Available Online
Journal of Social Sciences Advancement
www.scienceimpactpub.com/jssa
DOI: https://doi.org/10.52223/JSSA25-060401

Internal Migration and Household Food Insecurity in Pakistan: Evidence from Nationally Representative Microdata

Waqas Shair [1,*], Amjad Rehman Asghar [2], Kalsoom Nisar [3], Badar un Nisa [4]

[1] Assistant Professor, School of Economics & Finance, Minhaj University Lahore, Pakistan
[2] Assistant Professor, Department of Sociology, University of Jhang, Jhang, Pakistan
[3] PhD Scholar, Institute of Social and Cultural Studies, University of the Punjab, Lahore, Pakistan
[4] Research supervisor, COTHM College, Lahore, Pakistan

ARTICLE INFO

ARTICLE HISTORY
Received: September 17, 2025
Accepted: November 25, 2025
Published: December 30, 2025

KEYWORDS
Migration;
Food Insecurity;
Household Welfare;
Internal Mobility;
Pakistan

ABSTRACT

This study investigates the impact of internal migration on household food insecurity in Pakistan using nationally representative data from the PSLM 2019–20 survey. Food insecurity is measured through the Food Insecurity Experience Scale (FIES), while internal migration is identified by whether the household head has moved from another district. Using a linear probability model and heterogeneity analysis, the findings show that migrant-headed households are significantly more likely to experience food insecurity than non-migrant households. The effect is stronger among urban and male-headed migrant households, weaker among rural migrants, and statistically insignificant for female-headed migrant households. These results suggest that internal migration can expose households to economic uncertainty, limited social support, and livelihood instability, which increases their vulnerability to food insecurity. The study underscores the need for targeted policy measures to support migrant households, particularly in urban areas, to help reduce their risk of food insecurity.

Corresponding Author: Waqas Shair (Email: waqas.eco@mul.edu.pk)

INTRODUCTION

Food insecurity continues to pose a major development concern in Pakistan. The Pakistan Social and Living Standards Measurement (PSLM) Survey 2019-20 shows that 83.56 percent of households were food secure, while 14.64 percent experienced moderate food insecurity and 1.80 percent faced severe food insecurity (Pakistan Bureau of Statistics, 2020). These figures are only slightly different from 2018-19, when 84.08 percent of households were food secure, 13.55 percent were moderately food insecure and 2.37 percent were severely food insecure. Although the change is small, the persistence of food insecurity among a significant share of households reflects ongoing socioeconomic stress and vulnerability. Within this broader setting, internal migration has emerged as an important demographic and economic process, influencing household livelihoods, living conditions, and potentially shaping food security outcomes.

Migration in Pakistan is closely associated with rapid urbanization, uneven regional development, and livelihood insecurity. The PSLM 2019-20 shows that about 6 percent of the population is migrants, with Punjab recording the highest share at 7 percent, followed by Sindh at 6 percent, while Khyber Pakhtunkhwa and Balochistan each report 4 percent (Pakistan Bureau of Statistics, 2020). People move in search of better living standards, employment, education, and greater social and economic security. However, migration also creates significant challenges. Large inflows into urban centres put pressure on housing, jobs, public services, and food supply systems (Crisp et al., 2012). Internal migration in Pakistan is driven by several push factors, including weak agricultural performance, climate-related shocks such as floods, poor rural infrastructure, low wages, unemployment, conflict, and broader economic instability. Recognising its growing importance, PSLM 2019-20 included a dedicated migration module for the first time, identifying migrants as individuals born in one district but living in another at the time of the survey.

Understanding how migration affects household food insecurity is therefore essential. Migration can help families by improving access to income, markets, and basic services. At the same time, it can also create new risks, including high living costs, insecure jobs, social exclusion, and limited access to social protection (Anderson et al., 2021). This study is important because it provides evidence to help policymakers see whether migration functions as a resilience strategy or becomes a source of vulnerability in Pakistan. The study has three main objectives. First, it examines the overall effect of internal migration on household food insecurity. Second, it explores whether this relationship differs between rural and urban households. Third, it investigates gender differences by comparing male-headed and female-

headed households. By addressing these questions, the study supports more informed planning for social protection, urban management, and food security policy in Pakistan.

The literature suggests a strong link between internal migration and food insecurity, shaped by economic, environmental, and social pressures. Global evidence shows that rising vulnerability and food crises often push households to move in search of more secure livelihoods. Carril-Caccia et al. (2025) find that food crises significantly increase migration flows, and that the severity of the crisis influences both the scale and direction of movement. Although their work focuses on cross-country movement, it highlights how declining livelihood security encourages migration as a coping strategy. Similar patterns appear in national contexts. Ghanayem et al. (2025) report that livelihood stress, weak agricultural systems, and limited policy support in Jordan drive migration, with food insecurity acting as both a cause and an outcome. At the same time, migration can also provide support. Mazani (2025) shows that in South Africa, migrant networks and community support can improve access to food. Other studies also stress that the effects of migration are not uniform. Raj et al. (2025), Kassymova et al. (2025), and Gebrihet and Gebresilassie (2025) demonstrate that gender roles, environmental pressures, and displacement can either reshape food systems or worsen food insecurity, depending on local context.

Environmental pressures also play an important role in shaping migration and food security outcomes. Zhu et al. (2025) show that in climate-vulnerable regions of Bangladesh, households exposed to climate risks often consider migration as an option. However, this movement can reduce investment in local adaptation and weaken long-term resilience. Other studies point to a different possibility. Martey and Etwire (2025) find that internal migration in Ghana can help households adopt sustainable agricultural practices through remittances and shifts in labour, which may strengthen food availability over time. Together, these findings suggest that the impact of migration on food security is not automatic. It depends on whether migration enables households to build capacity, adapt to changing conditions, and sustain their livelihoods, or whether it limits these opportunities and increases vulnerability.

Pakistan-specific evidence provides clearer insights that are closely aligned with this study. Shair et al. (2023a) show that migrant households in Pakistan are more likely to experience food insecurity, although migration is examined as one factor among several socioeconomic influences. Anwar et al. (2024) further find that households relying on coping strategies during periods of economic crisis are more likely to be food insecure. This suggests that migration may function as one of several survival strategies, but it does not always lead to improved household stability. Evidence from beyond Pakistan also offers useful parallels. Nnam (2025) demonstrates that mobility linked to resource-based conflicts in Nigeria disrupts agriculture and local food systems, showing how movement driven by stress can intensify vulnerability rather than reduce it.

Although existing research sheds light on how migration is linked to food crises, vulnerability, and food outcomes, much of it concentrates on international movements (Carril-Caccia et al., 2025), specific regional contexts (Ghanayem et al., 2025; Mazani, 2025), gendered dynamics (Raj et al., 2025), environmental pressures (Kassymova et al., 2025), or conflict-driven displacement (Gebrihet & Gebresilassie, 2025). Evidence from Pakistan indicates that migrant households are more likely to face food insecurity, but migration is usually examined as one of several factors rather than the main focus (Shair et al., 2023b; Shair et al., 2024). As a result, there is still a clear gap in understanding how internal migration directly influences household food insecurity within the Pakistani context.

METHODOLOGY

Econometric Model

The study uses a Linear Probability Model (LPM) as estimated by Ordinary Least Squares (OLS) to evaluate the impact of internal migration on household food insecurity. In this context, the dependent variable is a dichotomous variable indicating household food insecurity. It defined as coded 1 food insecure and zero for food secure. The key variable of interest is migration status of the household head and is defined as 1 for a migrant and zero for non-migrant. The econometric model is specified as follows:

$$FI_i = \alpha + \beta MIG_i + \gamma X_i + \mu_r + \varepsilon_i \quad (1)$$

where FI_i denotes the food insecurity status of household i, MIG_i shows migration status of the household head, X_i is a vector of variables which is consist of household and socio-economic characteristics such as (age, gender, marital status, education, household size, labour force status, income proxies, urban-rural residence, and province), μ_r captures regional fixed effects, and ε_i is the error term.

In the LPM model, it is easy to interpret the probability of food insecurity associated with migration since the coefficient β depicts the change in the probability of food insecurity associated with migration. Although the linear probability model (LPM) is known to have heteroskedasticity, probability bounds issues, and even other limitations, the model is given reliable standard errors and the results of the LPM model were compared with different non-linear models to check for the consistency of the results. In addition to the baseline regression model, separate estimations

for rural and urban households and by the gender of the household head were also carried out in order to capture the heterogeneity of the effects.

Data and Variable Description

The study relies on the microdata of the Pakistan social and living standards measurement (PSLM) survey 201920, which was carried out by the Pakistan Bureau of Statistics (PBS). The PSLM is a household survey conducted nationally to give sound estimates on living conditions, welfare conditions, as well as socioeconomic indicators in Pakistan. It is also surveyed in all the provinces, such as Punjab, Sindh, Khyber Pakhtunkhaw, and Balochistan and both the rural and urban regions are represented. In this study, the sample size consists of 160,619 households after adjusting the missing observations.

Measurement of Food Insecurity and Study Variables

The Food Insecurity Experience Scale (FIES) contained in the PSLM 201920 survey is used in the study as a measure of household food insecurity. The FIES comprises eight standardized questions that have a progressive scale of food-related constraints that have been encountered in the last 12 months. These items measure the household experiences ranging from the fear of lack of food to the real deprivation and starvation. Table 1 displays the eight FIES items that were used in this study.

Table 1: Food Insecurity Experience Scale (FIES) Items

Item No.	FIES Question (Reference Period: Past 12 Months)
Q1	Worried about not having enough food to eat because of a lack of money or other resources
Q2	Unable to eat healthy and nutritious food because of a lack of money or other resources
Q3	Ate only a few kinds of foods because of a lack of money or other resources
Q4	Had to skip a meal because there was not enough money or other resources to get food
Q5	Ate less than you thought you should because of a lack of money or other resources
Q6	Ran out of food because of a lack of money or other resources
Q7	Were hungry but did not eat because there was not enough money or other resources for food
Q8	Went without eating for a whole day because of a lack of money or other resources

In accordance with the responses of the FIES, there are four levels of food insecurity. Households that give responses to all eight questions with no affirmative response will be regarded as food secure. The positive responses to Q1 to Q3 mean that there is a mild food insecurity, which is associated with anxiety and decreased quality of diet. Positive responses to Q4–Q6 capture moderate food insecurity, representing reductions in food quantity and meal skipping. Severe food insecurity is identified when households report experiencing hunger or going without food for an entire day (Q7–Q8). For empirical estimation, these categories are further collapsed into a binary indicator, where moderate and severe food insecurity are coded as food insecure (1), while food secure and mildly food insecure households are coded as 0, as summarized in Table 2.

Table 2: FIES eight questions methodology

Category	FIES Question Numbers	Description	Binary Coding
Food Secure	No to all Q1–Q8	No worry, restriction, or deprivation of food	0
Mild Food Insecurity	Any Yes to Q1–Q3	Worry about food, inability to eat preferred/healthy food, or limited dietary variety	0
Moderate Food Insecurity	Any Yes to Q4–Q6	Reduction in quantity, meal skipping, or insufficient food intake	1
Severe Food Insecurity	Any Yes to Q7–Q8	Hunger and going without food for an entire day	1

In addition to the food insecurity indicators, several demographic and socioeconomic characteristics are included to control for household heterogeneity. These include migration status of the household head, province and region of residence, gender and age of household head, household size, marital status, and labour force participation. These variables are defined and coded in Table 3.

Table 3: Definition of variables

Variable	Definition / Measurement	Type	Coding
Food Insecurity Status	Household food insecurity based on FIES / food security indicators	Binary Outcome	0 = Food Secure, 1 = Food Insecure
Migrant Status	Indicates whether the household head is migrant to the current district	Binary Explanatory	0 = Non-migrant, 1 = Migrant
Province	Province of residence	Categorical	Khyber Pakhtunkhwa, Punjab, Sindh, Balochistan
Region	Place of residence	Binary	0 = Rural, 1 = Urban
Gender of Household Head	Biological sex of household head	Binary	0 = Male, 1 = Female
Age of Household Head (years)	Age of head in completed years	Continuous	14–99
Household Size	Total number of household members	Continuous	1–42
Marital Status of Household Head	Marital status of head	Categorical	0 = Never Married, 1 = Formerly Married, 2 = Currently Married
Labour Force Status	Employment status of household head	Categorical	0 = Employed, 1 = Unemployed, 2 = Not in Labour Force

Descriptive Statistics of Key Variables

Table 4 provides an overview of the main variables used in the analysis and offers a first snapshot of the migration and food insecurity profile of households in Pakistan. The results show that 17.6 percent of households are food insecure, while 82.4 percent are food secure. Although the largest share of respondents to the survey did not experience moderate or severe food insecurity, the large share of food-insecure households is quite substantial, given the large national scope of the sample. If this is the case, the food insecurity still and will still continue to be a matter of concern, especially so at the national level, even when the aggregated data tells that food can be accessed.

Only 7.8% of all household heads in Pakistan are migrants, while a whopping 92.2% are non-migrants. This shows how, in Pakistan, internal migration still constitutes a significant number, while still covering a minority of the households. The distribution of the provinces is a reflection of the demographic makeup of Pakistan. Close to half of the households included in the sample are in the province of Punjab (49.6%), then Sindh (23.1%), Khyber Pakhtunkhwa (17.8%), and lastly Balochistan (9.5%). This distribution shows that the dominant migration and food insecurity analyses are focused on Punjab and Sindh, while Khyber Pakhtunkhwa and Balochistan have considerable economic and geographical features that must be taken into account to achieve a thorough understanding of the situation. The situation shows that 68.9% of the households are in rural settings, while 31.1% are in urban areas, which demonstrates that the majority of the sample is rural and shows the crucial relation between agrarian livelihoods and food security outcomes.

Demographic trends are illustrated through statistics. Households are dominated by a male figure in 91.5% of cases, with their female counterparts making up 8.5% of household heads. This observation aligns with Pakistani traditions where the male figure of a household is predominantly registered. The householders have an average age of 44 years, an indication that the majority of household heads are in their peak age of employment, with a considerable span (standard deviation 13.44 years). Households in this study average a size of 5.42 people, indicating that the families concerned in the study are of significant size and have a high dependence on economically disadvantaged environments.

For household heads in the sample data, the marital status data indicate that most household heads are married (91.4%), with a small share being divorced (6.7%) and an even smaller number who have never married (1.9%). This corresponds with the age structure in the sample data, which indicates that the migration and food security decisions are likely to be made within the households. In terms of the labour force status, 82.5% of the heads of households are employed, 1.2% are unemployed, and 16.4% are outside of the labour force. While the unemployment rate among heads appears low, the share of those not participating in the labour market is non-trivial and may be associated with age, disability, or household roles, all of which can have implications for food security.

Taken together, these statistics describe a setting where most households are rural, male-headed, and relatively large, with a small but important share of migrant-headed households and a non-negligible proportion facing food insecurity. This profile provides important context for interpreting the regression results, particularly when assessing how internal migration interacts with province, region, household composition, and labour market status to influence the likelihood of household food insecurity.

Table 4: Descriptive statistics

Variable	Category *(N=160,619)*	Mean / Proportion	Std. Dev.	Min	Max
Food Insecurity Status	Secure (0)	0.824	0.381	0	1
	Insecure (1)	0.176	0.381	0	1
Migrant Status	Non-migrant (0)	0.922	0.267	0	1
	Migrant (1)	0.078	0.267	0	1
Province	Khyber Pakhtunkhwa	0.178	0.383	0	1
	Punjab	0.496	0.500	0	1
	Sindh	0.231	0.421	0	1
	Balochistan	0.095	0.293	0	1
Region	Rural	0.689	0.463	0	1
	Urban	0.311	0.463	0	1
Gender of Household Head	Male	0.915	0.278	0	1
	Female	0.085	0.278	0	1
Age of Household Head (years)		44.25	13.44	14	99
Household Size (persons)		5.42	2.60	1	42
Marital Status	Never Married	0.019	0.137	0	1
	Formerly Married	0.067	0.250	0	1
	Currently Married	0.914	0.281	0	1
Labour Force Status	Employed	0.825	0.380	0	1
	Unemployed	0.012	0.108	0	1
	Not in Labour Force	0.164	0.370	0	1

RESULTS AND DISCUSSION

Baseline Regression Model

Table 5 presents the baseline OLS estimates for the determinants of household food insecurity. The dependent variable is a binary indicator equal to 1 if the household is moderately or severely food insecure and 0 otherwise. In this linear probability framework, each coefficient can be interpreted as the change in the probability of food insecurity, in percentage points, associated with a one-unit change in the explanatory variable, holding other factors constant.

The coefficient on migrant household head is positive and statistically significant at the 1 percent level (0.0239, $p < 0.01$). This implies that households headed by migrants are, on average, about 2.4 percentage points more likely to be food insecure than non-migrant households, after controlling for province, region, demographic characteristics, and labour force status. Given that the overall prevalence of food insecurity in the sample is 17.6 percent, this effect is meaningful. It suggests that internal migration is associated with higher vulnerability, possibly reflecting adjustment costs, weaker social networks, insecure employment, and higher living costs in destination areas.

The results show that households of internal migrants are more likely to be food insecure as migration exposes them to a set of economic and social vulnerabilities. Many households migrate without secure jobs, have to pay high resettlement and housing costs, and often concentrate on informal, low-paying and unstable jobs. These factors bring about a lack of stability in income and, therefore a lack of purchasing power, which is a direct impact on accessing

food. Migration can also undermine traditional social support networks and community safety nets, meaning that migrant households can have less access to informal assistance, social protection programmes or subsidised services.

Although many migrants move to urban areas in search of opportunities, they tend to settle in low-income neighbourhoods, where the cost of living is high and where livelihoods are insecure, which offsets any potential urban advantages. At the same time, households who migrate to rural or peripheral areas may have limited markets, infrastructure constraints and fewer employment opportunities. In many instances, migration also causes household disorganization and labour distribution, especially when dependents depend on unpredictable income or erratic remittances. These combined economic pressures, institutional barriers and social disadvantages are helping explain why internal migration in Pakistan is associated with a higher probability of household food insecurity, rather than improved wellbeing.

The provincial disparities are also major. In comparison with Khyber Pakhtunkhwa (the reference category), the household in Punjab has a relatively small yet significant rise in the likelihood of food insecurity (2.25 percentage points), whereas in Sindh and Balochistan, the increase is significantly larger, ranging between 7.2 and 7.3 percentage points. These trends show that Sindh and Balochistan have less favourable structural, economic, and environmental factors that contribute to food security than Khyber Pakhtunkhwa. They also match issues on the differences between infrastructure, labour markets, and social protection among the provinces. Such disadvantages can also increase food insecurity risks to migrant households in such provinces.

As indicated in the region variable, urban households are considerably less likely to be food insecure compared to rural households. The urban residence coefficient is -.0561, which means that an urban residence lowers the likelihood of food insecurity by approximately of 5.6 percentage points relative to a rural residence. This finding is congruent with the notion that urban households are more likely to have superior physical and economic access to the markets, a broader range of income opportunities, and a higher number of services available. Meanwhile, this observation in combination with the positive migration effect, leads to the idea that not all migrants equally enjoy the fruits of the city. To others, the expenses and risks of changing location might counterbalance the benefits that would otherwise be found in urban locations.

The gender of household head results reveal that female-headed households are, on average, less likely to be food insecure than are male-headed households, other things held constant. The female headship coefficient is negative (-0.0277), so the probability of food insecurity decreases by 2.8 percentage points less as compared to that of male-headed households. This goes against the common assumption that female-headed households are always more vulnerable. One possible explanation is that female heads in this sample may be more likely to receive remittances, safety net support, or to manage resources more cautiously. It may also reflect the selective survival of better-off female-headed households or unobserved support from extended families. The finding indicates that one should not assume that all female-headed households are homogeneous in terms of their disadvantaged state.

The impact of the household head age is negatively and statistically significant with a coefficient of -0.0017. Each additional year of age reduces the probability of food insecurity by about 0.17 percentage points. Older household heads may have more stable livelihoods, accumulated assets, social capital, and better knowledge of local markets and coping strategies. However, the effect is gradual, rather than dramatic, which is consistent with age capturing experience rather than a sharp change in status.

Household size is positively and statistically significantly but comparatively small. The coefficient of 0.0011 implies that an increase of one more household member leads to the increase in the likelihood of food insecurity by approximately 0.11 percentage points. Smaller families have reduced consumption demands, whereas bigger families have higher consumption demands, and when the income does not increase in tandem, food insecurity becomes a natural outcome of the situation. The small scale of the coefficient can be explained by the fact that bigger households are also able to provide more labour and income, which partially compensates for increased needs.

There are significant impacts on the marital status of the head of the household. Compared to never-married heads, households whose heads were formerly married (widowed, divorced, or separated) have a 9.3 percentage points higher likelihood of being food insecure (0.0927, $p < 0.01$). It is one of the highest coefficients in the model and indicates that vulnerability is closely connected with family disruption. Ex-married heads might no longer have a spouse's income, labour, or social support, which directly impacts their capability to afford proper food. The positive but less significant impact is also observed in currently married heads, whose probability of food insecurity increases by 1.6 percent. This is probably an indication of the duty of taking care of a bigger household, such as children and other dependents.

The status of the labour force becomes one of the most significant determinants. Households that have unemployed heads are 18.4 percentage points more likely to be food insecure than the other predictors, a 1.5 percentage point difference that is the largest difference among the predictors. This emphasizes the core idea of having employment as a stable food access. Unemployment has a direct negative effect on income, purchasing power, and can put

households in distress coping mode. Interestingly, families in which the head is not part of the labour force (such as age, disability, or household) have a less likely food insecurity probability than in the case of employed heads, and this has a coefficient of -0.0105. It could be caused by heterogeneity in this group: not all of the non-participating heads will be in households with other earners, pensions, remittances, or social transfers, which alleviates food insecurity.

The F-statistic is very significant ($p < 0.000$), and this indicates that the set of regressors is jointly significant in explaining variation in food insecurity. The R-squared itself is quite low (0.0161), which is common with linear probability models with large and cross-sectional microdata when there is a large number of unobserved factors that can affect the outcome. Emphasis is thus placed on the sign, magnitude and importance of each coefficient as opposed to overall explanatory power.

Overall, the baseline results show that internal migration is positively associated with household food insecurity even after controlling for a wide range of socioeconomic and demographic characteristics. Food insecurity is also shaped by provincial context, rural residence, unemployment, marital disruption, and household size, while age and female headship appear to offer some protective effects. These patterns are consistent with the idea that internal migration, in the context of Pakistan's unequal regional development and labour markets, can expose households to higher risk rather than automatically improving their food security.

Table 5: OLS Regression Results for Determinants of Household Food Insecurity

Variable	Coefficient	Std. Error	t-Statistic	p-Value	95% CI
Migrant (Ref: Non-migrant)					
Migrant Household Head	0.0239	0.0036	6.62	0.000	0.0168 to 0.0309
Province (Ref: Khyber Pakhtunkhwa)					
Punjab	0.0225	0.0027	8.36	0.000	0.0172 to 0.0277
Sindh	0.0716	0.0032	22.39	0.000	0.0653 to 0.0778
Balochistan	0.0731	0.0039	18.99	0.000	0.0656 to 0.0807
Region (Ref: Rural)					
Urban	−0.0561	0.0022	−25.96	0.000	−0.0604 to −0.0519
Gender (Ref: Male Head)					
Female Head	−0.0277	0.0044	−6.31	0.000	−0.0363 to −0.0191
Age of Household Head	−0.0017	0.0001	−20.69	0.000	−0.0019 to −0.0016
Household Size	0.0011	0.0004	2.80	0.005	0.0003 to 0.0018
Marital Status (Ref: Never Married)					
Formerly Married	0.0927	0.0083	11.16	0.000	0.0764 to 0.1090
Currently Married	0.0160	0.0070	2.28	0.023	0.0022 to 0.0298
Labour Force Status (Ref: Employed)					
Unemployed	0.1844	0.0088	20.97	0.000	0.1672 to 0.2017
Not in Labour Force	−0.0105	0.0032	−3.22	0.001	−0.0168 to −0.0041
Constant	0.2081	0.0077	27.12	0.000	0.1931 to 0.2232
Number of observations = 160,619 F(12, 160606) = 219.30 Prob > F = 0.000 R-squared = 0.0161 Adjusted R-squared = 0.0160 Root MSE = 0.3777					

Heterogeneity Analysis

Table 6 presents the heterogeneity analysis and focuses on how the effect of internal migration on household food insecurity varies across different subgroups. The coefficient for migrant status is positive and highly significant in the

full sample (0.024, $p < 0.01$), confirming that, on average, households headed by migrants are about 2.4 percentage points more likely to be food insecure than non-migrant households, after controlling for other factors. This baseline effect is then unpacked by rural–urban location and by gender of the household head.

In the case of the rural subsample, the magnitude of the migration coefficient is smaller (0.015, $p < 0.01$), but it is still positive and statistically significant. This means that this relative to the non-migrant rural households, rural migrant households are still more vulnerable to food insecurity, but the incremental risk is relatively moderate. One possible reason is that rural migrants may move into rural areas or smaller towns that are close to the destination area, where the cost of living is lower, and with which they might still be able to rely on some extended family networks, land access, or agricultural work, even after migration.

In the urban subsample, there is an increasing effect of migration. The coefficient rises to 0.030 ($p < 0.01$), indicating that migrant headed households in urban areas are 3 percentage points more likely to be food insecure than their counterparts who are not migrants. This is a significant impact when compared to the overall rate of food insecurity. It probably reflects the particular difficulties that migrants encounter in urban labour markets and in housing: high rents, informal or unstable jobs, lack of job security, and limited access to social networks and local support systems. While there are generally better physical opportunities for migrants to access food markets in urban areas, this may not translate into food security if their incomes are low and volatile.

The heterogeneity by gender of the household head gives us further insight. Among male-headed households, the migration coefficient is also 0.030 ($p<0.01$), very close to the urban effect. This suggests that internal migration has a large effect on increasing the likelihood of food insecurity among male-headed households, even when other variables are taken into account. It is consistent with the proposition that male migrants tend to work in sectors where jobs are precarious, may have the main burden of earning the family's income and be subject to heavy pressure to support larger families, making them more sensitive to income shocks and price rises. It is consistent with the idea that male migrants often work in precarious sectors, may shoulder the main earning responsibility, and face strong pressure to support larger families, which makes them more sensitive to income shocks and price rises.

In contrast, the coefficient for female-headed households is negative and statistically insignificant (−0.006, $p > 0.10$). This means that for households headed by women, migration status does not have a clear or systematic effect on food insecurity once other variables are controlled for. There are several possible reasons. Female-headed migrant households may be a more selective group, for example, widows or separated women who receive regular remittances or support from relatives, or who have access to targeted social protection programmes. It is also possible that the relatively small number of female-headed migrant households in the sample reduces the precision of the estimates, making it harder to detect a significant effect.

Overall, the heterogeneity analysis shows that the adverse association between migration and food insecurity is not uniform. It is stronger in urban areas and among male-headed households, weaker in rural areas, and not statistically significant for female-headed households. These patterns suggest that the risks associated with internal migration in Pakistan are shaped by where households settle and how gender roles and responsibilities are configured within the household. For policy, this implies that generic interventions for “migrants” may be insufficient. Instead, measures to improve food security need to be tailored to urban migrant households and male-headed migrant households in particular, while also recognising that some female-headed migrant households may be relatively better protected through remittances or support networks, even though they may still face other forms of vulnerability.

Table 6: Heterogeneity Analysis

VARIABLES	(1) Full sample	(2) Rural	(3) Urban	(4) Male head	(5) Female head
Migrant = Yes	0.024***	0.015***	0.030***	0.030***	-0.006
	(0.004)	(0.006)	(0.004)	(0.004)	(0.009)
Punjab	0.022***	0.008***	0.067***	0.022***	0.011
	(0.003)	(0.003)	(0.006)	(0.003)	(0.007)
Sindh	0.072***	0.092***	0.072***	0.069***	0.058***
	(0.003)	(0.004)	(0.007)	(0.003)	(0.013)
Balochistan	0.073***	0.070***	0.090***	0.070***	0.129***
	(0.004)	(0.004)	(0.009)	(0.004)	(0.029)
Urban	-0.056***			-0.060***	-0.034***

	(0.002)			(0.002)	(0.008)
Female	-0.028***	-0.037***	0.010		
	(0.004)	(0.005)	(0.008)		
Age	-0.002***	-0.001***	-0.002***	-0.002***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household size	0.001***	-0.001	0.005***	0.001***	-0.002
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Formerly married	0.093***	0.084***	0.089***	0.043***	0.076**
	(0.008)	(0.011)	(0.013)	(0.009)	(0.032)
Currently married	0.016**	0.010	0.020*	0.027***	-0.073**
	(0.007)	(0.009)	(0.010)	(0.007)	(0.032)
Unemployed	0.184***	0.203***	0.149***	0.183***	0.145***
	(0.009)	(0.011)	(0.014)	(0.009)	(0.026)
Labour force	-0.010***	-0.008**	-0.013**	0.016***	-0.089***
	(0.003)	(0.004)	(0.005)	(0.004)	(0.008)
Constant	0.208***	0.218***	0.117***	0.211***	0.307***
	(0.008)	(0.010)	(0.013)	(0.008)	(0.035)
Observations	160,619	110,655	49964	147,015	13604
Observations	160619	110655	49,964	147015	13,604
R-squared	0.016	0.017	0.013	0.016	0.058
Adj. R-squared	0.0160	0.0169	0.0124	0.0154	0.0577

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Figure 1 visually summarizes the heterogeneity analysis by plotting the estimated coefficients of the migration variable across different subsamples, along with their confidence intervals. The figure shows that the effect of migration on food insecurity is positive and statistically significant for the full sample, rural households, urban households, and male-headed households, as indicated by the confidence intervals that do not cross zero. The effect is clearly strongest for urban and male-headed households, reflecting a higher vulnerability of these migrant groups to food insecurity. The size of the coefficient is smaller for rural migrants, suggesting relatively lower but still significant risk. In contrast, the coefficient for female-headed migrant households is negative and statistically insignificant as the confidence interval of the estimate crosses zero, implying there is no clear relationship between migration and food insecurity for this group. Overall, the figure shows that the negative impact of migration is not homogeneous and varies by location and gender, with the urban and male-headed migrant households being the most affected, as they are at the highest risk of food insecurity.

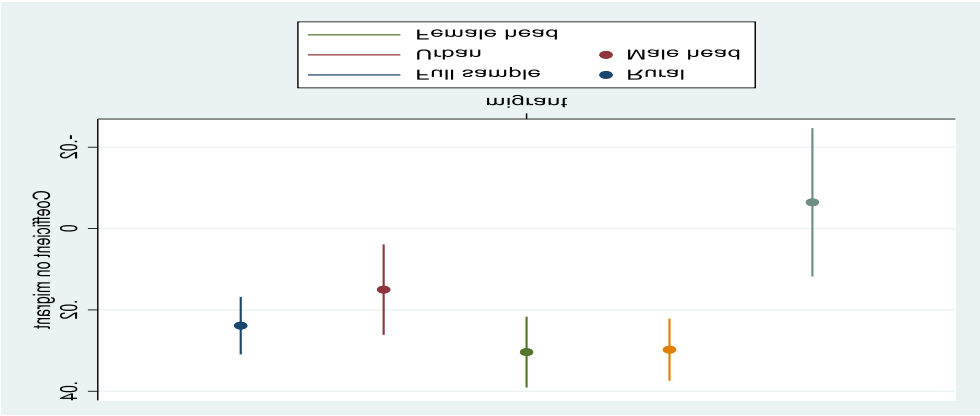

Figure 1. Migration and food insecurity

CONCLUSIONS

The findings of this study reveal a clear and consistent link between internal migration and household food insecurity in Pakistan. Migrant-headed households are significantly more likely to experience food insecurity than non-migrant households, even after key socioeconomic and demographic factors are taken into account. This suggests that internal migration does not always improve household welfare and can instead expose families to new economic and social risks. The results reflect the adjustment difficulties, unstable employment, limited social support, and higher living costs that many migrant households face, which can weaken their ability to secure adequate food. The heterogeneity analysis shows that this relationship is not the same for all groups. The effect of migration is stronger among urban and male-headed households, weaker in rural areas, and statistically insignificant among female-headed migrant households. This indicates that migration outcomes depend on where households settle and how they are structured. Overall, the evidence suggests that internal migration is linked to higher food insecurity risks for specific groups in Pakistan, underscoring the need to recognise migration as an important factor in national food security discussions.

REFERENCES

Anderson, B., Poeschel, F., & Ruhs, M. (2021). Rethinking labour migration: Covid-19, essential work, and systemic resilience. *Comparative Migration Studies, 9*(1), 45.

Anwar, M., Shair, W., & Hussain, S. (2024). Effect of coping strategies on household food insecurity in Pakistan amid global economic crisis. *International Social Science Journal, 74*(254), 1397-1421.

Carril-Caccia, F., Paniagua, J., & Suárez-Varela, M. (2025). Forced migration and food crises: F. Carril-Caccia et al. *Journal of Population Economics, 38*(4), 69.

Crisp, J., Morris, T., & Refstie, H. (2012). Displacement in urban areas: new challenges, new partnerships. *Disasters, 36*, S23-S42.

Gebrihet, H. G., & Gebresilassie, Y. H. (2025). Armed conflict and household food insecurity: Impacts and coping strategies in the conflict-affected rural settings of Tigray, Ethiopia. *Cogent Social Sciences, 11*(1), 2483392.

Ghanayem, A. A., Nor, R. M., & Al-Assaf, A. A. (2025). Formulating Strategies for Improving Food Security among Smallholder Farmers in The Middle Jordan Valley (Ghawr). *Research on World Agricultural Economy,* 706-725. https://doi.org/10.36956/rwae.v6i3.1950

Kassymova, S., Mustafayev, K., & Kabiyeva, A. (2025). Development of an Ecological-Economic Assessment System for the Sustainable Development of Regions in Kazakhstan. *Economics-Innovative and Economics Research Journal, 13*(4), 339-361.

Martey, E., & Etwire, P. M. (2025). Migration and adoption of sustainable agricultural practices in Ghana. *Journal of Applied Economics, 28*(1), 2480983.

Mazani, P. (2025). Cross-Border Solidarity: Migrant-Led Associations as Spaces of Epistemic Resistance and Food Security Innovation in South Africa. *African Human Mobility Review, 11*(2), 87-109.

Nnam, M. U. (2025). Violent herder–farmer conflicts and human security in Nigeria: a focus on food security. *Development in Practice*, 1-12. https://doi.org/10.1080/09614524.2025.2573963

Pakistan Bureau of Statistics. (2020). Pakistan Social and Living Standards Measurement Survey (PSLM) 2019–20 Report. https://www.pbs.gov.pk/wp-content/uploads/2020/07/Key_Finding_Report_of_PSLM_District_Level_Survey_2019-20.pdf

Raj, R., Ravula, P., Pratheepa, C. M., Bhanjdeo, A., Sogani, R., & Rao, N. (2025). Male migration and the transformation of gendered agricultural work: A comparative exploration of heterogeneity across selected Indian states. *Gender, Place & Culture, 32*(12), 1757–1785.

Shair, W., Afzal, H., Ahmad, A., & Iftikhar, R. (2024). Exploring the determinants of food insecurity in Pakistan. *Pakistan Journal of Humanities and Social Sciences, 12*(3), 2681-2689.

Shair, W., Hussain, S., & Idrees, M. (2023b). Social safety net programs and food insecurity in Pakistan. In Social and Economic Studies within the Framework of Emerging Global Developments (Vol. 2, pp. 105–119). Peter Lang. https://www.peterlang.com/document/1330921

Shair, W., Mir, S. A., Hussain, S., & Bukhari, S. (2023a). Effect of safety net programs on household food insecurity in Pakistan. *Journal of Policy Research, 9*(1), 131–141.

Zhu, N., Yang, J., Rahman, A., Sarker, M. N. I., Afrin, S., Afroj, M., & Firdaus, R. R. (2025). Coping with climate change: an analysis of farmers' adoption behavior and its impact on production efficiency. *Environment, Development and Sustainability*, *27*(6), 13439-13459.