still relied on firewood (89%) for daily cooking and very few used liquefied petroleum gas (LPG), which was mostly used by non-migrant households. Migrant households relied more heavily on kerosene than LPG. In this study, a significant association ($p< 0.003$) between fuel for cooking and migration was found.

Finally, a majority of the households did not have access to sanitation (toilet) facilities, and primarily used open spaces for urination and defecation. Hence, this study found a significant relationship ($p< 0.005$) between household sanitation and migration. Households without sanitation facilities were 1.19 times more likely to migrate than households with sanitation facilities (Figures 1 and 2).

Household Indexes

This study constructed an index for different variables of household resources for total sample households. The likelihood odds value was calculated by applying the following formula: ***Observed Value - Best Value / Worst Value - Best Value = Odd Unit Value.*** Here, observed value indicates the actual value obtained for each variable considered for constructing the index. Best, base or minimum value denotes a value of around 1.0 and, if the value exceeds 1.0, then it is considered as the worst value. Unit difference value denotes the difference between the best and worst values in units. The index results indicate that the summarized observed value for Household Infrastructure Index is 1.78 units, wherein the base value is 1.0 unit and worst value is 2.36 units, and the unit distance differential value is 0.574. Likewise, the summarized observed value of the Household Infrastructure Index for migrants is 1.84 units, while it is 1.74 units for non-migrants. Here, the best (base) index value remains constant while the worst index values for both migrants and non-migrants are 2.36 units (Figure 1 and 2). The unit distance differential index value for migrants is 0.618 units, while it is 0.544 units for non-migrants, which confirms that migrant households are

less advantageous than non-migrant households in terms of household infrastructure. The study further calculated the likelihood odds of household migration status by taking social groups and migration into consideration. This study found that SCs were 1.71 times more likely to migrate than their non-SC counterparts. The odds ratios for migration are 1.40 times for STs, 0.41 times for OBCs and zero times for the general category.

Figure 1: Index for various aspects of sample households
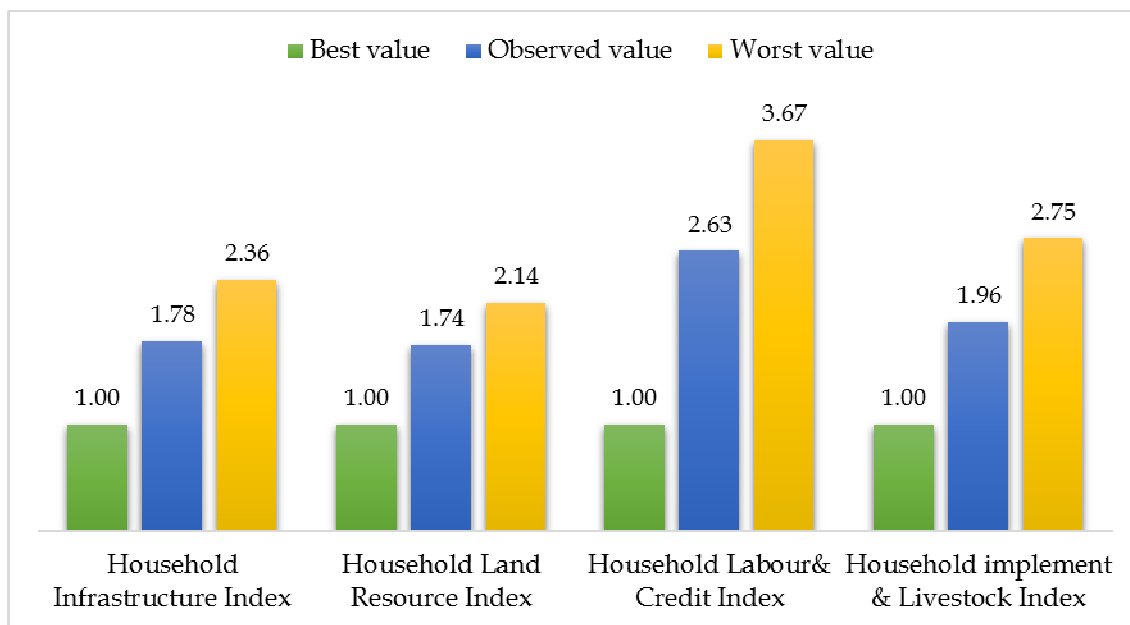
Source: Field survey in Mahabubnagar District of Telangana State, 2010.

Figure 2: Index for various aspects by migration status
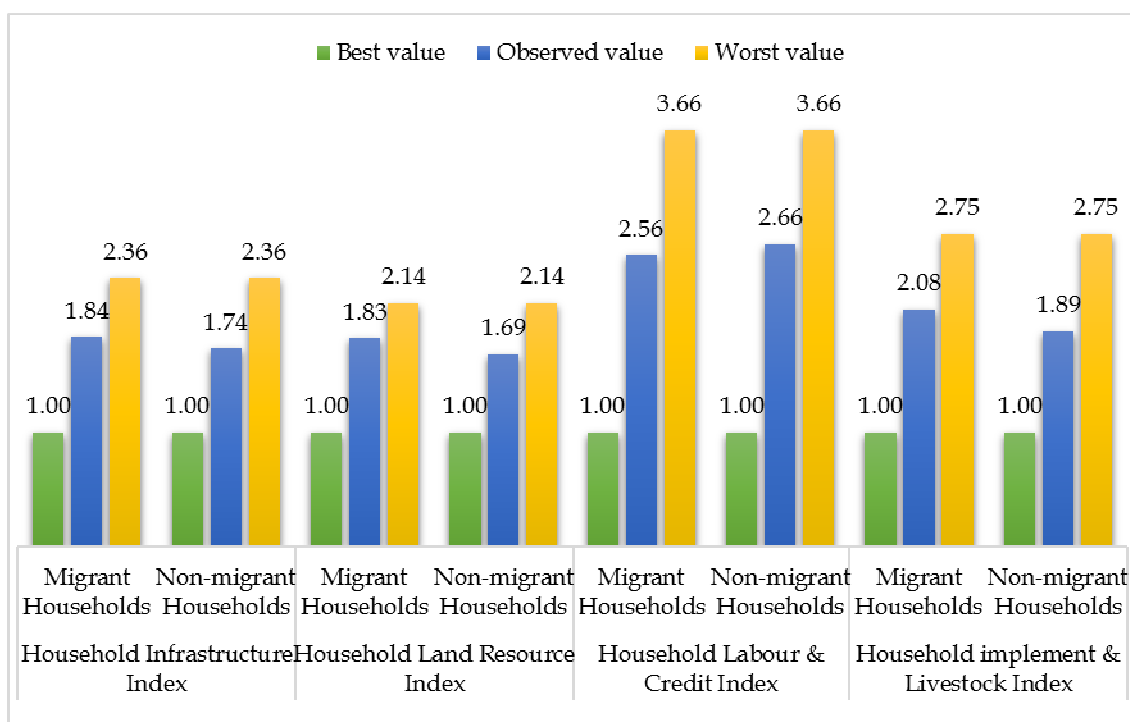
Source: Field survey in Mahabubnagar District of Telangana State, 2010.

Household Resources and Seasonal Migration

The information on land ownership shows that, out of the 240 sample households total, only 18% were landless. In other words, the majority owned arable land. Among the landless, migrant households (69%) outnumbered their non-migrant counterparts. Of the total land-owning households, 60%were non-migrants while the share for migrants was just 23% (Table 1). Owning land does not provide the full picture, though. To understand the economic situation, it is important to assess the extent of the land holding, the nature of the soil and the irrigation facilities because these factors significantly influence economic well-being and household decision-making.

The Household Land Resource Index shows that the summarized observed index value is 1.74 units, the worst observed index value is 2.14 units, and the best observed value is 1.00 units. However, the differential unit value for land resources is 0.0649 units. As per the household's migration status, the observed index value is 1.83 units and the worst index value is 2.14 units for migrant households. The best observed index value remains constant for all variables. For non-migrant households, the observed value is 1.69 and the worst value is 2.14. The differential unit value for households is 0.728 for migrant and 0.605 for non-migrant households. On the whole, the relationship between land ownership and migration is significant ($p = 0.000$). As a result, land-owning households had an odds ratio of 0.72 for migration compared to a value of 4.13 for landless households.

Table 1: Land owning households by migration status

Land	Akkaram		Chityala		Pata Kodangal		Total	
	Mig*	Non-mig*	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
Yes	19 (28)	48 (72)	14 (22)	49 (78)	22 (32)	46 (68)	55 (28)	143 (72)
No	12 (92)	1 (8)	14 (82)	3 (18)	3 (25)	9 (75)	29 (69)	13 (31)
Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: (i) Parentheses indicate their respective proportions, (ii) *Migrants and Non-migrants.

Moreover, within the category of the land-owning households, 28% of the land was owned by migrant households while the rest was owned by non-migrant households**.** Of this, 67% of non-migrant households owned dry land. In the case of both types of land (i.e., dry and wet land), non-migrant households outnumbered their migrant counterparts. However, among the migrant household category, 53% owned dry land and 47% owned both dry and wet land while, among the non-migrant households, 41% owned dry land and 59% owned both dry and wet land (Table 2). The relationship between dry land and migration is very strong and significant at a level of $p< 0.001$ whereas, for wet and dry land, the significance level is 0.010. However, households with dry land had an odds ratio of 0.91 for migration, while those in households with both dry and wet land had an odds ratio of 0.55 for migration.

Table 2: Land-owning households according to migration status

Villages	Akkaram		Chityala		Pata Kodangal		Total	
Type of land	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
Dry land	11 (41)	16 (59)	11 (26)	32 (74)	7 (41)	10 (59)	29 (33)	58 (67)
Both land	8 (20)	32 (80)	3 (15)	17 (85)	15 29)	36 (71)	26 (23)	85 (77)
Total	19 (28)	48 (72)	14 (22)	49 (78)	22 (32)	46 (68)	55 (28)	143 (72)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

One-fifth of the households owned three acres of land, while 15%owned two and four acres each, and 12% owned five acres. Interestingly, 12% of the households possessed more than eight acres of land. In all the above-mentioned categories of area of land owned, the land-owning non-migrant households outnumbered their migrant counterparts (data not presented). Further, 54% did not have access to any kind of irrigation facilities (including landless households). In this dimension, most (71%) non-migrant households had more access to irrigation facilities than migrant households. Within the migrant category, 69% of the households did not have irrigation facilities, while the corresponding proportion is 54% in the case of non-migrant households (Table 3). The difference in the likelihood of access to irrigation is not so wide between the migrant and non-migrant households. However, the relationship between irrigation and migration is significant (p = 0.000) across the study villages. Regarding the likelihood of migration, households with access to irrigation had an odds ratio of 0.59 for migration compared to a value of 1.52 for households without access.

Table 3: Households with irrigation access by migration status

Villages	Akkaram		Chityala		Pata Kodangal		Total	
Irrigation	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
Yes	8 (20)	32 (80)	3 (15)	17 (85)	15 (29)	36 (71)	27 (24)	85 (76)
No	23 (58)	17 (42)	25 (42)	35 (58)	10 (35)	19 (65)	58 (45)	71 (55)
Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

Only 4% of land transactions took place during the last five years in the study villages. All of these transactions were made by the non-migrant households, and there is not a single migrant household that sold its land (Table 4). Likewise, 3% of the total number of households bought land. Incidentally, all the buyer households happened to be from Pata Kodangal. It is noteworthy that 50% of the land was purchased by migrant households, and the rest by non-migrants. Among the migrant households, only 5% purchased land, while the corresponding proportion is 3% for non-migrant households. Interviews with respondents suggest that migrants are more inclined to buy land using income from migration. Though both migrant and non-migrant households bought land in roughly equal amounts, the likelihood of land purchase was lower for non-migrant households than for

migrant households. The odds ratio for migration in land-purchasing households is 1.85, while the corresponding value is 1.0 for non-land-purchasing households.

Table 4: Land transactions by different households according to migration status

Land transactions		Akkaram		Chityala		Pata Kodangal		Total	
		Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
Sold land	Yes	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	9 (100)	(0.0)	9 (100)
	No	31 (39)	49 (61)	28 (35)	52 (65)	25 (35)	46 (65)	84 (36)	147 (64)
	Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)
Purchased land	Yes	(0.0)	(0.0)	(0.0)	(0.0)	4 (50)	4 (50)	4 (50)	4 (50)
	No	31 (39)	49 (61)	28 (35)	52 (65)	21 (29)	51 (71)	80 (35)	152 (65)
	Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: (i) Parentheses indicate their respective proportions.
(ii) Only land transactions from the last five years have been included in this analysis.

The data for lease transactions show that 7% of the households purchased land on lease from others farmers for cultivation. Of this, 3% of the migrant and 4% of non-migrant households purchased land on lease. Among the leased-in households, 52% were non-migrants. Interestingly, among the migrant households, only 10% purchased land on lease while the corresponding proportion is 6% for non-migrant households. On the other hand, 11% leased out their land. Of these, non-migrant households were more likely to do so than migrant households (55% and 45%, respectively). Among migrants, 14% leased out their land, while among non-migrants, the proportion is 10% (Table 5). Due to household vulnerabilities, migrant households were more likely to lease out their land and travel to other regions for economic opportunities.

There is a significant relationship between leased-in-land transactions and migration (p = 0.280). The relationship between lease-out and migration is also significant (p = 0.275). The odds ratio for migration by lease-in households is 1.71 times, while the corresponding value is 0.96 for households that did not lease land.

Table 6 shows the proportion of households whose family members participated in the village labor or employment market during the study year. On the whole, 46% of the households had not worked in the labor market in the village of origin, with non-migrant households outnumbering migrant households (excluding their labor for their own cultivation). It is interesting to note that most of these laborers were either head of the household or they or their spouse were the main breadwinner of the household. However, in both head of the household and spouse categories, non-migrant households outnumbered migrant households. Within the non-migrant households, the head of the household's share is around 44%, while it is 56% in the case of migrant households. Migrants would tend to depend more on the local labor market for work and, thus, are more prone to migrate.

Table 5: Lease-in and lease-out land households by migration status

Villages		Akkaram		Chityala		Pata Kodangal		Total	
Lease details		Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
Lease in land	Yes	6 (67)	3 (33)	1 (20)	4 (80)	1 (33)	2 (67)	8 (48)	9 (52)
	No	25 (35)	46 (65)	27 (36)	48 (64)	24 (31)	53 (69)	76 (34)	147 (66)
	Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)
Leased out land	Yes	4 (27)	11 (73)	4 (80)	1 (20)	4 (57)	3 (43)	12 (45)	15 (55)
	No	27 (42)	38 (58)	24 (32)	51 (68)	21 (29)	52 (71)	72 (34)	141 (66)
	Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

Labor, Credit Market and Seasonal Migration

The Index for Household Labor and Credit shows that the summarized, observed index value is 2.63 units, the worst observed index value is 3.67 units and the best observed index value is 1.0 unit. However, the differential unit value for labor and credit is .0610 units. Looking at the migration status for migrant households, the observed index value is 2.56 units and the worst observed index value is 3.66 units, while the best index value remains constant for all measured aspects. By contrast, for non-migrant households, the observed value is 2.66 and the worst value is 3.66. However, the differential unit value for migrants is 0.586 and 0.624 for non-migrant households (Figures 1 and 2). The association between working in the labor market at place of origin and migration is statistically significant ($p = 0.127$) for all the sample households in the study villages. The odds ratio for migration of households working in the village labor market is 0.80, while the comparable value is 1.24 for households not working in the labor market.

Table 6: Household participation in origin labor market by migration status (At least one member)

Villages	Akkaram		Chityala		Patakodangal		Total	
Code of labor	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
No	11 (26)	32 (74)	17 (55)	14 (45)	5 (14)	32 (86)	33 (30)	78 (70)
1	20 (57)	15 (43)	11 (23)	36 (77)	16 (49)	17 (51)	47 (41)	68 (59)
2	(0.0)	2 (100)	(0.0)	1 (100)	1 (25)	3 (75)	1 (14)	6 (86)
3	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	1 (100)	0	1 (100)
4	(0.0)	(0.0)	(0.0)	1 (100)	(0.0)	1 (100)	0	2 (100)
5	(0.0)	(0.0)	(0.0)	(0.0)	1 (50)	1 (50)	1 (50)	1 (50)
6	(0.0)	(0.0)	(0.0)	(0.0)	2 (100)	(0.0)	2 (100)	(0.0)
Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

Thirty percent of the migrant household members worked in agriculture as daily-wage-earning laborers and 23% worked under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), a government sponsored 100 day employment program to rural households. Among the non-migrants, 29% worked in the agricultural sector and 19% worked in the MGNREGA scheme. In the case of migrants, the corresponding percentages are 31% and 30% respectively. Agricultural and MGNREGA work were the major source of employment in the study villages. As a result, resource-deprived households, show greater inclination to migrate out of the village (Table 7). The association between labor market at point of origin and migration is significant (p = 0.302). Moreover, agricultural laborers are 1.04 times more likely to migrate and MGNREGA workers are 1.58 times more likely to do so compared to non-migrant households. MGNREGA workers might have become migrants in the scheme when MGNREGA work was offered, and then migrated in the absence of the scheme.

Table 7: Employment status of respondents in origin labor market by migration status (At least one member)

Villages	Akkaram		Chityala		Patakodangal		Total	
Nature of work	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
Non-workers	11 (26)	32 (74)	17 (55)	14 (45)	5 (14)	32 (86)	33 (30)	78 (70)
Agri-labor	12 (48)	13 (52)	9 (28)	23 (72)	5 (33)	10 (67)	26 (36)	46 (64)
Construction worker	(0.0)	(0.0)	(0.0)	1 (100)	(0.0)	(0.0)	0	1 (100)
MGNREGA worker	8 (67)	4 (33)	2 (14)	12 (86)	15 (54)	13 (46)	25 (46)	29 (54)
Piece/contract labor	(0.0)	(0.0)	(0.0)	1 (100)	(0.0)	(0.0)	0	1 (100)
Other works	(0.0)	(0.0)	(0.0)	1 (100)	(0.0)	(0.0)	0	1 (100)
Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

Furthermore, 16% of the households worked in nearby villages. Non-migrant households exceeded migrant households in this regard. Among the non-migrants, only 15% worked in the outside labor market; the corresponding proportion is 19% for migrant households. Migrant households may be more vulnerable and in need of more work and, hence, the likelihood of their working in the nearby village labor markets is high (Table 8). If there is employment available in nearby villages, these households are inclined to commute daily and take up any type of manual labor. This curbs long-distance migration and helps them avoid the associated risks of that. Hence, a significant relationship between working in the nearby villages and migration was found (p = 0.239). Households with members who work in nearby villages are 1.29 times more likely to migrate whereas not-working households are 1.19 times more likely to migrate.

Table 8: Households working in nearby labor markets

Villages	Akkaram		Chityala		Pata Kodangal		Total	
Working in other villages	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
0	11 (26)	32 (74)	17 (55)	14 (45)	5 (13)	33 (87)	33 (29)	79 (71)
Yes	1 (50)	1 (50)	4 (25)	12 (75)	11 (52)	10 (48)	16 (41)	23 (59)
No	19 (54)	16 (46)	7 (21)	26 (79)	9 (43)	12 (57)	35 (39)	54 (61)
Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

The study reveals that 65% of the households accessed credit from different sources, while the rest did not attain credit from any source. Among the credit-taking households, 48% took credit from banks and 17% borrowed from moneylenders in the study villages. Migrant households were less likely to have access to credit than non-migrant households. Within the migrant household category, 39% took loans from banks and 21% depended on moneylenders for credit. Among the non-migrants, 52% took credit from banks and 15% from moneylenders. Non-migrants by and large accessed loans or credit from banks. Although the migrants attained credit from banks, loans from moneylenders were more common, compared to the non-migrants. The lower rate of access to credit was mainly due to landlessness or the possession of only small and marginal land holdings (Table 9). Thus, there is a significant relationship between credit and migration (p = 0.149) in the study villages. Households that took credit from the bank were 0.76 times more likely to migrate than household that did not, and households that have borrowed from moneylenders were 1.46 times more likely to migrate than those who did not borrow from moneylenders. Households that did not have access to credit were 1.19 times more likely to migrate compared to households with access to credit.

Table 9: Credit-receiving households by migration status

Villages	Akkaram		Chityala		Pata Kodangal		Total	
Credit	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
0 (not taken)	11 (30)	26 (70)	19 (54)	16 (46)	3 (23)	10 (77)	33 (39)	52 (61)
Banks	8 (30)	19 (70)	7 (21)	27 (79)	18 (34)	35 (66)	33 (29)	81 (71)
Money lenders	12 (75)	4 (25)	2 (18)	9 (82)	4 (29)	10 (71)	18 (44)	23 (56)
Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

Additionally, in Akkaram, the average (mean) amount of credit taken by migrant households was more than 21,000 rupees[2] (Rs.) whereas for non-migrants it was around Rs. 14,000. In the

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[2] 1 US dollar is approximately equivalent to 65 rupees.

case of Chityala, the average amount of credit attained by the non-migrant households was around Rs. 13,000. For migrant households, it was just Rs. 5,600. In Pata Kodangal, the amount of credit taken by non-migrants was around Rs. 26,000 and Rs. 23,000 for migrant households. With regard to maximum amount of credit taken by different types of households in Akkaram, the maximum amount of credit taken by migrant households was around Rs. 70,000, while non-migrant households took a maximum of Rs. 60,000. In Chityala, the corresponding amounts were around Rs. 45,000 for migrants and Rs. 40,000 for non-migrants. In Patakodangal, the maximum amount of credit taken by migrant households was around Rs. 100,000, while the amount borrowed by non-migrant households was Rs. 80,000 (Table 10).

Table 10: Amount of loans taken by households according to migration status

Villages	Akkaram		Chityala		Pata Kodangal	
Credit amount	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
Mean	21,323	14,408	5,643	13,365	23,600	26,145
Maximum	70,000	60,000	40,000	45,000	100,000	80,000

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

Agricultural Equipment, Livestock and Seasonal Migration

The data about agricultural equipment show that 60% of households possessed agricultural equipment and 40%did not (this includes landless households). Further, the non-migrant households owned more equipment than the migrant households. Among the non-migrants, 63% possessed a plow kit while the corresponding proportion is 52% for migrant households. A plow kit includes all plowing-related implements (Table 11). Inadequacy of agricultural equipment influences whether a household will cultivate their land or migrate to cities. Further, 10% of the households, mostly non-migrant, possessed two plow kits (Table 11). The Index for Agricultural Equipment and Livestock shows that 1.96 units is the observed value and the worst value is 2.75 (best value remains constant at 1.0). The differential scale of unit is 0.549 units. Further, the relationship between traditional agricultural equipment and migration is insignificant ($p = 0.95$) in the study villages. The odds ratio for migration of plow-kit-households is 0.83, while the odds ratio for migration of households without agricultural equipment is 1.29.

Table 11: Households with traditional equipment by migration status

Village	Akkaram		Chityala		Patakodangal		Total	
Equip	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
No. of. HH with	18 (43)	24 (57)	18 (53)	16 (47)	4 (19)	17 (81)	40 (41)	57 (59)
plows	13 (34)	25 (66)	10 (22)	36 (78)	21 (36)	38 (64)	44 (31)	99 (69)
Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)
No	18 (43)	24 (57)	18 (53)	16 (47)	4 (19)	17 (81)	40 (41)	57 (59)
1	12 (39)	19 (61)	10 (22)	35 (78)	14 (35)	26 (65)	36 (31)	80 (69)
2	1 (20)	4 (80)	(0.0)	1 (100)	6 (35)	11 (65)	7 (30)	16 (70)
3	(0.0)	2 (100)	(0.0)	(0.0)	1 (50)	1 (50)	1 (25)	3 (75)
Total	31 (39)	49 (61)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

This study shows that 26% of the total number of households (mostly non-migrants) possessed a traditional hand pump, or sprayer for crops. The proportion of households with a traditional sprayer is 32% for non-migrant households and 15% for migrant households. There is a significant association between possessing a traditional hand pump and migration (p = 0.005). The odds ratio for migration of households with a hand pump is 0.49, while the corresponding value for those without a hand pump is 1.24. The relationship between having a modern sprayer and migration is significant (p = 0.015) in the study villages. The odds ratio for migration of households with a sprayer is 0.41, while the comparable value for households without a sprayer is 1.14.

The other important household resource is livestock. Sixty percent of sample households owned at least one head of livestock. The non-migrants held more livestock than the migrants (Table 12) and there is a significant association between livestock possession and migration (p = 0.170). Households without livestock were 1.34 times more likely to migrate compared to households with livestock.

Table 12: Livestock-owning households by migration status (with at least one head of livestock)

Villages	Akkaram		Chityala		Patakodangal		Total	
Livestock-1	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig	Mig	Non-mig
0	18 (43)	24 (57)	18 (55)	15 (45)	5 (23)	17 (77)	41 (42)	56 (58)
Buffalo	(0.0)	(0.0)	(0.0)	1 (100)	(0.0)	(0.0)	(0.0)	1 (100)
Bullock	4 (31)	9 (69)	1 (14)	6 (86)	6 (25)	18 (75)	11 (25)	33 (75)
Cattle	9 (39)	14 (61)	9 (23)	30 (77)	14 (42)	19 (58)	32 (34)	63 (66)
Goat	(0.0)	2 (100)	(0.0)	(0.0)	(0.0)	1 (100)	(0.0)	3 (100)
Total	31 (39)	49 (69)	28 (35)	52 (65)	25 (31)	55 (69)	84 (35)	156 (65)

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Parentheses indicate their respective proportions.

Logistic Model

Thus far, the paper has discussed various aspects of households with reference to migration, aspects that likely affected the household's overall conditions and decision-making. Multivariate analysis is used to examine the significance of the associations of some of the important household variables with regard to migration. A binary logistic model is used to explore these issues using the household indexes that were presented earlier (Figures 1 and 2). This can not only clarify the strength of the relationship between different variables and migration, but also identify the likelihood of being a migrant household with regard to such variables. Thus, it depicts which variables play a major role in the household's decision to migrate.

Hypothesis

In determining the migration status of a household, factors of importance could include the household's basic amenities, fixed-resource holdings, participation in the labor market, access to credit, possession of agriculture equipment and livestock. Households could adopt a strategy of diversifying their family labor for better income by sending members to work in more prosperous regions. By contrast, some households may decide to migrate in order to improve their economic and social status in their village of origin. Others, perhaps with the least resources, may resort to leaving the village for survival or in order to find employment in the absence of jobs at the origin.

The potential explanatory variables for categorization as a migrant household are explained here. The hypothesis is that lack of household resources pushes households to migrate. Second, inadequate resources lead to diversifying family labor for higher income by migrating out. It is hypothesized that a household which possess better basic amenities and fixed resources has greater participation in the labor market in the village of origin and has access to credit as well as equipment and livestock, and is presumed to be less likely to travel toward other more prosperous regions, and vice versa. This may not be true for all cases because some of the members of high income households or villages may decide to migrate as they prosper out of a desire to explore living in new towns and cities (Deshingkar& Farrington, 2006).

Results of the Logistic Model

A household's decision to migrate is influenced by number of factors which could be grouped here as basic infrastructure, fixed resources, participation in labor market, access to credit and possession of agricultural equipment and livestock. These variables which are measured at the household level are used as independent variables in the logistic regression model; the dependent variable is migration status (i.e., whether they migrated or did not migrate in 2010, the year of the study).

The results show a significant association between having lesser values of household resources, equipment and livestock and being a migrant household. Second, there is a

significant association between having better basic infrastructure and higher participation in labor and credit markets and being a migrant household. This finding implies that the fewer resources, equipment and livestock, the greater the likelihood of the household to have a member migrate out. With regard to infrastructure, the findings suggest that the better the infrastructure, the greater the participation in the labor and credit market and, thus, the greater the tendency to migrate toward other regions. Hence, there is an acceptable significant relationship between infrastructure and labor and credit markets. Therefore, households with basic infrastructure and a high rate of participation in the labor and credit markets are 1.03 and 1.10 times, respectively, more likely to migrate than households with less infrastructure and market participation. Likewise, the odds ratios reveal that a household with fixed resources, equipment and livestock were 0.58 and 0.77 times less likely to migrate than their counterparts with fewer fixed resource, equipment and livestock (Table 13).

Table 13: Logistic regression of migration status of households on selected characteristics

*Migration Status	Odds Ratio	Std. Err.	P>z
Household Infrastructure Index	1.03	0.12	0.77
Household Resource Index	0.58	0.14	0.02
Labor & Credit Index	1.10	0.05	0.05
Equipment& Livestock Index	0.77	0.07	0.01

Source: Field survey in Mahabubnagar District of Telangana State, 2010.
Note: Base value is 1; < 1 &> 1 reflect best and worst values.

Conclusion

A majority of households across the study villages possess basic amenities and resources, however the non-migrant households possess more resources than migrant households. These resources play a critical role in household strategies and diversification of family labor. Further, rural markets can be unstable or become inactive and, hence, dependency on them is limited. This exposes vulnerability of households with fewer resources, leaving them with no choice but to migrate to cities and other prosperous regions. Household resources, family needs, education and other social factors play critical roles in household decision-making. The context of seasonal migration vis-à-vis resources and rural markets is dynamic. This and other related studies highlight the fact that there are multiple factors or combinations of factors that influence households in many ways, and do not all necessarily impact migration status in the same manner.

In other words, agrarian distress in the villages pushes resource-poor households to cities for alternative employment opportunities. It is no exaggeration to say that if a situation like this continues for a long period of time, then the rural economy will erode even further. Consequently, villages may be depopulated of the working-age groups, leaving children and older adults as the primary occupants of villages in the future.

Based on the findings of this study, it is recommended that community leaders introduce policies that minimize migration out of economic desperation. In order to curb such distress-driven migration, rural areas should be given equal importance in the development process, with greater attention to agriculture, the irrigation sector, credit and other allied sectors. At the same time, towns and cities overcrowded with migrants further increases unemployment, poverty and social imbalance in urban areas. This may be nothing more than a shift of rural problems to urban areas that, in turn, causes new problems to emerge. Hence, attention must be paid to create employment opportunities in the village economies so that farmers and wage-seekers can engage productively in local markets for improved livelihood and reduced need for survival migration.

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