



A Statistical Study of Migration Patterns in Rural Areas of Uttarkashi District of Uttarakhand

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Abstract: Out-migration in Uttarakhand has emerged as a significant socio-economic issue, with a large section of the population, particularly the youth, leaving the hill areas searching for better employment opportunities, education, and healthcare. This study is based on primary and secondary data. For primary data collection, field surveys were conducted, while secondary data were gathered from journals, books, government reports, and reports from the Uttarakhand Rural Development and Migration Commission. This study is based on a household survey conducted across 18 villages in the Uttarkashi District. The data were analysed using SPSS, MS Excel, and MS Word software. In this paper, an association between types of migrants and specific demographic characteristics was identified and tested using the chi-square test. The key finding of this study is that as the level of education and income increases, migration also increases. Male migration is higher than female migration. This phenomenon has led to the depopulation of many villages, often called "ghost villages," resulting in adverse effects on local economies, agriculture, and traditional culture.

Keywords: Migration pattern • chi-square test • Rural area of Uttarkashi

Introduction

Studying human populations is vital to understanding how societies evolve and function. Demography refers to the statistical analysis of human population characteristics—its size, composition, and spatial distribution—and the dynamics of change influenced by birth and death rates, migration, and social mobility (Bogue 1969). Among these, migration—a non-biological factor—is a significant driver of demographic shifts. It typically arises from aspirations for better living conditions, economic opportunities, or access to essential resources.

The United Nations Multilingual Demographic Directory defines migration as a form of geographic mobility involving the movement of individuals from one geographical unit to another. This process generally entails movement from an origin to a destination and may be short-term or long-term, each with

significant socio-economic implications. Ravenstein (1885) introduced the idea of an inverse relationship between migration and distance. Zipf (1946) built on this with a gravity model, proposing that migration volume is inversely related to distance and positively associated with the population sizes of the two areas. Lee (1966) refined this further by identifying push and pull factors—conditions at the origin that compel people to leave and those at the destination that attract them. Economic disparity, particularly expected income differentials between urban and rural regions, plays a crucial role in influencing migration patterns (Todaro 1976). In India, migration is a complex developmental issue. The 2011 Census reported around 450 million migrants based on the place of last residence (POLR), constituting 37% of the total population. The Economic Survey 2023–24 projects that more



than 40% of India's population will reside in urban areas by 2030. As per the Periodic Labour Force Survey (PLFS) 2020–21, 55% of migration occurs within rural areas, followed by 18.9% from rural to urban regions, 15.9% urban-to-urban, and 10.2% urban-to-rural migration.

Uttarakhand, a Himalayan state formed in 2000, is characterised by 86% mountainous terrain and 65% forest cover (Government of Uttarakhand, 2022). Despite its ecological richness, rural-to-urban migration predominates. Awasthi (2010) links this out-migration to economic backwardness, using logistic regression to show that poverty, unemployment, and inadequate services are primary push factors. The Uttarakhand Migration Report (2022) reveals a rise in uninhabited villages—from 1,034 in 2011 to 1,792 in 2022. Districts such as Almora, Tehri, and Pauri witnessed the highest out-migration, while Nainital, Chamoli, and Uttarkashi also faced demographic shifts. This migration, driven by lack of livelihood opportunities and urban pull factors, has led to village abandonment and mounting pressure on urban infrastructure, posing significant socio-economic and developmental challenges for the state.

Study Area

The district of Uttarkashi, situated northwest of Uttarakhand, India, is essential for exploring migration statistics. The district was constituted on February 24, 1960. It borders Tibet (China) to the east, Kinnaur (Himachal Pradesh) to the north, Tehri Garhwal to the

south, and Dehradun and portions of Himachal Pradesh to the west (Fig 1). With a total size of 8,016 square kilometres, Uttarkashi is distinguished by its rough terrain, high elevations, and substantial forest cover. The district has 427 village panchayats, 677 revenue villages, six development blocks, and six tehsils. According to the 2011 Census, 330,086 people live in Uttarkashi, with a sex ratio of 958 women for every 1,000 men and a literacy rate of 65.2%. Because of its closeness to the Himalayas and places of worship, the district's economy is mainly based on agriculture, with tourism serving as a supplement. The district's migratory patterns are influenced by a lack of employment prospects, difficult living conditions, and desires for improved healthcare and educational resources. Because of these elements, Uttarkashi is essential for comprehending and forecasting migration dynamics in the Himalayan region.

Objectives

- To Study the Migration Profile of Uttarkashi District.
- To examine the association between demographic characteristics and Migration patterns.

Hypotheses

- There is no significant association between the Migration patterns and the Gender of Household Members.
- There is no significant association between the Migration patterns and the members' age group.

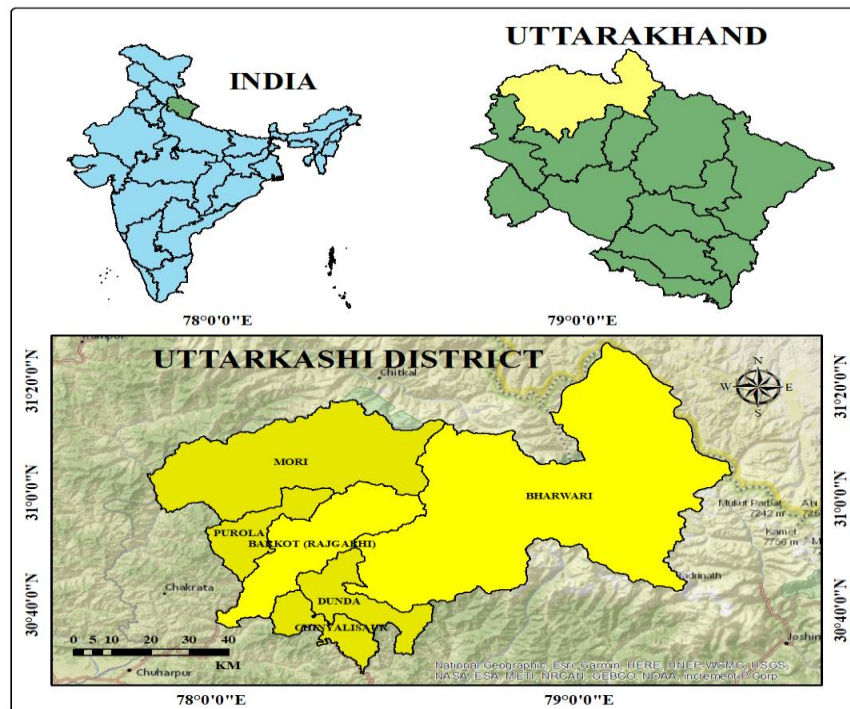


Fig.1: Location and Extend of Study Area Source: Survey of India

There is no significant association between the Migration patterns and the age group of the member

- There is no significant association between the Migration patterns and the average annual Income of the member (member age above 15 years)
- There is no significant association between the Migration patterns and Occupation

Methodology

This study is based on primary data collected through a structured sampling framework to ensure accuracy and representativeness. The district was stratified into six administrative development blocks, serving as the primary units of analysis. Each block was further categorised into three zones based on distance from the block headquarters: near (0–10 km), intermediate (10–30 km), and interior (beyond 30 km). One village from each zone was randomly selected to eliminate selection bias. Within each village, a systematic sampling

approach was used to select 10 households at fixed intervals from an ordered list, ensuring diverse and unbiased representation. This multi-stage sampling method balanced geographical diversity with statistical rigour, providing reliable data. The study also examined the association between migrant types and demographic characteristics using the chi-square test. To analyze the association, a crosstabulation is conducted to compare the distribution of migration patterns across characteristics of household members. To further assess the strength and significance of the association, a chi-squared test of independence was conducted. This statistical test helps ascertain whether the observed differences in migration patterns are due to chance or if they indicate a meaningful relationship. Additionally, Phi, Cramer's V, and contingency coefficients were measured in SPSS to assess the strength of these associations.



Table 1. Salient geographical and population features of the surveyed villages

| District | Development Block | Sample Village | Village Type | H.H | Respondent | Male | Female |
|--------------|-------------------|----------------|--------------|------------|------------|------------|------------|
| Uttarkashi | Naugaon | Sara | Near | 10 | 65 | 32 | 33 |
| | | Bajari | Intermediate | 10 | 48 | 26 | 22 |
| | | Darsoun | Interior | 10 | 48 | 24 | 24 |
| | Purola | Kurda | Near | 10 | 49 | 25 | 24 |
| | | Pani Gaon | Intermediate | 10 | 39 | 22 | 17 |
| | | Sar | Interior | 10 | 58 | 31 | 27 |
| | Mori | Dobhal Gaon | Near | 10 | 58 | 28 | 30 |
| | | Saur | Intermediate | 10 | 61 | 33 | 28 |
| | | Arakot | Interior | 10 | 45 | 23 | 22 |
| | Chinyalisour | Bhunarya | Near | 10 | 49 | 24 | 25 |
| | | Baldogi | Intermediate | 10 | 46 | 28 | 18 |
| | | Chhijula | Interior | 10 | 39 | 21 | 18 |
| | Bhatwari | Bela tipri | Near | 10 | 50 | 26 | 24 |
| | | Sada | Intermediate | 10 | 49 | 25 | 24 |
| | | Purali | Interior | 10 | 42 | 24 | 18 |
| | Dunda | Pujar Gaon | Near | 10 | 51 | 28 | 23 |
| | | Baun | Intermediate | 10 | 47 | 26 | 21 |
| | | Won | Interior | 10 | 52 | 31 | 21 |
| Total | 6 | 18 | | 180 | 896 | 477 | 419 |

Source: Field Survey by Research

Result And Discussion

1. Association between the Migration Patterns and the Gender of Household Members.

Migration patterns are influenced by gender, as women encounter unique risks and vulnerabilities that differ from those faced by men. Understanding how gender affects migration can shed light on the distinct experiences of both males and females. Crosstabulation in Table 2 shows that, in the Uttarkashi district, males are more involved in temporary (38.8%), seasonal (4.8%), and

return (8.2%) migrations, while females are more likely to be non-migrants (61.6%) and mostly if migrate then for temporary (25.8%) based only. show that gender-based migration in Uttarkashi is still dominated by males. Females are still less likely to migrate from villages. The following hypothesis is tested for statistically investigating migration patterns and the gender of the member.

Null Hypothesis (H₀): There is no significant association between the migration pattern and the gender of the household member.

Table 2: Cross tabulation of Migration Patterns by Gender of Household Members.

| Migration Pattern | Gender of the Member | | |
|---------------------|----------------------|-------------------|------------------|
| | Male (Count, %) | Female (Count, %) | Total (Count, %) |
| No Migration | 191 (40.0%) | 258 (61.6%) | 449 (50.1%) |
| Permanent Migration | 39 (8.2%) | 34 (8.1%) | 73 (8.1%) |
| Temporary Migration | 185 (38.8%) | 108 (25.8%) | 293 (32.7%) |
| Seasonal Migration | 23 (4.8%) | 5 (1.2%) | 28 (3.1%) |
| Return Migration | 39 (8.2%) | 14 (3.3%) | 53 (5.9%) |
| Total | 477 (100.0%) | 419 (100.0%) | 896 (100.0%) |

Source: Data analysis by Researcher & SPSS



Table 3: Chi-Square Test Results and Effect Size Measures for Association Between Gender and Migration Pattern

| Chi-Square Tests | Value | df | Asymp. Sig. (2-sided) |
|---|-------------------------|-------|-----------------------|
| Pearson Chi-Square | 50.396 ^a | 4 | 0 |
| Likelihood Ratio | 51.91 | 4 | 0 |
| Linear-by-Linear Association | 47.687 | 1 | 0 |
| N of Valid Cases | 896 | | |
| a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 13.09. | | | |
| Symmetric Measures | | Value | Approx. Sig. |
| Nominal by Nominal | Phi | 0.237 | 0.000 |
| | Cramer's V | 0.237 | 0.000 |
| | Contingency Coefficient | 0.231 | 0.000 |
| N of Valid Cases | | 896 | |

Source: Data analysis by Researcher & SPSS

Further, as shown in Table 3, the Pearson chi-square value ($\chi^2 = 50.396$, $p < 0.05$), the results are significant, as the p-value is less than 0.05. Therefore, we reject the null hypothesis, indicating a statistically significant association between the type of migration and the gender of the members. Phi, Cramer's V, and Contingency Coefficient, which measure the strength of the association. Show that the association is 0.237. This means there is a 23.7 % association between gender and migration pattern. The linear-by-linear Association value is 47.687 with a p-value of .000, showing a strong linear relationship between the variables.

2. Association between migration patterns and the members' age group.

Migration patterns generally fluctuate across different age groups, revealing distinct patterns that highlight how age influences the movement of populations. Younger individuals often migrate in search of education or job opportunities, while older adults might relocate for retirement or to be

closer to family. This age-related variation underscores the diverse motivations and circumstances that drive people to seek new homes at various stages of their lives. Crosstabulation in Table 4 shows that in Uttarkashi, Migration is less common among those aged 0–15 years (71.7%) and 65+ years (87.2%), which may indicate dependency or decreased mobility. On the other hand, due to work and educational prospects, "Temporary Migration" is more prevalent among working-age groups, especially those between the ages of 15 and 25 (47.2%) and 25 and 35 (47.0%). Compared to "Seasonal Migration" and "Return Migration," which are minor but visible in particular age groups, "Permanent Migration" is comparatively low, peaking at 25–35 years old (12.7%). The following hypothesis is tested for statistically investigating migration patterns and the age group of the member.

Null Hypothesis (H_0): There is no significant association between the migration pattern and the age group of the household member.

Table 4: Cross tabulation of Migration Patterns by Age Group of Members

| Migration pattern | Age group of the member(year) | | | | | | | | Total |
|---------------------|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 0–5 | 5–15 | 15–25 | 25–35 | 35–45 | 45–55 | 55–65 | 65+ | |
| No Migration | 43 | 69 | 78 | 37 | 71 | 65 | 52 | 34 | 449 |
| | (71.7%) | (61.1%) | (36.4%) | (22.3%) | (57.7%) | (62.5%) | (67.5%) | (87.2%) | (50.1%) |
| Permanent Migration | 6 | 5 | 15 | 21 | 6 | 8 | 9 | 3 | 73 |
| | (10.0%) | (4.4%) | (7.0%) | (12.7%) | (4.9%) | (7.7%) | (11.7%) | (7.7%) | (8.1%) |
| Temporary Migration | 10 | 39 | 101 | 78 | 33 | 20 | 11 | 1 | 293 |
| | (16.7%) | (34.5%) | (47.2%) | (47.0%) | (26.8%) | (19.2%) | (14.3%) | (2.6%) | (32.7%) |
| Seasonal Migration | 0 | 0 | 4 | 10 | 5 | 7 | 2 | 0 | 28 |
| | (0.0%) | (0.0%) | (1.9%) | (6.0%) | (4.1%) | (6.7%) | (2.6%) | (0.0%) | (3.1%) |



| | | | | | | | | | |
|-----------|--------|--------|--------|---------|--------|--------|--------|--------|--------|
| Return | 1 | 0 | 16 | 20 | 8 | 4 | 3 | 1 | 53 |
| Migration | (1.7%) | (0.0%) | (7.5%) | (12.0%) | (6.5%) | (3.8%) | (3.9%) | (2.6%) | (5.9%) |
| Total | 60 | 113 | 214 | 166 | 123 | 104 | 77 | 39 | 896 |
| | (100%) | (100%) | (100%) | (100%) | (100%) | (100%) | (100%) | (100%) | (100%) |

Source: Data analysis by Researcher & SPSS

Table 5. Chi-Square Test Results and Effect Size Measures for Association Between Age of the Member and Migration Pattern

| Member and Migration Pattern | | | | | | |
|--|----|-------------------------|----------------------|-------------------|------------------------|-------------------|
| Chi-Square Tests | | | Value | df | Asymp. Sig. (2-sided) | |
| Pearson Chi-Square | | | 165.116 ^a | 28 | .000 | |
| Likelihood Ratio | | | 188.055 | 28 | .000 | |
| Linear-by-Linear Association | | | 11.850 | 1 | .001 | |
| N of Valid Cases | | | 896 | | | |
| a. 11 cells (27.5%) have an expected count of less than 5. The minimum expected count is 1.22. | | | | | | |
| Symmetric Measures | | | Value | Asymp. Std. Error | Approx. T ^b | Approx. Sig. |
| Nominal | by | Phi | .429 | | | .000 |
| Nominal | | Cramer's V | .215 | | | .000 |
| | | Contingency Coefficient | .394 | | | .000 |
| Interval by Interval | | Pearson's R | -.115 | .031 | -3.463 | .001 ^c |
| Ordinal by Ordinal | | Spearman Correlation | -.079 | .033 | -2.381 | .017 ^c |
| N of Valid Cases | | | 896 | | | |

a. Not assuming the null hypothesis, b. Using the asymptotic standard error, the null hypothesis is assumed.

c. Based on normal approximation.

Source: Data analysis by Researcher & SPSS

As a result, shown in Table 5. The study rejects the null hypothesis by demonstrating a statistically significant relationship between age group and migration type (Chi-Square = 165.116, $p < 0.001$), indicating a statistically significant association between the migration pattern and age of the members. According to the moderate association strength (Cramer's $V = 0.215$) and mild negative correlations (Pearson's $R = -0.115$, Spearman = -0.079), migration tendencies appear to change with age. These results emphasise how age plays a crucial role in determining migratory trends with socioeconomic factors.

3. Association between migration pattern and literacy level of the member.

The rural areas lack educational facilities, especially in higher education. People migrate to the urban centres for this purpose, and after completing their education, they have the tendency to settle down. So, the Literacy level of the member is closely associated with their decision to migrate. For the Uttarkashi district, the cross-tabulation of migrant patterns and

literacy levels in Table 6 highlights significant differences in educational attainment. Among non-migrants, the largest percentage (24.28%) has education up to Junior High School (grades VI–VIII), with 16.26% completing Intermediate education and 7.57% being illiterate. In contrast, temporary migrants show a higher prevalence of higher education, with 28.33% classified as undergraduates and 18.77% at the Intermediate level, suggesting that many seek educational and employment opportunities. Permanent migrants also exhibit considerable educational attainment, as 28.77% hold undergraduate degrees and 13.70% possess technical degrees. Conversely, seasonal migrants mainly have Intermediate-level education (46.43%) and limited access to higher education. Return migrants demonstrate a more balanced educational distribution, with 20.75% holding Intermediate, Undergraduate, or Technical Degrees, indicating improved outcomes post-migration. Overall, in Uttarkashi district, higher education levels are more common among permanent and



temporary migrants, while seasonal migrants tend to have lower attainment. The following hypothesis is tested for statistically investigating migration patterns and literacy levels of the members.

Null Hypothesis H_0 : There is no significant association between the migration pattern and literacy level of the member.

Table 6: Cross tabulation of Migration Patterns by Literacy Level of Members.

| Type of Migrant | Literacy level | | | | | | | | | | | Total |
|-----------------|----------------|-------------|-------------|--------------|-------------|--------------|------------------|---------------|------------|-------------|---------------|-------|
| | Illiterate | Pre-Primary | Primary | Junior High | High School | Intermediate | Under Graduation | Post-Graduate | Diploma | Technical | Literate Only | |
| No Migration | 34 (7.57%) | 63 (14.03%) | 63 (14.03%) | 109 (24.28%) | 47 (10.47%) | 73 (16.26%) | 30 (6.68%) | 5 (1.11%) | 10 (2.23%) | 8 (1.78%) | 7 (1.56%) | 449 |
| Permanent | 2 (2.74%) | 7 (9.59%) | 1 (1.37%) | 11 (15.07%) | 5 (6.85%) | 13 (17.89%) | 21 (28.77%) | 1 (1.37%) | 2 (2.74%) | 10 (13.70%) | 0 (0.00%) | 73 |
| Temporary | 2 (0.68%) | 17 (5.80%) | 9 (3.07%) | 28 (9.56%) | 17 (5.80%) | 55 (18.77%) | 83 (28.33%) | 19 (6.48%) | 17 (5.80%) | 46 (15.70%) | 0 (0.00%) | 293 |
| Seasonal | 1 (3.57%) | 1 (3.57%) | 0 (0.00%) | 0 (0.00%) | 4 (14.29%) | 13 (46.43%) | 7 (25.00%) | 1 (3.57%) | 1 (3.57%) | 0 (0.00%) | 0 (0.00%) | 28 |
| Return | 0 (0.0%) | 1 (1.89%) | 0 (0.00%) | 1 (1.89%) | 2 (3.77%) | 11 (20.75%) | 11 (20.75%) | 8 (15.09%) | 8 (15.09%) | 11 (20.75%) | 0 (0.00%) | 53 |
| Total | 39 | 89 | 73 | 149 | 75 | 165 | 152 | 34 | 38 | 75 | 7 | 896 |

Source: Data analysis by Researcher & SPSS

Table 7: Chi-Square Test Results and Effect Size Measures for Association Between literacy level of the Member and Migration Pattern. Source: Data analysis by Researcher & SPSS

| Chi-Square Tests | Value | df | Asymp. Sig. (2-sided) |
|------------------------------|----------------------|----|-----------------------|
| Pearson Chi-Square | 311.323 ^a | 40 | .000 |
| Likelihood Ratio | 334.927 | 40 | .000 |
| Linear-by-Linear Association | 179.309 | 1 | .000 |
| N of Valid Cases | 896 | | |

a. 23 cells (41.8%) have an expected count of less than 5. The minimum expected count is .22.

| Symmetric Measures | Value | Asymp. Std. Error | Approx. T ^b | Approx. Sig. |
|---|-------|-------------------|------------------------|-------------------|
| Nominal by Phi | .589 | | | .000 |
| Nominal by Cramer's V | .295 | | | .000 |
| Contingency Coefficient | .508 | | | .000 |
| Interval by Interval Pearson's R | .448 | .026 | 14.966 | .000 ^c |
| Ordinal by Ordinal Spearman Correlation | .483 | .026 | 16.478 | .000 ^c |
| N of Valid Cases | 896 | | | |

a. Not assuming the null hypothesis, b. Using the asymptotic standard error, the null hypothesis is assumed.

c. Based on normal approximation.

As per the result shown in Table 7, the study rejected the null hypothesis, which shows a

substantial correlation between literacy level and migration patterns (Chi-Square = 311.323,



$p < 0.001$). While positive correlations (Pearson's $R = 0.448$, Spearman $= 0.483$) imply that in Uttarkashi district, higher educational attainment significantly increases migration risk, mainly temporary and permanent types, the association's strength (Cramer's $V = 0.295$) is moderate. Overall, Migration patterns differ significantly based on individuals' levels of educational attainment.

4. Association between the migration patterns and the average annual Income of the member

Migration, whether taking place within a country or across international borders, is frequently driven by a myriad of economic factors. Among these, income stands out as a pivotal element, shaping individuals' decisions to seek better opportunities, improved living conditions, and greater financial stability in new environments. For the Uttarkashi district, crosstabulation of migration patterns and the average annual Income of the member (member age above 15 years) in Table 8 highlights significant differences in income distribution among varied migrant categories. The findings reveal that non-migrant households are primarily concentrated in the very low- and low-income sectors, with 87.9% earning below ₹1 lakh and 75.0% making between ₹1–3 lakh. This indicates that individuals who do not migrate tend to have a

weaker economic profile. In contrast, temporary migrants enjoy a more favourable income distribution, with 47.8% situated in the upper-middle income category (₹6–10 lakh) and 47.6% in the high-income group (above ₹10 lakh). Permanent migrants also display a strong presence in higher income brackets, with 23.8% classified as high-income earners and 14.1% as upper-middle income earners. Return migrants predominantly occupy the lower-middle income range (₹3–6 lakh), comprising 17.7% of this category, suggesting modest economic gains. On the other hand, seasonal migrants are mostly found in the lower income levels, although a small percentage have achieved higher earnings. A significant number of people fall into the "No Income Reported" category, which may indicate economic dependency, unemployment, or the absence of formal income reporting. Overall, in the Uttarkashi district, temporary and permanent migration is associated with higher household incomes, in contrast to the economic challenges faced by non-migrants. The following hypothesis is tested for statistically investigating migration patterns and the average annual Income of the member.

Null Hypothesis H_0 : There is no significant association between migration patterns and the average annual Income of the member (member age above 15 years)

Table 8: Cross tabulation of Migration Patterns and the Average Annual Income of the Member.

| Migration Type | Very Low | Low | Lower-Middle | Upper-Middle | High | No Income Reported | Total |
|---------------------|----------------|-----------------|-----------------|----------------|----------------|--------------------|-----------------|
| No Migration | 51 (87.9%) | 90 (75.0%) | 57 (40.4%) | 22 (23.9%) | 0 (0.0%) | 117 (40.2%) | 337 (46.6%) |
| Permanent Migration | 0 (0.0%) | 1 (0.8%) | 11 (7.8%) | 13 (14.1%) | 5 (23.8%) | 32 (11.0%) | 62 (8.6%) |
| Temporary Migration | 3 (5.2%) | 14 (11.7%) | 40 (28.4%) | 44 (47.8%) | 10 (47.6%) | 133 (45.7%) | 244 (33.7%) |
| Seasonal Migration | 1 (1.7%) | 8 (6.7%) | 8 (5.7%) | 4 (4.3%) | 3 (14.3%) | 4 (1.4%) | 28 (3.9%) |
| Return Migration | 3 (5.2%) | 7 (5.8%) | 25 (17.7%) | 9 (9.8%) | 3 (14.3%) | 5 (1.7%) | 52 (7.2%) |
| Total | 58 (100.0%) | 120 (100.0%) | 141 (100.0%) | 92 (100.0%) | 21 (100.0%) | 291 (100.0%) | 723 (100.0%) |

Source: Data analysis by Researcher & SPSS



Table 9: Chi-Square Test Results and Effect Size Measures for Association Between Migration Patterns and the Average Annual Income of the Member.

| Chi-Square Tests | | Value | df | Asymp. Sig. (2-sided) | |
|--|-------------------------|----------------------|-------------------|------------------------|-------------------|
| Pearson Chi-Square | | 193.393 ^a | 20 | .000 | |
| Likelihood Ratio | | 215.081 | 20 | .000 | |
| Linear-by-Linear Association | | 12.010 | 1 | .001 | |
| N of Valid Cases | | 723 | | | |
| a. 8 cells (26.7%) have an expected count of less than 5. The minimum expected count is .81. | | | | | |
| Symmetric Measures | | Value | Asymp. Std. Error | Approx. T ^b | Approx. Sig. |
| Nominal by Nominal | Phi | .517 | | | .000 |
| | Cramer's V | .259 | | | .000 |
| | Contingency Coefficient | .459 | | | .000 |
| | | | | | |
| Interval by Interval | Pearson's R | .129 | .036 | 3.492 | .001 ^c |
| Ordinal by Ordinal | Spearman Correlation | .183 | .038 | 4.993 | .000 ^c |
| N of Valid Cases | | | 723 | | |

a. Not assuming the null hypothesis, b. Using the asymptotic standard error, the null hypothesis is assumed.
c. Based on normal approximation.

Source: Data analysis by Researcher & SPSS

The results presented in Table 9 demonstrating a significant correlation between average yearly income and migration patterns (Chi-Square = 193.393, $p < 0.001$). so that study rejected the null hypothesis. here relationship suggests that individuals with varying income levels exhibit different tendencies when it comes to migration decisions. Specifically, the analysis demonstrates that the association between income and the likelihood of both temporary and permanent migration is considerably strong, as evidenced by a Cramer's V statistic of 0.259. and positive correlations (Pearson's $R = 0.129$, Spearman's $\rho = 0.183$) are also present. these results highlight the inclination of higher-income individuals to pursue migration for work-related opportunities and economic advancement, while those from lower-income brackets appear to migrate less frequently.

5. Association between Migration Patterns and the Occupation of the Member.

A worker's job and employment status play crucial roles in migration studies, highlighting the economic factors driving the movement from rural areas to urban centres. In the Uttarkashi district, as referred to in Table 10, migration trends differ significantly among various occupational groups. For those in

agriculture and related fields, migration remains low, with 92.6% indicating no migration and just 1.1% participating in temporary movement. Domestic workers also show a high percentage of non-migration (44.3%) but have a considerable amount of short-term migration (30%). For wage labourers, temporary migration is the most frequent at 23.5%, with seasonal migration following at 29.4%. In the trade and business sector, temporary migration is prevalent at 20.4%, with 7.4% reporting permanent moves. Student migration features notable temporary movements (39.1%) and minimal return migration (0.6%). Government employees tend to migrate temporarily (67.2%), while those in private or contract jobs have a strong link with temporary migration at 71%. Occupations related to tourism account for 50% of return migration. Religious artisans demonstrate very low mobility, with 92.9% not relocating. In the social services sector, migration types are evenly spread (25% each). Lastly, among the unemployed and job seekers, temporary migration is significantly high at 77.8%. The following hypothesis is tested for statistically investigating migration patterns and Occupation of the member.



Null Hypothesis H_0 : There is no significant association between migration patterns and Occupation of the member.

Table 10: Cross tabulation of Migration Patterns and the Occupation of the Member.

Source: Data analysis by Researcher & SPSS

| Occupation | No Migration | Permanent Migration | Temporary Migration | Seasonal Migration | Return Migration | Total |
|--------------------------------|--------------|---------------------|---------------------|--------------------|------------------|-------|
| Agriculture & Allied | 162 (92.6%) | 0 (0.0%) | 2 (1.1%) | 4 (2.3%) | 7 (4.0%) | 175 |
| Household Work | 31 (44.3%) | 13 (18.6%) | 21 (30.0%) | 1 (1.4%) | 4 (5.7%) | 70 |
| Wage Labor | 5 (29.4%) | 1 (5.9%) | 4 (23.5%) | 5 (29.4%) | 2 (11.8%) | 17 |
| Trade & Business | 16 (29.6%) | 4 (7.4%) | 11 (20.4%) | 8 (14.8%) | 15 (27.8%) | 54 |
| Student | 175 (53.0%) | 23 (7.0%) | 129 (39.1%) | 1 (0.3%) | 2 (0.6%) | 330 |
| Government Job | 4 (6.0%) | 14 (20.9%) | 45 (67.2%) | 1 (1.5%) | 3 (4.5%) | 67 |
| Retired/non-active | 28 (77.8%) | 1 (2.8%) | 1 (2.8%) | 0 (0.0%) | 6 (16.7%) | 36 |
| Private/Contract Job | 5 (8.1%) | 9 (14.5%) | 44 (71.0%) | 1 (1.6%) | 3 (4.8%) | 62 |
| Tourism Agency | 7 (31.8%) | 0 (0.0%) | 0 (0.0%) | 4 (18.2%) | 11 (50.0%) | 22 |
| Religious/Traditional Artisans | 13 (92.9%) | 0 (0.0%) | 0 (0.0%) | 1 (7.1%) | 0 (0.0%) | 14 |
| Social Service | 1 (25.0%) | 1 (25.0%) | 1 (25.0%) | 1 (25.0%) | 0 (0.0%) | 4 |
| Unemployed/Seeking Work | 2 (4.4%) | 7 (15.6%) | 35 (77.8%) | 1 (2.2%) | 0 (0.0%) | 45 |
| Total | 449 (50.1%) | 73 (8.1%) | 293 (32.7%) | 28 (3.1%) | 53 (5.9%) | 896 |

Table 11: Chi-Square Test Results and Effect Size Measures for Association Between Migration Patterns and the Occupation of the Member.

| Chi-Square Tests | Value | df | Asymp. Sig. (2-sided) |
|------------------------------|----------------------|----|-----------------------|
| Pearson Chi-Square | 601.423 ^a | 44 | .000 |
| Likelihood Ratio | 585.435 | 44 | .000 |
| Linear-by-Linear Association | 84.633 | 1 | .000 |
| N of Valid Cases | 896 | | |

a. 30 cells (50.0%) have an expected count of less than 5. The minimum expected count is .13.

| Symmetric Measures | Value | Asymp. Std. Error | Approx. T ^b | Approx. Sig. |
|-------------------------|-------|-------------------|------------------------|-------------------|
| Nominal by Nominal | | | | |
| Phi | .819 | | | |
| Cramer's V | .410 | | | |
| Contingency Coefficient | .634 | | | |
| Interval by Interval | | | | |
| Pearson's R | .308 | .030 | 9.663 | .000 ^c |
| Ordinal by Ordinal | | | | |
| Spearman Correlation | .347 | .031 | 11.074 | .000 ^c |
| N of Valid Cases | 896 | | | |

a. Not assuming the null hypothesis, b. Using the asymptotic standard error, the null hypothesis is assumed.

c. Based on normal approximation.

Source: Data analysis by Researcher & SPSS

As the result shown in table 11, The Chi-Square analysis indicates a significant connection between occupation and migration status ($\chi^2 (44) = 601.42$, $p < .001$), suggesting that the nature of a person's job is closely related to their migration patterns. This relationship is further highlighted by a Cramer's V value of 0.410 and a Phi

coefficient of 0.819, both of which reflect a moderate to strong association. Additionally, both Pearson's R (0.308) and Spearman's rho (0.347) show significance ($p < .001$), pointing to a consistent positive trend: as jobs transition from traditional, local positions (like farming or craftwork) to more mobile or formal employment (such as government roles,



private contracting, or being a student), the chances of temporary or return migration increase notably. Essentially, the type of job not only influences whether individuals choose to migrate but also affects the characteristics of their migration.

Conclusion

This study explores migration in Uttarkashi district, Uttarakhand, highlighting key socio-economic and geographic factors such as age, income, education, and occupation. Migration is predominantly male-driven, as socio-cultural norms often restrict female mobility. The 15–35 age group shows the highest migration rates, primarily for education and employment, while children and the elderly rarely migrate. Higher education levels correlate with increased migration, reflecting limited local opportunities. Income also influences mobility—non-migrants generally belong to low-income groups, whereas higher-income individuals tend to migrate. Geographic isolation and inadequate local resources intensify out-migration, especially among young men seeking better livelihoods. This pattern affects both rural and urban areas: rural regions face depopulation and the rise of “ghost villages,” while urban centres experience pressure on infrastructure and services. The findings stress the need for targeted policies, including rural job creation, gender-sensitive planning, improved infrastructure, and sustainable urban development, to address migration challenges and ensure balanced regional growth.

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