Sugar Industry Employment and Rural Migration: Understanding Workers' Intentions to Stay in Pakistani Villages

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Abstract

TMigration remains a critical socio-economic phenomenon in Pakistan, particularly within agro-industrial sectors such as the sugar industry. This study investigates the factors influencing sugar mill workers' intentions to remain in rural villages, focusing on selected districts in Punjab and Sindh. Using a structured questionnaire administered to 260 respondents, combined with correlation and factor analysis in SPSS, the research examines demographic characteristics, occupational conditions, welfare provisions, and social influences. Results reveal that the workforce is predominantly male-headed, middle-aged, and modestly educated, with extended working hours and limited access to welfare services. The problem-facing index highlights lack of institutional support, inadequate credit facilities, and food insecurity as the most pressing challenges. Factor analysis demonstrates that occupational stability and welfare provisions exert the strongest influence on workers' retention, while social cohesion and family obligations also play significant roles. These findings align with migration theories such as Todaro's income-differential model and Massey's push-pull framework, while also reflecting the Sustainable Development Goals (SDGs), particularly SDG 8 (Decent Work), SDG 9 (Infrastructure), and SDG 10 (Reduced Inequalities). The study underscores the need for comprehensive policy interventions that integrate labor welfare, institutional support, and rural infrastructure development to ensure sustainable retention of sugar mill workers in villages. By situating the analysis within both theoretical and policy frameworks, this research contributes to the discourse on rural development, industrial labor, and migration management in Pakistan.

Keywords: Sugar industry; migration; rural retention; occupational welfare; push-pull factors; Pakistan; Sustainable Development Goals (SDGs); industrial labor; socio-economic challenges; rural development

Introduction

Migration has long been recognized as a defining feature of socio-economic transformation in developing countries, shaping labor markets, rural livelihoods, and industrial growth. Pakistan, with its dual dependence on agriculture and agro-based industries, presents a particularly complex case where rural-urban migration intersects with the dynamics of industrial employment. According to the International Organization for Migration (IOM, 2021), Pakistan is among the top labor-exporting nations globally, yet internal migration patterns—especially between rural villages and industrial hubs—remain equally significant in influencing socio-economic outcomes. Within this context, the sugar industry, one of Pakistan's largest agro-industrial sectors, plays a pivotal role in rural employment and development. The sugar mills, concentrated in Punjab and Sindh, not only process the country's primary cash crop but also absorb thousands of rural workers whose livelihood decisions are deeply intertwined with migration dynamics (Government of Pakistan, Economic Survey 2023).

The sugar industry's importance to Pakistan's economy cannot be overstated. It contributes substantially to agricultural GDP, supports millions of cane growers, and sustains ancillary industries such as transport, packaging, and trade (Khan & Hussain, 2022). Yet, despite its economic significance, the sector is plagued by challenges including seasonal employment, wage disparities, and inadequate welfare provisions. These conditions often compel workers to migrate to urban centers in search of stability, while others remain in villages due to family obligations, cultural ties, or limited alternatives. Understanding the factors that influence sugar mill workers' intentions to stay in rural areas is therefore critical for designing policies that balance industrial growth with sustainable rural development.

Migration decisions are typically shaped by a combination of push and pull factors. Push factors include poverty, landlessness, lack of educational opportunities, and poor infrastructure, while pull factors encompass better wages, improved living standards, and access to urban amenities (Todaro, 1969; Massey et al., 1993). In Pakistan, rural households often face acute vulnerabilities such as indebtedness, seasonal unemployment, and climate-induced risks, which intensify the push towards migration (Shahbaz et al., 2021). Conversely, sugar mills located in rural districts offer industrial employment that can act as a pull factor, retaining workers in villages by providing relatively stable income and proximity to family networks. However, the precarious nature of mill work—characterized by long hours, limited health facilities, and absence of social security—raises questions about whether such employment genuinely supports retention or merely delays inevitable migration (Atiqur & Sarker, 2021).

The socio-demographic profile of sugar mill workers further complicates this dynamic. Studies on agro-industrial labor in South Asia reveal that workers are predominantly male, middle-aged, and possess modest educational backgrounds, with limited upward mobility (Hanif et al., 2020; Al-Maruf et al., 2022). In Pakistan, similar patterns are evident: most sugar mill workers belong to nuclear families, have primary or secondary education, and rely heavily on industrial wages for survival (Ahmad & Raza, 2023). These characteristics suggest that migration decisions are not merely economic but also shaped by social and cultural considerations, including family responsibilities, community ties, and perceptions of rural life. For instance, workers may choose to remain in villages despite economic hardships due to attachment to ancestral land or the desire to raise children in familiar environments (Majumder & Rahman, 2023).

The implications of these migration dynamics extend beyond individual households to broader development goals. Retaining workers in rural areas aligns with several Sustainable

Development Goals (SDGs), including SDG 2 (Zero Hunger), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure). By ensuring that sugar mill workers have access to fair wages, education, healthcare, and housing, policymakers can strengthen rural economies, reduce inequalities (SDG 10), and promote inclusive growth (SDG 17). Conversely, unchecked migration to urban centers risks exacerbating rural depopulation, weakening agricultural productivity, and intensifying urban poverty and congestion (Ghimira et al., 2019).

Despite the significance of these issues, research on migration intentions among sugar mill workers in Pakistan remains limited. While several studies have examined rural-urban migration among farmers and industrial laborers (Basu et al., 2021; Hossain et al., 2016), few have focused specifically on agro-industrial workers in the sugar sector. This gap is particularly striking given the sector's scale and its role in shaping rural livelihoods. Existing literature highlights the importance of economic incentives, household welfare, and environmental factors in migration decisions, but the unique socio-economic challenges faced by sugar mill workers—such as seasonal employment cycles, exposure to industrial hazards, and dependence on cane supply chains—require dedicated investigation (Mannan et al., 2022).

This study seeks to fill that gap by empirically examining the factors influencing sugar mill workers' intentions to stay in villages in Pakistan. Using a structured questionnaire and correlation analysis, it explores the interplay of physical, social, educational, occupational, welfare, and personal factors that shape workers' decisions. By focusing on sugar mills in selected districts, the research provides insights into how industrial employment interacts with rural development, migration patterns, and socio-economic stability. The findings aim to inform policymakers, industry stakeholders, and development practitioners about strategies to enhance worker retention, improve living conditions, and promote sustainable rural-industrial integration.

In sum, migration among sugar mill workers in Pakistan is not merely a matter of economic calculus but a complex phenomenon shaped by structural inequalities, industrial dynamics, and social attachments. By situating this inquiry within the broader discourse on migration and rural development, the study contributes to both academic scholarship and practical policymaking. It underscores the need for comprehensive strategies that address immediate challenges—such as wages, working hours, and welfare provisions—while also advancing long-term goals of education, infrastructure, and social equity. Only through such holistic approaches can Pakistan's sugar industry serve as a driver of inclusive rural development rather than a source of precarious livelihoods and forced migration.

Literature Review

Migration has long been a defining feature of socio-economic transformation in South Asia, particularly in agrarian economies like Pakistan. The sugar industry, one of the largest agro-industrial sectors in the country, provides employment to thousands of rural workers, yet their decisions to remain in villages or migrate to urban centers are shaped by a complex interplay of economic, social, and institutional factors. This literature review synthesizes existing scholarship on migration dynamics, rural retention, and industrial labor, situating sugar mill workers within broader theoretical and empirical contexts. It draws on both classical migration theories and contemporary empirical studies from Pakistan and neighboring countries to highlight the determinants of workers' intentions to stay in rural areas.

Migration Theories and Conceptual Frameworks

The study of migration has been anchored in several theoretical frameworks. Todaro's (1969) model of rural-urban migration emphasizes expected income differentials and employment

probabilities as key determinants of migration decisions. This model is particularly relevant to Pakistan's sugar industry, where workers weigh the relatively stable but low-paying mill jobs against uncertain urban opportunities. Massey et al. (1993) expanded this perspective through the push-pull framework, which integrates economic, social, and cultural factors. Push factors such as poverty, landlessness, and lack of infrastructure drive workers away from villages, while pull factors such as better wages, education, and healthcare attract them to cities. These theories remain foundational in understanding the migration-retention dilemma faced by sugar mill workers.

More recent perspectives, such as the new economics of labor migration (NELM), argue that migration decisions are household strategies aimed at diversifying income and reducing risk (Stark & Bloom, 1985). In Pakistan, where rural households often face indebtedness and seasonal unemployment, migration becomes a collective decision rather than an individual choice. This framework is particularly relevant to sugar mill workers, whose families may depend on both agricultural income and industrial wages, balancing the risks of migration with the stability of rural employment.

Rural-Urban Migration in Pakistan

Empirical studies on migration in Pakistan highlight the dominance of rural-to-urban flows. Naz and Khan (2021) found that urbanization in Pakistan has accelerated due to employment instability and lack of rural services. The Labour Force Survey (2018) reported that economic opportunity, infrastructure deficits, and climate vulnerability are primary drivers of migration. Altaf (2024) emphasized that migration in Pakistan is not only driven by economic incentives but also by household strategies to cope with risk, consistent with NELM. These findings suggest that sugar mill workers' decisions to stay or migrate are embedded within broader national trends of rural-urban mobility.

Hossain et al. (2016), in a comparative study of Bangladesh, found that education, household occupation, and landholding significantly influenced migration. Interestingly, 83% of migrants expressed a desire to return to villages post-retirement, citing urban congestion and loss of community ties. This resonates with Pakistan's context, where social cohesion and family obligations often deter migration despite economic hardships.

Sugar Industry and Rural Employment

The sugar industry is a cornerstone of Pakistan's rural economy. According to the Pakistan Economic Survey (2023), the sector supports millions of cane growers and thousands of mill workers, contributing substantially to agricultural GDP. However, the industry is plagued by seasonal volatility, wage disparities, and welfare gaps. Pirzada et al. (2023) argue that policy misalignment and lack of deregulation have led to inefficiencies and labor exploitation. Fatima and Shahid (2017) documented poor occupational health and safety conditions in sugar mills, including long working hours, inadequate housing, and limited healthcare facilities. These findings highlight the precarious nature of industrial employment in rural Pakistan.

Ahmad and Raza (2023) found that sugar mill workers are predominantly male, middle-aged, and poorly educated, with limited upward mobility. Their study revealed that job stability and proximity to family were key reasons for rural retention, while lack of institutional support and credit access were major push factors. These findings underscore the dual role of sugar mills as both stabilizers of rural employment and sources of vulnerability.

Welfare, Infrastructure, and Retention

Access to welfare and infrastructure is critical for rural retention. UNDP (2019) emphasized that healthcare, education, and housing are essential for sustainable rural development. Gatti (2020) argued that infrastructure deficits exacerbate migration pressures, as workers seek

better amenities in urban areas. In sugar mill communities, welfare factors such as electricity, clean water, and medical services significantly influence workers' decisions to stay. The problem-facing index in recent studies confirms that lack of government support and credit facilities are the most severe challenges (Hasan et al., 2025).

Basu et al. (2021) used logistic regression to show that education, satisfaction, and additional earners reduce migration likelihood. Their findings suggest that multi-dimensional welfare access can stabilize rural labor markets. In Pakistan, where sugar mill workers often face food insecurity and inadequate housing, improving welfare provisions could enhance retention and reduce migration pressures.

Comparative Insights from South Asia

Studies from Bangladesh and India provide valuable comparative insights. Al-Maruf et al. (2022) identified 21 variables influencing rural-urban migration in Bangladesh, including seasonal dearth, family loans, and agricultural instability. These factors mirror Pakistan's context, where sugar mill workers often face seasonal employment and debt cycles. Majumder and Rahman (2023) linked migration to environmental degradation and public health risks, arguing for integrated urban planning and rural investment. Khan and Illiyan (2023) found that push factors such as poverty and landlessness were more influential than pull factors in India, highlighting the structural nature of migration pressures.

These comparative studies suggest that sugar mill workers in Pakistan face similar challenges, including economic insecurity, institutional neglect, and environmental vulnerability. However, the strong role of social cohesion and family obligations in Pakistan may differentiate its migration dynamics from neighboring countries.

Sustainable Development Goals (SDGs) and Policy Alignment

The findings of migration studies align with several Sustainable Development Goals (SDGs). SDG 2 (Zero Hunger) addresses food insecurity, a major challenge for sugar mill workers. SDG 4 (Quality Education) highlights educational disparities that limit upward mobility. SDG 8 (Decent Work) emphasizes labor conditions and job stability, while SDG 9 (Infrastructure) underscores the importance of housing, utilities, and transport. SDG 10 (Reduced Inequalities) tackles wage gaps and institutional neglect, and SDG 17 (Partnerships) advocates for multi-sectoral collaboration. By integrating these goals, research on sugar mill workers contributes to a rights-based, inclusive development framework that supports both economic growth and social equity.

Gaps in Literature and Future Directions

Despite the growing body of research on migration, rural retention among industrial workers remains underexplored. Most studies focus on farmers or urban migrants, leaving a gap in understanding the unique vulnerabilities of mill workers. Your study fills this gap by combining quantitative analysis with SDG alignment, offering actionable insights for policymakers. Future research should explore gendered dimensions of migration, particularly the role of female-headed households, and adopt longitudinal designs to track migration trajectories over time. Comparative analyses across agro-industrial sectors, such as textiles and rice, could further enrich understanding. Finally, examining the impact of climate change on rural labor and migration decisions would provide critical insights into future challenges.

Methodology

Study Area

The study was conducted in selected districts of Punjab and Sindh, Pakistan, where sugar mills are most concentrated. Punjab accounts for nearly 60% of the country's sugar production, while Sindh contributes around 30%, making these provinces ideal for examining the socio-

economic and migratory dynamics of sugar mill workers (Government of Pakistan, Economic Survey 2023). Districts such as Rahim Yar Khan, Muzaffargarh, Faisalabad, and Thatta were purposively selected due to their high density of sugar mills and significant reliance on rural labor. This purposive sampling ensured that the study captured the realities of workers employed in areas where the sugar industry is a dominant source of livelihood. Surrounding agricultural communities were also included to assess the broader interdependencies between cane growers, mill workers, and rural households.

Research Design

The study adopted a quantitative survey to provide a comprehensive understanding of migration intentions. This approach allowed for triangulation of data, enhancing the validity and reliability of findings (Creswell & Plano Clark, 2018). The quantitative component focused on structured questionnaires administered to sugar mill workers.

Sample Size Determination

Determining an appropriate sample size was critical to ensure generalizability. Since the exact population of sugar mill workers in the selected districts was unknown, the study employed Kothari's (2004) formula for sample size determination under conditions of unknown population size. Assuming a 95% confidence level (Z = 1.96), a 5% margin of error (e = 0.05), and an estimated proportion (p) of 0.80 representing workers experiencing significant socio-economic impacts, the calculated sample size was 260 respondents. This figure was proportionately distributed across the selected districts based on the relative size of their sugar mill workforce.

Sampling Technique

A purposive stratified sampling technique was employed. Workers were stratified by employment type (seasonal vs. permanent), gender, and age group to ensure representation of diverse socio-demographic categories. Seasonal workers, who constitute a large proportion of the sugar mill workforce, were deliberately oversampled to capture their unique vulnerabilities. Within each stratum, respondents were selected randomly to minimize bias.

Data Collection Instruments

Primary data were collected using a structured questionnaire divided into two sections.

1. **Demographic and socio-economic profile**: This section captured information on age, gender, education, household composition, migration status, employment type, and working hours.
2. **Factors influencing migration intentions**: Drawing on established frameworks (Todaro, 1969; Massey et al., 1993), the questionnaire included items on physical infrastructure, social and cultural ties, educational opportunities, occupational conditions, welfare provisions, and personal/family considerations. A five-point Likert scale ranging from "very high influence" to "very low influence" was used to measure the perceived importance of each factor.

The questionnaire was initially drafted in English and then translated into Urdu and Sindhi to ensure accessibility. Back-translation was conducted to maintain semantic accuracy (Brislin, 1970). A pilot survey with 20 workers was carried out to test clarity, reliability, and cultural appropriateness. Feedback from the pilot led to minor revisions in wording and sequencing of questions.

Validity and Reliability

Content validity was ensured through consultation with academic experts in agricultural economics and labor studies, as well as practitioners from Pakistan's sugar industry. Construct validity was established by aligning questionnaire items with theoretical constructs of

migration and rural development. Reliability was tested using Cronbach's alpha, with values above 0.70 indicating acceptable internal consistency (Nunnally, 1978).

Data Collection Procedure

Fieldwork was conducted between October and December 2025, coinciding with the peak sugarcane crushing season when mills operate at full capacity. Trained enumerators administered questionnaires face-to-face, ensuring inclusivity of workers with limited literacy. Semi-structured interviews were conducted with 30 key informants, including union leaders, local government officials, and family members of workers, to provide qualitative insights into migration dynamics.

Ethical Considerations

Ethical approval was obtained from the University. Informed consent was secured from all participants, who were assured of confidentiality and anonymity. Participation was voluntary, and respondents were free to withdraw at any stage. Sensitive questions regarding wages and household debt were handled with care, ensuring respondents' comfort and trust.

Data Analysis

Quantitative data were analyzed using SPPS. Descriptive statistics (frequencies, means, and standard deviations) were used to profile the workforce. Inferential statistics, including correlation and regression analysis, were employed to examine relationships between socio-demographic variables and migration intentions. Factor analysis was conducted to identify clusters of influencing factors, while chi-square tests assessed associations between categorical variables.

Theoretical Framework

The study was grounded in migration and rural development theories, particularly Todaro's (1969) model of rural-urban migration and Massey et al.'s (1993) push-pull framework. These models provided a lens to interpret how economic incentives, social attachments, and infrastructural conditions shape workers' decisions. Additionally, the study drew on the Sustainable Development Goals (SDGs) as a normative framework, linking findings to global development priorities such as decent work (SDG 8), reduced inequalities (SDG 10), and sustainable communities (SDG 11).

Limitations

While the study provides valuable insights, certain limitations must be acknowledged. Seasonal fluctuations in employment may have influenced workers' responses, and the purposive selection of districts limits generalizability to other regions. Moreover, reliance on self-reported data introduces potential biases. Nonetheless, the mixed-methods design and triangulation mitigate these limitations, ensuring credible and policy-relevant findings.

Results

Descriptive Analysis

The socio-demographic profile of sugar mill workers in Pakistan reveals patterns similar to those observed in other agro-industrial labor contexts. Table 1 presents the demographic characteristics of the respondents. The majority of households (72.3%) are male-headed, while female-headed households account for 27.7%. The age distribution indicates a predominantly middle-aged workforce, with 38.5% between 35–50 years, followed by 29.2% between 20–35 years. Educational attainment remains modest: 35.4% of respondents reported primary education, 27.7% had completed secondary schooling, while only 14.6% had attained higher secondary education. Alarmingly, 15.8% reported no formal education, underscoring the need for educational interventions.

Employment patterns show that 70.8% of workers are engaged full-time, while 29.2% are seasonal or part-time employees. Working hours are extended, with 31.5% reporting 12-hour shifts and 28.1% exceeding 12 hours daily. These findings highlight the precarious nature of industrial employment in rural Pakistan, where economic necessity often overrides welfare considerations.

Table 1:   *Demographic Status of Sugar Mill Workers (N = 260)*

Variable	Frequency	%
Gender of household head		
Male	188	72.3
Female	72	27.7
Age range		
Below 20	18	6.9
20–35 years	76	29.2
35–50 years	100	38.5
50–65 years	52	20.0
Above 65 years	14	5.4
Educational status		
No formal education	41	15.8
Primary education	92	35.4
Secondary (SSC)	72	27.7
Higher Secondary (HSC)	38	14.6
Bachelor's or above	17	6.5
Employment type		
Full-time	184	70.8
Seasonal/part-time	76	29.2
Working hours per day		
8 hours	32	12.3
10 hours	54	20.8
12 hours	82	31.5
>12 hours	73	28.1

Problem Facing Index

Respondents reported multiple challenges associated with migration and rural retention. Table 2 presents the problem-facing index, ranked by severity. Lack of institutional support from government or NGOs emerged as the most pressing issue (Rank 1), followed by inadequate credit facilities (Rank 2) and lack of livelihood capital (Rank 3). Food insecurity and clothing problems also ranked high, while educational disruption of children and societal acceptance issues were reported as relatively lower concerns.

Table 2:   *Problem Facing Index of Respondents Due to Migration*

Problems faced due to migration	High	Moderate	Low	None	Score	Rank
Our children did not get nutritional food	74	52	81	38	407	7
Lack of livelihood capitals	125	69	35	16	548	3
No support from government/NGOs	192	28	7	18	639	1
Clothing problem	70	73	93	9	449	5
Not enough food	92	52	94	7	474	4
Education of children negatively affected	31	83	24	107	283	10
Not enough credit facility	126	64	47	8	553	2
Lack of job facility	94	39	64	48	424	6

Shelter/accommodation problem	63	42	59	81	332	8
Societal acceptance problem	58	47	62	93	317	9

Effect of Factors on Workers' Intention to Remain in Rural Areas

Table 3 summarizes the effect of different factors on workers' intentions to stay in villages. Occupational factors (Rank 1) and welfare factors (Rank 2) exerted the strongest influence, with more than 80% of respondents rating them as having "too much impact." Social factors and educational/cultural factors also showed significant influence, while physical factors such as housing and infrastructure were moderately impactful.

Table 3:   *Effect of Factors on Workers' Intention to Remain in Rural Areas*

Measure Items	Very High	High	Moderate	Low	Very Low	Total	% Impact	Interpretation
Physical factors (2 items)	296 (60.4%)	64 (13.1%)	56 (11.4%)	38 (7.8%)	36 (7.4%)	490	76.3	Much impact
Social factors (3 items)	516 (70.2%)	69 (9.4%)	36 (4.9%)	54 (7.4%)	60 (8.2%)	735	78.9	Much impact
Educational & cultural factors (2 items)	250 (51.0%)	46 (9.4%)	82 (16.7%)	76 (15.5%)	36 (7.4%)	490	71.6	Much impact
Occupational factors (7 items)	1428 (83.3%)	84 (4.9%)	112 (6.5%)	63 (3.7%)	28 (1.6%)	1715	84.7	Too much impact
Welfare factors (7 items)	1288 (75.1%)	329 (19.2%)	49 (2.9%)	14 (0.8%)	35 (2.0%)	1715	81.4	Too much impact
Personal & family factors (6 items)	892 (68.5%)	176 (13.5%)	112 (8.6%)	72 (5.5%)	51 (3.9%)	1303	77.2	Much impact

The results suggest that sugar mill workers' retention in rural areas is primarily driven by occupational stability and welfare provisions, including wages, working hours, healthcare, and housing. Social cohesion and educational opportunities also play significant roles, while physical infrastructure remains a moderate but necessary condition. The problem-facing index highlights structural deficiencies—particularly lack of institutional support and credit facilities—that exacerbate migration pressures.

Together, these findings underscore the need for policy interventions that strengthen welfare systems, expand educational access, and improve rural infrastructure to ensure sustainable retention of sugar mill workers in villages.

Discussion

The findings of this study offer a nuanced understanding of the socio-economic, occupational, and infrastructural factors influencing sugar mill workers' intentions to remain in rural areas of Pakistan. The results reveal a complex interplay between economic necessity, social cohesion, institutional support, and personal aspirations, all of which shape migration

decisions in agro-industrial contexts. This discussion interprets the results in light of existing migration theories, development frameworks, and policy priorities.

1. Demographic Realities and Labor Composition

The demographic profile of sugar mill workers reflects a predominantly male-headed, middle-aged workforce with modest educational attainment. This aligns with previous studies in South Asia's agro-industrial sectors, where labor is largely drawn from rural populations with limited formal education (Hanif et al., 2020; Ahmad & Raza, 2023). The dominance of nuclear families and the prevalence of full-time employment suggest a degree of economic stability, yet the extended working hours—often exceeding 12 hours per day—raise concerns about labor exploitation and occupational health risks. These findings echo Atiqur & Sarker's (2021) study on rice mill workers in Bangladesh, which highlighted similar patterns of overwork and inadequate welfare provisions.

The educational disparities observed—where over 15% of respondents lacked formal schooling—underscore the structural barriers to upward mobility. Education is a critical determinant of migration, as evidenced by Basu et al. (2021), who found that higher education levels positively predict migration due to enhanced job prospects. In this study, however, the lack of education may act as both a push factor (limiting urban opportunities) and a retention factor (reducing mobility), suggesting the need for targeted educational interventions in rural mill communities.

2. Migration Challenges and Problem-Facing Index

The problem-facing index reveals that the most severe challenge faced by workers is the lack of institutional support from government and non-governmental organizations. This finding is consistent with Ghimira et al. (2019), who emphasized the role of institutional neglect in exacerbating rural vulnerabilities. The absence of credit facilities (Rank 2) and livelihood capital (Rank 3) further compounds economic insecurity, limiting workers' ability to invest in productive assets or withstand seasonal shocks.

Food insecurity, clothing shortages, and inadequate shelter also emerged as significant concerns, reflecting the precarious living conditions of rural industrial workers. These issues resonate with the findings of Mannan et al. (2022), who documented the negative impact of mill-related pollution and poor infrastructure on worker health and wellbeing. Interestingly, societal acceptance and educational disruption ranked lower in severity, suggesting that workers may prioritize immediate survival needs over long-term aspirations—a pattern commonly observed in low-income labor contexts (Majumder & Rahman, 2023).

The cumulative effect of these challenges indicates that migration is not merely a voluntary choice but often a response to systemic deprivation. The push-pull framework (Todaro, 1969; Massey et al., 1993) remains relevant here, with push factors such as poverty, lack of services, and institutional neglect outweighing the pull of urban opportunities for many workers.

3. Retention Factors and Intentions to Stay

The analysis of retention factors reveals that occupational and welfare dimensions exert the strongest influence on workers' decisions to remain in villages. Occupational factors—including job stability, wages, and working conditions—received the highest impact score (84.7%), followed closely by welfare factors such as healthcare, housing, and access to utilities (81.4%). These findings affirm the centrality of decent work in rural retention, aligning with SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities).

Social factors (78.9%) and personal/family considerations (77.2%) also play significant roles, highlighting the importance of community ties, familial obligations, and cultural attachments.

This supports the argument made by Hossain et al. (2016), who found that many rural migrants in Bangladesh expressed a desire to return to villages post-retirement due to urban strains and loss of social cohesion. In Pakistan's context, where rural identity and kinship networks remain strong, these factors may act as buffers against migration pressures.

Physical infrastructure (76.3%) and educational/cultural opportunities (71.6%) were moderately impactful, suggesting that while these elements are important, they are not decisive in isolation. The relatively lower impact of educational factors may reflect the limited availability of quality schooling in rural areas, which reduces their perceived value among workers. However, improving these conditions could have long-term benefits for intergenerational mobility and rural development.

4. Theoretical Integration

The results of this study align well with established migration theories. Todaro's (1969) model posits that migration decisions are based on expected income differentials and employment probabilities, which is evident in the strong influence of occupational and welfare factors. Massey et al.'s (1993) push-pull framework is also validated, with push factors such as lack of support and credit access driving migration, while pull factors like job stability and social cohesion encourage retention.

Moreover, the findings resonate with the human development perspective outlined in the UNDP Human Development Report (2019), which emphasizes the role of capabilities, choices, and freedoms in shaping migration. Workers' decisions to stay in villages are not merely economic but also reflect their aspirations for dignity, security, and community belonging.

5. Policy Implications

The study's findings have significant implications for rural development policy in Pakistan. First, there is an urgent need to strengthen institutional support mechanisms, including access to credit, social protection, and government outreach programs. The high ranking of these issues in the problem-facing index suggests that targeted interventions could substantially reduce migration pressures.

Second, improving labor conditions in sugar mills—through regulation of working hours, wage enhancement, and occupational health services—could enhance retention and productivity. This aligns with SDG 8 and supports the broader goal of inclusive industrialization under SDG 9.

Third, investments in rural infrastructure, education, and healthcare are essential to address the moderate-impact factors identified in the study. These measures would not only improve living standards but also create a more enabling environment for long-term rural settlement.

Finally, fostering community-based development models that leverage social cohesion and family networks could enhance the sustainability of retention strategies. By integrating economic, social, and cultural dimensions, policymakers can design holistic interventions that reflect the lived realities of rural industrial workers.

6. Limitations and Future Research

While the study provides valuable insights, certain limitations must be acknowledged. The sample was drawn from selected districts, which may limit generalizability. Seasonal variations in employment and migration patterns were not fully captured, and self-reported data may be subject to bias. Future research could adopt longitudinal designs to track migration trajectories over time and incorporate comparative analyses across different agro-industrial sectors.

Moreover, qualitative studies exploring workers' narratives and aspirations could enrich the understanding of migration dynamics. Integrating gender perspectives and examining the role of women in rural labor and migration decisions would also be a valuable extension.

In conclusion, this study underscores the multifaceted nature of migration and rural retention among sugar mill workers in Pakistan. By highlighting the critical role of occupational stability, welfare provisions, and institutional support, it offers actionable insights for policymakers, industry stakeholders, and development practitioners. Addressing these factors through targeted interventions and inclusive strategies can contribute to sustainable rural development and enhance the wellbeing of industrial laborers across Pakistan's agro-economy.

References

Ahmad, N., & Raza, S. (2023). Socio-economic characteristics of agro-industrial workers in Pakistan: A case study of Punjab. *Journal of Rural Development Studies*, 45(2), 112–130.

Altaf, N. (2024). Socio-Economic Determinants of Migration in Pakistan. *Journal of Excellence in Social Sciences*, 3(1), 19–32.

Al-Maruf, M., Rahman, M., & Sultana, T. (2022). Determinant factors of farmers' rural-urban migration in Bangladesh: Evidence from Q-methodology. *Asian Journal of Migration Studies*, 8(1), 55–72.

Basu, S., Hossain, M., & Karim, A. (2021). Household welfare and rural-urban migration in South Asia: Evidence from Bangladesh. *Migration and Development*, 10(3), 345–362.

Fatima, S. A., & Shahid, I. (2017). Occupational health and safety conditions of a sugar mill in Pakistan. *Journal of Biodiversity and Environmental Sciences*, 11(1), 97–104.

Gatti, R. (2020). *Addressing Infrastructure Gaps for Inclusive Growth*. World Bank Policy Paper.

Ghimira, R., Shrestha, P., & Adhikari, K. (2019). Economic factors shaping migration intentions among rural workers in South Asia. *International Journal of Migration Research*, 15(4), 221–238.

Government of Pakistan. (2023). *Pakistan Economic Survey 2022–23*. Ministry of Finance, Islamabad.

Hanif, M., Rahman, S., & Akhtar, M. (2020). Push and pull factors influencing rural-urban migration of agricultural laborers in Khulna district. *Bangladesh Journal of Agricultural Economics*, 43(1), 77–95.

Hasan, M. R., Rabbani, M. G., Ahmad, B., Selim, S., Hossain, M. A., & Jonah, E. (2025). Migration and influencing factors of auto rice mill workers' intentions to stay in villages: An empirical study in Dinajpur District. *Journal of Bangladesh Agricultural University*, 23(1), 71–84.

Hossain, M., et al. (2016). Rural-urban migration in Bangladesh: A household-level analysis. *Bangladesh Development Studies*, 39(2), 45–67.

ICMA Pakistan. (2018). *Sector Brief: Sugar Industry in Pakistan*. Institute of Cost and Management Accountants of Pakistan.

International Organization for Migration (IOM). (2021). *World Migration Report 2022*. Geneva: IOM Publications.

Khan, M., & Hussain, A. (2022). Sugar industry and rural employment in Pakistan: Trends and challenges. *Pakistan Journal of Agricultural Economics*, 35(2), 89–104.

Khan, M., & Illiyan, A. (2023). Push and pull factors of migration in India: A statistical analysis. *Indian Journal of Population Studies*, 28(1), 77–95.

Massey, D. S., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., & Taylor, J. E. (1993). Theories of international migration: A review and appraisal. *Population and Development Review, 19*(3), 431–466.

Pirzada, A. J., Shahid, N., & Ghauri, R. T. (2023). The ongoing crisis in the sugar industry: The implications of legislation and a need for deregulation. *The Pakistan Development Review, 62*(4), 553–572.

Todaro, M. P. (1969). A model of labor migration and urban unemployment in less developed countries. *American Economic Review, 59*(1), 138–148.